

# Boundless Economics

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# 1.1: The Study of Economics

## 1.1.1: The Magic of the Economy

The study of economics makes individuals cognizant of their environment and better decision makers.

### Learning Objective

Explain how the study of economics provides knowledge to understand the system and policies that guide life.

### Key Points

- Economics also allows individual agents to balance expectations.
- Economics provides distilled frameworks to analyze complex societal interactions, as in the case of consumer and firm behavior.
- Being knowledgeable about economics foundations allows an individual to be an active and aware participant rather than a passive economic agent.

### Key Terms

circular flow

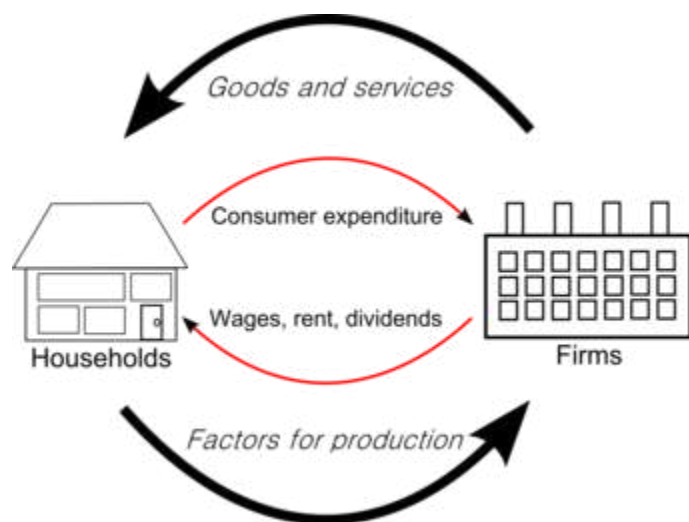
A model of market economy that shows the flow of dollars between households and firms.

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

Economics is a social science. This means that economics has two important attributes. Economics studies human activities and constructions in environments with scarce resources, and uses the scientific method and empirical evidence to build its base of knowledge.

The evaluation of human interactions as it relates to preferences, decision making, and constraints is a significant foundation of economic theory. The complexity of the dynamics of human motivation and systems has led to the establishment of assumptions that form the basis of the theory of consumer and firm behavior, both of which are used to model circular flow interactions within the economy .



## Circular Flow of the Economy

Economics provides an accessible foundation for understanding the complexity of the interactions in the world. For example, the circular flow diagram displays the economic framework related to the dynamic interconnectedness of economic agents. In the graph above the display is limited to households and firms but other depictions of circular flow incorporate the government and international trading partners.

Economics provides distilled frameworks to analyze complex societal interactions, as in the case of consumer and firm behavior. An understanding of how wages and consumption flow between consumers and producers provides agents with an ability to understand the symbiosis of the



relationship rather than fixating on the contentious components that surface from time to time.

Economics also allows individual agents to balance expectations. An understanding of the ebb and flow of the economy through the boom and bust of the business cycles, creates the potential for emotional balance by reminding agents to limit desperation in downturns and exuberance in expansions.

By developing an understanding of the foundations of economics, individuals can become better decision makers with respect to their own lives and maintain a balance with respect to an externality that has the potential to supplement or deter their plans. Since economic theories are a basis of decision making and regulatory policy, being knowledgeable about economics foundations allows an individual to be an active and aware participant rather than a passive economic agent.

## **1.1.2: Is Economics a Science?**

Economics is a social science that has diverse applications.

### **Learning Objective**

Explain how economic theory and analysis can be applied throughout society

### **Key Points**

- Economics incorporates both qualitative and quantitative assessment.
- Economics is divided into two broad areas: microeconomics and macroeconomics.
- Economics can be applied throughout society from business to individual behavior with further application in the study of crime, family and other social institutions and interactions.

### **Key Term**

social science

A branch of science that studies the society and human behavior in it, including anthropology, communication studies, criminology, economics, geography, history, political science, psychology, social studies, and sociology.

### **Example**

- Market interaction between buyers and sellers is an evaluation of social behavior in an activity where each agent is seeking to maximize return and minimize cost. This is a classic scenario of economics, involving social interaction (qualitative) with optimization (quantitative).

Economics is a social science that assesses the relationship between the consumption and production of goods and services in an environment of finite resources. A focus of the subject is how economic agents behave or interact both individually (microeconomics) and in aggregate (macroeconomics).

Microeconomics examines the behavior individual consumers and firms within the market, including assessment of the role of preferences and constraints. Macroeconomics analyzes the entire economy and the issues affecting it. Primary focus areas are unemployment, inflation, economic growth, and monetary and fiscal policy.

The discipline of economics evolved in the mid-19th century through the combination of political economy, social science and philosophy and gained entrenchment with the increased scrutiny of the asymmetric financial and welfare distribution attributed to sovereign rule. Early writings are attributable to Jeremy Bentham, David Ricardo, John Stuart Mill and his son John Mill and are focused on human welfare and benefits rather than capitalism and free markets .



## Founders of Economics

John Stuart Mill, along with David Ricardo, Jeremy Bentham and other political and social philosophers of the mid-nineteenth century are credited with the founding of the social-political theory that has evolved to be the discipline of economics.

As in other social sciences, economics does incorporate mathematics in the theoretical and analytics framework of the discipline. Formal economic modeling began in the 19th century with the use of differential calculus to represent and explain economic behavior, such as utility maximization, an early economic application of mathematical optimization in microeconomics. Economics utilizes mathematics to assess the relationships between economic actors in environments in which resources are finite.

The use of mathematics in economics increased the quantitative analysis inherent in the discipline; however, given the discipline's essentially social science roots, many economists from John Maynard Keynes to Robert Heilbroner and others criticized the broad use of mathematical models for human behavior, arguing that some human choices can not be modeled or evaluated in a mathematical equation.

Economic theory and analysis may be applied throughout society, including business, finance, health care, and government. The underlying components of economic theory can also be applied to variety of other subjects, such as crime, education, the family, law, politics, religion, social institutions, war, and science.

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# 1.2: Individual Decision Making

## 1.2.1: Scarcity Leads to Tradeoffs and Choice

When scarce resources are used, actors are forced to make choices that have an opportunity cost.

### Learning Objective

Give examples of economic trade-offs.

### Key Points

- Scarce resources diminish as they are used and almost all resources are scarce.
- In order to use a scarce resource, you are inherently using the resource for one purpose and not an alternative.
- The cost of using a resource is called the opportunity cost: the value of the next best alternative that you could be using the resource for instead.

### Key Terms

Scarce

Insufficient to meet demand.

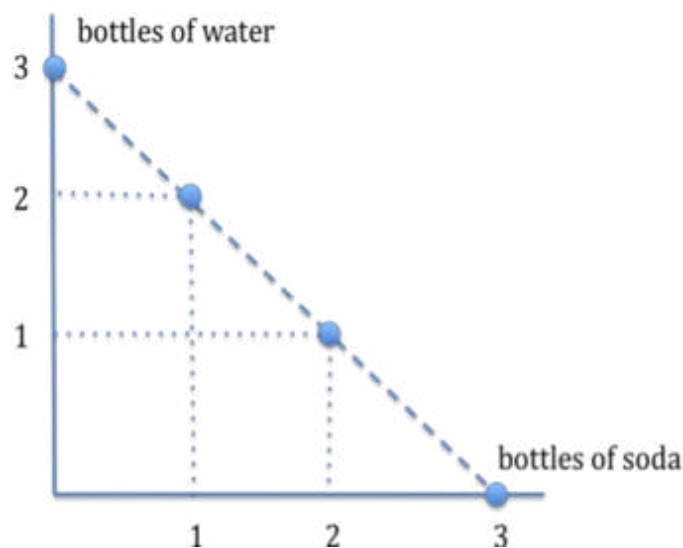
Opportunity cost

The value of the best alternative forgone.

A fundamental concept in economics is that of scarcity. In contrast to its colloquial usage, scarcity in economics connotes not that something is nearly impossible to find, but simply that it is not unlimited. For example, the number of available hours in a day is a scarce resource: there is a finite

amount of time available to you to do work, hang out with friends, and relax. Most resources are scarce in most situations.

Since resources tend to be scarce, anyone that uses the resource has to make a decision about how to use it. Suppose, for example, that you are a drink manufacturer. To produce a beverage, you have to use some scarce resources: the plastic for the bottle, the workers' time, a machine to fill the bottles, etc. If you choose to make one bottle of water, you have chosen to not make a bottle of soda. Your scarce resources force you to make a choice and a trade-off producing one product or another.



## Tradeoffs

Since resources are scarce for a drink manufacturer, it must make a tradeoff between producing bottles of water and bottles of soda.

Like producers, consumers also have to make choices. Often, consumer must choose between current consumption ("I want to buy an ice cream") and future consumption ("I should rather save my money so I can buy an ice cream tomorrow"). Since consumers' resources such as time, attention, and money are limited, they must choose how to best allocate them by making tradeoffs.

The concept of trade-offs due to scarcity is formalized by the concept of opportunity cost. The opportunity cost of a choice is the value of the best

alternative forgone. In other words, if you can only produce bottles of soda and water, the opportunity cost of producing a bottle of water is the value of producing a bottle of soda. Similarly, there is an opportunity cost in everything: the opportunity cost of you reading this is what you could be doing with your time instead (say, watching a movie). When scarce resources are used (and just about everything is a scarce resource), people and firms are forced to make choices that have an opportunity cost.

## 1.2.2: Individuals Face Opportunity Costs

Individuals face opportunity costs when they choose one course of action over another.

### Learning Objective

Distinguish between explicit costs and opportunity costs

### Key Points

- The opportunity cost is the value of the next best alternative foregone.
- Every decision necessarily means giving up other options, which all have a value.
- The opportunity cost is the value one could have derived from using the same resources another way, though this is not always easily quantifiable.

### Key Term

#### Opportunity Costs

The value of the best alternative forgone, in a situation in which a choice needs to be made between several mutually exclusive alternatives given limited resources.

When individuals make decisions, they are necessarily deciding between taking one course of action over another. In doing so, they are choosing both what to do and, by extension, what *not* to do. The value of the next best



choice forgone is called the opportunity cost. In other words, the opportunity cost of a course of action is the value of the option that the individual chose not to take.

Individuals face opportunity costs in both economic and non-economic decisions. One of the easiest way to imagine an individual's opportunity costs is to imagine a student who decides to study. By choosing to study, the student is implicitly choosing to not go to a party, hang out with friends, or catch up on some much-needed sleep . In this example, the opportunity cost is not easily expressed in dollars and cents, but is just as real.



## **Opportunity Cost**

By choosing to go to spend time and money on things like classes and computers, you are necessarily choosing not to spend it on something else, like going on vacation. This is an opportunity cost.

Rational individuals will try to minimize their opportunity costs. By doing so, individuals are maximizing the amount that they can get out of their resources (time, money, effort, etc.). This makes sense: individuals should seek to get the most and give up the least.

As economic actors, individuals face opportunity costs as well. For example, suppose you decide to purchase a new computer. You could have chosen to spend your money on books or rent or a spring break trip; whichever one of those options is most valuable to you (beside purchasing a new computer) is the opportunity cost.

Such logic applies for every economic decision: purchasing one good means that an individual has chosen to spend resources one way instead of another. Opportunity costs are an important consideration for economists and business people, but are faced by individuals even when they are not making classically economic decisions.

### **1.2.3: Individuals Make Decisions at the Margins**

Individuals will choose the option that yields the greatest net marginal benefit.

#### **Learning Objective**

Apply the concepts of marginal analysis and utility to decision-making

#### **Key Points**

- The marginal cost or benefit is the amount that a decision will change the total cost or benefit from where it is currently.
- Individuals will make choice that maximizes the net marginal benefit (marginal benefit - marginal cost).
- While total or average cost and benefit are important, provided enough resources, individuals will look only at the net marginal benefit.

#### **Key Terms**

marginal cost

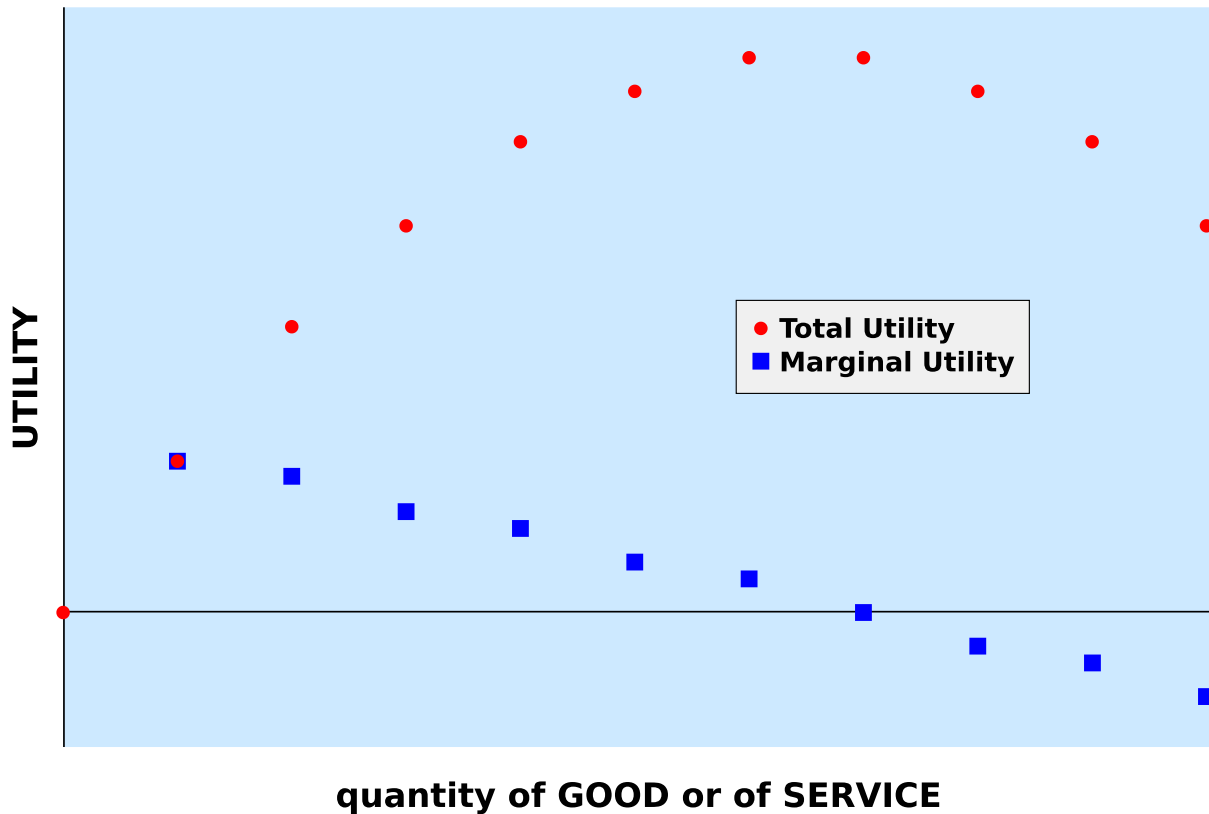
The additional cost from taking a course of action.

marginal benefit

The additional benefit from taking a course of action.

When individuals make decisions, they do so by looking at the additional cost and benefit of the decision. The cost or benefit of the single decision is called the marginal cost or the marginal benefit. This is different from the

total or average: net marginal benefit (marginal benefit minus marginal cost) is the amount that total benefit will change due to the single decision. For example, if the cost of making 9 pieces of pizza is \$90 and the cost of making 10 pieces is \$110, the marginal cost of producing the tenth piece of pizza is \$20. In theory, individuals will only choose an option if marginal benefit exceeds marginal cost.



## Marginal and Total Utility

Marginal utility is the amount that a certain action will change total utility. Individuals use net marginal utility to make decisions.

Let's take an example. Suppose you are buying a car and have three choices:

1. Car A, which costs \$10,000
2. Car B, which costs \$12,000
3. Car C, which costs \$15,000

The prices represent the marginal costs of each car; purchasing the car will add the cost of the car to your total costs. Also suppose Car A provides you \$15,000 worth of utility, Car B provides \$15,000, and Car C provides \$25,000. Those utilities, in dollar terms, are the marginal benefit of each car.

In order to make the decision, you look at the marginal cost and marginal benefit of each car. By subtracting the cost from the benefit, Car A offers \$5,000 of marginal benefit, Car B offers \$3,000, and Car C offers \$10,000. Obviously, Car C is the best choice because, at the margins, it offers the most benefit to you.

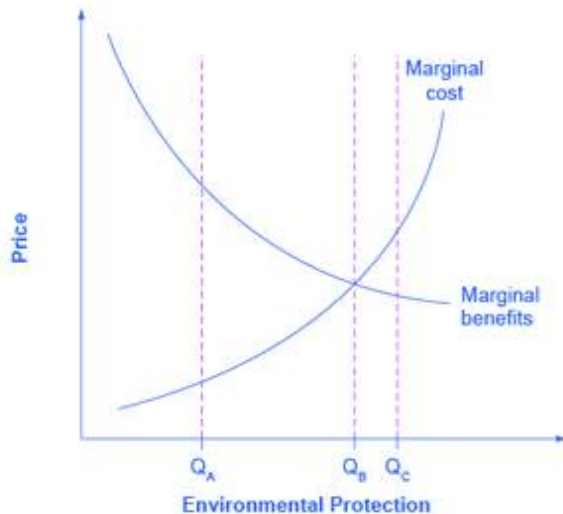
Note that you are concerned not with your total or average cost and benefit (assuming no resource or other external restrictions), but with the marginal cost and benefit. As a decision maker, you want to know how much the decision will change your current state, so you look at the margins, not the overall picture. That is not to say that things like the total cost are unimportant, but that, assuming there are enough resources, individuals will look at the marginal change each option will provide to his/her life or to the firm and chose the one with the greatest net marginal benefit.

## Marginal Benefits and Costs for Pollution

The tools of marginal analysis can illustrate the marginal costs and the marginal benefits of reducing pollution. When the quantity of environmental protection is low (quantity ) and pollution is extensive, there are cheap and easy ways to reduce pollution, and the marginal benefits of doing so are quite high. At , it makes sense to allocate more resources to fight pollution.

However, as environmental protection increases, the cheap and easy ways of reducing pollution decrease, and pollution can only be reduced with costly methods. In other words, the largest marginal benefits are achieved first, followed by decreasing marginal benefits. As the quantity of environmental protection increases to , the gap between marginal benefits and marginal

costs decreases. At point  $Q_C$ , the marginal costs will exceed the marginal benefits. At this level of environmental protection, society is not allocating resources efficiently, because too many resources are being given up to reduce pollution.



## Marginal Costs and Marginal Benefits of Environmental Protection

Reducing pollution is costly—resources must be sacrificed. The marginal costs of reducing pollution are generally increasing, because the least expensive and easiest reductions can be made first, leaving the more expensive methods for later. The marginal benefits of reducing pollution are generally declining, because the steps that provide the greatest benefit can be taken first, and steps that provide less benefit can wait until later.

### 1.2.4: Individuals Respond to Incentives

Incentives are ways to encourage or discourage certain behaviors or choices.

#### Learning Objective

Predict how pay incentives will influence a person's work performance

## Key Points

- Price is one of the main incentives studied in economics. Price incentivizes producers to supply a certain amount, and consumers to purchase a certain amount.
- Economics is mainly concerned with studying remunerative incentives (those that concern material reward).
- Individuals, firms, and governments all change incentives in hopes of encouraging desired outcomes.

## Key Terms

### Incentive Structure

The cumulative set of promised rewards and/or punishments that encourage actors to make a set of decisions.

### incentive

Something that motivates an individual to perform an action.

An incentive is something that motivates an individual to perform an action. The study of incentive structures is central to the study of all economic activities (both in terms of individual decision-making and in terms of cooperation and competition within a larger institutional structure).

Perhaps the most notable incentive in economics is price. Price acts as a signal to suppliers to produce and to consumers to buy. For example, a sale is nothing more than a store providing an incentive to potential customers to buy. The lowering of the price makes the purchase a better idea for some customers; the sale seeks to persuade individuals to change their actions (namely, to buy the product).



## **Sales are Incentives**

Sales are incentives for consumers to buy, because firms know consumers generally respond to lower prices by purchasing more.

Similarly, the increase in price acts as an incentive to suppliers to produce more of a good. If suppliers think they can sell their products for more, they will be inclined to produce more. The price acts, therefore, as an incentive to customers to buy and suppliers to produce.

## **Types of Incentives**

Incentives come in many other forms, however. Broadly, most incentives can be grouped into one of four categories:

- **Remunerative incentives:** The incentive comes in the form of some sort of material reward – especially money – in exchange for acting in a particular way. Wages, prices, and bribery are all examples of remunerative incentives. This is the type of incentive that is typically associated with economics.
- **Moral incentives:** This occurs when a certain choice is widely regarded as the right thing to do, or as particularly admirable, or where the failure to act in a certain way is condemned as indecent. Societies and cultures are two main sources of moral incentives.
- **Coercive incentives:** The incentive is a promise of some sort of punishment if the wrong decision is made. For example, the promise of imprisonment is a coercive incentive for people to not steal.
- **Natural Incentives:** Things such as curiosity, mental or physical exercise, admiration, fear, anger, pain, joy, the pursuit of truth, and a sense of control of people or oneself can cause individuals to make certain decisions.

Economics is mainly concerned with remunerative incentives, though when discussing government regulations, coercive incentives often come into play. By manipulating incentives, individuals (as well as businesses and governments) hope to encourage some behaviors and discourage others.

## **Incentives and Performance**

Companies leverage incentives-based strategies to drive performance and optimize employee decision-making and behaviors through meaningful reward systems. While there are both advantages and drawbacks to this type of approach, remunerative (financial) incentives are highly attractive options for employers in a variety of industries and businesses. Providing incentives such as variable income, where an individual can obtain more personal rewards for successfully creating a product or making a sale, often drives up production for highly motivated employees.

An example of this would be a manufacturing facility making widgets. The floor manager shifts the wage system from an hourly wage perspective to a straight piece rate system. The more widgets a worker creates, the higher his or her prospective income will be. Under this incentive system less



productive workers may stay the same, but highly productive workers will respond by increasing their production.

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# 1.3: Interaction of Individuals, Firms, and Societies

## 1.3.1: Introducing the Firm

Firms allow an economy to operate more efficiently and reduce the transaction costs of coordinating production.

### Learning Objective

Explain the importance of private companies and firms in the economy

### Key Points

- Firms generally appear and become prevalent as an alternative to individual trade when it is more efficient to produce in a non-market environment.
- Limited liability separates the management of a firm from its ownership, allowing companies to raise money easily because owners do not need to risk everything in the case of bankruptcy.
- Most industries experience increasing returns to scale up to a point, which means that more goods can be produced using fewer resources.
- According to Ronald Coase, the main reason to establish a firm is to avoid some of the transaction costs of using the price mechanism.

### Key Terms

increasing returns to scale

The characteristic of production in which output increases by more than the proportional increase in inputs.

firm

A business enterprise, however organized.

"Firm" is simply another word for company or business. The basic economic marketplace consists of transactions between households and firms. Firms use factors of production - land, labor, and capital - to produce goods that are consumed by households. They may be organized in many different ways - corporations, partnerships, sole proprietorships, and collectives are all examples of firms. Economists who study the theory of the firm attempt to describe, explain, and predict the nature of a firm, including its existence, behavior, structure, and relationship to the market.

## **The Evolution of the Firm**

Not all markets and societies involve firms. In many medieval cities, most production was done by individual craftsmen who were loosely organized into guilds, or by tenant farmers who rented family-sized plots of land. Transactions took place primarily between individuals.

Firms generally appear and become prevalent as an alternative to individual trade when it is more efficient to produce in a non-market environment. For example, in a labor market, it might be too difficult or costly for firms or organizations to engage in production when they have to hire and fire their workers depending on demand/supply conditions. While the advantages of consolidation for efficiency are potentially many and varied, the underlying concept is that integrating operational paradigms enables potential synergy via the construct of a firm.

Firms also allow economic growth, not only for the firm but for the broader society in which it resides. Through separating the business from the individual(s) who starts it, the funding, insurance and liability of a firm can function independently of a person. The separation of a firm from the individual also allows more specifically applicable regulations and laws, broader accumulation of investment capital and more complex strategic alliances. While the detailed implications of a firm and its relationship with individuals and society are complex, the important takeaway is that firms play an integral role in economic structure.



## **The Firm**

Organizing production under firms reduces the transaction costs of coordinating production in the market.

## **The Transaction Theory of the Firm**

According to Ronald Coase, people begin to organize their production in firms when the transaction cost of coordinating production through the market exchange is greater than within the firm. He notes that a firm's

interactions with the market may not be under its control (for instance because of sales taxes), but its internal allocation of resources are: "Within a firm, ... market transactions are eliminated and in place of the complicated market structure with exchange transactions is substituted the entrepreneur ... who directs production." He asks why alternative methods of production (such as the price mechanism and economic planning), could not either achieve all production, so that either firms use internal prices for all their production, or one big firm runs the entire economy.

For Coase the main reason to establish a firm is to avoid some of the transaction costs of using the price mechanism. These include discovering relevant prices (which can be reduced but not eliminated by purchasing this information through specialists), as well as the costs of negotiating and writing enforceable contracts for each transaction (which can be large if there is uncertainty). Moreover, contracts in an uncertain world will necessarily be incomplete and have to be frequently re-negotiated. The costs of haggling about division of surplus, particularly if there is asymmetric information and asset specificity, may be considerable. Organization into a firm can considerably reduce these costs.

## **1.3.2: Trade Leads to Gains**

Producers and consumers trade because the exchange makes both parties better off.

### **Learning Objective**

Explain why parties trade.

### **Key Points**

- The benefit of exchange to producers is measured by the profit the producer makes. The benefit of exchange to a consumer is measured by net utility gained.
- Consumer surplus is the monetary gain obtained by consumers because they are able to purchase a product for a price that is less than the

- highest price that they would be willing to pay.
- Producer surplus is the amount that producers benefit by selling at a market price that is higher than the least that they would be willing to sell for.
  - An allocation of resources is Pareto efficient when it is impossible to make any one individual better off without making at least one individual worse off.

## Key Terms

### utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

### consumer surplus

The difference between the maximum price a consumer is willing to pay and the actual price they do pay.

### producer surplus

The amount that producers benefit by selling at a market price that is higher than the lowest price at which they would be willing to sell.

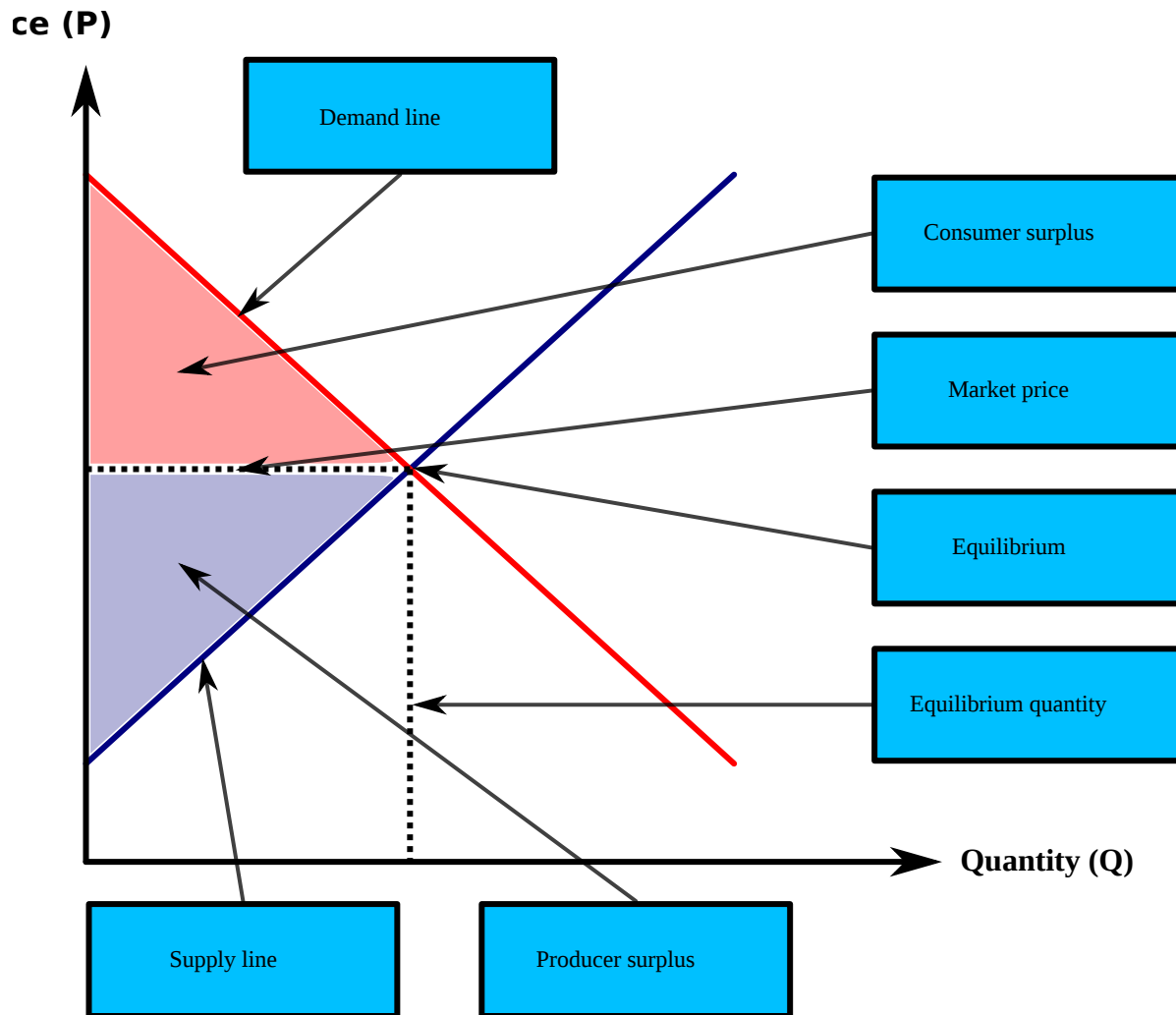
Producers and consumers trade because the exchange makes both parties better off. The benefit of exchange to producers is measured by the amount of profit – that is, the difference between the average cost of producing an item and the price received for that item. The benefit of exchange to a consumer is measured by net utility gained. This is measured by taking the difference between the maximum price a consumer is willing to pay and the actual price they do pay. To understand this, imagine purchasing a car. You would be willing to pay up to \$15,000 for a car in good condition, but you are able to buy one for only \$12,000. Since you value the car at \$3,000 more than you paid for it, \$3,000 is the benefit that you gained from the transaction.



Economists refer to these benefits from exchange as producer and consumer surplus. Consumer surplus is the monetary gain obtained by consumers because they are able to purchase a product for a price that is less than the highest price that they would be willing to pay. Producer surplus is the amount that producers benefit by selling at a market price that is higher than the least that they would be willing to sell for.

The amount of consumer and producer surplus that is gained from a transaction can be seen on a standard supply and demand graph. Consumer surplus is the area (triangular if the supply and demand curves are linear) above the equilibrium price of the good and below the demand curve. This reflects the fact that consumers would have been willing to buy a single unit of the good at a price higher than the equilibrium price, a second unit at a price below that but still above the equilibrium price, etc., yet they in fact pay just the equilibrium price for each unit they buy.

Likewise, in the supply-demand diagram, producer surplus is the area below the equilibrium price but above the supply curve. This reflects the fact that producers would have been willing to supply the first unit at a price lower than the equilibrium price, the second unit at a price above that but still below the equilibrium price, etc., yet they in fact receive the equilibrium price for all the units they sell. The sum of consumer and producer surplus is called economic, or social, surplus, and reflects the total amount of benefit received by society when consumers and producers trade.



## Consumer and Producer Surplus

Consumer surplus is the area between the demand line and the equilibrium price, and producer surplus is the area between the supply line and the equilibrium price.

## Exchange and Pareto Optimality

An allocation of resources is Pareto efficient when it is impossible to make any one individual better off without making at least one individual worse off. For example, imagine that two individuals prefer peanut butter and jelly sandwiches to a sandwich with only peanut butter or only jelly. A distribution in which Individual A has all of the peanut butter and

individual B has all of the jelly is not Pareto efficient, because both parties would be better off if they shared their resources.

Similarly, an action that makes at least one party better off without making any individual worse off is called a Pareto improvement. Any transaction in a free market always produces a Pareto improvement because it makes consumers and/or producers better off without making either party worse off (if this were not the case, the consumer and/or the producer would refuse to participate in the transaction in the first place). It is commonly assumed that outcomes that are not Pareto efficient are to be avoided, and if a Pareto improvement is possible it should always be implemented.

One way to look at whether a transaction is a Pareto improvement is to ask whether it increases consumer or producer surplus without decreasing either party's surplus. Lowering an item's price without changing the quantity sold, for example, may increase consumer surplus, but is not a Pareto improvement because producers suffer negative consequences.

### **1.3.3: Thinking about Efficiency**

An efficient market maximizes total consumer and producer surplus.

#### **Learning Objective**

Define economic efficiency.

#### **Key Points**

- Economists assume that firms seek to maximize their profits - defined as the difference between total revenue and total cost - while consumers seek to maximize their utility - which is roughly defined as the total satisfaction gained from goods, services, or actions.
- An efficient allocation of resources maximizes total consumer and producer surplus.
- Because they produce efficient outcomes, the seemingly haphazard workings of the marketplace can promote the common good.

- Efficiency is but one of many vying goals in an economic system, and different notions of efficiency may be complementary or may be at odds.

## **Key Terms**

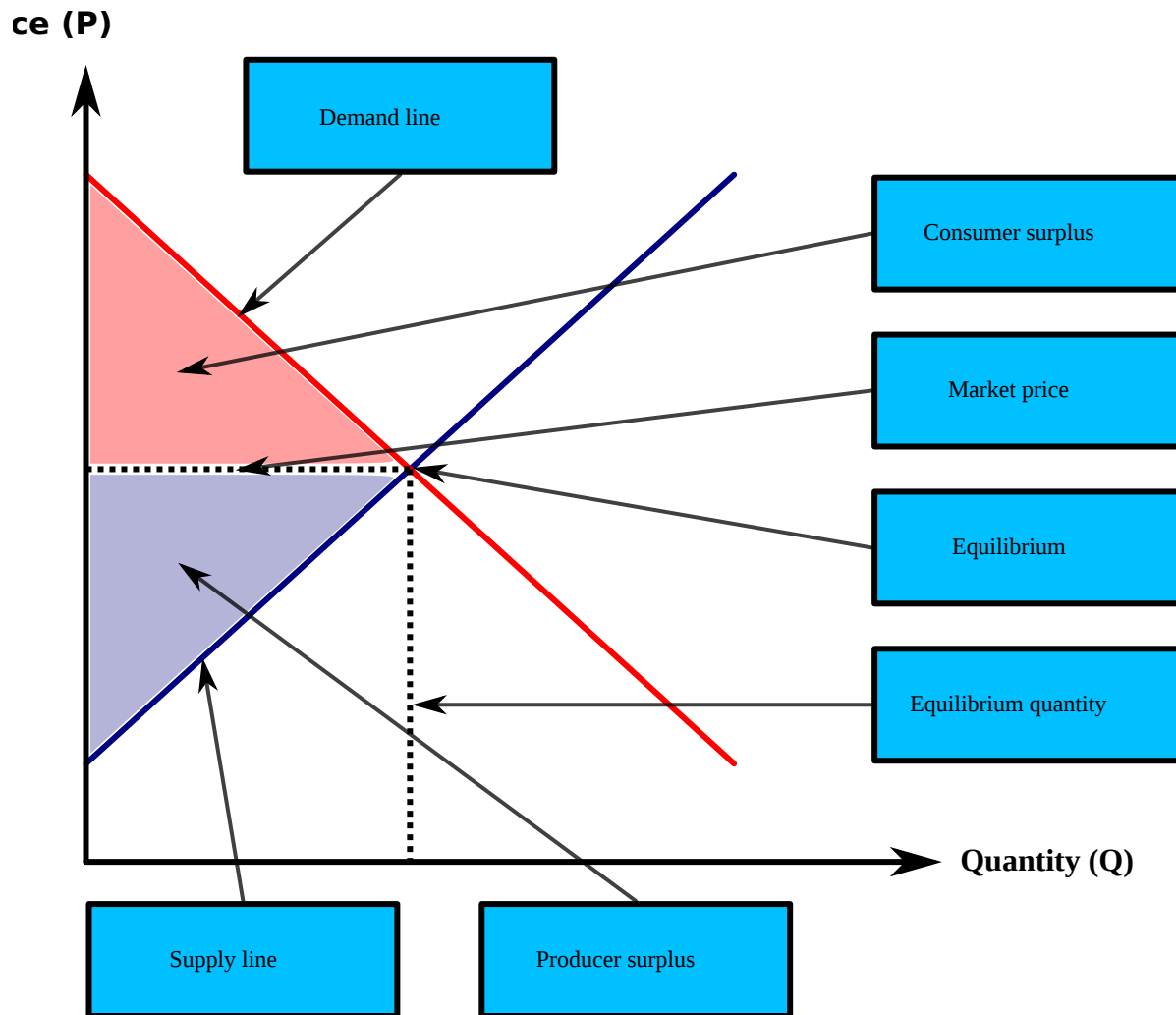
producer surplus

The amount that producers benefit by selling at a market price that is higher than the lowest price at which they would be willing to sell.

consumer surplus

The difference between the maximum price a consumer is willing to pay and the actual price they do pay.

Every economic transaction has a buyer and a seller who will only participate if she is receiving at least a minimum benefit. These benefits are represented as consumer surplus and producer surplus, respectively. In , both types of surpluses are displayed graphically. An efficient market maximizes total consumer and producer surplus.



## Consumer and Producer Surplus

Consumer and producer surplus are maximized at the market equilibrium - that is, where supply and demand intersect.

The market shown in is one without any distortions such as regulations, taxes, or an inability for buyers to meet sellers. It is subject to what Adam Smith described as the *invisible hand*: if the price is anything except the equilibrium price, market forces will eventually return the market price to equilibrium .

Not all markets are efficient. There are a number of reasons why a market may be inefficient. Perhaps most well known is inefficiency caused by government intervention. Governments can institute any number of policies

that prevent markets from achieving the free market equilibrium price and quantity: taxes raise prices, quotas limit the quantity sold, and regulations affect the supply and demand curves. Market inefficiency can also be caused by things such as irrational market actors and barriers to transactions, such as an inability for buyers and sellers to find one another.

Economists often seek to maximize efficiency, but it is important to contextualize such aims. Efficiency is but one of many vying goals in an economic system, and different notions of efficiency may be complementary or may be at odds. Most commonly, efficiency is contrasted or paired with morality, particularly liberty, and justice. Some economic policies may be seen as increasing efficiency at a cost to other goals or values, though this is certainly not a universal tradeoff. For example, taxation will always cause some inefficiency in markets, but many individuals believe that the benefits of programs such as Social Security and public schooling are worth the loss in efficiency.

### **1.3.4: The Function and Nature of Markets**

In a free market, the price and quantity of an item are determined by the supply and demand for that item.

#### **Learning Objective**

Summarize the defining characteristics of a free market economy

#### **Key Points**

- A market is defined as a system or institution whereby parties engage in exchange. A market economy is an economy in which decisions regarding investment, production, and distribution are based on supply and demand, and prices of goods and services are determined in a free price system.
- In a perfectly competitive market there are many buyers and sellers so no individual actor may affect a good's price; there are no barriers to

exit or entry; products are homogeneous; and all actors in the economy have perfect information.

- Changes to the market supply and market demand will cause changes in the equilibrium price and quantity of the good produced.
- When markets are perfectly competitive, the equilibrium outcome of trade in the market is economically efficient. This means that the market is producing the largest net gain possible for society, given consumers' utility functions and producers' production functions.

## Key Terms

### equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

### market economy

An economy in which goods and services are exchanged in a free market, as opposed to a state-controlled or socialist economy; a capitalistic economy.

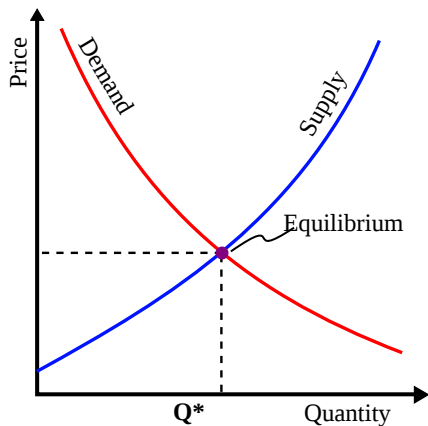
In economics, a market is defined as a system or institution whereby parties engage in exchange. A market economy is an economy in which decisions regarding investment, production, and distribution are based on supply and demand, and prices of goods and services are determined in a free price system. The major defining characteristic of a market economy is that decisions on investment and the allocation of producer goods are mainly made through markets. This is the opposite of a planned economy, where investment and production decisions are embodied in a plan of production.

A free market is a market structure that is not controlled by a designated authority. Free markets may have different structures: perfect competition, oligopolies, monopolistic competition, and monopolies are all types of markets that may exist in a capitalist economy. The most basic models in economics assume that markets are free and experience perfect competition - there are many buyers and sellers so no individual actor may affect a

good's price; there are no barriers to exit or entry; products are homogeneous; and all actors in the economy have perfect information.

## Market Equilibrium

In a free market, the price and quantity of an item is determined by the supply and demand for that item. The market demand function describes the amount of a good that all consumers will purchase at a given price, while the market supply function expresses the amount that producers will supply at a given price. Consider the market for computers. At a price of \$1,200, the market may demand 8,000 computers, while producers are willing to supply 15,000 computers. This is not the equilibrium price because at \$1,200, supply exceeds demand. In order to reach equilibrium, the price must drop, causing demand to rise and supply to fall until the two are equal. This can be expressed graphically by drawing the market supply function and the market demand function and finding the point where the two curves intersect .



## Market Supply and Demand

The market equilibrium exists where the market demand curve and the market supply curve intersect.

Changes to the market supply and market demand will cause changes in the equilibrium price and quantity of the good produced. For example, if a new technology is invented that allows producers to manufacture cars more efficiently, supply will rise and the market supply curve will shift to the



right. The new market equilibrium will have a higher number of cars sold at a lower price. When markets are perfectly competitive, the equilibrium outcome of trade in the market is economically efficient. This means that the market is producing the largest net gain possible for society, given consumers' utility functions and producers' production functions.

### **1.3.5: Markets are Typically Efficient**

A perfectly competitive market with full property rights is typically efficient.

#### **Learning Objective**

Define efficient markets.

#### **Key Points**

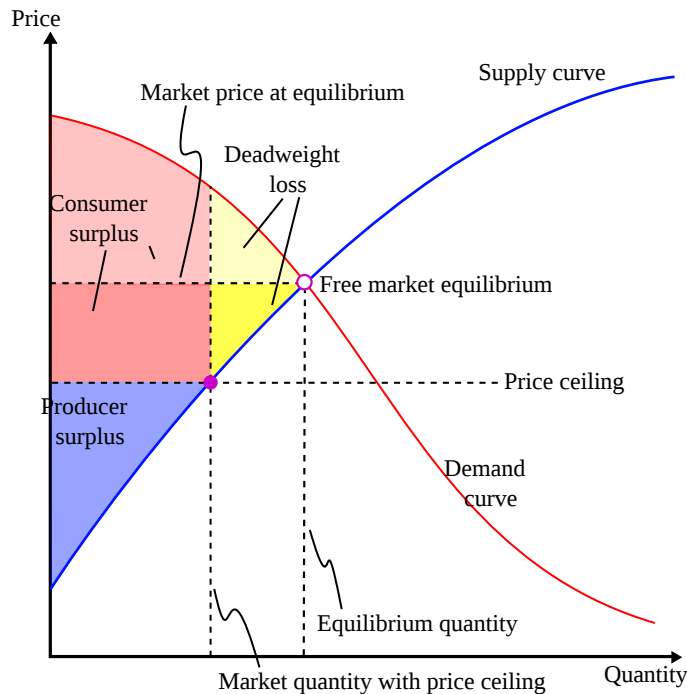
- A market has productive efficiency when units of goods are being supplied at the lowest possible average cost.
- A market has allocative efficiency if the price of a product that the market is supplying is equal to the value consumers place on it.
- It is important to note that achieving economic efficiency is not always the most important goal for a society. A market can be perfectly efficient but highly unequal.
- A smoothly functioning market requires that producers possess property rights to the goods and services they produce and that consumers possess property rights to the goods and services they buy.

#### **Key Term**

Pareto efficiency

The state in which no one can be made better off by making another worse off.

An efficient market maximizes total consumer and producer surplus; there is no deadweight loss. An economic system is said to be more efficient than another (in relative terms) if it can provide more goods and services for society without using more resources. In absolute terms, a situation can be called economically efficient if:



## Economic Inefficiency

A sign of economic inefficiency in a market is the presence of deadweight loss.

1. No one can be made better off without making someone else worse off (commonly referred to as Pareto efficiency),
2. No additional output can be obtained without increasing the amount of inputs, and
3. Production proceeds at the lowest possible per-unit cost.

Economists refer to two types of market efficiency. A market has productive efficiency when units of goods are being supplied at the lowest possible average cost. This condition is satisfied if the equilibrium quantity is at the minimum point of the average total cost curve. For example, if a

farm can produce 10,000 bushels of corn with 20 employees, but is currently producing 10,000 bushels with 25 employees, it is not achieving productive efficiency.

A market has allocative efficiency if the price of a product that the market is supplying is equal to the value consumers place on it. This is equivalent to saying that the marginal cost of an item is equal to its price. If a market is not allocatively efficient, then it is creating too much of something that consumers value less than other goods, or not enough of something that consumers value more. A market that produces 500 loaves of bread but only one gallon of milk is probably not allocatively efficient.

As you study economics further, it is usually safe to assume that markets are efficient unless you're dealing with a distortion (e.g. regulations, imperfect information sharing).

It is important to note that achieving economic efficiency is not always the most important goal for a society. A market can be perfectly efficient but highly unequal, for example. If 1% of the population controls virtually all the income, then the market will efficiently allocate virtually all of its production to those same people. While this is economically efficient, many would argue that it is not desirable. Efficient markets may have negative effects on those that exist outside of the market; for example, the energy market may cause environmental harm that is not captured in the economic notion of efficiency.

### **1.3.6: Government Intervention May Fix Inefficient Markets**

Governments can intervene to make a market more efficient when a market failure, such as externalities or asymmetric information, exists.

#### **Learning Objective**

Discuss the role of government in addressing common market failures

## Key Points

- Economic efficiency occurs under the following conditions: competitive markets with accurate exchange of information and mobile resources, in which individuals bear the full costs and benefits of their transactions.
- The criteria for economic efficiency are rarely fully met.
- If a transaction affects individuals not involved in the transaction (either positively or negatively), that transaction is said to have an externality.
- Governments can intervene by taxing negative externalities or subsidizing positive externalities.
- Free markets will generally produce less than the optimal amount when a good is nonexcludable and nonrivalrous, which means that a government can make the market more efficient by producing the public good itself.

## Key Terms

public good

A good that is both non-excludable and non-rivalrous in that individuals cannot be effectively excluded from use and where use by one individual does not reduce availability to others.

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

free rider

One who obtains benefit from a public good without paying for it directly.

In an efficient market, firms can produce goods at the lowest possible cost while individuals can access the goods and services they desire, all while

utilizing the least resources possible. A market can be said to be economically efficient if it has certain qualities:

- perfectly competitive
- mobile resources
- accurate and freely available information
- individuals directly receive the costs and benefits of their transactions

Market failure is the name for when a market is not efficient; that is, when it deviates from one or more of the above conditions. However, in reality no market is perfectly efficient. In general, minor inefficiencies do not dramatically affect society. But when society is adversely affected by economic inefficiency, such as when a monopoly firm raises prices to a point where people cannot afford a basic good, the government will sometimes intervene.

Consider the problem of externalities, the phenomenon of when a transaction occurs that affects people who were not directly involved. For example, when a coal plant producing electricity causes pollution, there is a transaction between the company and the resident who purchases the product. But if you live near the coal plant and suffer from asthma due to the smog it produces, you are encountering a negative externality. You had no choice in the transaction, but are experiencing its effects.

Externalities are an example of economic inefficiency, since those involved in the economic transaction do not bear the full costs of the transaction. In this case, governments can intervene by taxing the transaction and using the money to negate the harmful effects or to compensate those affected by the negative externality. Similarly, when a transaction produces positive externalities, efficiency is achieved when the government subsidizes the transaction. Education is an example of a transaction that has a positive effect on society.

Another case in which markets do not operate efficiently on their own is the market for public goods. Public goods are nonrival, which means that more than one (and sometimes many!) individual can use the good at one time. They are also nonexcludable, which means that their use cannot be prevented. For example, consider a beautiful fountain in a public park. The

company that built the fountain cannot force people to pay money in order to enjoy it, since its in a public area; and since one person looking at the fountain doesn't prevent others from looking at it, it is a nonrival good.

Free markets will generally produce less than the optimal amount when a good is nonexcludable and nonrivalrous, which means that a government can make the market more efficient by producing the public good itself. By using tax revenue, governments can avoid the problem of free riders and produce an efficient quantity of public goods even when the free market cannot.



## **National Defense as a Public Good**

National defense is a classic example of a good that is nonexcludable and nonrivalrous. It will be under-produced unless the government provides it.

### **1.3.7: Full Economy Interactions**

Variables that describe the full economy, such as GDP and unemployment, are determined by the decisions of individual economic actors.

#### **Learning Objective**

Explain how the macroeconomy is the sum of many individual economic actors' decisions.

## Key Points

- Macroeconomists combine the demand of all consumers in a market (aggregate demand) and the supply from all producers in a market (aggregate supply) to look at the way these groups interact on a large scale.
- Just as the choices made by individual consumers and producers can be aggregated to describe an entire industry, their combined effects can also influence a nation's overall economic activity.
- GDP is measured by adding together all the production undertaken by a nation's firms. Individual firms affect GDP every time they choose to produce more or less. Consumers affect GDP whenever they increase or decrease demand for goods.

## Key Terms

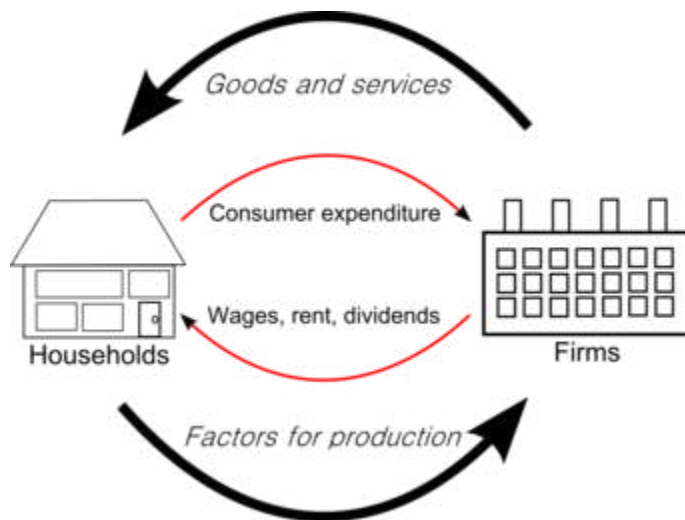
inflation

An increase in the general level of prices or in the cost of living.

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

In the most basic economic model, the economy consists of interactions between households, which provide labor and purchase goods, and firms, which employ labor and produce goods. Macroeconomics studies the aggregate effects of the actions of many individual households and firms. While microeconomists might study how a market with one producer and one consumer reaches equilibrium, macroeconomists combine the demand of all consumers in a market (aggregate demand) and the supply from all producers in a market (aggregate supply) to look at the way these groups interact on a large scale.



## Circular Flow

The economy consists of interactions between firms and households.

Consider the market for CDs. Each individual consumer has a demand function for CDs that determines how many he will buy at a particular price - for example, one consumer may only buy a single album if they cost \$15 each, but would buy two if the price dropped to \$10 each. Likewise, each producer has a production function that determines how many CDs it will produce at a given price; it may produce 10,000 CDs if they can be sold for \$10, but will increase production to 12,000 if the price rises to \$15. In order to understand the entire market for CDs, economists add the demand of all consumers at each possible price, creating an aggregate demand curve, and the total quantity supplied by producers at each possible price, creating an aggregate supply curve. The point at which these two curves intersect shows the market equilibrium for CDs.

### The Macroeconomy

Just as the choices made by individual consumers and producers can be aggregated to describe an entire industry, their combined effects can also influence a nation's overall economic activity. Macroeconomists study a variety of these effects, but three are central to macroeconomic research:



- Gross domestic product (GDP) - the size of an entire economy's output - is measured by adding together all the production undertaken by a nation's firms. Individual firms affect GDP every time they choose to produce more or less. Consumers affect GDP whenever they increase or decrease demand for goods.
- Inflation occurs when many individual consumers increase demand for a good, raising the equilibrium price for the economy as a whole.
- Unemployment rises when firms choose to produce less or when consumers decrease their demand at a given price.

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# 1.4: Basic Economic Questions

## 1.4.1: Production Outputs

A firm's production outputs are what it creates using its resources: goods or services.

### Learning Objective

Identify how suppliers determine what and how much to supply

### Key Points

- The profit-maximizing amount of output occurs when the marginal cost of producing another unit equals the marginal revenue received from selling that unit.
- Output are the quantity of goods or services produced in a given time period, by a firm, industry or country.
- There are four types of market scenario that a firm may encounter when making a production decision: economic profit, normal profit, loss-minimizing condition, and shutdown. The firm should always produce unless it encounters a shutdown scenario.

### Key Terms

fixed costs

A cost of business which does not vary with output or sales; overheads.

average total cost

Average cost or unit cost is equal to total cost divided by the number of goods produced (the output quantity,  $Q$ ). It is also equal to the sum of

average variable costs (total variable costs divided by Q) plus average fixed costs (total fixed costs divided by Q).

variable cost

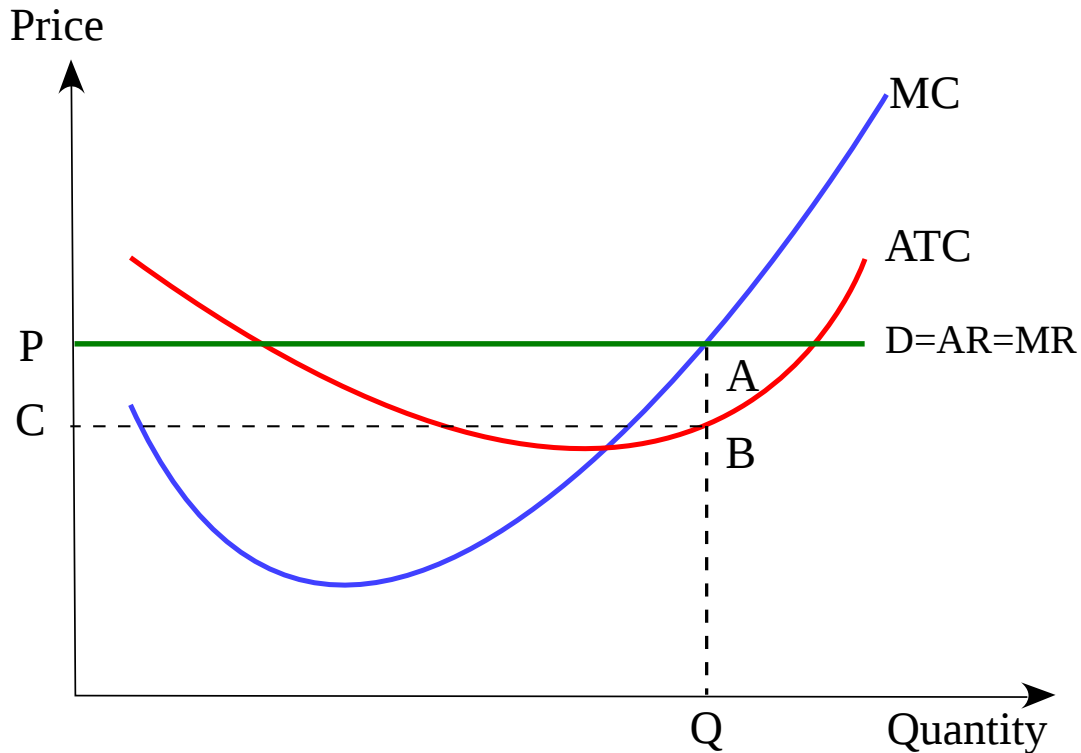
A cost that changes with the change in volume of activity of an organization.

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

Production outputs are the goods and services created in a given time period, by a firm, industry or country. These goods can either be consumed or used for further production. Production outputs can be anything from crops to technological devices to accounting services. Producing these outputs incur costs which must be considered when determining how much of a good should be produced.

Determining what to produce and how much to produce can be difficult. Microeconomics assumes that firms and businesses are profit-seeking. This means that above all else they will produce goods and services to the degree that maximizes their profits. In economic theory, the profit-maximizing amount of output occurs when the marginal cost of producing another unit equals the marginal revenue received from selling that unit. When the product's marginal costs exceeds marginal revenue, the firm should stop production.



## Production Conditions

A firm will seek to produce such that its marginal cost (MC) is equal to marginal revenue (MR, which is equal to the price and demand). It is not produced based on average total cost (ATC).

Once a firm has established what its profit-maximizing output is, the next step it must consider is whether to produce the good given the current market price. There are several key terms to be familiar with prior to addressing this question.

- Fixed costs are those expenses that remain constant regardless of the amount of good that is produced. For example, no matter how much of a good you produce, you will still have to pay the same amount of rent for your factory or storage units.
- Variable costs are only those expenses that are directly tied to the production of more units; fixed costs are not included.

- Opportunity costs are the cost of an opportunity forgone (and the loss of the benefits that could be received from that opportunity); the cost equals the most valuable forgone alternative.
- Average total cost is the all expenses incurred to produce the product, including fixed costs and opportunity costs, divided by the number of the units of the good produced.

There are four different types of conditions that generally describe a firm's profit as described in :

- Economic Profit: The firm's average total cost is less than the price of each additional product at the profit-maximizing output. The economic profit is equal to the quantity output multiplied by the difference between the average total cost and the price.
- Normal Profit: The average total cost equals the price at the profit-maximizing output. In this case, the economic profit equals zero. In this scenario, the firm should produce of the product.
- Loss-minimizing condition: The firm's product price is between the average total cost and the average variable cost. The firm should still continue to produce because additional sales would offset a portion of fixed costs. If the manufacturer stopped production, it would sustain all the fixed costs as a loss.
- Shutdown: The price is below average variable cost at the profit-maximizing output. Production should be shutdown because every unit produced increases loss. The revenue gained from sales of these products do not offset variable and fixed costs. If it does not produce goods, the firm suffers a loss due to fixed costs, but it does not incur any variable costs.

## **1.4.2: Production Inputs and Process**

Labor, capital, and land are the three necessary inputs for any production process.

### **Learning Objective**

Explain the use of capital and labor in production



## Key Points

- Capital, otherwise known as capital assets, are manufactured goods that are used in production of goods or services.
- Cash is not included in capital in terms of a production input. Homes and personal automobiles are also not included in capital because these items are not directly tied to the production of goods or services.
- Labor is a measure of the work done by human beings to create a manufactured output.

## Key Terms

labor

The workers used to manufacture the output.

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings (structures).

input

Something fed into a process with the intention of it shaping or affecting the outputs of that process.

The process of production generates output, otherwise referred to as good and services. Production processes require three inputs: land, capital and labor. Land is simply the place where you produce your product, whether it is a factory or a farm, and may included capital if the output being created is a service. In most scenarios, the inputs in the production process are primarily capital and labor.

## Capital

Capital, otherwise known as capital assets, are manufactured goods that are used in production of goods or services. Control of these assets are the primary means of creating wealth. Included in capital is anything that has been manufactured that can be used to enhance a person's ability to perform economically useful work. For a caveman, a stick or a stone would have been considered capital. For a post-industrial worker, a laptop, computer, and cellphone would be considered capital .



### **Girls running warping machines in Loray Mill, Gastonia, N.C. by Lewis Hine, 1908.**

Any tool or machine that could be used to improve someone's ability to work would be included in capital.

In regards to production, it also is important to know what capital is not. While capital may refer to funds invested in a business in other disciplines such as accounting, cash is not included in capital in terms of a production input in economics. Homes and personal automobiles are also not included in capital because these items are not directly tied to the production of goods or services.

### **Labor**

Labor is a measure of the work done by human beings to create a manufactured output. Producers demand labor because it aids in producing output which can then be sold. In production, a worker will only be hired when the marginal revenue s/he brings in exceeds or equals the marginal cost of hiring that worker. The cost of one worker is the wage.

The value of labor varies based on the skills and talents that the individual worker brings to that job. If the job involves designing and building a computer, an engineer's labor is more valuable than a tailor. If the job requires the manufacture of a suit, an employer would prefer the tailor. Other elements that influence the perception of the value of a specific type of labor in production include the amount of training necessary to execute the task and the barriers to conducting that type of work.

### **1.4.3: Production Recipients**

The process of producing and distributing a good or service is called a supply chain, and it is composed of many economic actors.

#### **Learning Objective**

Identify the market actors involved in taking a product from the original producer to the consumer

#### **Key Points**

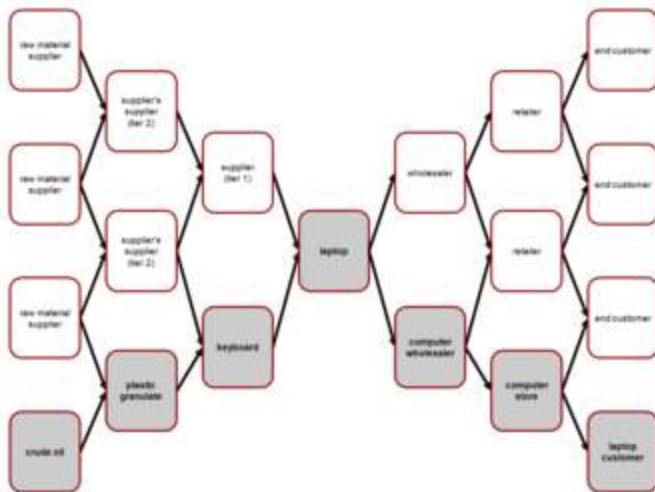
- Supply chains vary based on industry, the resources of the manufacturer, and market conditions.
- The purpose of a supply chain is to act as an integrating function that links major business functions and processes into a cohesive business model.
- Typical steps in a supply chain include: extraction of raw materials; acquisition of components; production; inventory; transportation; wholesaler; and retailer.

#### **Key Term**

## supply chain

A system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer.

A supply chain is a system of organizations, people, activities, information and resources involved in moving a product or service from supplier to customer. The company's supply chain illustrates the total process of transforming raw materials into a finished product, and then selling that finished product to consumers .



## Supply Chain

This represents the typical supply chain for a computer. The right half of the chart represents the steps it takes from producing the final product to the consumers.

The purpose of a supply chain is to act as an integrating function that links major business functions and processes into a cohesive business model. When designed well, a supply chain is able to respond to shifts in demand and changes in the marketplace. Based on these shifts, the supply chain is able to alter production levels accordingly so that supply can meet demand so that the firm is able to maximize its profit.

Supply chains vary based on industry, the resources of the manufacturer, and market conditions. Some typical elements and actors in a supply chain include:

- **Extraction/Acquisition of Raw Materials or Components.** Before the production of a good can be initiated, you need to have all of the necessary elements. These elements could be unrefined raw materials that the company transforms into components or pre-assembled parts. A firm may have subsidiaries or divisions that obtain raw materials or it might acquire those elements from a third party.
- **Production.** This is the process that transforms the elements acquired from the prior step into the finished good. Economic actors involved in this step include product designers, assembly-line workers, and floor management.
- **Inventory.** Once the good is completed, it is generally placed into a centralized inventory location while decisions are made by inventory managers and a firm's sales division.
- **Transportation.** Finished goods must be transported to stores and other locations where consumers can obtain the good. Depending on the type of business, goods may be transferred to smaller regional inventory depots, merchants, or directly to a consumer.
- **Wholesaler.** A wholesaler is someone who sells a good to smaller stores, who in turn sells the good to consumers.
- **Retailer.** The retailer buys the product in bulk and sells individual or smaller groups of units to the end consumer.

## **1.4.4: Differences Between Centrally Planned and Market Economies**

The key difference between centrally planned and market economies is the degree of individual autonomy.

### **Learning Objective**

Compare the characteristics of capitalist and socialist economic systems

## Key Points

- A pure planned economy has one person or group who controls what is produced; all businesses work together to produce goods and services that are planned and distributed by the government.
- Planned economies have several advantages. Ideally, there is no unemployment, and needs never go unfulfilled; because the government knows how much food, medicine, and other goods is needed, it can produce enough for all.
- Realistically, these systems tend to suffer from large inefficiencies and are overall not as successful as other types of economic systems.
- A pure market economy is one perfectly free of external control. Individuals are left up to themselves to decide what to produce, who to work for, and how to get the things they need.
- Because there is no regulation ensuring equality and fairness, market economies are burdened with unemployment, and even those with jobs can never be certain that they will make enough to provide for all of their needs.
- Because they do not need to wait for word from the government before changing their output, companies under market economies can quickly keep up with fluctuations in the economy, tending to be more efficient than regulated markets.

## Key Terms

Centrally planned economy

When the government is responsible for setting the amount produced.

autonomy

Self-government; freedom to act or function independently.

market economy

An economy in which goods and services are exchanged in a free market, as opposed to a state-controlled or socialist economy; a

capitalistic economy.

While there are many different variations of national economies, the two dominant economic coordination mechanisms are centrally planned and market based. Before you can analyze any national economy, you need to understand these two opposing viewpoints on how to run an economy. The key difference between the two is the amount of individual autonomy within the two systems.

## **Centrally Planned Economy**

A pure planned economy has one person or group who controls what is produced; all businesses work together to produce goods and services that are planned and distributed by the government. These economies are also called command economies because everyone must follow specific guidelines set up by the controlling authority. The reason behind this type of planning is to make sure that everything needed is produced and that everyone's needs are fulfilled. Since most peoples' needs are provided for in a centrally planned economy, compensation is primarily morally based. Most assets are owned by the state.

Planned economies have several advantages. Ideally, there is no unemployment and needs never go unfulfilled. Because the government knows how much food, medicine, and other goods is needed, it can produce enough for all. But achieving these outcomes depends on the group that organizes production and distribution to accurately identify what the consumers will need, determine what it would take to meet those goals, and anticipate all possible situations. This means there are a lot of opportunities to make a mistake. Realistically, these systems tend to suffer from large inefficiencies and are overall not as successful as other types of economic systems.



## **V.I. Lenin**

The Soviet Union, as established by V.I. Lenin, is an example of a country that tried to establish a pure centrally planned economy.

## **Market Based Economy**

A pure market economy, or capitalist system, is one perfectly free from external control. Individuals may decide what to produce, who to work for, and how to get the things they need. They are compensated with material goods for their work, and most assets are privately owned. This type of economy, though it may be chaotic at times, allows people to change along with the shifting market conditions to maximize their profits. Although they



avoid many of the inadequacies of planned economies, market economies are not free of their own problems and downfalls. Perhaps the greatest problem is that business firms may refuse to produce goods that unprofitable for them. For instance, in 2000 there was a shortage of tetanus vaccine in the United States. Because it was expensive to make, most companies were unwilling to start production themselves, leaving only one firm struggling to keep up with demand. In a planned economy, this shortage would not happen because the government would boost production of the vaccine if it were needed.

Because there is no regulation to ensure equality and fairness, market economies may be burdened with unemployment and even those with jobs can never be certain that they will make enough to provide for all of their needs. Despite these and other problems, market economies come with many advantages, chief among which is speed. Because they do not need to wait for word from the government before changing their output, companies under market economies can quickly keep up with fluctuations in the economy, tending to be more efficient than regulated markets. Also, individuals have more freedom and opportunities to do the jobs they want and to profit by them.

## **1.4.5: Mixed Economies**

A mixed economy is a system that embraces elements of centrally planned and free market systems.

### **Learning Objective**

Explain the characteristics of a mixed economy

### **Key Points**

- Most of the means of production in a mixed economy are privately owned in a mixed economy.
- The government strongly influences the economy through direct intervention in a mixed economy, such as through subsidies and

- regulation of the markets.
- Most government intervention in mixed economy is limited to minimizing the negative consequences of economic events, such as unemployment in recessions, to promote social welfare.

## **Key Terms**

### mixed economy

A system in which both the state and private sector direct the economy, reflecting characteristics of both market economies and planned economies.

### monopoly

A market where one company is the sole supplier.

A mixed economy is a system that embraces elements of centrally planned and free market systems. While there is no single definition of a mixed economy, it generally involves a degree of economic freedom mixed with government regulation of markets. Most modern economies are mixed, including the United States and Cuba. Countries hope that by embracing elements of both systems they can gain the benefits of both while minimizing the systems disadvantages.

In general, most of the means of production in a mixed economy are privately owned. There are some exceptions to this general rule, such as some hospitals and businesses. The mostly private ownership of all means of production allows the market to quickly respond to changing circumstances and economic factors. As a result, the market is generally the dominant form of economic coordination. However, to mitigate the negative influence that a pure market economy has on fairness and distribution, the government strongly influences the economy through direct intervention in a mixed economy. Different ways a government directly intervenes in an economy include:

- granting a business a monopoly,
- granting a subsidy to a sector,

- creating and enforcing regulation,
- direct participation in the market , or
- providing money and other resources segments of its populations, such as through a welfare program.

Most government intervention in mixed economy is limited to minimizing the negative consequences of economic events, such as unemployment in recessions, to promote social welfare.

While mixed economies vary based on their degree of government intervention, some elements are consistent. Generally, individuals in mixed economies are able to:

- participate in managerial decisions,
- travel,
- buy and sell items privately,
- hire and fire employees,
- organize organizations,
- communicate, and
- protest peacefully.

However, the government in mixed economies generally subsidizes public goods, such as roads and libraries, and provide welfare services such as social security. These governments also regulate labor and protect intellectual property.

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# 1.5: Economic Models

## 1.5.1: Math Review

Mathematical economics uses mathematical methods, such as algebra and calculus, to represent theories and analyze problems in economics.

### Learning Objective

Review basic algebra and calculus' concepts relevant in introductory economics

### Key Points

- Using mathematics allows economists to form meaningful, testable propositions about complex subjects that would be hard to express informally.
- Algebra is the study of operations and their application to solving equations. It provides structure and a definite direction for economists when they are analyzing complex data.
- Concepts in algebra that are used in economics include variables and algebraic expressions.
- Calculus is the mathematical study of change. Economists use calculus in order to study economic change whether it involves the world or human behavior.
- In economics, calculus is used to study and record complex information - commonly on graphs and curves.

### Key Terms

variable

something whose value may be dictated or discovered.

quantitative

Of a measurement based on some number rather than on some quality.

As a social science, economics analyzes the production, distribution, and consumption of goods and services. The study of economics requires the use of mathematics in order to analyze and synthesize complex information.

## **Mathematical Economics**

Mathematical economics is the application of mathematical methods to represent theories and analyze problems in economics. Using mathematics allows economists to form meaningful, testable propositions about complex subjects that would be hard to express informally. Math enables economists to make specific and positive claims that are supported through formulas, models, and graphs. Mathematical disciplines, such as algebra and calculus, allow economists to study complex information and clarify assumptions.

## **Algebra**

Algebra is the study of operations and their application to solving equations. It provides structure and a definite direction for economists when they are analyzing complex data. Math deals with specified numbers, while algebra introduces quantities without fixed numbers (known as variables). Using variables to denote quantities allows general relationships between quantities to be expressed concisely. Quantitative results in science, economics included, are expressed using algebraic equations.

Concepts in algebra that are used in economics include variables and algebraic expressions. Variables are letters that represent general, non-specified numbers. Variables are useful because they can represent numbers whose values are not yet known, they allow for the description of general problems without giving quantities, they allow for the description of relationships between quantities that may vary, and they allow for the description of mathematical properties. Algebraic expressions can be



simplified using basic math operations including addition, subtraction, multiplication, division, and exponentiation.

In economics, theories need the flexibility to formulate and use general structures. By using algebra, economists are able to develop theories and structures that can be used with different scenarios regardless of specific quantities.

## **Calculus**

Calculus is the mathematical study of change. Economists use calculus in order to study economic change whether it involves the world or human behavior.

Calculus has two main branches:

- Differential calculus is the study of the definition, properties, and applications of the derivative of a function (rates of change and slopes of curves) . By finding the derivative of a function, you can find the rate of change of the original function.
- Integral calculus is the study of the definitions, properties, and applications of two related concepts, the indefinite and definite integral (accumulation of quantities and the areas under curves) .

Calculus is widely used in economics and has the ability to solve many problems that algebra cannot. In economics, calculus is used to study and record complex information - commonly on graphs and curves. Calculus allows for the determination of a maximal profit by providing an easy way to calculate marginal cost and marginal revenue. It can also be used to study supply and demand curves.

## **Common Mathematical Terms**

Economics utilizes a number of mathematical concepts on a regular basis such as:

- **Dependent Variable:** The output or the effect variable. Typically represented as  $y$ , the dependent variable is graphed on the  $y$ -axis. It is the variable whose change you are interested in seeing when you change other variables.
- **Independent or Explanatory Variable:** The inputs or causes. Typically represented as  $x_1, x_2, x_3, \dots$ , the independent variables are graphed on the  $x$ -axis. These are the variables that are changed in order to see how they affect the dependent variable.
- **Slope:** The direction and steepness of the line on a graph. It is calculated by dividing the amount the line increases on the  $y$ -axis (vertically) by the amount it changes on the  $x$ -axis (horizontally). A positive slope means the line is going up toward the right on a graph, and a negative slope means the line is going down toward the right. A horizontal line has a slope of zero, while a vertical line has an undefined slope. The slope is important because it represents a rate of change.
- **Tangent:** The single point at which two curves touch. The derivative of a curve, for example, gives the equation of a line tangent to the curve at a given point.

## 1.5.2: Assumptions

Economists use assumptions in order to simplify economics processes so that they are easier to understand.

### Learning Objective

Assess the benefits and drawbacks of using simplifying assumptions in economics

### Key Points

- Neo-classical economics employs three basic assumptions: people have rational preferences among outcomes that can be identified and associated with a value, individuals maximize utility and firms

maximize profit, and people act independently on the basis of full and relevant information.

- An assumption allows an economist to break down a complex process in order to develop a theory and realm of understanding. Later, the theory can be applied to more complex scenarios for additional study.
- Critics have stated that assumptions cause economists to rely on unrealistic, unverifiable, and highly simplified information that in some cases simplifies the proofs of desired conclusions.
- Although simplifying can lead to a better understanding of complex phenomena, critics explain that the simplified, unrealistic assumptions cannot be applied to complex, real world situations.

## **Key Terms**

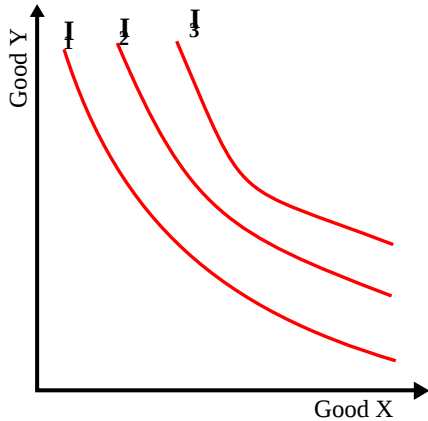
### simplify

To make simpler, either by reducing in complexity, reducing to component parts, or making easier to understand.

### assumption

The act of taking for granted, or supposing a thing without proof; a supposition; an unwarrantable claim.

As a field, economics deals with complex processes and studies substantial amounts of information. Economists use assumptions in order to simplify economic processes so that it is easier to understand. Simplifying assumptions are used to gain a better understanding about economic issues with regards to the world and human behavior .



## Simple indifference curve

An indifference curve is used to show potential demand patterns. It is an example of a graph that works with simplifying assumptions to gain a better understanding of the world and human behavior in relation to economics.

## Economic Assumptions

Neo-classical economics works with three basic assumptions:

1. People have rational preferences among outcomes that can be identified and associated with a value.
2. Individuals maximize utility (as consumers) and firms maximize profit (as producers).
3. People act independently on the basis of full and relevant information.

## Benefits of Economic Assumptions

Assumptions provide a way for economists to simplify economic processes and make them easier to study and understand. An assumption allows an economist to break down a complex process in order to develop a theory and realm of understanding. Good simplification will allow the economists to focus only on the most relevant variables. Later, the theory can be applied to more complex scenarios for additional study.

For example, economists assume that individuals are rational and maximize their utilities. This simplifying assumption allows economists to build a structure to understand how people make choices and use resources. In reality, all people act differently. However, using the assumption that all people are rational enables economists study how people make choices.

## **Criticisms of Economic Assumptions**

Although, simplifying assumptions help economists study complex scenarios and events, there are criticisms to using them. Critics have stated that assumptions cause economists to rely on unrealistic, unverifiable, and highly simplified information that in some cases simplifies the proofs of desired conclusions. Examples of such assumptions include perfect information, profit maximization, and rational choices. Economists use the simplified assumptions to understand complex events, but criticism increases when they base theories off the assumptions because assumptions do not always hold true. Although simplifying can lead to a better understanding of complex phenomena, critics explain that the simplified, unrealistic assumptions cannot be applied to complex, real world situations.

### **1.5.3: Hypotheses and Tests**

Economics, as a science, follows the scientific method in order to study data, observe patterns, and predict results of stimuli.

#### **Learning Objective**

Apply the steps of the scientific method to economic questions

#### **Key Points**

- The scientific method involves identifying a problem, gathering data, forming a hypothesis, testing the hypothesis, and analyzing the results.
- A hypothesis is simply a prediction.
- In economics, extensive testing and observation is required because the outcome must be obtained more than once in order to be valid.

- Cause and effect relationships are used to establish economic theories and principles. Over time, if a theory or principle becomes accepted as universally true, it becomes a law. In general, a law is always considered to be true.
- The scientific method provides the framework necessary for the progression of economic study.

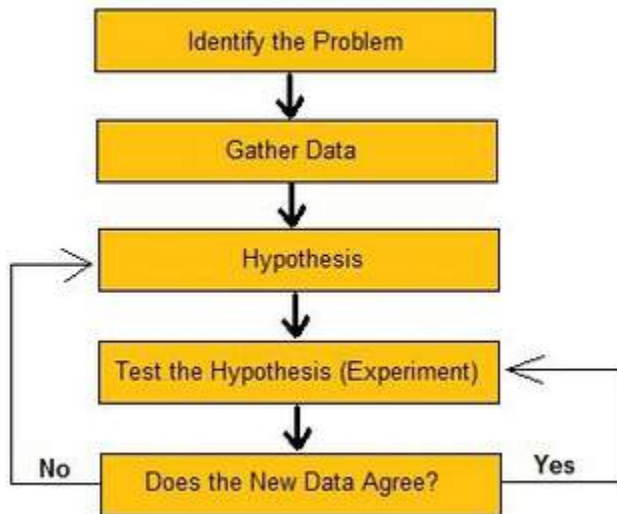
## **Key Term**

hypothesis

An assumption taken to be true for the purpose of argument or investigation.

Economics, as a science, follows the scientific method in order to study data, observe patterns, and predict results of stimuli.

There are specific steps that must be followed when using the scientific method . Economics follows these steps in order to study data and build principles:



## Scientific Method

The scientific method is used in economics to study data, observe patterns, and predict results.

1. Identify the problem - in the case of economics, this first step of the scientific method involves determining the focus or intent of the work. What is the economist studying? What is he trying to prove or show through his work?
2. Gather data - economics involves extensive amounts of data. For this reason, it is important that economists can break down and study complex information. The second step of the scientific method involves selecting the data that will be used in the study.
3. Hypothesis - the third step of the scientific method involves creating a model that will be used to make sense of all of the data. A hypothesis is simply a prediction. What does the economist think the overall outcome of the study will be?
4. Test hypothesis - the fourth step of the scientific method involves testing the hypothesis to determine if it is true. This is a critical stage within the scientific method. The observations must be tested to make sure they are unbiased and reproducible. In economics, extensive testing and observation is required because the outcome must be obtained more than once in order for it to be valid. It is not unusual for

testing to take some time and for economists to make adjustments throughout the testing process.

5. Analyze the results - the final step of the scientific method is to analyze the results. First, an economist will ask himself if the data agrees with the hypothesis. If the answer is "yes," then the hypothesis was accurate. If the answer is "no," then the economist must go back to the original hypothesis and adjust the study accordingly. A negative result does not mean that the study is over. It simply means that more work and analysis is required.

Observation of data is critical for economists because they take the results and interpret them in a meaningful way. Cause and effect relationships are used to establish economic theories and principles. Over time, if a theory or principle becomes accepted as universally true, it becomes a law. In general, a law is always considered to be true. The scientific method provides the framework necessary for the progression of economic study. All economic theories, principles, and laws are generalizations or abstractions. Through the use of the scientific method, economists are able to break down complex economic scenarios in order to gain a deeper understanding of critical data.

## **1.5.4: Economic Models**

A model is simply a framework that is designed to show complex economic processes.

### **Learning Objective**

Recognize the uses and limitations of economic models

### **Key Points**

- Many models use mathematical techniques in order to investigate, theorize, and fit theories into economic situations.
- Economic models have two functions: 1) to simplify and abstract from observed data, and 2) to serve as a means of selection of data based on



- a paradigm of econometric study.
- Creating a model has two basic steps: 1) generate the model, and 2) checking the model for accuracy - also known as diagnostics.
  - Examples of the uses of economic models include: professional academic interest, forecasting economic activity, proposing economic policy, presenting reasoned arguments to politically justify economic policy, as well as economic planning and allocation.

## **Key Terms**

deductive

Based on inferences from general principles.

diagnostics

The process of determining the state of or capability of a component to perform its function(s).

qualitative

Based on descriptions or distinctions rather than on some quantity.

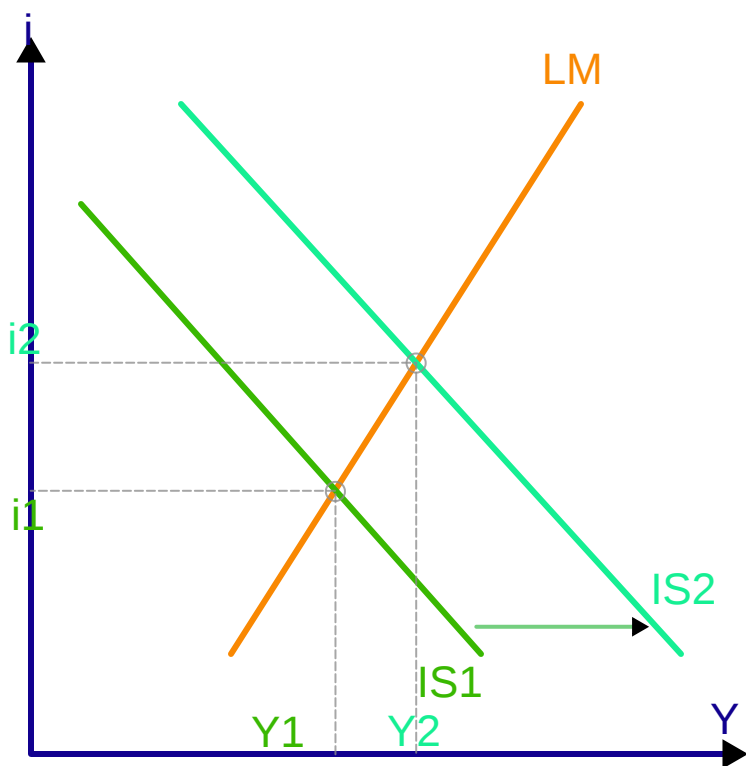
## **Economic Models**

In economics, a model is defined as a theoretical construct that represents economic processes through a set of variables and a set of logical or quantitative relationships between the two. A model is simply a framework that is designed to show complex economic processes. Most models use mathematical techniques in order to investigate, theorize, and fit theories into economic situations.

## **Uses of an Economic Model**

Economists use models in order to study and portray situations. The focus of a model is to gain a better understanding of how things work, to observe

patterns, and to predict the results of stimuli . Models are based on theory and follow the rules of deductive logic.



## Economic model diagram

In economics, models are used in order to study and portray situations and gain a better understand of how things work.

Economic models have two functions: 1) to simplify and abstract from observed data, and 2) to serve as a means of selection of data based on a paradigm of econometric study. Economic processes are known to be enormously complex, so simplification to gain a clearer understanding is critical. Selecting the correct data is also very important because the nature of the model will determine what economic facts are studied and how they will be compiled.

Examples of the uses of economic models include: professional academic interest, forecasting economic activity, proposing economic policy,

presenting reasoned arguments to politically justify economic policy, as well as economic planning and allocation.

## **Constructing a Model**

The construction and use of a model will vary according to the specific situation. However, creating a model does have two basic steps: 1) generate the model, and 2) checking the model for accuracy - also known as diagnostics. The diagnostic step is important because a model is only useful if the data and analysis is accurate.

## **Limitations of a Model**

Due to the complexity of economic models, there are obviously limitations that come into account. First, all of the data provided must be complete and accurate in order for the analysis to be successful. Also, once the data is entered, it must be analyzed correctly. In most cases, economic models use mathematical or quantitative analysis. Within this realm of observation, accuracy is very important. During the construction of a model, the information will be checked and updated as needed to ensure accuracy. Some economic models also use qualitative analysis. However, this kind of analysis is known for lacking precision. Furthermore, models are fundamentally only as good as their founding assumptions.

The use of economic models is important in order to further study and understand economic processes. Steps must be taken throughout the construction of the model to ensure that the data provided and analyzed is correct.

### **1.5.5: Normative and Positive Economics**

Positive economics is defined as the "what is" of economics, while normative economics focuses on the "what ought to be".

### **Learning Objective**

Contrast normative and positive statements about economic policy

## **Key Points**

- Positive economics is a branch of economics that focuses on the description and explanation of phenomena, as well as their causal relationships.
- Positive economics clearly states an economic issue and normative economics provides the value-based solution for the issue.
- Normative economics is a branch of economics that expresses value or normative judgments about economic fairness. It focuses on what the outcome of the economy or goals of public policy should be.
- Positive economics does impact normative economics because it ranks economic policies or outcomes based on acceptability (normative economics).

## **Key Terms**

normative economics

Economic thought in which one applies moral beliefs, or judgment, claiming that an outcome is "good" or "bad".

positive economics

The description and explanation of economic phenomena and their causal relationships.

Positive and normative economic thought are two specific branches of economic reasoning. Although they are associated with one another, positive and normative economic thought have different focuses when analyzing economic scenarios.

## **Positive Economics**

Positive economics is a branch of economics that focuses on the description and explanation of phenomena, as well as their causal relationships. It

focuses primarily on facts and cause-and-effect behavioral relationships, including developing and testing economic theories. As a science, positive economics focuses on analyzing economic behavior. It avoids economic value judgments. For example, positive economic theory would describe how money supply growth impacts inflation, but it does not provide any guidance on what policy should be followed. "The unemployment rate in France is higher than that in the United States" is a positive economic statement. It gives an overview of an economic situation without providing any guidance for necessary actions to address the issue.

## **Normative Economics**

Normative economics is a branch of economics that expresses value or normative judgments about economic fairness. It focuses on what the outcome of the economy or goals of public policy *should* be. Many normative judgments are conditional. They are given up if facts or knowledge of facts change. In this instance, a change in values is seen as being purely scientific. Welfare economist Amartya Sen explained that basic (normative) judgments rely on knowledge of facts.

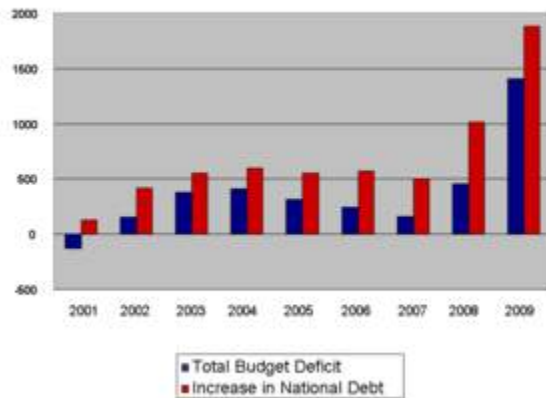
An example of a normative economic statement is "The price of milk should be \$6 a gallon to give dairy farmers a higher living standard and to save the family farm. " It is a normative statement because it reflects value judgments. It states facts, but also explains what should be done. Normative economics has subfields that provide further scientific study including social choice theory, cooperative game theory, and mechanism design.

## **Relationship Between Positive and Normative Economics**

Positive economics does impact normative economics because it ranks economic policies or outcomes based on acceptability (normative economics). Positive economics is defined as the "what is" of economics, while normative economics focuses on the "what ought to be. " Positive economics is utilized as a practical tool for achieving normative objectives.

In other words, positive economics clearly states an economic issue and normative economics provides the value-based solution for the issue .

Total Deficits vs. National Debt Increases (\$ Billions)



## Debt Increases

This graph shows the debt increases in the United States from 2001-2009. Positive economics would provide a statement saying that the debt has increased. Normative economics would state what needs to be done in order to work towards resolving the issue of increasing debt.

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# 1.6: Differences Between Macroeconomics and Microeconomics

## 1.6.1: Macroeconomics

Macroeconomics is the study of the performance, structure, behavior and decision-making of an economy as a whole.

### Learning Objective

Define macroeconomics and identify the main users of macroeconomics

### Key Points

- For most macroeconomists, the purpose of this discipline is to maximize national income and provide national economic growth.
- The most common macroeconomic topics of study for national entities are sustainability, full employment, price stability, external balance, equitable distribution of income and wealth, and increasing productivity.
- Macroeconomists hope that their models help address two key areas of research: the causes and consequences of short-run fluctuations in national income (otherwise known as the business cycle) and what determines long-run economic growth.

### Key Terms

Macroeconomics

The study of the performance, structure, behavior, and decision-making of an economy as a whole, rather than individual markets.

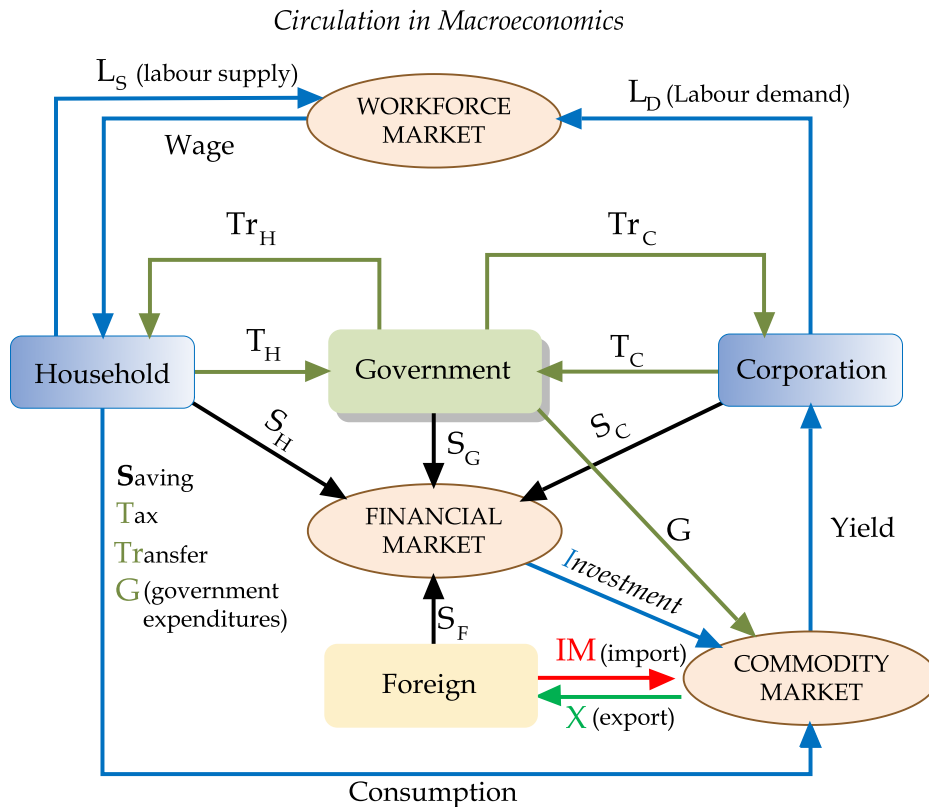
deflation

A decrease in the general price level, that is, in the nominal cost of goods and services.

inflation

An increase in the general level of prices or in the cost of living.

Macroeconomics is the study of the performance, structure, behavior and decision-making of an economy as a whole . Macroeconomists focus on the national, regional, and global scales. For most macroeconomists, the purpose of this discipline is to maximize national income and provide national economic growth. Economists hope that this growth translates to increased utility and an improved standard of living for the economy's participants. While there are variations between the objectives of different national and international entities, most follow the ones detailed below:



## Circulation in Macroeconomics

Macroeconomics studies the performance of national or global economies and the interaction of certain entities at these levels.

- Sustainability occurs when an economy achieves a rate of growth which allows an increase in living standards without undue structural and environmental difficulties.
- Full employment occurs when those who are able and willing to have a job can get one. Most economists believe that there will always be a certain amount of frictional, seasonal and structural unemployment (referred to as the natural rate of unemployment). As a result, full employment does not mean zero unemployment.
- Price stability occurs when prices remain largely stable and there is not rapid inflation or deflation. Price stability is not necessarily zero inflation; steady levels of low-to-moderate inflation is often regarded as ideal.

- External balance occurs when exports roughly equal imports over the long run.
- Equitable distribution of income and wealth among the economy's participants. This does not, however, mean that income and wealth are the same for everyone.
- Increasing Productivity over time throughout the national economy.

To achieve these goals, macroeconomists develop models that explain the relationship between factors such as national income, output, consumption, unemployment, inflation, savings, investment and international trade. These models rely on aggregated economic indicators such as GDP, unemployment, and price indices.

On the national level, macroeconomists hope that their models help address two key areas of research:

- the causes and consequences of short-run fluctuations in national income, otherwise known as the business cycle, and
- what determines long-run economic growth.

## **1.6.2: Microeconomics**

Microeconomics deals with the economic interactions of a specific person, a single entity or a company; it is the study of markets.

### **Learning Objective**

Define Microeconomics, Identify the main users of microeconomics

### **Key Points**

- One of the major goals of microeconomics is to analyze the market and determine the price for goods and services that best allocates limited resources among the different alternative uses.
- Microeconomics assumes businesses are rational and produce goods that maximize their profit.

- The science of microeconomics covers a variety of specialized areas of study including: industrial organization, labor economics, financial economics, public economics, political economy, health economics, urban economics, law and economics, and economic history.

## **Key Terms**

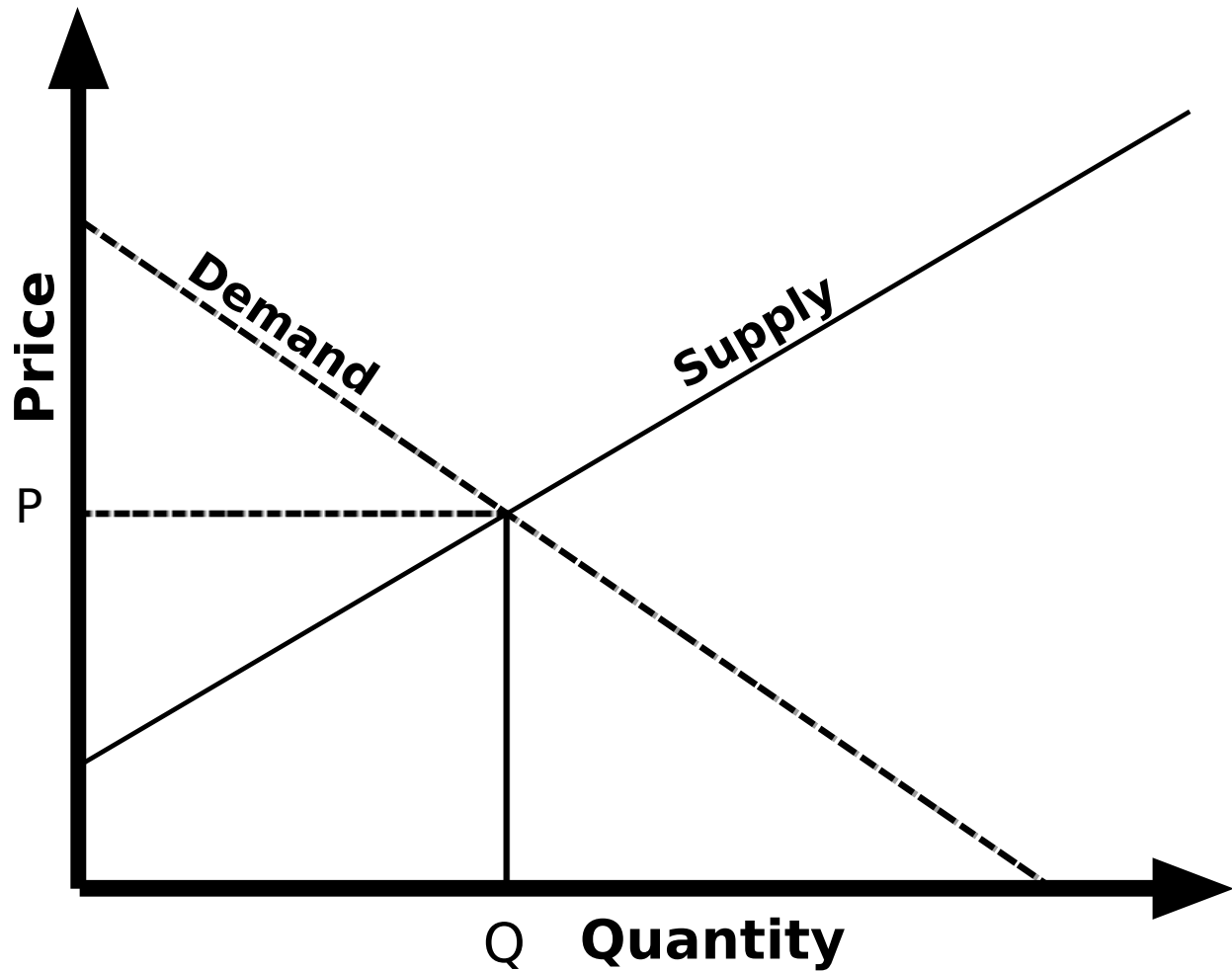
microeconomics

That field that deals with the small-scale activities such as that of the individual or company.

Scarcity

an inadequate amount of something; a shortage

Microeconomics deals with the economic interactions of a specific person, a single entity, or a company. These interactions, which mainly are buying and selling goods, occur in markets. Therefore, microeconomics is the study of markets. The two key elements of this economic science are the interaction between supply and demand and scarcity of goods .



## Supply and Demand Graph

Microeconomics is based on the study of supply and demand at the personal and corporate level.

One of the major goals of microeconomics is to analyze the market and determine the price for goods and services that best allocates limited resources among the different alternative uses. This study is especially important for producers as they decide what to manufacture and the appropriate selling price. Microeconomics assumes businesses are rational and produce goods that maximizes their profit. If each firm takes the most profitable path, the principles of microeconomics state that the market's limited resources will be allocated efficiently.

The science of microeconomics covers a variety of specialized areas of study including:

- Industrial Organization: the entry and exit of firms, innovation, and the role of trademarks.
- Labor Economics: wages, employment, and labor market dynamics.
- Financial Economics: topics such as optimal portfolios, the rate of return to capital, and corporate financial behavior.
- Public Economics: the design of government tax and expenditure policies.
- Political Economics: the role of political institutions in policy.
- Health Economics: the organization of health care system.
- Urban Economics: challenges faced by cities, such as sprawl, traffic congestion, and poverty.
- Law and Economics: applies economic principles to the selection and enforcement of legal regimes.
- Economic History: the history and evolution of the economy.

### **1.6.3: Key Differences**

Microeconomics focuses on individual markets, while macroeconomics focuses on whole economies.

#### **Learning Objective**

Recognize questions addressed by microeconomics and macroeconomics

#### **Key Points**

- Microeconomics and macroeconomics both focus on the allocation of scarce resources. Both disciplines study how the demand for certain resources interacts with the ability to supply that good to determine how to best distribute and allocate that resource among many consumers.
- Microeconomics studies the behavior of individual households and firms in making decisions on the allocation of limited resources.



Another way to phrase this is to say that microeconomics is the study of markets.

- Macroeconomics is generally focused on countrywide or global economics. It studies involves the sum total of economic activity, dealing with the issues such as growth, inflation, and unemployment.
- There are some economic events that are of great interest to both microeconomists and macroeconomists, but they will differ in how and why they analyze the events.

## Key Terms

### Macroeconomics

The study of the performance, structure, behavior, and decision-making of an economy as a whole, rather than individual markets.

### microeconomics

The study of the behavior of individual households and firms in making decisions on the allocation of limited resources.

### inflation

An increase in the general level of prices or in the cost of living.

Stemming from Adam Smith's seminal book, *The Wealth of Nations*, microeconomic and macroeconomics both focus on the allocation of scarce resources . Both disciplines study how the demand for certain resources interacts with the ability to supply that good to determine how to best distribute and allocate that resource among many consumers. Both disciplines are about maximization: microeconomics is about maximizing profit for firms, and surplus for consumers and producers, while macroeconomics is about maximizing national income and growth.



## **Adam Smith, Founding Father of Economics**

Adam Smith's book, *Wealth of Nations*, was the basis of both microeconomic and macroeconomic study.

The main difference between microeconomics and macroeconomics is scale. Microeconomics studies the behavior of individual households and firms in making decisions on the allocation of limited resources. Another way to phrase this is to say that microeconomics is the study of markets.

In contrast macroeconomics involves the sum total of economic activity, dealing with the issues such as growth, inflation, and unemployment. Macroeconomics is the study of economies on the national, regional or global scale.

This key difference alters how the two approach economic situations. Microeconomics does consider how macroeconomic forces impact the world, but it focuses on how those forces impact individual firms and industries. While macroeconomists study the economy as a whole, microeconomists are concerned with specific firms or industries.

Many economic events that are of great interest to both microeconomist and macroeconomists, though they differ in how they analyze those events. A shift in tax policy would interest economists in both disciplines. A microeconomist might focus on how the tax might shift supply in a specific market or influence a firm's decision making, while the macroeconomist will consider whether the tax will translate into an improved standard of living for all of the economy's participants.

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## **2: The Market System**

# 2.1: Introducing the Market System

## 2.1.1: Defining a Market System

A market system is a way to match buyers and sellers.

### Learning Objective

Identify the characteristics of a market system

### Key Points

- Publishing current prices is a key component with a market system.
- Competition is the primary regulatory mechanism in a market system.
- Economists recognize a number of different structures of market systems based on characteristics such as the level of competition.

### Key Term

price

The quantity of payment or compensation given by one party to another in return for goods or services.

In an economy, a market system is any systematic process that enables many market players to bid and ask. In other words, a market system is a place (virtual or physical) that facilitates the matching of buyers and sellers. Many markets exist, and each can be defined based on a number of characteristics, such as what is being exchanged in the market, the regulations, who is allowed to participate, and how transactions occur.

One defining component of markets is the medium of exchange, or the price. In most American markets, the medium of exchange is dollars. Both buyers and sellers look at the price to determine whether or not they want to trade. A seller has a certain minimum price at which s/he is willing to sell, though s/he would happily accept more. Likewise, a buyer has a certain maximum price at which s/he is willing to buy, though s/he would happily pay less. If the minimum the seller would accept is less than the maximum a buyer would pay, a transaction can occur. Markets help such buyers and sellers meet to trade.

In market systems, prices are discoverable; both buyers and sellers are capable of finding out the current price at which a transaction could occur. Publishing current prices is a key component with a market system. The chosen prices impact the immediate group of buyers and sellers, but also may impact long term supply and demand decisions within the market.

There are many examples of market systems. Perhaps the most famous is the stock market in which buyers and sellers trade stocks . The prices at which those sales occur is recorded, and is the basis for the stock price you may have seen in the newspaper or on TV. There are markets for many types of products other than stocks: the global oil market, your local farmers' market, and eBay are all forms of markets with their own defining characteristics.



## **NASDAQ Stock Market Display**

The NASDAQ is a stock market where buyers and sellers of stocks can meet and trade.

Another important component of market systems is that there is competition, which serves as the main regulatory mechanism. Based on the level of competition in a market system, economists have identified a number of different types of structures, such as monopoly, oligopoly, and perfect competition. We will go into more detail on different market structures later in the book.

### **2.1.2: Gains from Markets**

Gains in a market are referred to as total welfare or economic surplus.

#### **Learning Objective**

Explain how to calculate total welfare

#### **Key Points**

- Within total welfare, economists look at consumer surplus and producer surplus.



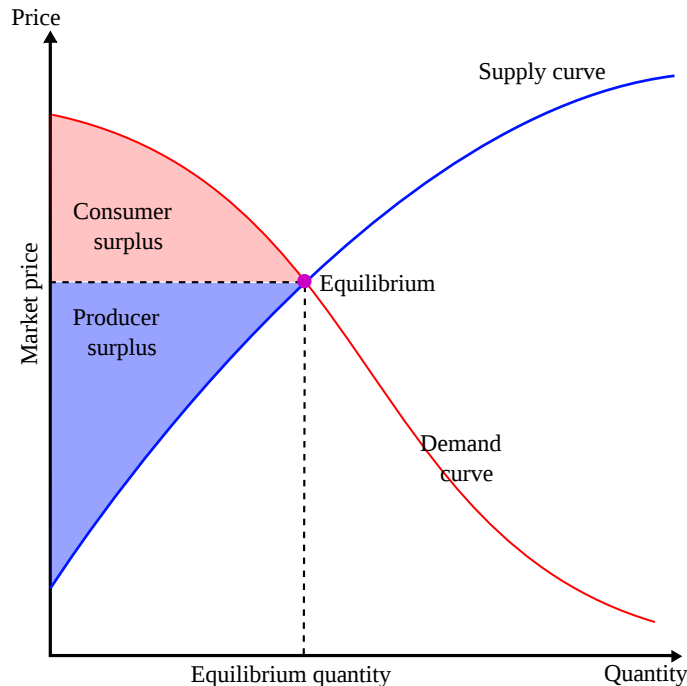
- Consumer surplus is the monetary gain that consumers receive when they purchase a good for less than the highest price they are willing to pay.
- Producer surplus is the amount that producers benefit by selling a good at a market price that is higher than the least that they would be willing to sell it for.
- In order to calculate the total welfare, the supply and demand of the good must be used to determine the economic gain.
- When the supply of a good increases, the price falls which increases consumer surplus. When the demand for a good increases, the price increases and the supply decreases resulting in producer surplus.

## **Key Term**

welfare

Health, safety, happiness and prosperity; well-being in any respect.

Gains within a market are referred to as total welfare or economic surplus. Within total welfare, economists look at consumer surplus and producer surplus. A surplus is defined as the excess of a good or service when the quantity supplied exceeds the quantity demanded; this occurs when the price is above the equilibrium price.



## Economic Surpluses

The total welfare (or economic surplus) is the sum of the consumer surplus and the producer surplus.

Consumer surplus is the monetary gain that consumers receive when they purchase a good for less than the highest price they are willing to pay. For example, a customer is willing to pay \$50 for a new pair of running shoes. They are able to purchase the pair for \$35 and consumer surplus is \$15.

Producer surplus is the amount that producers benefit by selling a good at a market price that is higher than the least that they would be willing to sell it for. An example would be a manufacturer that makes jeans. The lowest price the producer is willing to sell a pair of jeans for is \$40, but the jeans actually sell for \$50. The producer surplus is \$10.

In order to calculate the total welfare, the supply and demand of the good must be used to determine the economic gain. On a demand and supply curve graph, the consumer surplus is located under the demand curve and above a horizontal line that shows the actual price of a good (equilibrium price).

When the supply of a good increases, the price falls which increases consumer surplus. When the demand for a good increases, the price increases and the supply decreases resulting in producer surplus. When a good is in high demand, consumers are willing to pay more in order to obtain the good.

## 2.1.3: Production Possibility Frontier

A production-possibility frontier (PPF) graphs the combinations for the production of two commodities with which the same amounts are used.

### Learning Objective

Explain the benefits of trade and exchange using the production possibilities frontier (PPF)

### Key Points

- A PPF graph shows the maximum production level for one commodity for any production level of the other commodity.
- If a point on the graph is above the curve it indicates efficiency, while a point below the curve signifies inefficiency.
- The PPF graph shows how resources must be shared among goods during the production process.
- Within an economy, if the capacity to produce both goods increases which results in economic growth.

### Key Terms

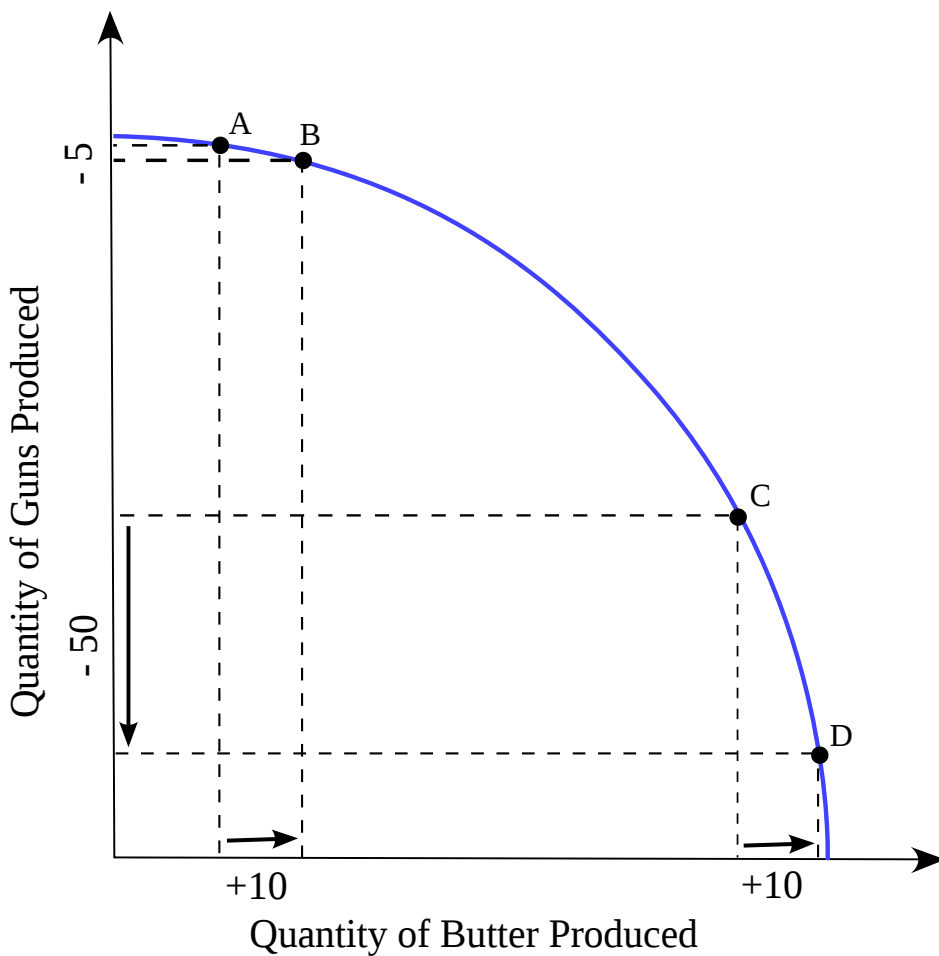
commodity

Raw materials, agricultural and other primary products as objects of large-scale trading in specialized exchanges.

marginal

Of, relating to, or located at or near a margin or edge; also figurative usages of location and margin (edge).

Within a market system, economists use the production possibility frontier (PPF) to graph the combinations of the amounts of two commodities that can be produced using the same amount of each factor of production. A PPF graph chooses specific input quantities. As a result, it shows the maximum production level for one commodity for any production level of the other commodity. PPF is used to define production efficiency.



## A common PPF

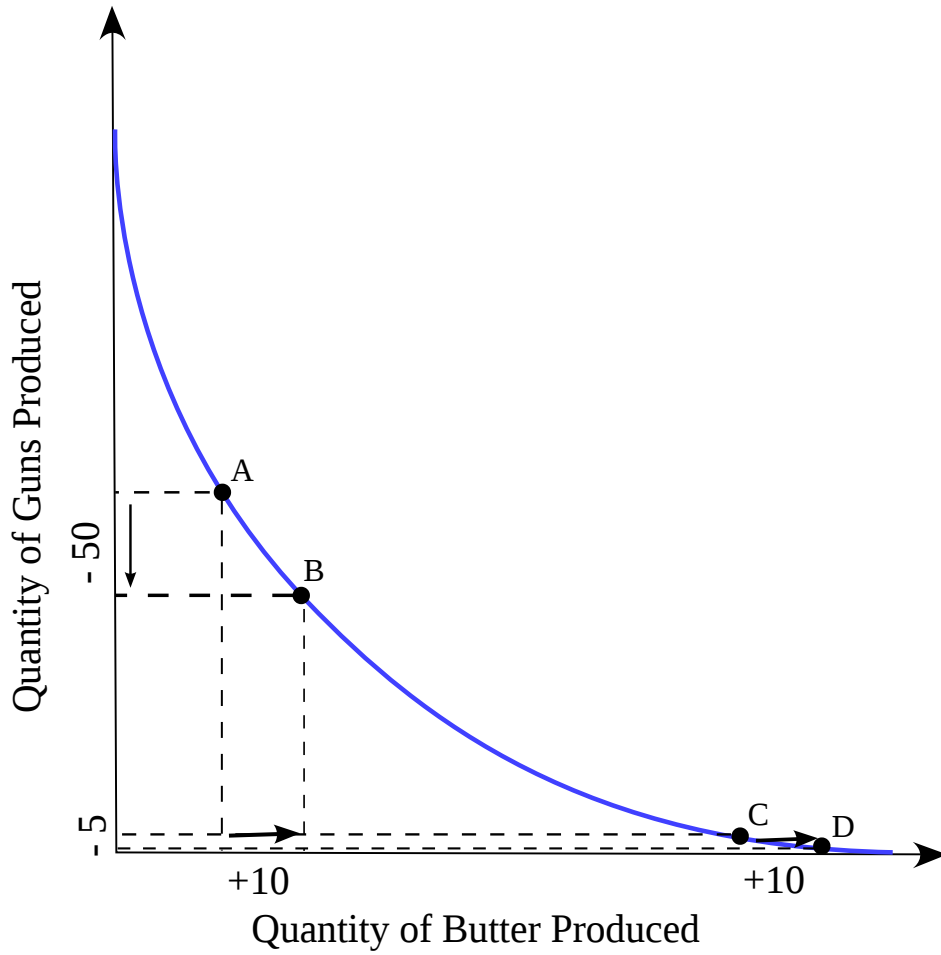
A common PPF where there is an increase in opportunity cost.

Within a PPF graph, the use of a curve or line acts as a benchmark for measuring efficiency. If a point on the graph is above the curve it indicates efficiency, while a point below the curve signifies inefficiency. For further analysis, additional information is always supplied with a PPF including the period of time taken for the observation, production technologies, and the amounts of inputs that were available.

Economists can use a PPF to illustrate a number of economic concepts including scarcity, opportunity cost, productive efficiency, allocative efficiency, and economies of scale.

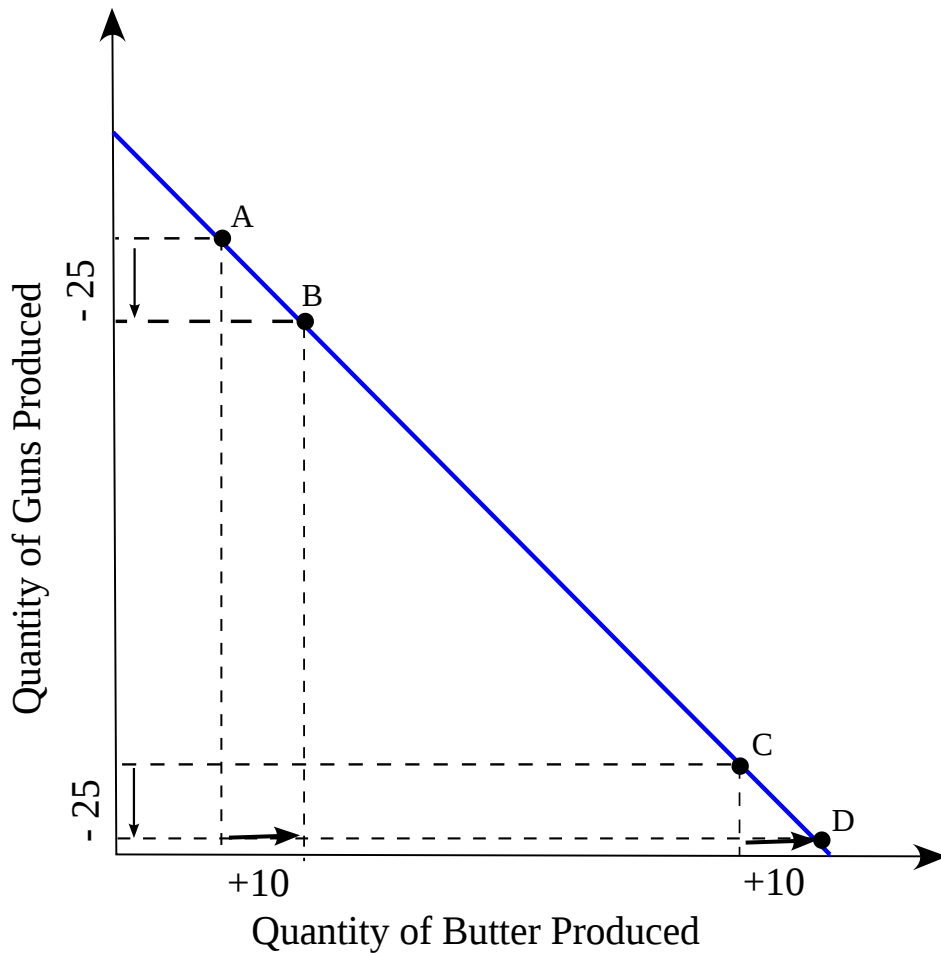
When an economy is operating on the PPF curve it is efficient. It is not possible to produce more of one good without decreasing the amount produced for the other good. Likewise, if the economy is operating below the PPF curve, it is inefficient. In this case, the economy can reallocate resources and produce more of both the goods.

The PPF graph shows how resources must be shared among goods during the production process. The points of the graph show the trade-off that takes place between two goods. For example, if more of Good A needs to be produced, the amount of resources in use by Good B must be reduced and transferred to Good A. The sacrifice in production of Good B is called opportunity cost. When graphing PPF there are three types: the common, the straight line, and the inverted PPF . All three of the PPF graphs are directly influenced by the opportunity cost.



## An inverted PPF

An inverted PPF where the opportunity cost is decreasing.



## A straight line PPF

A straight line PPF where the opportunity cost is constant.

The slope of the PPF shows the rate at which the production of one good can be transferred to another. The slope is called the marginal rate of transformation (MRT).

Within an economy, if the capacity to produce both goods increases, the result is economic growth. Factors that influence economic capacity include technology, an increase in the supply of factors of production, and production interactions such as trade and exchange. When any of these factors are used it allows for an increase in capacity so that the production of neither good has to be sacrificed.

PPF graphs help economists study the current state of production as well as possible production scenarios. The output of the economy is impacted by many factors. When production can be graphed and monitored it allows adjustments to be made to work towards attaining economic growth and stability.

## 2.1.4: The Circular Flow Model

In economics, a circular flow model is a diagram that is used to represent the monetary transactions in an economy.

### Learning Objective

State the function of the circular flow diagram and the production possibilities frontier

### Key Points

- There are two flows present within the model including flows of physical things (goods or labor) and flows of money (what pays for physical things).
- The circular flow of income follows a specific pattern: Production → Income → Expenditure → Production.
- The production possibility frontier can be used to illustrate the circular flow model.
- Economists use data, statistics, and natural experiments in order to make economic "laws" that explain general patterns.

### Key Terms

expenditure

Act of expending or paying out.

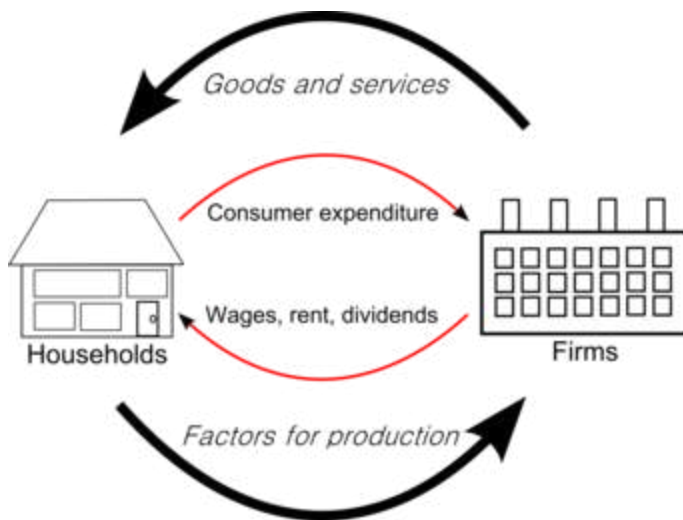
Factors of production



In economics, factors of production are inputs. They may also refer specifically to the primary factors, which are stocks including land, labor, and capital goods applied to production.

In economics, a circular flow model is a diagram that is used to represent the monetary transactions in an economy. There are two flows present within the model including flows of physical things (goods or labor) and flows of money (what pays for physical things). A circular flow model depicts the inner workings of a market system and specific portions of the economy.

The basic circular flow model consists of two sectors that determine income, expenditure, and output. A state of equilibrium is reached when there is no tendency for the levels of income ( ), expenditure ( ), and output ( ) to change ( ). This equation means that the expenditure of buyers (households) becomes income for sellers (firms). The firms spend the income on factors of production, which "transfers" the income to the factor owners. The factor owners spend the income on goods which leads to the circular flow of payments .



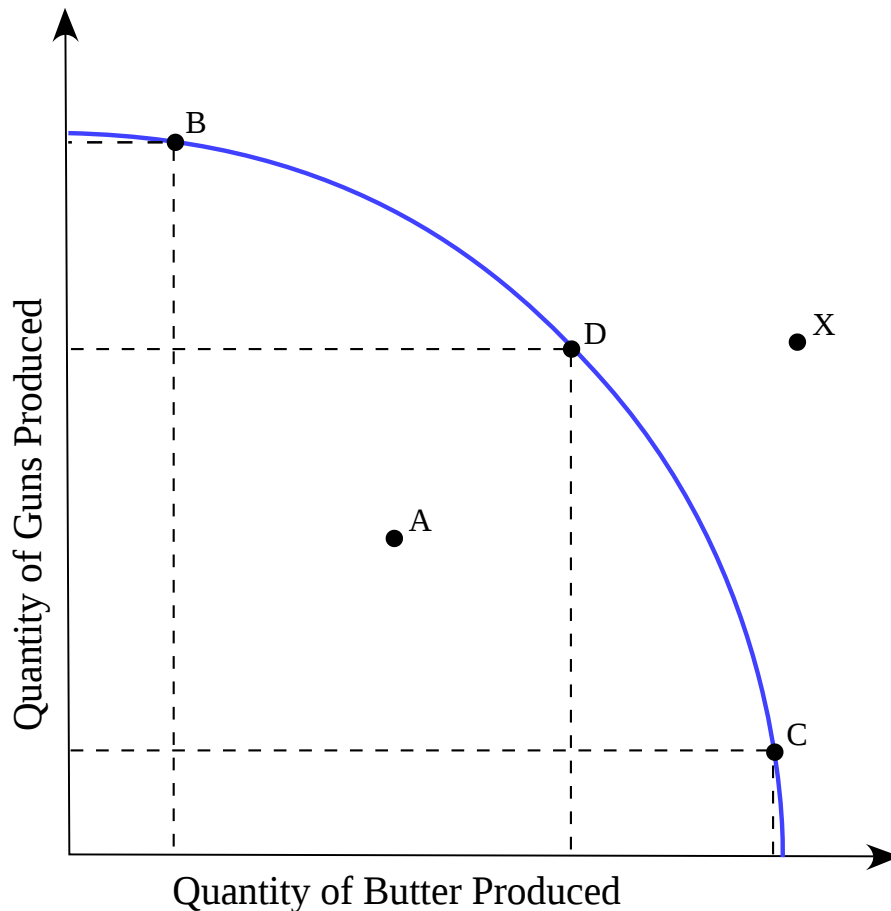
## Circular flow of goods income

The circular flow model shows the flow of payments between households and firms.

The circular flow of payments is important within an economy because it 1) measures the national income, 2) provides knowledge of interdependence, 3) illustrates the unending nature of economic activities, and 4) shows injections and leakages.

The circular flow of income follows a specific pattern: Production → Income → Expenditure → Production. This circular flow is ongoing between households and firms.

The circular flow of income can also be analyzed using the production possibility frontier (PPF). The PPF is a graph that shows the various combinations of amounts of two commodities that could be produced using the same fixed total amount of each of the factors of production. The graph shows the maximum possible production level of one commodity for any production level of the other, based on the state of technology. The PPF defines production efficiency. A point of the frontier line indicates the efficient use of available inputs, while a point beneath the curve shows inefficiency. A PPF graph shows opportunity cost, actual output, potential output, and economic growth.



## Production Possibilities Frontier Curve

The graph illustrates a typical production possibilities frontier curve. When a market is operating on the PPF it is said to be efficient.

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# **3: Introducing Supply and Demand**

# 3.1: Demand

## 3.1.1: The Law of Demand

In general, the law of demand states that the quantity demanded and the price of a good or service is inversely related, other things remaining constant.

### Learning Objective

Explain the concept of demand and discuss the factors that affect it

### Key Points

- The demand curve is downward sloping, indicating the negative relationship between the price of a product and the quantity demanded.
- For normal goods, a change in price will be reflected as a move along the demand curve while a non-price change will result in a shift of the demand curve.
- Two exceptions to the law of demand are Giffen goods and Veblen goods.

### Key Terms

Giffen good

A good which people consume more of as only the price rises; Having a positive price elasticity of demand.

Veblen good

A good for which people's preference for buying them increases as a direct function of their price, as greater price confers greater status.



normal good

A good for which demand increases when income increases and falls when income decreases but price remains constant.

In economics, the law of demand states that the quantity demanded and the price of a good or service is inversely related, other things remaining constant. Therefore, the demand curve will generally be downward sloping, indicating the negative relationship between the price of a good or service and the quantity demanded.

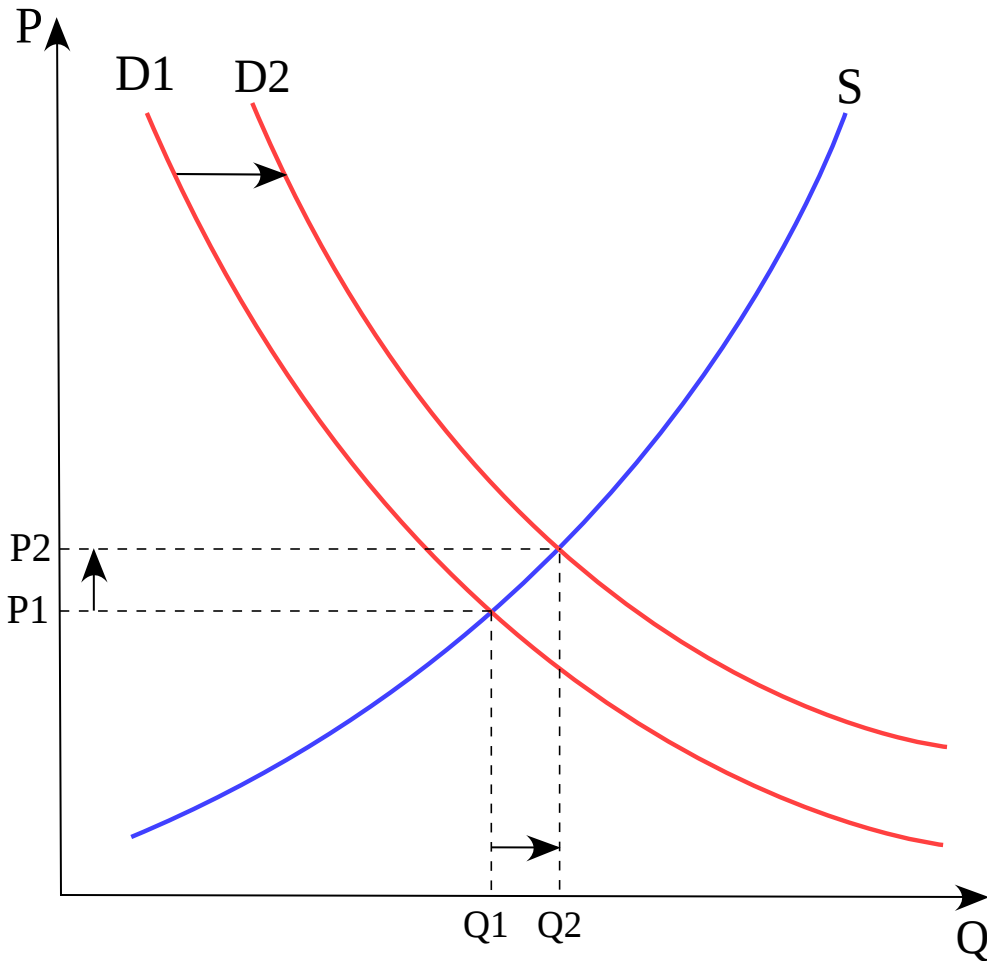
## **Movement along the demand curve**

If the income of the consumer, prices of the related goods, and preferences of the consumer remain unchanged, then the change in quantity of good demanded by the consumer will be negatively correlated to the change in the price of the good or service. The change in price will be reflected as a move along the demand curve.

## **Shift in the demand curve**

The demand curve will shift, move either inward or outward as a result of non-price factors. A shift in demand can be related to the following factors (non-exhaustive list):

- Consumer preferences
- Consumer income
- Change in the price of related goods (i.e. compliments)
- Change in the number of buyers
- Consumer expectations



## Law of Demand

A demand curve, shown in red and shifting to the right, demonstrating the inverse relationship between price and quantity demanded (the curve slopes downwards from left to right; higher prices reduce the quantity demanded).

Though in general terms and specific to normal goods, demand will exhibit a downward slope, there are exceptions: Giffen goods and Veblen goods

## Giffen goods

A Giffen good describes an extreme case for an inferior good. In theory, a Giffen good would display the characteristic that as price increases, demand

for the product increases. In the real world application, there has not been a *true*

example of a Giffen good, though a popular albeit historically inaccurate example is the purchase of potatoes (an inferior good) as prices continued to increase during the Irish potato famine.

## **Veblen goods**

Some expensive commodities like diamonds, expensive cars, designer clothing and other high-price limited items, are used as status symbols to display wealth. The more expensive these commodities become, the higher their value as a status symbol and the greater the demand for them. The amount demanded of these commodities increase with an increase in their price and decrease with a decrease in their price. These goods are known as a Veblen goods.

### **3.1.2: Demand Schedules and Demand Curves**

A demand curve depicts the price and quantity combinations listed in a demand schedule.

#### **Learning Objective**

Describe the relationship between demand curves and demand schedules

#### **Key Points**

- Demand curves are a graphical representation of a demand schedule, which is the table view of an economic agents' price to quantity relationship.
- Demand curves embody preferences, substitution potential and income, as well as other characteristics that influence an economic agent's ability to assess willingness to pay at a specific point in time for goods and services.

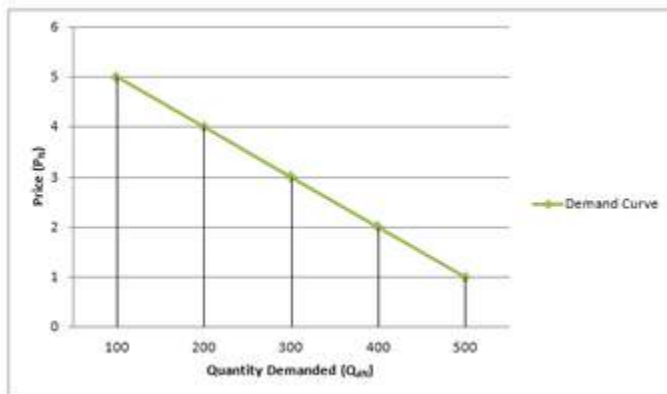
- Demand curves may be linear or curved.
- Aggregate demand is the sum of the quantity demanded for a specific price over a group of economic agents.

## Key Term

### equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

The demand curve is a graphical representation depicting the relationship between a commodity's different price levels and quantities which consumers are willing to buy. The curve can be derived from a demand schedule, which is essentially a table view of the price and quantity pairings that comprise the demand curve.



## Demand Schedule and Curve

The demand curve is the graphical representation of the economic entity's willingness to pay for a good or service. It is derived from a demand schedule, which is the table view of the price and quantity pairs that comprise the demand curve.

Given that in most cases, as the price of a good increases, agents will likely decrease consumption and substitute away to another good or service, the demand curve embodies a negative price to quantity relationship. The curve

typically slopes downward from left to right; though there are some goods and services that exhibit an upward sloping demand, these goods and services are characterized as *abnormal*.

The demand curve of an individual agent can be combined with that of other economic agents to depict a market or aggregate demand curve. Using a demand schedule, the quantity demanded per each individual can be summed by price, resulting in an aggregate demand schedule that provides the total demanded specific to a given price level. The plotting of the aggregated quantity to price pairings is what is referred to as an aggregate demand curve. In this manner, the demand curve for all consumers together follows from the demand curve of every individual consumer.

The demand curve in combination with the supply curve provides the market clearing or equilibrium price and quantity relationship. This is found at the intersection or point at which the supply and demand curves cross each other.

### **3.1.3: Market Demand**

Market demand is the summation of the individual quantities that consumers are willing to purchase at a given price.

#### **Learning Objective**

Examine the relationship between market demand and individual demand

#### **Key Points**

- The graphical representation of a market demand schedule is called the market demand curve.
- Following the law of demand, the demand curve is almost always represented as downward-sloping. This means that as price decreases, consumers will buy more of the good.
- Two different hypothetical types of goods with upward-sloping demand curves are Giffen goods and Veblen goods.

## **Key Term**

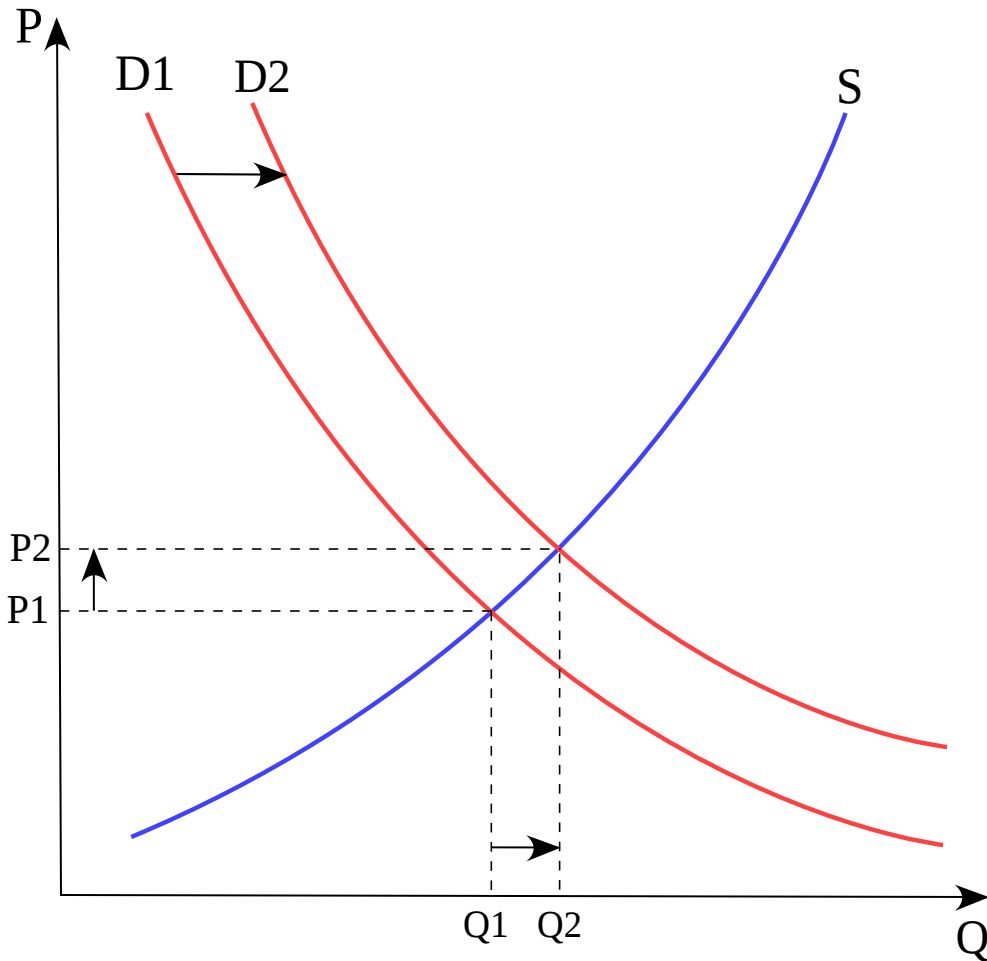
### Market demand

The summation of the individual quantities that consumers are willing to purchase at a given price.

The demand schedule represents the amount of some good that a buyer is willing and able to purchase at various prices. The relationship between price and quantity demanded reflected in this schedule assumes the following factors remain constant:

- Income levels;
- Population; Tastes and preferences;
- Price of substitute goods; and
- Price of complementary goods

The demand schedule is depicted graphically as the demand curve. The demand curve is shaped by the law of demand. In general, this means that the demand curve is downward-sloping, which means that as the price of a good decreases, consumers will buy more of that good.



## Demand Curve

The demand curve is the graphical depiction of the demand schedule. For most goods and services, the demand curve exhibits a negative relationship between price and quantity and is as a result downward sloping.

A market demand schedule is a table that lists the quantity of a good all consumers in a market will buy at every different price. A market demand schedule for a product indicates that there is an inverse relationship between price and quantity demanded. The graphical representation of a market demand schedule is called the market demand curve.

Market Demand Schedule	
Price of a Small Soda	Number demanded per day
\$0.25	890
\$0.50	500
\$0.75	480
\$1.00	470
\$1.25	410
\$1.50	350
\$1.75	280
\$2.00	240
\$2.25	200
\$2.50	150
\$2.75	100

## Market Demand Schedule

A market demand schedule is a table that lists the quantity of a good all consumers in a market will buy at every different price.

The determinants of demand are:

- Income
- Tastes and preferences
- Prices of related (AKA complimentary) goods and services
- Prices of substitutes
- Number of potential consumers

The market demand is the summation of the individual quantities that consumers are willing to purchase at a given price.

As noted, both individual demand curves and market demand are typically expressed as downward shaping curves. However, special cases exist where the preference for the good or service may be perverse. Two different hypothetical types of goods with upward-sloping demand curves are Giffen goods (an inferior but staple good) and Veblen goods (goods characterized as being more desirable the higher the price; luxury or status items).



## 3.1.4: Ceteris Paribus

Ceteris paribus is defined as "all else being equal," or "holding all else constant".

### Learning Objective

Explain the rationale for the assumption of ceteris paribus

### Key Points

- When ceteris paribus is employed in economics, all other variables with the exception of the variables under evaluation are held constant.
- An example of the use of ceteris paribus in macroeconomics is: what would happen to the demand for labor by firms if a minimum wage was imposed at a level above the prevailing wage rate, ceteris paribus.
- An example of the use of ceteris paribus in microeconomics is: what would happen for the demand for a normal good when income increases, ceteris paribus.

### Key Term

ceteris paribus

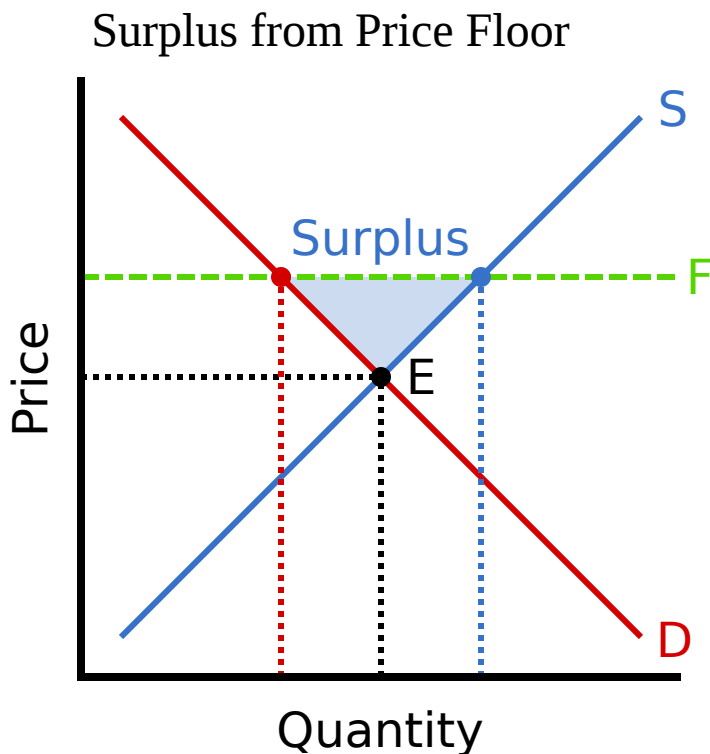
all else equal; holding everything else constant

Economics seeks to interpret, analyze and or evaluate situations that occur between individuals, firms and other entities. Due to the potential for multiple agents and other known and unknown external activities to be involved or present but not relevant to an analysis, economics employs the assumption of "all else constant," which is the English translation of the Latin phrase "ceteris paribus".

When the ceteris paribus assumption is employed in economics, all other variables - with the exception of the variables under evaluation - are held constant.

## **A Macroeconomic Example**

What would happen to the demand for labor by firms if a minimum wage was imposed at a level above the prevailing wage rate, *ceteris paribus*? As depicted in below, the supply and demand curve are held constant, as are labor and leisure preferences for workers, and output considerations for firms, in addition to all other variables and characteristics embedded within the shape of the supply and demand curves. Thus, what is being evaluated is the impact of a constraint on market equilibrium.



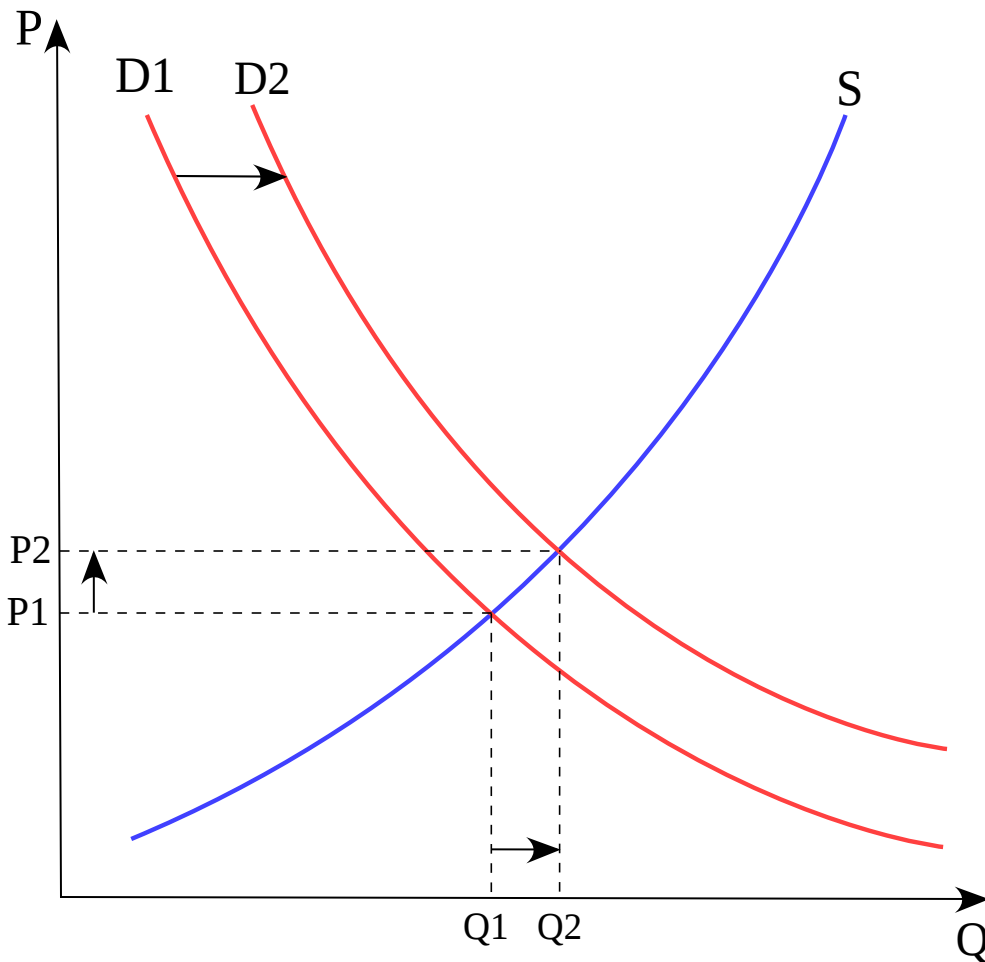
## Macroeconomics: Binding price floor

E is the equilibrium wage level when there is no binding minimum wage. When a minimum wage is imposed, *ceteris paribus*, suppliers of labor are willing to provide more labor than firms (demand for labor) are willing to purchase at the binding minimum wage rate. There is no shifting of either curve related to behavior influenced by the higher wage rate because *ceteris paribus* is holding labor-leisure trade-off (of workers) and substitution of labor (by firms) constant, along with other potential influencing variables.

## A Microeconomic Example

What would happen for the demand for a normal good when income increases, *ceteris paribus*? In this case, as depicted in , a consumer's preferences for the good and his demand for complements and substitutes are being held constant along with other attributes that could potentially impact his demand for a good, such as the good's price. The supply of the good and the market and firm characteristics implicit in the shape of the

supply curve are also held constant. This allows for an analysis of the increase in income, on the consumer's demand for the single good alone.



## Microeconomics: Income and Demand

A consumer is able to purchase a normal good and has a demand curve,  $D_1$ , which provides the relationship between price and quantity given his preferences, income and other consumption attributes. Assuming an increase in his income, *ceteris paribus*, his demand curve would shift outward to  $D_2$ , corresponding to a higher quantity for each purchase price. The consumer would then move his consumption for the good from  $Q_1$  to  $Q_2$ , increasing his purchase of the good.

## 3.1.5: Changes in Demand and Shifts in the Demand Curve

Demand is the relationship between the willingness to purchase a quantity of a good or service at a specific price.

### Learning Objective

Distinguish between shifts in the demand curve and movement along the demand curve

### Key Points

- A change in price will result in a movement along a demand curve.
- A change in a non-price variable will result in a shift in the demand curve.
- An outward shift in demand will occur if income increases, in the case of a normal good; however, for an inferior good, the demand curve will shift inward noting that the consumer only purchases the good as a result of an income constraint on the purchase of a preferred good.

### Key Terms

normal good

A good for which demand increases when income increases and falls when income decreases but price remains constant.

inferior good

a good that decreases in demand when consumer income rises; having a negative income elasticity of demand.

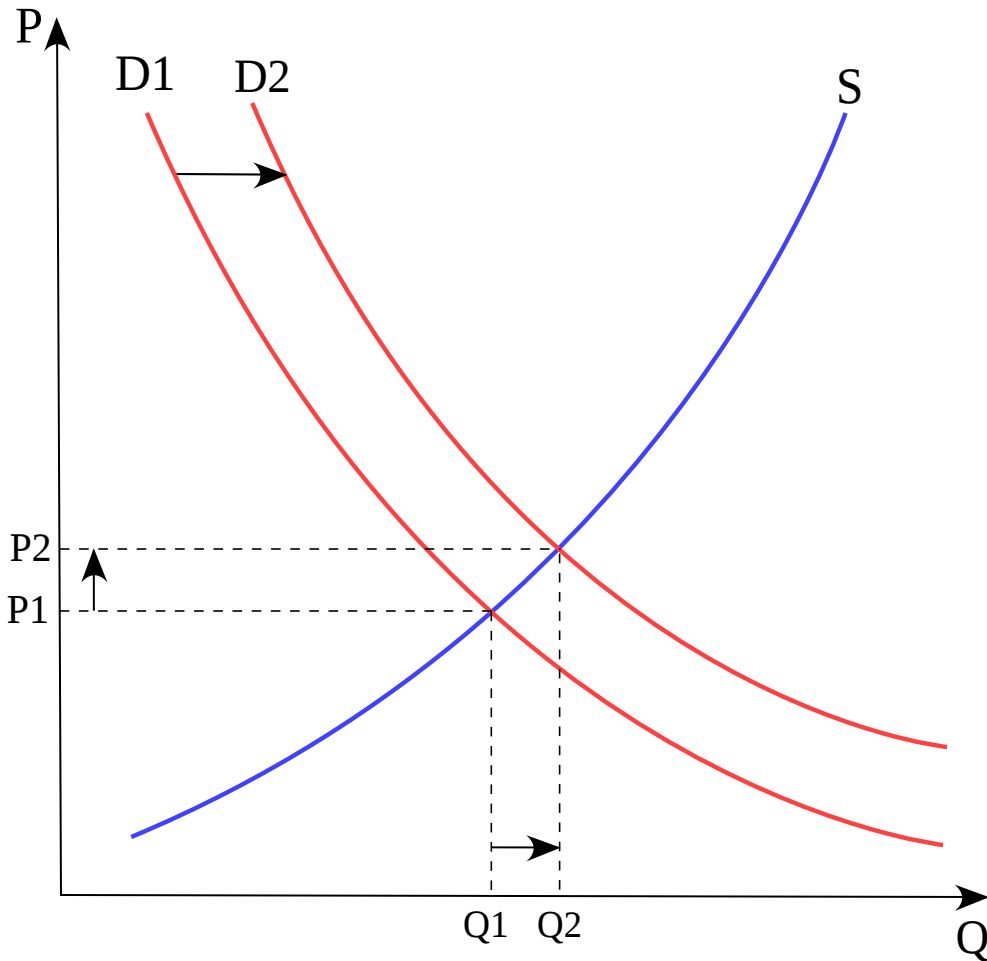
The demand curve is a graphical representation of an economic agent's willingness to purchase a given quantity of a good or service at a specific price based on preferences, income, and other prevailing factors at a given

point in time. Demand curves in combination with supply curves, which depict the price to quantity relationship of producers, are a representation of the goods and services market. Where the two curves intersect is market equilibrium, the price to quantity relationship where demand and supply are equal.

Movements in demand are specific to either movements along a given demand curve or shifts of the entire demand curve.

Movements along the demand curve are due to a change in the price of a good, holding constant other variables, such as the price of a substitute. If the price of a good or service changes the consumer will adjust the quantity demanded based on the preferences, income and prices of other factors embedded within a given curve for the time period under consideration.

Shifts in the demand curve are related to non-price events that include income, preferences and the price of substitutes and complements. An increase in income will cause an outward shift in demand (to the right) if the good or service assessed is a *normal good* or a good that is desirable and is therefore positively correlated with income. Alternatively, an increase in income could result in an inward shift of demand (to the left) if the good or service assessed is an *inferior good* or a good that is not desirable but is acceptable when the consumer is constrained by income .



## Demand Curve

A demand curve provides an economic agent's price to quantity relationship related to a specific good or service. Movements along a demand curve are related to a change in price, resulting in a change in quantity; shifts in demand (D1 to D2) are specific to changes in income, preferences, availability of substitutes and other factors.

A change in preferences could result in an increase (outward shift) or decrease (inward shift) in the quantity level desired for a specific price; while a change in the price of a substitute, could result in an outward shift if the price of the substitute increases and an inward shift if the substitute's price decreases. The demand curve for a good will shift in parallel with a shift in the demand for a complement.

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## 3.2: Supply

### 3.2.1: The Law of Supply

The law of supply states that there is a positive relationship between the quantity that suppliers are willing to sell and the price level.

#### Learning Objective

Explain the Law of Supply

#### Key Points

- Quantity supplied moves in the same direction as price.
- The supply curve is an upward sloping curve.
- Producers are willing to increase production at higher prices to increase profit.

#### Key Terms

surplus

That which remains when use or need is satisfied, or when a limit is reached; excess; overplus.

shortage

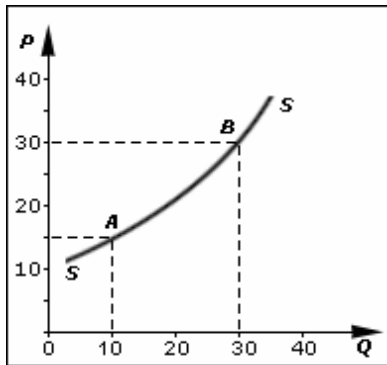
a lack or deficiency

equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

The law of supply is a fundamental principle of economic theory. It states that an increase in price will result in an increase in the quantity supplied, all else held constant.

An upward sloping supply curve, which is also the standard depiction of the supply curve, is the graphical representation of the law of supply. As the price of a good or service increases, the quantity that suppliers are willing to produce increases and this relationship is captured as a movement along the supply curve to a higher price and quantity combination.



## The Law of Supply

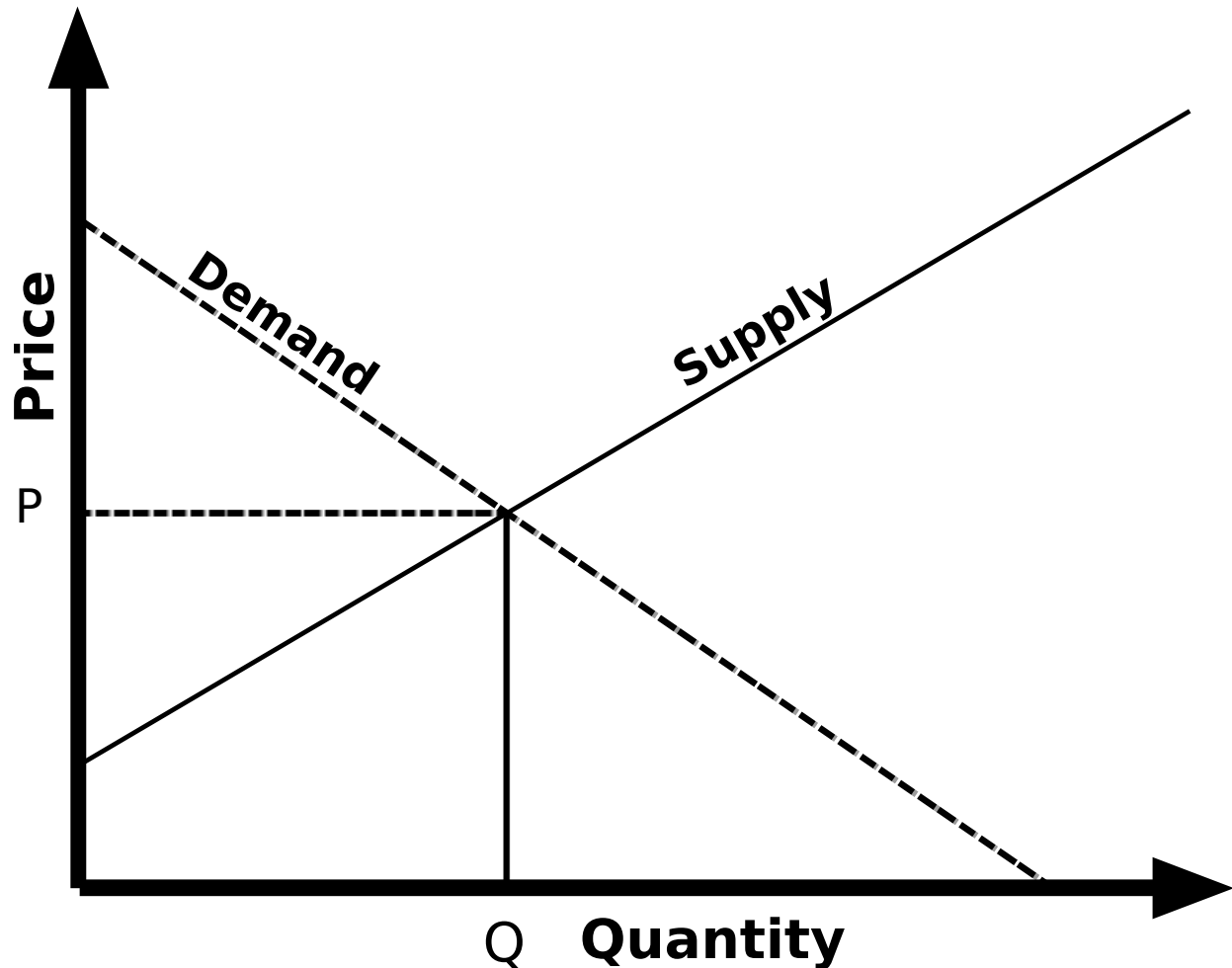
Supply has a positive correlation with price. As the market price of a good increases, suppliers of the good will typically seek to increase the quantity supplied to the market.

The rationale for the positive correlation between price and quantity supplied is based on the potential increase in profitability that occurs with an increase in price.

All else held constant, including the costs of production inputs, the supplier will be able to increase his return per unit of a good or service as the price for the item increases. Therefore, the net return to the supplier increases as the spread or difference between the price and the cost of the good or service being sold increases.

The law of supply in conjunction with the law of demand forms the basis for market conditions resulting in a price and quantity relationship at which both the price to quantity relationship of suppliers and demanders (consumers) are

equal. This is also referred to as the equilibrium price and quantity and is depicted graphically at the point at which the demand and supply curve intersect or cross one another. It is the point where there is no surplus or shortage in the market .



### **Law of Supply and Law of Demand: Equilibrium**

The law of supply and the law of demand form the foundation for the establishment of an equilibrium--where the price to quantity combination for both suppliers and demanders are the same.

### **3.2.2: Supply Schedules and Supply Curves**

A supply schedule is a tabular depiction of the relationship between price and quantity supplied, represented graphically as a supply curve.

## **Learning Objective**

Explain the price to quantity relationship exhibited in the supply curve

## **Key Points**

- The supply curve plots the quantity that is willingly supplied at any given price.
- The individual supply curves can be summed by quantity provided at a specific price to achieve an aggregate supply curve.
- The supply curve is upward sloping in the short run.

## **Key Terms**

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

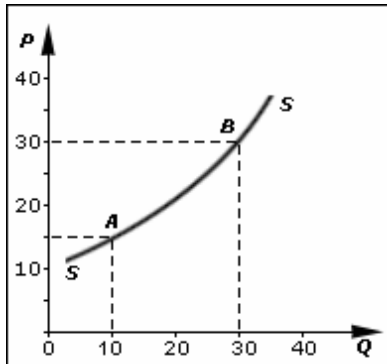
equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

Supply is the amount of some product that producers are willing and able to sell at a given price, all other factors being held constant. In general, supply depicts a positive relationship between the price of a good or service and the quantity that the producer is willing to supply: if a supplier believes it can sell the product for more, it will want to make more of the product. As a result, as the price of a good or service increases, suppliers increase the quantity available for purchase.

A supply schedule is a table that shows the relationship between the price of a good and the quantity supplied. The supply curve is a graphical depiction

of the supply schedule that illustrates that relationship between the price of a good and the quantity supplied .



## The Supply Schedule and Supply Curve

The supply curve is a graphical depiction of the price to quantity pairings presented in a supply schedule. The supply schedule is a table view of the relationship between the price suppliers are willing to sell a specific quantity of a good or service.

The supply curves of individual suppliers can be summed to determine aggregate supply. One can use the supply schedule to do this: for a given price, find the corresponding quantity supplied for each individual supply schedule and then sum these quantities to provide a group or aggregate supply. Plotting the summation of individual quantities per each price will produce an aggregate supply curve.

In theory, in the long run the aggregate supply curve will not be upward sloping but will instead be vertical, consistent with a fixed supply level. This is due to the underlying assumption that in the long run, supply of a good only depends on the fixed level of capital, technology, and natural resources available.

The supply curve provides one side of the price-to-quantity relationship that ensures a functional market. The other component is demand. When the supply and demand curves are graphed together they will intersect at a point that represents the market equilibrium - the point where supply equals demand and the market clears.

### 3.2.3: Market Supply

Market supply is the summation of the individual supply curves within a specific market where the market is characterized as being perfectly competitive.

#### Learning Objective

Identify the market conditions that yield a market supply curve.

#### Key Points

- A supply curve is the graphical representation of the supplier's positive correlation between the price and quantity of a good or service.
- The supply curve can only be attributed to a depiction of a perfectly competitive market due to the unique attributes of perfect competition: firms are price takers, no single firm's actions can influence the market price, and ease of exit and entry.
- The market supply curve is derived by summing the quantity for a given price across all market participants (suppliers). It depicts the price-to-quantity combinations available to consumers of the good or service.

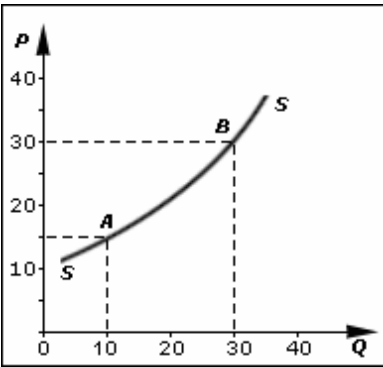
#### Key Term

Supply curve

A graphical representation of the quantity producers are willing to make when the product can be sold at a given price.

A supply curve is the graphical representation of the supplier's positive correlation between the price and quantity of a good or service. As a result, the supply curve is upward sloping . Market supply is the summation of the individual supply curves within a specific market.





## Market Supply

The market supply curve is an upward sloping curve depicting the positive relationship between price and quantity supplied.

The market supply curve is derived by summing the quantity suppliers are willing to produce when the product can be sold for a given price. As a result, it depicts the price to quantity combinations available to consumers of the good or service. In combination with market demand, the market supply curve is requisite for determining the market equilibrium price and quantity.

By its very nature, conceptualizing a supply curve requires the firm to be a perfect competitor, namely requires the firm to have no influence over the market price. This is true because each point on the supply curve is the answer to the question "If this firm is faced with this potential price, how much output will it be able to and willing to sell?" If a firm has market power, its decision of how much output to provide to the market influences the market price, then the firm is not "faced with" any price, and the question is meaningless.

The attributes of a competitive market signal that the price is set external to any firm. Therefore, production in the market is a sliding scale dependent on price. As price increases, quantity increases due to low barriers to entry, and as the price falls, quantity decreases as some firms may even opt out of the market.

The supply curve can be derived by compiling the price-to-quantity relationship of a seller. A seller could set the price of a good or service equal to zero and then incrementally increase the price; at each price he could

calculate the hypothetical quantity he would be willing to supply. Following this process the seller would be able to trace out its complete individual supply function. The market supply curve is simply the sum of every seller's individual supply curve.

### **3.2.4: Determinants of Supply**

Supply levels are determined by price, which increases or decreases supply along the price curve, and non-price factors, which shifts the entire curve.

#### **Learning Objective**

Identify the factors that affect the supply of a good

#### **Key Points**

- Supply is the quantity of a good or service that a supplier provides to the market.
- Suppliers will shift production for non-price changes related to the determinants of supply and will slide production levels across the supply curve for price related movements.
- Innumerable factors and circumstances could affect a seller's willingness or ability to produce and sell a good.

#### **Key Terms**

incentive

Something that motivates, rouses, or encourages.

intervention

The action of interfering in some course of events.

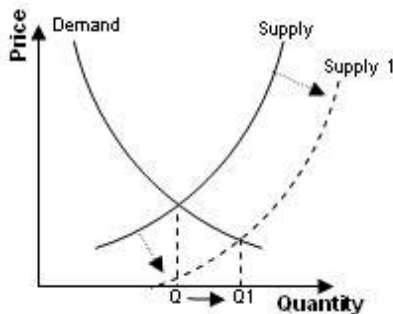
Supply is the quantity of a good or service that a supplier provides to the market. Innumerable factors and circumstances could affect a seller's

willingness or ability to produce and sell a good. Some of the more common factors are:

- Good's own price: An increase in price will induce an increase in the quantity supplied.
- Prices of related goods: For purposes of supply analysis, related goods refer to goods from which inputs are derived to be used in the production of the primary good.
- Conditions of production: The most significant factor here is the state of technology. If there is a technological advancement related to the production of the good, the supply increases.
- Expectations: Sellers' expectations concerning future market conditions can directly affect supply.
- Price of inputs: If the price of inputs increases the supply curve will shift left as sellers are less willing or able to sell goods at any given price. Inputs include land, labor, energy and raw materials.
- Number of suppliers: As more firms enter the industry the market supply curve will shift out driving down prices. The market supply curve is the horizontal summation of the individual supply curves.
- Government policies and regulations: Government intervention can take many forms including environmental and health regulations, hour and wage laws, taxes, electrical and natural gas rates and zoning and land use regulations. These regulations can affect a good's supply.

Suppliers will change their production levels along the supply curve in response to a price change, so that their production level is equal to demand. However, some factors unrelated to price can shift the production level. For example, a technological improvement that reduces the input cost of a product will shift the supply curve outward, allowing suppliers to provide a greater supply at the same price level.

Figure 5 – “Supply and Demand”  
Curves



## Determinants of Supply

If the price of a good changes, there will be movement along the supply curve. However, the supply curve itself may shift outward or inward in response to non-price related factors that affect the supply of a good, such as technological advances or increased cost of materials.

### 3.2.5: Changes in Supply and Shifts in the Supply Curve

The supply curve depicts the supplier's positive relationship between price and quantity.

#### Learning Objective

Distinguish between shifts in the supply curve and movement along the supply curve

#### Key Points

- A change in the price of a good or service, holding all else constant, will result in a movement along the supply curve.
- A change in the cost of an input will impact the cost of producing a good and will result in a shift in supply; supply will shift outward if costs decrease and will shift inward if they increase.

- A change in the expected demand for a good or service will result in a shift in supply; supply will shift outward if enthusiasm is expected to increase and will shift inward if there is an expectation for consumers preferences to change in favor of an alternate good or service.

## **Key Term**

### Non-price changes

Shocks, either exogenous or endogenous, that affect the positioning of the supply curve.

### Price changes and movement along supply curve

If the price of the good or service changes, all else held constant such as price of substitutes, the supplier will adjust the quantity supplied to the level that is consistent with its willingness to accept the prevailing price. The change in price will result in a movement along the supply curve, called a change in quantity supplied, but *not* a shift in the supply curve. Changes in supply are due to non-price changes.

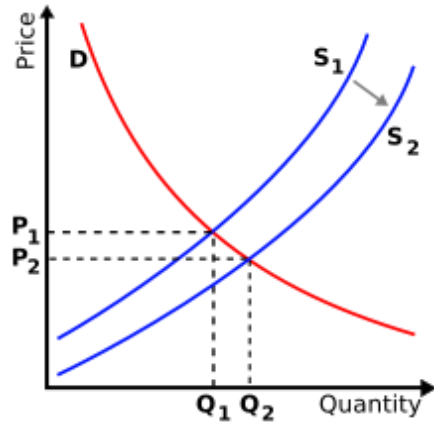
## **Non-price changes and shifts of the supply curve**

If production costs increase, the supplier will face increasing costs for each quantity level. Holding all else the same, the supply curve would shift inward (to the left), reflecting the increased cost of production. The supplier will supply less at each quantity level.

If production costs declined, the opposite would be true. Lower costs would result in an increase in output, shifting the supply curve outward (to the right) and the supplier will be willing sell a larger quantity at each price level. The supply curve will shift in relation to technological improvements and expectations of market behavior in very much the same way described for production costs.

Technological improvements that result in an increase in production for a set amount of inputs would result in an outward shift in supply.

Supply will shift outward in response to indications of heightened consumer enthusiasm or preference and will respond by shifting inward if there is an assessment of a negative impact to production costs or demand .



## Supply Shifts

A shift in supply from S1 to S2 affects the equilibrium point, and could be caused by shocks such as changes in consumer preferences or technological improvements.

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## 3.3: Market Equilibrium

### 3.3.1: Clearing the Market at Equilibrium Price and Quantity

When a market achieves perfect equilibrium there is no excess supply or demand, which theoretically results in a market clearing.

#### Learning Objective

Define market equilibrium

#### Key Points

- The interdependent relationship between supply and demand in the field of economics is inherently designed to identify the ideal price and quantity of a given product or service in a marketplace.
- A market clearing, by definition, is the economic assumption that the quantity supplied will consistently align with the quantity demanded.
- Market clearing requires a variety of assumptions which simplify the complexities of real markets to coincide with a more theoretical framework, most centrally the assumptions of perfect competition and Say's Law.
- While this concept of market clearing resonates well in theory, the actual execution of markets is very rarely perfect. The concepts of consolidated markets and 'sticky' markets reduces the accuracy of these models.

#### Key Terms

Say's Law

The idea that money is perishable.

## Incumbents

A holder of a position as supplier to a market or market segment that allows the holder to earn above-normal profits.

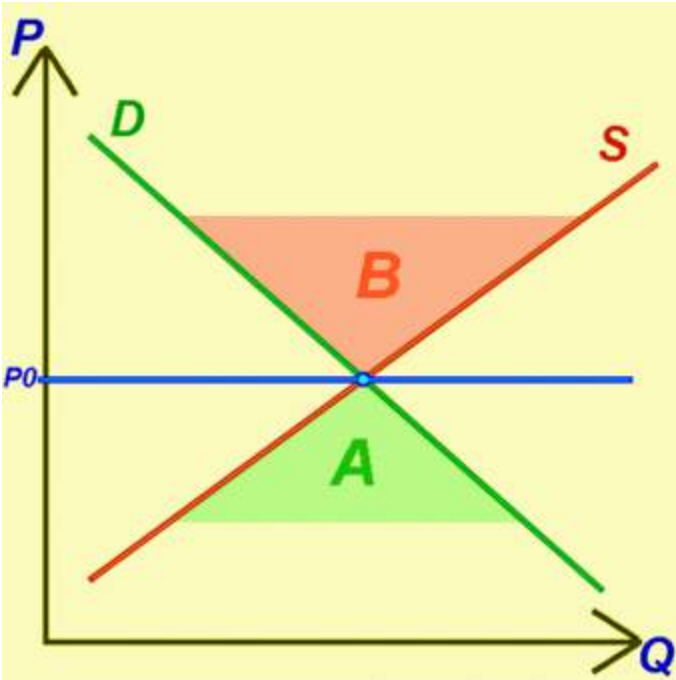
## Opportunity cost

The cost of an opportunity forgone (and the loss of the benefits that could be received from that opportunity); the most valuable forgone alternative.

## Example

- A textbook example of a monopoly was the Da Beers family, who owned the vast majority of diamond mines worldwide. Through effectively controlling the diamond market supply (via owning the mines), and warehousing the diamonds in a way to substantially alter the available supply, it became reasonably easy for Da Beers to charge prices in excess of what a reasonable equilibrium would be.

The interdependent relationship between supply and demand in the field of economics is inherently designed to identify the ideal price and quantity of a given product or service in a marketplace. This equilibrium point is represented by the intersection of a downward sloping demand line and an upward sloping supply line, with price as the y-axis and quantity as the x-axis. At perfect equilibrium there is no excess demand (represented by 'A' in the figure) or excess supply (represented by 'B' in the figure), which theoretically results in a market clearing.



## Equilibrium Pricing

This chart effectively highlights the various basic implications of a simple supply and demand chart. The equilibrium point is where market clearing will theoretically occur.

## Market Clearing Assumptions

A market clearing, by definition, is the economic assumption that the quantity supplied will consistently align with the quantity demanded. This definition requires a variety of assumptions which simplify the complexities of real markets to coincide with a more theoretical framework, most centrally the assumptions of perfect competition and Say's Law:

- Perfect competition is a market where the price determined for a given good or service is not affected by external forces or competition in a way that allows incumbents (companies) to attain market influence.
- Say's Law hinges on the concept that capital loses value over time, or that money is essentially perishable. The simplest way to view this law is interest rates. When you invest or owe money, that capital accrues

interest due to the fact that there is an opportunity cost in not investing that money elsewhere. This opportunity cost creates the assumption that money will not go unused.

Combining these two assumptions, in a perfectly competitive market the amount of a product or service that is supplied at a given price will equate to the amount demanded, clearing the market of all goods/services at a given equilibrium point.

## **Theory and Practice**

While this concept of market clearing resonates well in theory, the actual execution of markets is very rarely perfect. Markets demonstrate consistent shifts of supply and shifts of demand based on a wide spectrum of externalities. Even in static markets there is competitive consolidation that allows companies to charge differing price points than that of the equilibrium. The concept of monopolies provides a good example for this experience, as monopolies (see example) can control price and quantity simultaneously.

Another classic criticism of market clearing is the way in which the labor market functions. In the 1930's, during the worst depression recorded in the United States, the labor market did not clear the way economic theories of market clearing would assume it would. Instead, there seemed to be what John Maynard-Keynes (father of Keynesian Economics) called 'stickiness,' which preventing the market from normalizing. The importance of raising these concerns is the understanding that while the concept of market clearing, equilibrium and supply/demand charts are highly useful in understanding the basic functioning of markets, reality does not always conform with these models.

### **3.3.2: Impacts of Surpluses and Shortages on Market Equilibrium**

The existence of surpluses or shortages in supply will result in disequilibrium, or a lack of balance between supply and demand levels.

## Learning Objective

Infer the outcomes of departures from equilibrium using the model of supply and demand

## Key Points

- Surpluses, or excess supply, essentially indicates that the quantity of a good or service exceeds the demand for that particular good at the price in which the producers would wish to sell (equilibrium level).
- In a perfectly competitive market, excess supply is equivalent to the quantity available in the market beyond the equilibrium point of intersection between supply and demand. This will result in a shift in market equilibrium towards lower price points.
- Shortage is a term used to indicate that the supply produced is below that of the quantity being demanded by the consumers. This disparity implies that the current market equilibrium at a given price is unfit for the current supply and demand relationship.
- In a perfectly competitive market, a shortage in supply will ultimately result in a shift in the equilibrium point, transitioning towards a higher price point due to the limited supply availability.

## Key Terms

Disequilibrium

The loss of equilibrium or stability, especially due to an imbalance of forces.

surplus

That which remains when use or need is satisfied, or when a limit is reached.

shortage

Not enough or not sufficient for a given demand.

In the analysis of market equilibrium, specifically for pricing and volume determinations, a thorough understanding of the supply and demand inputs is critical to economics. Surpluses and shortages on the supply end can have substantial impacts on both the pricing of a specific product or service, alongside the overall quantity sold over time. Shifts such as these in the supply availability results in disequilibrium, or essentially a lack of balance between current supply and demand levels. Surpluses and shortages often result in market inefficiencies due to a shifting market equilibrium.

## **Surpluses**

Surpluses, or excess supply, indicate that the quantity of a good or service exceeds the demand for that particular good at the price in which the producers would wish to sell (equilibrium level). This inefficiency is heavily correlated in circumstances where the price of a good is set too high, resulting in a diminished demand while the quantity available gains excess. There are substantial business risks inherently built into the concept of surpluses, as the general outcome will be either selling off inventory at sub-par prices or leftover unsold inventory. In both scenarios businesses will be forced to minimize margins or incorporate losses on that particular good. Governmental intervention can often create surplus as well, particularly through the utilization of a price floor if it is set at a price above the market equilibrium .



## Price Floor

A price floor ensures a minimum price is charged for a specific good, often higher than that what the previous market equilibrium determined. This can result in a surplus.

In a perfectly competitive market, particularly pertaining to goods that are not perishable, excess supply is equivalent to the quantity available in the market beyond the equilibrium point of intersection between supply and demand. In this theoretical scenario the equilibrium point will transition towards a lower price point due to the increased supply, which will in turn motivate consumers to purchase a higher quantity as a result. This allows the economic model of the market to correct itself.

## Shortages

Inversely, shortage is a term used to indicate that the supply produced is below that of the quantity being demanded by the consumers. This disparity implies that the current market equilibrium at a given price is unfit for the current supply and demand relationship, noting that the price is set too low. It could also indicate that the desired good has a low level of affordability

by the general public, and can be a dangerous societal risk for necessary commodities. Indeed, Garrett Hardin emphasized that a shortage of supply could also be perceived as a 'longage' of demand, as the two are inversely related. From this vantage point shortages can be attributed to population growth as much as resource scarcity.

In a perfectly competitive market, a shortage in supply will ultimately result in a shift in the equilibrium point, transitioning towards a higher price point due to the limited supply availability. This will prioritize who receives the good or service based upon their willingness and ability to pay a premium for the specific item in demand, leveraging those along the demand curve who are at higher levels with higher ability and willingness to pay.

### **3.3.3: Changes in Demand and Supply and Impacts on Equilibrium**

Alterations to overall supply or demand dictate the cross-section or equilibrium, ascertaining price and volume for a product or service.

#### **Learning Objective**

Illustrate how changes in supply or demand impact the market equilibrium

#### **Key Points**

- The interdependent relationship between the supply of a given product or service and the overall demand exercised by interested parties generates a theoretical equilibrium point, dictating the average market price and purchase volume relative to that price.
- Markets are in constant flux as demands and supplies are subjected to varying driving forces and influences. These shifts play a critical role, altering market equilibrium price points and volumes for products and services.
- Demand shifts can be caused by a wide variety of factors, but largely revolve around drivers of consumer behavior and circumstances.



- Supply shifts, similar to demand shifts, can ultimately be a result of a wide variety of externalities. Scarcity, or the lack of availability for a particular material, is a core driving force for overall supply.
- Due to a demand curve's sloping downward and a supply curve's sloping upwards, the curves will eventually cross at some point on any supply/demand chart. This point of equilibrium serves as a price and quantity tracking point.

## **Key Terms**

equilibrium

A condition in which competing forces are in balance.

scarcity

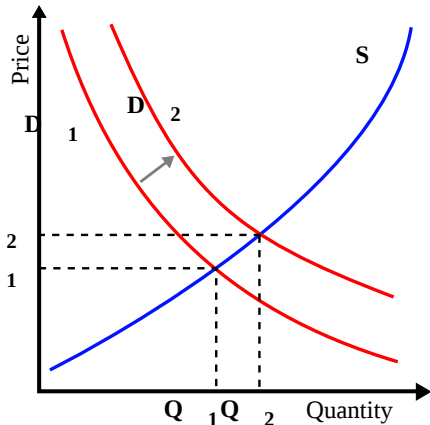
An insufficiency or lack of availability; a shortage.

The interdependent relationship between the supply of a given product or service and the overall demand exercised by interested parties generates a theoretical equilibrium point, dictating the average market price and purchased volume relative to that price. In a static market it would be reasonable to assume that prices and volumes would remain fairly predictable and consistent relative to the population, but realistic markets are not static. Instead, markets are in constant flux as demands and supplies are subjected to varying driving forces and influences. These shifts play a critical role in altering market equilibrium price points and volumes for products and services, requiring constant vigilance and adaptation by providers and consumers. To better understand market variations, it is useful to examine how changes in supply and demand may occur, as well as the impacts and implications of these changes.

## **Demand Shifts**

Demand shifts are defined by more or less of a given product or service being required at a fixed price, resulting in a shift of both price and quantity. As would be assumed, an increase in demand will shift price

upwards and volume to the right, increasing the overall value of both metrics relative to the prior equilibrium point. Alternately, a decrease in demand will shift price downwards and volume to the left, decreasing both measurements to realign equilibrium with a reduced demand.



## Demand Shifts

In this graph, the demand curve (red) has been affected by an increase in demand. This consequently increases price at a given volume.

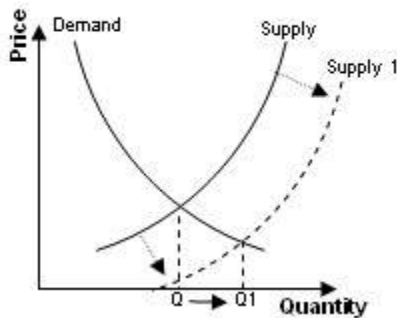
Demand shifts can be caused by a wide variety of factors, but largely revolve around drivers of consumer behavior and circumstances. Demand shifts can therefore often be affected by economic factors such as average spending power per person in a given economy or overall average income. Demand can also be affected by cultural changes, demographic shifts, availability of substitutes, environmental factors and concerns (e.g. climate change), politics, and advances in science (e.g. declining demand for unhealthy foods). Demand is particularly malleable in respect to goods that are not necessities, thus are desired or not based upon sociological norms.

## Supply Shifts

Supply shifts are defined by more or less of a particular product/service being available to fulfill a given demand, affecting the equilibrium point by shifting the supply curve upwards or downwards. A supply shift to the right, indicating more availability of the specified product or service, will

create a lower price point and a higher volume assuming a fixed demand. Alternately, a decrease in supply with a consistent given demand will see an increase in price and a decrease in quantity. This is an intuitive theory underlining the fact that scarcity is relevant to the willingness to pay.

Figure 5 – “Supply and Demand” Curves



## Supply Shifts

In this supply and demand chart we see an increase in the supply provided, shifting quantity to the right and price down. More of a given product, assuming the same demand, will result in lower price points at the equilibrium.

Supply shifts, similar to demand shifts, can ultimately be a result of a wide variety of external factors. As discussed above, scarcity plays a critical role in pricing and thus controlling supply is often even considered a strategic play by companies in specific industries (most notably industries like precious stones, rare earth metals, etc.). Supply shifts can also be a result of technological advances, over-utilization or consumption, globalization, supply-chain efficiency, and economics. For example, the discovery of a new gold deposit, acts as a shock to the supply of gold, shifting the curve right.

## Equilibrium

In combining these two potential shifts, equilibrium is constantly subjected to both factors resulting in supply shifts and factors resulting in demand shifts. Due to the demand curve sloping downward and the supply curve

sloping upwards, they inadvertently will cross at some given point on any supply/demand chart. This cross-section, or equilibrium, serves as a price and quantity tracking point based upon the consistent inputs of overall demand and supply availability. Any change in either factor will result in immediate impact on equilibrium, balancing the new demand or supply with a corresponding volume and appropriate average price point.

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# 3.4: Government Intervention and Disequilibrium

## 3.4.1: Why Governments Intervene In Markets

Governments intervene in markets when they inefficiently allocate resources.

### Learning Objective

Identify reasons why the government might choose to intervene in markets.

### Key Points

- The government tries to combat market inequities through regulation, taxation, and subsidies.
- Governments may also intervene in markets to promote general economic fairness.
- Maximizing social welfare is one of the most common and best understood reasons for government intervention. Examples of this include breaking up monopolies and regulating negative externalities like pollution.
- Governments may sometimes intervene in markets to promote other goals, such as national unity and advancement.

### Key Term

inefficient market

An economy where social optimality is not achieved; an economy where resources are not optimally allocated

Governments intervene in markets to address inefficiency. In an optimally efficient market, resources are perfectly allocated to those that need them in the amounts they need. In inefficient markets that is not the case; some may have too much of a resource while others do not have enough. Inefficiency can take many different forms. The government tries to combat these inequities through regulation, taxation, and subsidies. Most governments have any combination of four different objectives when they intervene in the market.

### Maximizing Social Welfare

In an unregulated inefficient market, cartels and other types of organizations can wield monopolistic power, raising entry costs and limiting the development of infrastructure. Without regulation, businesses can produce negative externalities without consequence. This all leads to diminished resources, stifled innovation, and minimized trade and its corresponding benefits. Government intervention through regulation can directly address these issues.

Another example of intervention to promote social welfare involves public goods. Certain depletable goods, like public parks, aren't owned by an individual. This means that no price is assigned to the use of that good and everyone can use it. As a result, it is very easy for these assets to be depleted. Governments intervene to ensure those resources are not depleted.

### Macro-Economic Factors

Governments also intervene to minimize the damage caused by naturally occurring economic events. Recessions and inflation are part of the natural business cycle but can have a devastating effect on citizens. In these cases, governments intervene through subsidies and manipulation of the money supply to minimize the harsh impact of economic forces on its constituents.

### Socio-Economic Factors

Governments may also intervene in markets to promote general economic fairness. Government often try, through taxation and welfare programs, to reallocate financial resources from the wealthy to those that are most in



need. Other examples of market intervention for socio-economic reasons include employment laws to protect certain segments of the population and the regulation of the manufacture of certain products to ensure the health and well-being of consumers.



## **Former President Bill Clinton signing welfare reform**

Former President signing a welfare reform bill. Welfare programs are one way governments intervene in markets.

### **Other Objectives**

Governments can sometimes intervene in markets to promote other goals, such as national unity and advancement. Most people agree that governments should provide a military for the protection of its citizens, and this can be seen as a type of intervention. Growing a large and impressive military not only increases a country's security, but may also be a source of pride. Intervening in a way that promotes national unity and pride can be an extremely valuable goal for government officials.

## **3.4.2: Price Ceilings**

A price ceiling is a price control that limits how high a price can be charged for a good or service.

## Learning Objective

Define price ceilings.

## Key Points

- For a price ceiling to be effective, it must be less than the free-market equilibrium price.
- The purpose of a price ceiling is to protect consumers of a certain good or service. By establishing a maximum price, a government wants to ensure the good is affordable for as many consumers as possible.
- Rent control is an example of a price ceiling.

## Key Terms

free-market equilibrium price

The price established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers

Price ceiling

An artificially set maximum price in a market.

A price ceiling is a price control that limits the maximum price that can be charged for a product or service. Generally ceilings are set by governments, although groups that manage exchanges can set ceilings as well. The purpose of a price ceiling is to protect consumers of a certain good or service. By establishing a minimum price, a government wants to ensure the good is affordable for as many consumers as possible .



## US Poster for Price Ceilings

Governments often impose price ceilings in times of war to ensure goods are available to as many people as possible.

An example of a price ceiling is rent control. These regulations require a more gradual increase in rent prices than what the market may demand. This regulation is meant to protect current tenants. Without rent control, there could be situations where the demand for housing in an area could cause rent prices to make a substantial jump. Unable to afford the new, significantly higher rent, a majority of the neighborhood's tenants may be forced to move out of the neighborhood. Rent controls limit the possibility of tenant displacement by minimizing the amount by which rent can be increased.

By definition, however, price ceilings disrupt the market. By setting a maximum price, any market in which the equilibrium price is above the price ceiling is inefficient. There will be excess demand because the price cannot increase enough to clear the excess.

For a price ceiling to be effective, it must be less than the free-market equilibrium price. This is the price established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers. It is also the price that the market will naturally set for a given good or service. If the price ceiling is higher than what the market would already charge, the regulation would not be effective. As a result, a government will do significant research into the current market conditions for a good before setting a price ceiling.

### 3.4.3: Price Ceiling Impact on Market Outcome

A binding price ceiling will create a surplus of supply and will lead to a decrease in economic surplus.

## **Learning Objective**

Explain how price controls lead to economic inefficiency

## **Key Points**

- A price ceiling has an economic impact only if it is less than the free-market equilibrium price.
- An effective price ceiling will lower the price of a good, which decreases the producer surplus. The effective price ceiling will also decrease the price for consumers, but any benefit gained from that will be minimized by the decreased sales due to the drop in supply caused by the lower price.
- If a ceiling is to be imposed for a long period of time, a government may need to ration the good to ensure availability for the greatest number of consumers.
- Prolonged shortages caused by price ceilings can create black markets for that good.

## **Key Terms**

Price ceiling

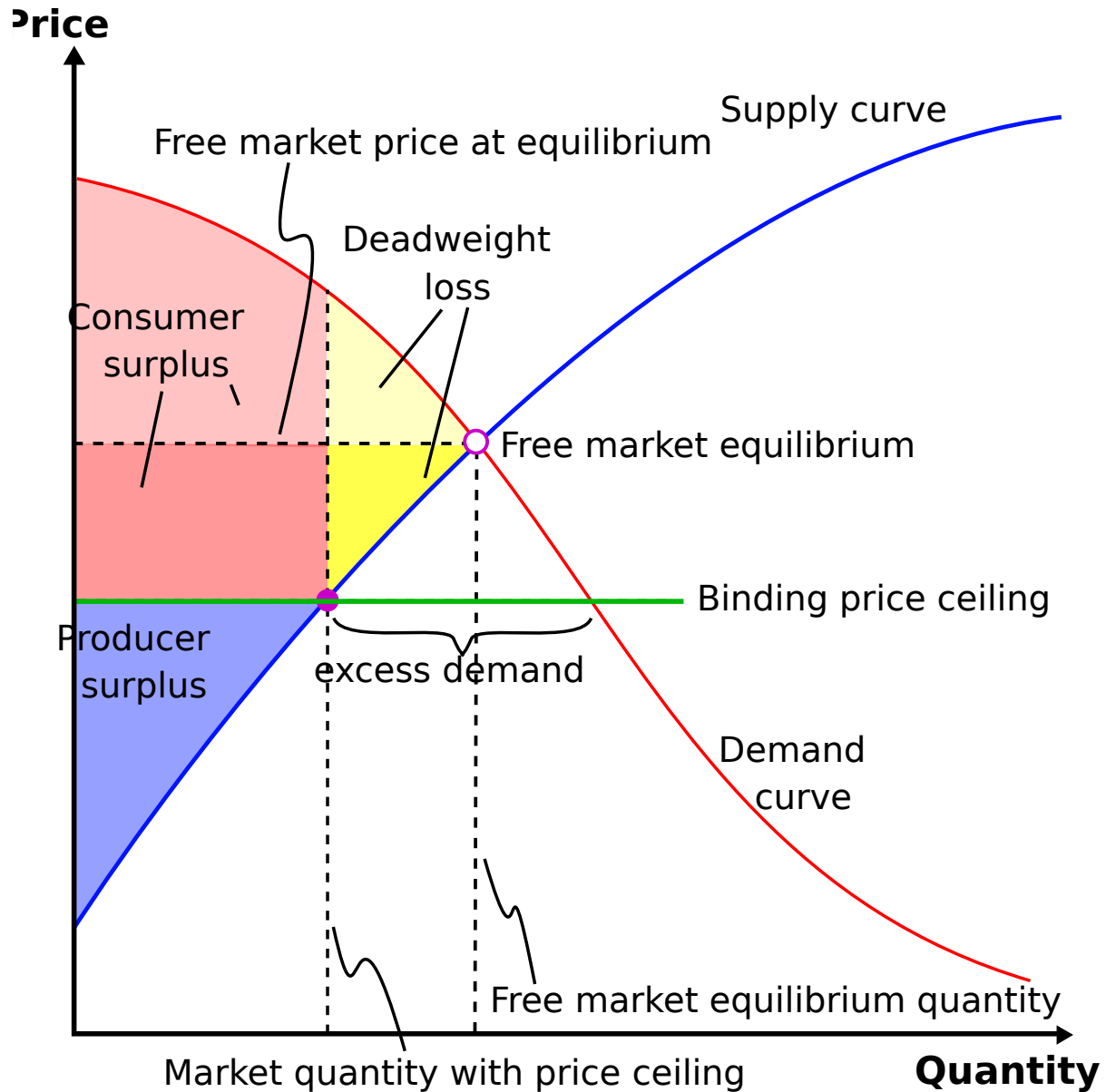
An artificially set maximum price in a market.

black market

trade that is in violation of restrictions, rationing or price controls

A price ceiling will only impact the market if the ceiling is set below the free-market equilibrium price. This is because a price ceiling above the equilibrium price will lead to the product being sold at the equilibrium price. If the ceiling is less than the economic price, the immediate result will be a supply shortage. As you can see from the chart below, a lower base price means less of a good will be produced. The quantity demanded will

increase because more people will be willing to pay the lower price to get the good while producers will be willing to supply less, leading to a shortage.



## Price Ceiling Chart

If a price ceiling is set below the free-market equilibrium price (as shown where the supply and demand curves intersect), the result will be a shortage of the good in the market. The dead weight loss, represented in yellow, is the minimum dead weight loss in such a scenario. If individuals who value the good most are not capable of purchasing it, there is a potential for a higher amount of dead weight loss.

A price ceiling will also lead to a more inefficient market and a decreased total economic surplus. Economic surplus, or total welfare, is the sum of consumer and producer surplus. Consumer surplus is the monetary gain obtained by consumers because they are able to purchase a product for a price that is less than the highest that they are willing pay. Producer surplus is the amount that producers benefit by selling at a market price that is higher than the least they would be willing to sell for. An effective price ceiling will lower the price of a good, which means that the the producer surplus will decrease. While the effective price ceiling will also decrease the price for consumers, any benefit gained from that will be minimized by decreased sales caused by decreased available supply for sale from producers due to the decrease in price. This translates into a net decrease total economic surplus, otherwise known as deadweight loss. This loss is signified in the attached chart as the yellow triangle.

## **Rationing**

If a ceiling is to be imposed for a long period of time, a government may need to ration the good to ensure availability for the greatest number of consumers. One way the government may ration the good is to issue ticket to consumers. A government will only allow as much of good to be out in the marketplace as there are available tickets. To obtain the good, the consumer must present the ticket and the money to the vendor when making the purchase. This is generally considered a fair way to minimize the impact of a shortage caused by a ceiling, but is generally reserved for times of war or severe economic distress.

## **Black Market**

Prolonged shortages caused by price ceilings can create black markets for that good. A black market is an underground network of producers that will sell consumers as much of a controlled good as they want, but at a price higher than the price ceiling. Black markets are generally illegal. However these markets provide higher profits for producers and more of a good for a consumers, so many are willing to take the risk of fines or imprisonment.

## 3.4.4: Price Floors

A binding price floor is a price control that limits how low a price can be charged for a product or service.

### Learning Objective

Define Price Floors.

### Key Points

- For a price floor to be affect the market, it must be greater than the free-market equilibrium price.
- Price floors above the equilibrium price will induce a surplus.
- The federal minimum wage is an example of a price floor.

### Key Terms

free-market equilibrium price

The price established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers

price floor

A mandated minimum price for a product in a market.

A price floor is a price control that limits how low a price can be charged for a product or service. Generally floors are set by governments, although groups that manage exchanges can set price floors as well. The purpose of a price floor is to protect producers of a certain good or service. By establishing a minimum price, a government seeks to promote the production of the good or service and ensure that the producers have sufficient resources to go about their work.



For a price floor to be effective, it must be greater than the free-market equilibrium price. This is the price established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers. It is also the price that the market will naturally set for a given good or service. If the price floor is lower than what the market would already charge, the regulation would serve no purpose. Since the price is set artificially high, there will be a surplus: there will be a higher quantity supplied and a lower quantity demanded than in a free market. As a result, a government will generally do significant research into the current market conditions for a good or service before setting a price floor.

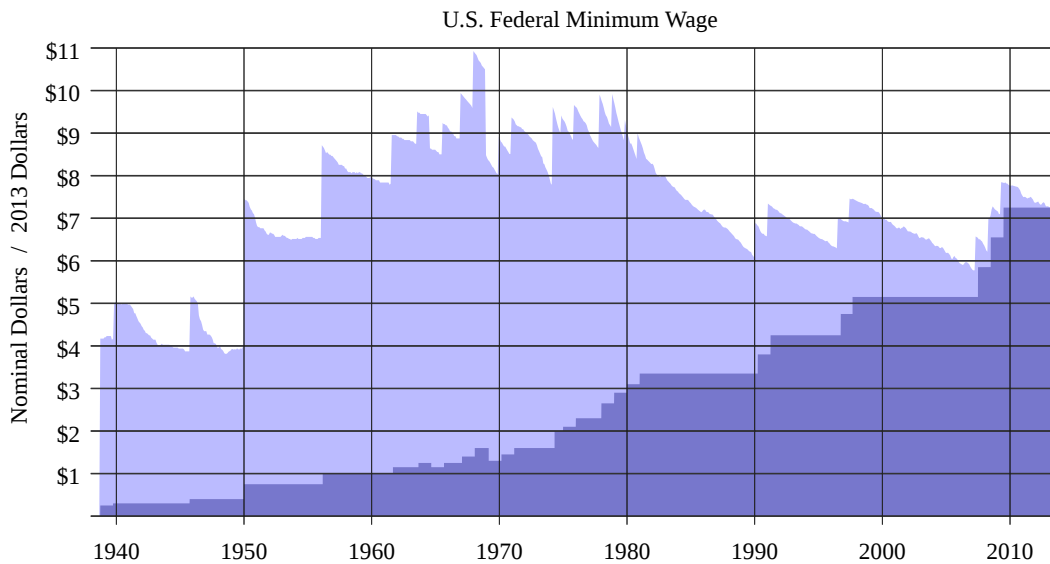


## Price Floor

If a price floor is set above the equilibrium price, consumers will demand less and producers will supply more.

An example of a price floor is the federal minimum wage. In this case the suppliers are employees and employers are the consumers. The federal government has established a price that all employers must pay their workers. Obviously employers can pay more than that amount, but they cannot pay less. The purpose of setting this floor is to ensure that all

employees make enough money from their jobs to provide for their basic needs.



## History of the Federal Minimum Wage

History of the federal minimum wage in real and nominal dollars. The federal minimum wage is one example of a price floor.

### 3.4.5: Price Floor Impact on Market Outcome

Binding price floors typically cause excess supply and decreased total economic surplus.

#### Learning Objective

Show how price floors contribute to market inefficiency

#### Key Points

- A price floor is economically consequential if it is greater than the free-market equilibrium price.
- Price floors lead to a surplus of the product.

- Supply surpluses created by price floors are generally added to producer's inventory or are purchased by governments.
- Consumer surplus is the gain obtained by consumers because they can obtain a product for a lower price than they would be willing to pay.
- Producer surplus is the benefit producers get by selling at a price higher than the lowest price they would sell for.

## **Key Terms**

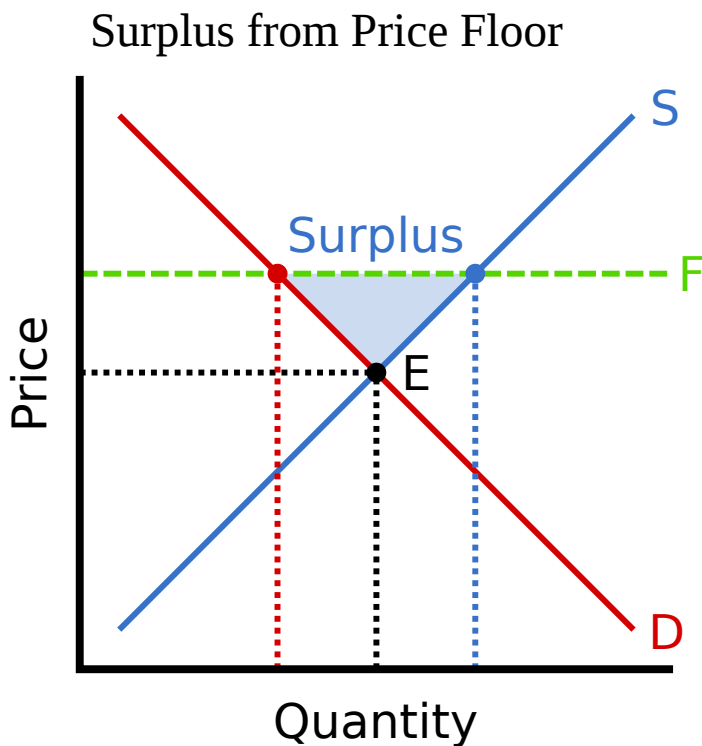
free-market equilibrium price

The price established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers

price floor

A mandated minimum price for a product in a market.

A price floor will only impact the market if it is greater than the free-market equilibrium price. If the floor is greater than the economic price, the immediate result will be a supply surplus. As you can see from , a higher base price will lead to a higher quantity supplied. However, quantity demand will decrease because fewer people will be willing to pay the higher price. This will lead to a surplus of supply.



## Surplus from a price floor

If a price floor is set above the free-market equilibrium price (as shown where the supply and demand curves intersect), the result will be a surplus of the good in the market.

A price floor will also lead to a more inefficient market and a decreased total economic surplus. Economic surplus, or total welfare, is the sum of consumer and producer surplus. Consumer surplus is the monetary gain obtained by consumers because they are able to purchase a product for a price that is less than the highest that they are willing pay. Producer surplus is the amount that producers benefit by selling at a market price that is higher than the least they would be willing to sell for. An effective price floor will raise the price of a good, which means that the the consumer surplus will decrease. While the effective price floor will also increase the price for producers, any benefit gained from that will be minimized by decreased sales caused by decreased demand from consumers due to the increase in price. This translates into a net decrease total economic surplus, otherwise known as deadweight loss.

Since well designed price floors create surpluses, the big issue is what to do with the excess supply. The first option is to let inventories grow and have the private producers bear the cost of storing it. The other option is for the government that set the price floor to purchase the excess supply and store it on its own. The government could then sell the surplus off at a loss in times of a food shortage.

### **3.4.6: Introduction to Deadweight Loss**

Deadweight loss is the decrease in economic efficiency that occurs when a good or service is not priced at its pareto optimal level.

#### **Learning Objective**

Define deadweight loss

#### **Key Points**

- Deadweight loss can be caused by monopolies, binding price controls, taxes, subsidies, and externalities.
- When deadweight loss occurs, it comes at the expense of consumer surplus and/or producer surplus.
- Deadweight loss can be visually represented on supply and demand graphs as a figure known as Harberger's triangle.

#### **Key Terms**

Pareto optimal

Describing a situation in which the profit of one party cannot be increased without reducing the profit of another.

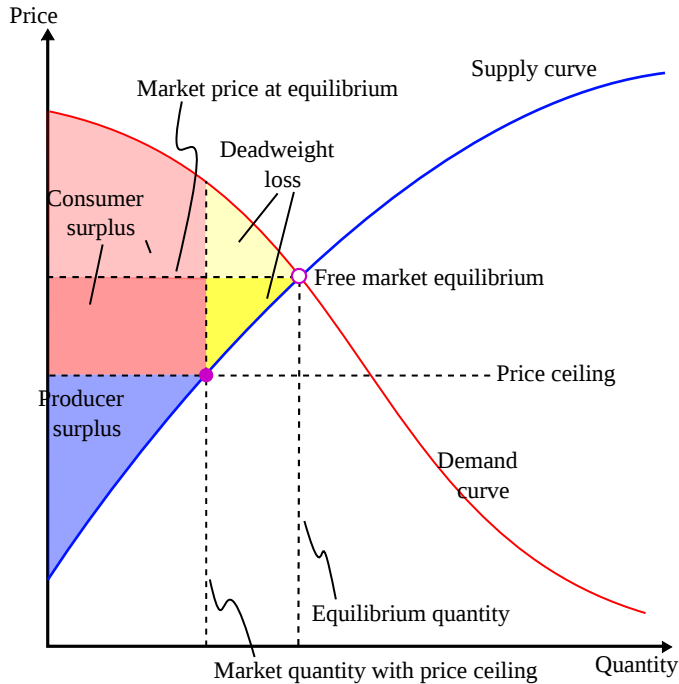
deadweight loss

A loss of economic efficiency that can occur when an equilibrium is not Pareto optimal.

Deadweight loss is the decrease in economic efficiency that occurs when a good or service is not priced and produced at its pareto optimal level. When output is at its pareto optimal point, the price, production, and consumption of a good cannot be altered for one person's benefit without making at least one other worse off. In a perfectly competitive market, products are priced at the pareto optimal point.

When deadweight loss occurs, it comes at the expense of either the consumer economic surplus or the producer's economic surplus. Consumer surplus is the gain that consumers receive when they are able to purchase a product for less than the price they are willing to pay; producer surplus is the benefit producers receive when they sell a product for more than they are willing to sell for. While price controls, subsidies and other forms of market intervention might increase consumer or producer surplus, economic theory states that any gain would be outweighed by the losses sustained by the other side. This net harm is what causes deadweight loss.

Deadweight loss can be visually represented on supply and demand graphs . Known as Harberger's triangle, the deadweight loss equals the area within the following three points:



## Deadweight loss

This chart illustrates the deadweight loss created when a price floor is instituted on the market for a good. The amount of deadweight loss is shown by the triangle highlighted in yellow. This area is known as Harberger's triangle.

- where the supply and demand curve intersect, otherwise known as the free market equilibrium;
- the point on the supply curve where the y-coordinate equals the non-pareto optimal price;
- the point on the demand curve where the y-coordinate equals the non-pareto optimal price.

## Example - Price Ceilings and Deadweight Loss

The chart above shows what happens when a market has a binding price ceiling below the free market price. Without the price ceiling, the producer surplus on the chart would be everything to the left of the supply curve and below the horizontal line where y equals the free market equilibrium price.

The consumer surplus would equal everything to the left of the demand curve and above the free market equilibrium price line.

With the price ceiling, instead of the producer's surplus going all the way to the pareto optimal price line, it only goes as high as the price ceiling. The consumer surplus extends down to the price ceiling, but it is limited on the right by Harberger's triangle. In this case, the reason for that limitation is due to quantity produced. The consumer would purchase more of the product at the ceiling price, but the producers are unwilling to supply enough to meet that demand because it is not profitable. As a result all of the goods that might have been produced and consumed if the good was priced optimally are not, representing a net loss for society.

### **3.4.7: Arguments for and Against Government Price Controls**

Many argue that price controls ensure resource availability, but most economists agree that these controls should be used sparingly.

#### **Learning Objective**

Justify the use of price controls when certain conditions are met

#### **Key Points**

- The main appeal of governmental imposed price controls is that they can ensure that citizens can purchase what they need in times of national economic hardship.
- Well designed price controls can ensure that basic staples are affordable, minimize the possibility of shortages, and prevent price gouging when shortages occur.
- By keeping prices artificially low through price ceilings, economists argue that demand is increased to a point where supply cannot keep up, leading to a shortage in the controlled product.
- Price floors often lead to surpluses, which can be just as detrimental as a shortage.



## **Key Terms**

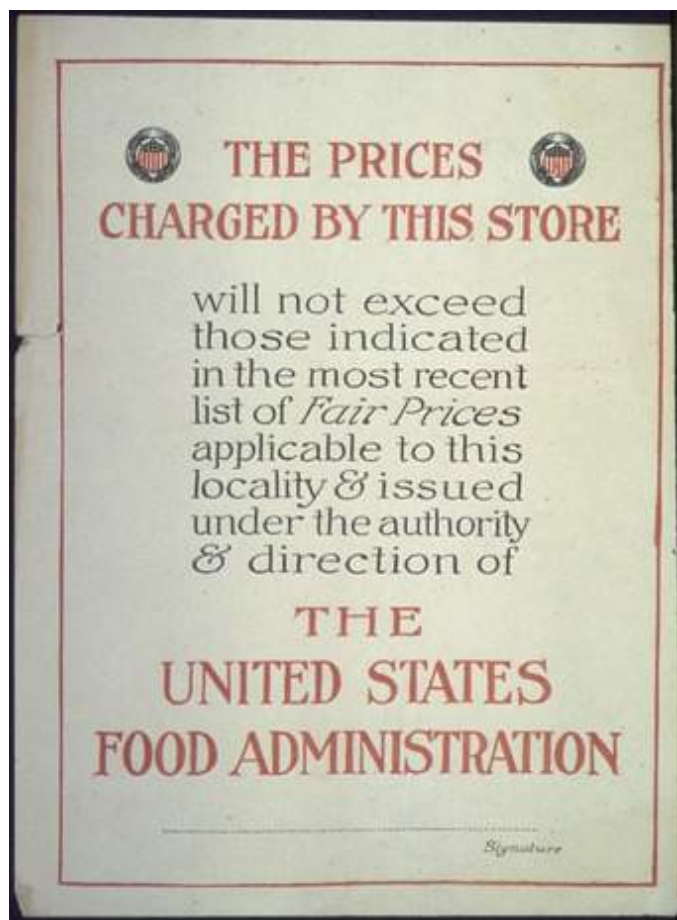
### Price control

A law that sets the maximum or minimum amount for which a good may be sold.

### staple

A basic or essential supply.

When unemployment is especially high or when there is a shortage of goods, it can be difficult for people to get what they need at an affordable price. The main appeal of government imposed price controls is that they can ensure that citizens can purchase what they need in times of national economic hardship .



## USFA Depression Price Fixing Poster

During the depression the US government fixed prices on basic staples, such as food, to ensure people would be able to obtain their basic necessities.

Well designed price controls can do three things. First, these regulations can ensure that a basic staple, such as food, remains affordable to most of a country's citizens. Second, regulation can protect the producers of a good and ensure that they get sufficient revenue. This in turn limits the possibility of shortages, which benefits consumer. Finally, when shortages occur, price controls can prevent producers from gouging their customers on price.

Generally price controls are used in combination with other forms of government economic intervention, such as wage controls and other regulatory elements.

While price controls may appear to be a sound decision in theory, most economists believe these controls should be used sparingly. By keeping prices artificially low through price ceilings, consumers demand a higher quantity than producers are willing to supply, leading to a shortage in the controlled product. As Nobel Prize winner Milton Friedman said, "We economists do not know much, but we do know how to create a shortage. If you want to create a shortage of tomatoes, for example, just pass a law that retailers can't sell tomatoes for more than two cents per pound. Instantly you'll have a tomato shortage. "

Price floors often lead to surpluses, which can be just as detrimental as a shortage. One of the best known price floors is the minimum wage, which establishes a base line per hour wage that must be paid for work. As a result, employers hire fewer employees than they would if they could pay workers lower than the minimum wage. As a result the supply of workers is greater than the amount of work, which creates higher unemployment.

### **3.4.8: Taxes**

Governments use its tax systems to raise funds for its programs and influence its citizens' economic actions.

#### **Learning Objective**

Categorize types of taxes into ad valorem taxes and excise taxes

#### **Key Points**

- A good tax system should be efficient, understandable and equitable. It should also allocate the costs of public services to those who use it, although that principle is hard to execute in practice.
- A direct tax is assessed on a person's income. Indirect taxes are assessed on an individual's participation in certain activities, such as making a purchase.
- The three types of tax systems are proportional, progressive, and regressive.
- Ad valorem and excise taxes are two types of indirect taxes.

## Key Terms

progressive

Increasing in rate as the taxable amount increases

regressive

Whose rate decreases as the amount increases.

Taxes are the primary means for governments to raise funds for its programs and to pay off its debts. It can also be used to influence its citizens' financial behavior. . Choosing the right set of rules that have all of the elements of a good tax system can be a challenge for any government.



## tax

Taxes are a tool used by governments to raise money and influence their citizens' economic choices.

## Elements of a Good Tax System

- Efficient: A tax system should raise the necessary revenues without unduly burdening the taxpayer.

- **Understandable:** A tax system should be easily understandable by the average citizen who has to pay the tax.
- **Equitable:** The tax burden should be distributed equitably among a nation's citizens. Generally, this means that those that are wealthier should pay more.
- **Benefit Principle:** Generally, the people who use public services should pay for them with higher taxes. However this principle is difficult to enforce in practice.

## Two Types of Tax Systems

1. **Direct Taxation:** A direct tax is assessed on the income of the taxpayer and is generally collected before the taxpayer collects his wages.
2. **Indirect Taxation:** An indirect tax is an avoidable tax assessed on certain activities, such as purchasing goods or services. Examples of an indirect tax include sales tax and VAT (value added tax).

## Types of Tax Structures

- **Proportional Tax:** Otherwise known as a flat tax, a flat tax rate is applied to all earned income regardless of how much the taxpayer earns. So a person making \$20,000 would pay the same rate as a person making \$120,000, but would pay significantly less in real dollars.
- **Progressive Tax:** The more a person earns, the higher the tax rate. Generally in a progressive tax system, income is divided into "brackets." For example, assume a tax system divides earners into people two groups. Those who earn less than \$100,000 pay 10% and people who earn \$100,000 or more pay 20%. A person earning \$20,000 would have to pay 10%, or \$2,000, while a person who earns \$120,000 would have to pay 20%, or \$24,000.
- **Regressive Tax:** In a regressive tax system, poorer families pay a higher tax rate. Although a regressive tax system is never explicitly used, some claim a sales tax is a type of regressive tax. Since high income earners spend a lower proportion of their income on goods and services in comparison to low income earners, the rich tend to pay proportionally less sales tax.

## **Ad Valorem vs Excise Tax**

Ad Valorem (or Value Added) and Excise Taxes are types of indirect taxes. Both are generally assessed on the sale of goods. These two taxes differ in three ways:

1. An excise tax typically applies to a narrower range of products, such as gasoline, tobacco, and alcohol.
2. An excise tax is typically heavier than an ad valorem, accounting for a higher fraction of a product's retail price.
3. Excise taxes are typically a fixed fee per unit, meaning that the government earns its revenue based on volume sold. Ad valorem taxes are proportional to the price of the good, so the government earns revenue based on the value of the good or service being sold.

### **3.4.9: Taxation Impact on Economic Output**

Tax incidence falls mostly upon the group that responds least to price, or has the most inelastic price-quantity curve.

#### **Learning Objective**

Analyze how changes in taxes affect the price of a good for sellers and buyers

#### **Key Points**

- When supply is inelastic and demand is elastic, the tax incidence falls on the producer.
- When supply is elastic and demand is inelastic, the tax incidence falls on the consumer.
- Tax incidence is the analysis of the effect a particular tax has on the two parties of a transaction; the producer that makes the good and the consumer that buys it.
- A marginal tax is an increase in a tax on a good that shifts the supply curve to the left, increases the consumer price, and decreases the price

for the sellers.

## **Key Terms**

elastic

Sensitive to changes in price.

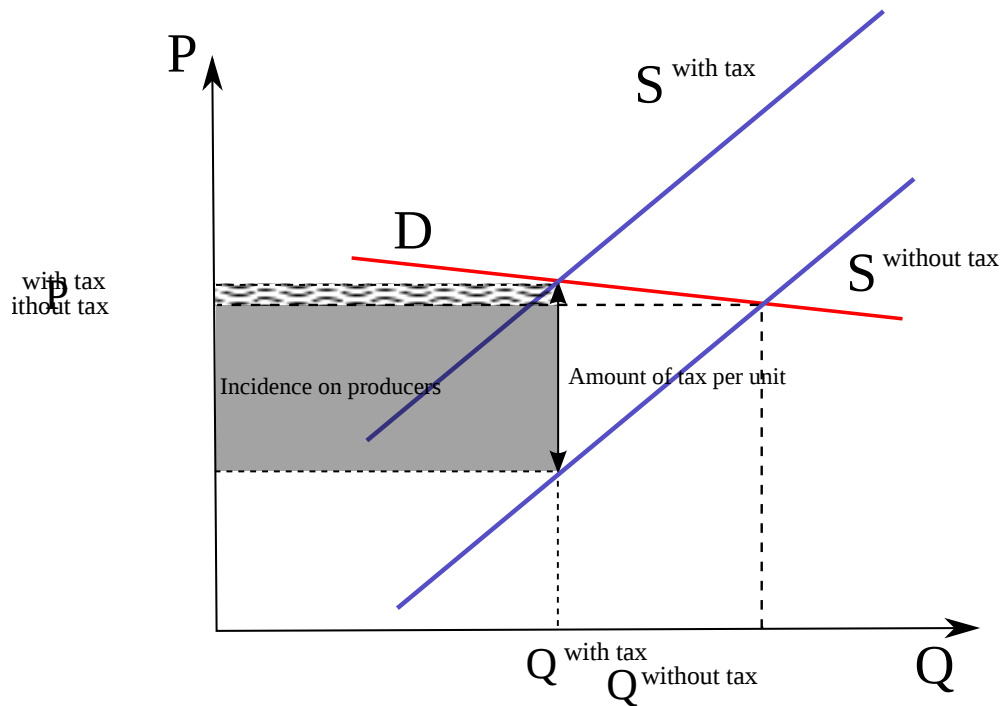
Tax incidence

The effect a particular tax has on the two parties of a transaction.

Tax incidence is the effect a particular tax has on the two parties of a transaction; the producer that makes the good and the consumer that buys it. The burden of the tax is not dependent on whether the state collects the revenue from the producer or consumer, but on the price elasticity of supply and the price elasticity of demand. To understand how elasticities influence tax incidence, its important to consider the two extreme scenarios and how the tax burden is distributed between the two parties.

Inelastic supply, elastic demand

Because supply is inelastic, the firm will produce the same quantity no matter what the price. Because demand is elastic, the consumer is very sensitive to price. A small increase in price leads to a large drop in the quantity demanded. The imposition of the tax causes the market price to increase and the quantity demanded to decrease. Because consumption is elastic, the price consumers pay doesn't change very much. Because production is inelastic, the amount sold changes significantly. The producer is unable to pass the tax onto the consumer and the tax incidence falls on the producer .



## Tax Incidence of Producer

When supply is inelastic but demand is elastic, the majority of the tax is paid for by the consumer. Since quantity demanded drops significantly in this scenario, the producer is forced to sell less.

Elastic supply, inelastic demand

Consumption is inelastic, so the consumer will consume the same quantity no matter the price. The producer will be able to produce the same amount of the good, but will be able to increase the price by the amount of the tax. As a result, the entirety of the tax will be borne by the consumer.

Similarly elastic supply and demand

Generally consumers and producers are neither perfectly elastic or inelastic, so the tax burden is shared between the two parties in varying proportions. If one party is comparatively more inelastic than the other, they will pay the majority of the tax.



## Increasing tax

If the government increases the tax on a good, that shifts the supply curve to the left, the consumer price increases, and sellers' price decreases. A tax increase does not affect the demand curve, nor does it make supply or demand more or less elastic. This potential increase in tax could be called marginal, because it is a tax in addition to existing levies.

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# 4: Economic Surplus

# 4.1: Consumer Surplus

## 4.1.1: Willingness to Pay and the Demand Curve

In general as the price of a good increases, the quantity demanded of that good decreases.

### Learning Objective

Explain the relationship between price and quantity demanded

### Key Points

- Demand is the willingness and ability of a consumer to purchase a good under certain circumstances.
- Demand curves are used to estimate behaviors in competitive markets and are often used with supply curves to estimate the market equilibrium price, or the price at which sellers are willing to sell the same amount of a product as the market's buyers are willing purchase.
- An individual's demand is defined by her utility, purchasing power, and ability to make a purchasing decision.

### Key Terms

utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

demand curve

The graph depicting the relationship between the price of a certain commodity and the amount of it that consumers are willing and able to purchase at that given price.

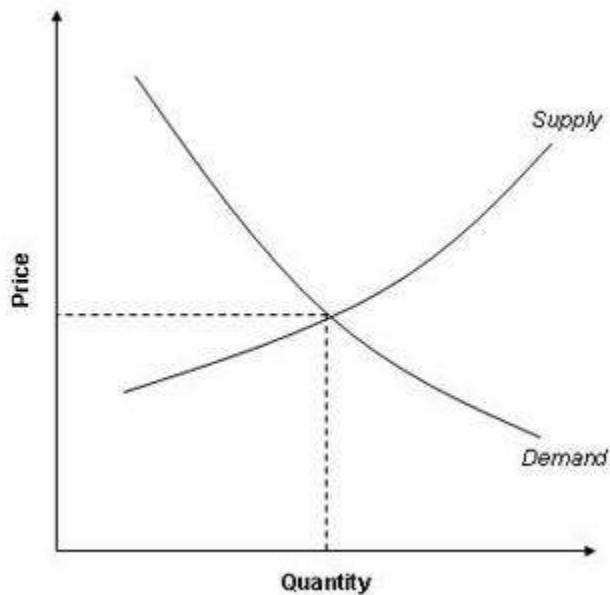
A demand curve is the graphical depiction of the relationship between the price of a certain commodity and the amount of it that consumers are willing and able to purchase at that price. Demand curves are used to estimate behaviors in competitive markets and are often used with supply curves to estimate the market equilibrium price, or the price at which sellers are willing to sell the same amount of a product as the market's buyers are willing purchase. A demand graph can reflect the preferences of a single consumer, a group of consumers or an entire market . For demand graphs that reflect a group, the individual demands at each price are added together.

Demand is the willingness and ability of a consumer to purchase a good *under the prevailing circumstances*. It is defined by three elements:

- **Individual Utility:** An item's utility is based on its ability to satisfy an individual's needs or wants. Some utility is universal; every human needs water to survive so it has high utility for everyone. Some utility is based on personal preference; some people prefer Coke over Pepsi so for them Coke has the higher utility. The more people that find utility in the good the greater the market demand; the greater the individual utility in the product the greater the individual demand.
- **Purchasing Power:** Demand is measured based on a person's willingness to buy under the prevailing circumstances. If an individual lacks the money to purchase the product, she can't demand it because she cannot afford it.
- **Ability to Decide:** The individual must be able to choose to make a purchase. Sometimes circumstances may prevent a person from purchasing something they might desire, even if they have the necessary money. For example, an underaged person may not be permitted by law to purchase cigarettes. That person might want the cigarettes and can afford to purchase them, but since it is against the law for him to purchase it, there is no demand.

For the vast majority of goods and services, an increase in price will lead to a decrease in the quantity demanded . There are two exceptions to this general rule.





## Supply and demand graph

The downward sloping demand curve reflects the fact that as price increases, consumers willing to purchase less of the good or service.

## Veblen Goods

Veblen goods are expensive luxury products, such as designer handbags and high-end cars. In these rare circumstances, decreasing the price actually decreases the demand for the good. The reason for this is because part of the value of the good is exclusivity. These items are status symbols and lowering the price diminishes the status.

## Giffen Goods

Giffen goods are another example where rising prices can lead to increased demand for a product. Giffen goods are very rare and are defined by three characteristics:

- It is an inferior good, or a good for which demand decreases as consumer income rises,
- There must be a lack of substitute product,
- The good must constitute a substantial percentage of the buyer's income, but not such a substantial percentage of the buyer's income that none of the associated normal goods are consumed.

For example, imagine a significant portion of a family's grocery bill is bread. Bread is a staple and it is the cheapest option out of the food available. If bread prices rise, the family will need to cut back on other groceries to make up the difference. However, since the family still need to eat a certain amount of calories each day and bread is still the cheapest option, they will purchase more bread to make up for the food they aren't purchasing and consuming. In this instance, bread is a giffen good.

## **4.1.2: The Demand Curve and Consumer Surplus**

Consumer surplus is the difference between the maximum price a consumer is willing to pay and the actual price they do pay.

### **Learning Objective**

Illustrate consumer surplus with the demand schedule and demand curve

### **Key Points**

- On a supply and demand chart, consumer surplus is bound by the y-axis on the left, the demand curve on the right, and a horizontal line where  $y$  equals the current market price.
- Another way to define consumer surplus in less quantitative terms is as a measure of a consumer's well-being.
- An individual's customer surplus for a product is based on the individual's utility of that product.

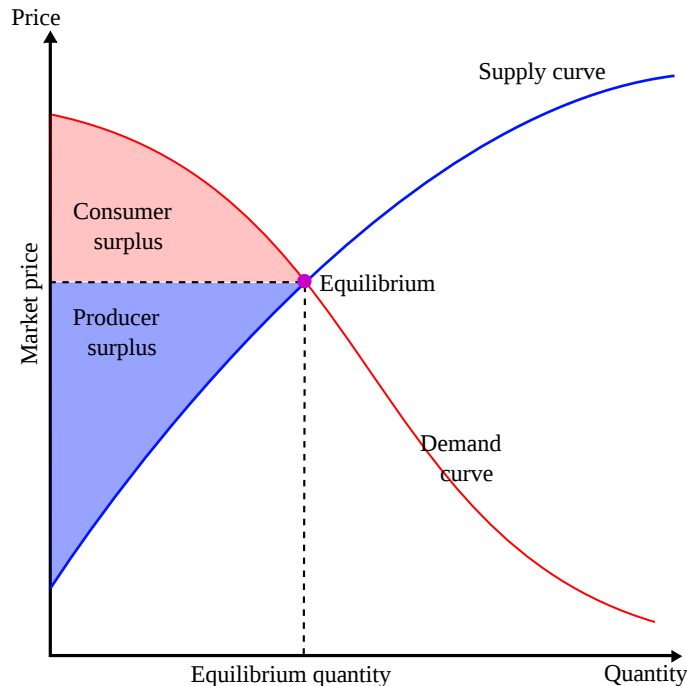
### **Key Term**

## consumer surplus

The difference between the maximum price a consumer is willing to pay and the actual price they do pay.

Consumer surplus is the difference between the maximum price a consumer is willing to pay and the actual price they do pay. If a consumer would be willing to pay more than the current asking price, then they are getting more benefit from the purchased product than they spent to buy it. Consumer surplus plus producer surplus equals the total economic surplus in the market.

This chart graphically illustrates consumer surplus in a market without any monopolies, binding price controls, or any other inefficiencies. The price in this chart is set at the pareto optimal. This means that the price could not be increased or decreased without one of the parties being made worse off. The consumer surplus, as marked in red, is bound by the y-axis on the left, the demand curve on the right, and a horizontal line where y equals the equilibrium price. This area represent the amount of goods consumers would have been willing to purchase at a price higher than the pareto optimal price. Generally, the lower the price, the greater the consumer surplus.



## Consumer Surplus

Consumer surplus, as shown highlighted in red, represents the benefit consumers get for purchasing goods at a price lower than the maximum they are willing to pay.

Another way to define consumer surplus in less quantitative terms is as a measure of a consumer's well-being. Some goods, like water, are valuable to everyone because it is a necessity for survival. But the utility, or "usefulness," of most goods vary depending on a person's individual preferences. Since the utility a person gets from a good defines her demand for it, utility also defines the consumer surplus an individual might get from purchasing that item. If a person has no use for a good, there is no consumer's surplus for that person in purchasing the good no matter the price. However, if a person finds a good incredibly useful, consumer surplus will be significant even if the price is high. An individual's customer surplus for a product is based on the individual's utility of that product.

### 4.1.3: Impacts of Price Changes on Consumer Surplus

Consumer surplus decreases when price is set above the equilibrium price, but increases to a certain point when price is below the equilibrium price.

## **Learning Objective**

Explain how shifting a price away from pareto optimal will impact consumer surplus

## **Key Points**

- Consumer surplus will only increase as long as the benefit from the lower price exceeds the costs from the resulting shortage.
- Consumer surplus always decreases when a binding price floor is instituted in a market above the equilibrium price.
- The total economic surplus equals the sum of the consumer and producer surpluses.
- Price helps define consumer surplus, but overall surplus is maximized when the price is pareto optimal, or at equilibrium.

## **Key Terms**

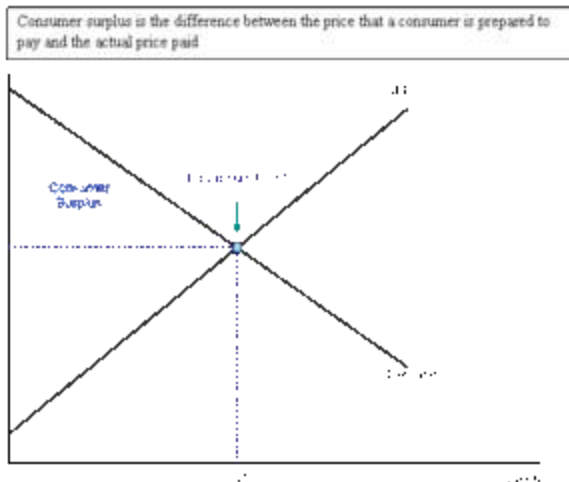
price floor

A mandated minimum price for a product in a market.

Price ceiling

A government-imposed price control or limit on how high a price is charged for a product.

Consumer surplus is defined, in part, by the price of the product. Recall that the consumer surplus is calculating the area between the demand curve and the price line for the quantity of goods sold . Assuming that there is no shift in demand, an increase in price will therefore lead to a reduction in consumer surplus, while a decrease in price will lead to an increase in consumer surplus.



## Consumer Surplus

An increase in the price will reduce consumer surplus, while a decrease in the price will increase consumer surplus.

Below are two scenarios that illustrate how changes in price can affect consumers' surplus. It is important to note that any shift from the good's pareto optimal price will result in a decrease in the total economic surplus. The total economic surplus equals the sum of the consumer and producer surpluses.

## Price Ceiling

A binding price ceiling is one that is lower than the pareto efficient market price. This means that consumers will be able to purchase the product at a lower price than what would normally be available to them. It might appear that this would increase consumer surplus, but that is not necessarily the case.

For consumers to achieve a surplus they have to be able to purchase the product, which means that producers have to make enough to be purchased at a price. If a good's price drops below the market equilibrium for whatever reason, manufacturing the product will be less profitable for the producers. So while more consumers will want to purchase the product because of its

low price, they will not be able to. This means the market will have a shortage for that good. This shortage will create a deadweight loss, or a market wide loss of efficiency and value that neither producer nor consumers obtain.

So any increase in consumer surplus due to the decrease in price may be offset by the fact that consumers that want the good cannot purchase it. At some point the benefit from the drop in price will be outweighed by the decrease in the good's availability.

## Price Floor

When a price floor is set above the equilibrium price, consumers will have to purchase the product at a higher price. Therefore, fewer consumers will purchase the product because some will decide that the utility they get from the good is not worth the price. Necessarily, this reflects a drop in consumer surplus.

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# 4.2: Producer Surplus

## 4.2.1: Market Power

Market power is a measure of a firm's economic strength that affects its pricing and supply decisions.

### Learning Objective

Summarize the relationship between market power and a firm's supply decision

### Key Points

- Firms with market power are said to be "price makers. " They can raise prices and change the quantity supplied of goods and services without hurting profits. Market power often exists when there is a monopoly or oligopoly.
- Firms with limited to no market power are said to be "price takers. " They cannot raise their prices or change the quantity supplied of goods and services without hurting profits. Perfectly competitive firms are examples of price takers with no market power.
- Market power is determined by the number of producers in the market, the size of each firm, barriers to entry in the market, and availability of substitute goods. Firm size and market size alone do not dictate market power.
- Market power is often measured with concentration ratios or the Herfindahl-Hirschman Index, but these are not perfect measures.

### Key Terms

market power

The ability of a firm to profitably raise the market price of a good or service over marginal cost. A firm with total market power can raise prices without losing any customers to competitors.

contestable market

An imperfectly competitive industry subject to potential entry if prices or profits increase.

concentration ratio

The proportion of total industry output produced by the largest firms (usually the four largest).

Herfindahl-Hirschman Index

A measure of the size of firms in relation to the industry and an indicator of the amount of competition among them.

Market power is a measure of the economic strength of a firm. It is the ability of a firm to influence the quantity or price of goods and services in a market. A firm is said to have significant market power when price exceeds marginal cost and long run average cost, so the firm makes economic profits. Such firms are often referred to as "price makers. " In contrast, firms with limited to no market power are referred to as "price takers. "

## **Determinants of Market Power**

A firm usually has market power by virtue of controlling a large portion of the market. However, market size alone is not the only indicator of market power. Other factors that affect a firm's market power include:

- Number of producers
- Size of firms in the market

The numbers and size of firms determine the extent that firms can withstand pressures and threats to change prices or product flows. However, being a large firm does not necessarily equal market power. For example, while

conglomerates may be very large, they may play only small roles in many different markets and have no ability to influence prices in any of them.

- Barriers to entry

Barriers to entry determine how contestable the market is. Even highly concentrated markets may be contestable markets if there are no barriers to entry or exit, which limits a firm's ability to raise its price above competitive levels.

Common barriers to entry include control of a scarce resource, increasing returns to scale, technological superiority, and government-imposed barriers.

- Availability of substitute goods

Greater availability of substitute goods will weaken a firm's market power.

## **Relationship between Market Power and Firm Behavior**

A firm's market power influences its behavior. For example, market power gives firms the ability to engage in unilateral anti-competitive behavior. Some of the behaviors that firms with market power are accused of engaging in include predatory pricing, product tying, and creation of overcapacity or other barriers to entry. If no individual participant in the market has significant market power, then anti-competitive behavior can take place only through collusion, or the exercise of a group of participants' collective market power.



## **Google Logo**

In 2012, the U.S. Federal Trade Commission opened an antitrust probe against Google's search practices. Google allegedly used its market dominance to promote its own products over competitors' products in web searches.

A monopoly, a price maker with market power, can raise prices and retain customers because the monopoly has no competitors. If a customer has no other place to go to obtain the goods or services, they either pay the increased price or do without.

An oligopoly may also be a price maker with market power, as firms may be able to collude and control the market price or quantity demanded.

A perfectly competitive firm, a price taker with no market power, cannot raise its price without losing its customers.

## **Measurement of Market Power**

Measurement of market power is often accomplished with concentration ratios or the Herfindahl-Hirschman Index (HHI).

## **Concentration Ratios**

The concentration ratio is the proportion of total industry output produced by the largest firms (usually the four largest). This measure of market power relates the size of firms to the size of the market. For monopolies, the four firm concentration ratio is 100 percent, while the ratio is zero for perfect competition.

## Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman Index (HHI) is a measure of the size of firms in relation to the industry, and an indicator of the amount of competition among them. The HHI is calculated by summing the squares of the percentage market shares of all participants in the market. The HHI for perfect competition is zero; for a monopoly, it is 10,000.

For example, if a market consists of five firms with market shares of 40, 20, 20, 15, and 5 percent each, the HHI is 2650 ( ).

## Measurement Problems

The use of the concentration ratio or the HHI to measure market power is not perfect. A high concentration ratio or large firm size is not the only way to achieve market power. Many smaller firms acting in unison can achieve the same result. Additionally, the measurements do not convey the extent to which market power may be concentrated in a local market.

### 4.2.2: Defining Producer Surplus

Producer surplus is the difference between the amount producers get for selling a good and the amount they want to accept for that good.

#### Learning Objective

Define producer surplus

#### Key Points

- Producer surplus can be thought of as the extra money, utility, or benefits the producer receives by selling a product at a price that is higher than its minimum acceptable price.

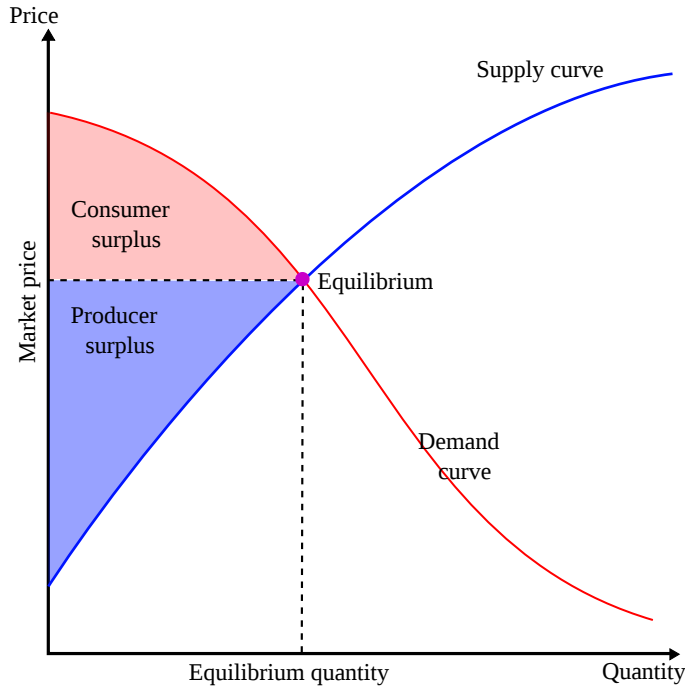
- The minimum acceptable price for producers is represented by the supply curve.
- Graphically, producer surplus is the shaded region just above the supply curve, but below the equilibrium price level.

## **Key Term**

### producer surplus

The amount that producers benefit by selling at a market price that is higher than the lowest price at which they would be willing to sell.

Producer surplus is the difference between what price producers are willing and able to supply a good for and what price they actually receive from consumers. It is the extra money, benefit, and/or utility producers get from selling a product at a price that is higher than their minimum accepted price, as shown by the supply curve.



## Economic Surplus

Producer surplus is the shaded area directly above the supply curve, up to the equilibrium point. Consumer surplus is the shaded area directly under the demand curve, up to the equilibrium point.

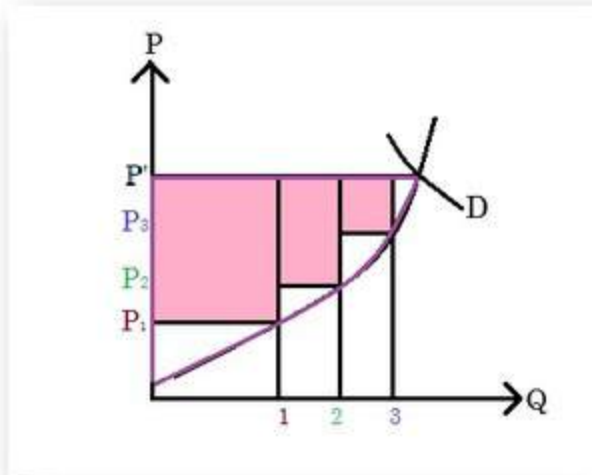
For example, above, the equilibrium price is  $P_e$ . However, at  $P_1$ , the producers are willing to sell one unit of a commodity for a price that is lower than  $P_e$ . The resulting rectangle from  $P_1$  on the  $P$ -axis, to its intersection with the supply curve, up to the level of  $P_e$  is the producer surplus at price level  $P_1$ .

Similarly, at  $P_2$ , the producers are willing to sell two units of a commodity at a price that is still lower than  $P_e$ . The rectangle from  $P_2$  on the  $P$ -axis, to its intersection with the supply curve, up to the level of  $P_e$  is the new producer surplus at price  $P_2$ . The total producer surplus at  $P_e$  is the first rectangle at the  $P_1$  price, plus the new rectangle from the  $P_2$  price.

This process is repeated for every price level up to the equilibrium price. To find the resulting total producer surplus, all of the rectangles for the individual price levels are added together, and the total area is the total



producer surplus. Below, the total producer surplus is made of all three pink rectangles - the surpluses at price levels of  $P_1$ ,  $P_2$ , and  $P_3$  - added together.



## Producer surplus

In the figure, producer surplus at different prices is represented by the pink rectangles.

### 4.2.3: Impact of Changing Price on Producer Surplus

Producer surplus is affected by changes in price, the demand and supply curve, and the price elasticity of supply.

#### Learning Objective

Examine producer surplus in terms of changes in demand, supply, price, and price elasticity

#### Key Points

- Changes in the equilibrium price are directly related to producer surplus, other things equal. As the equilibrium price increases, the potential producer surplus increases. As the equilibrium price decreases, producer surplus decreases.
- Shifts in the demand curve are directly related to producer surplus. If demand increases, producer surplus increases. If demand decreases, producer surplus decreases.
- Shifts in the supply curve are directly related to producer surplus. If supply increases, producer surplus increases. If supply decreases, producer surplus decreases.
- Price elasticity of supply is inversely related to producer surplus. If supply is completely elastic, it is drawn as a horizontal line, and producer surplus is zero. If supply is completely inelastic, it is shown as a vertical line, and producer surplus is infinite.

## **Key Terms**

producer surplus

The amount that producers benefit by selling at a market price that is higher than the lowest price at which they would be willing to sell.

price elasticity of supply

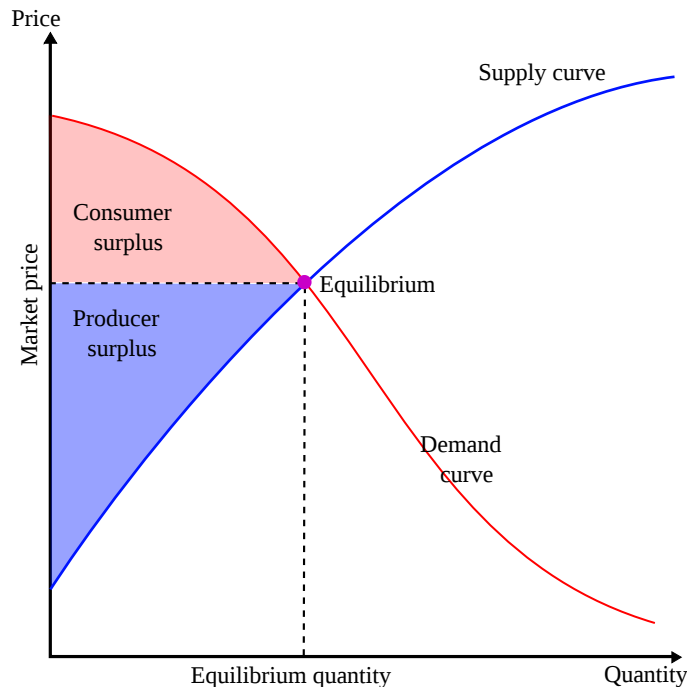
A numerical measure of the responsiveness of the quantity supplied of a product to a change in the price of the product alone.

Producer surplus is affected by many different factors. Changes in the price level, the demand and supply curves, and price elasticity all influence the total amount of producer surplus, other things held constant.

## **Changes in Price**

Changes in price are directly associated with the amount of surplus a producer will receive. Graphically, the producer surplus is directly above the supply curve, but below the price. Other things equal, as equilibrium price increases, the amount of potential producer surplus and the number of

goods supplied increases. Lower prices result in lower potential producer surplus and goods supplied: with a lower equilibrium price, the producer surplus triangle will be smaller.



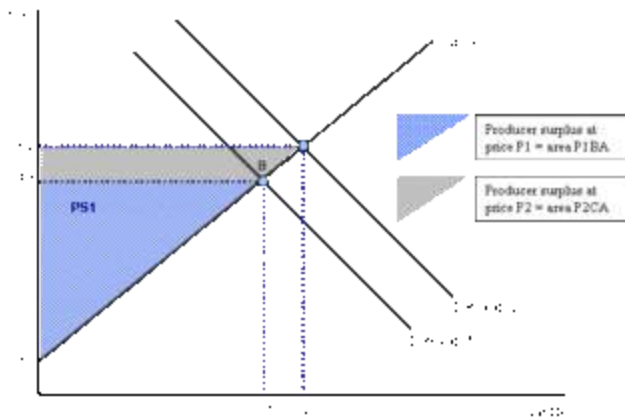
## Economic Surplus

The producer surplus is directly above the supply curve and is shaded in blue.

## Demand Curve

Shifts in the demand curve are directly related to the amount of producer surplus. If demand decreases, and the demand curve shifts to the left, producer surplus decreases. Conversely, if demand increases, and the demand curve shifts to the right, producer surplus increases.

At an initial demand represented by the "Demand (1)" curve, producer surplus is the blue triangle made of  $P_1$ ,  $Q_1$ , and  $P_1 - P_2$ . When demand increases, represented by the "Demand (2)" curve, producer surplus is the larger gray triangle made of  $P_1$ ,  $Q_2$ , and  $P_1 - P_2$ .



## Producer Surplus and the Demand Curve

If the demand curve shifts out, producer surplus increases, as seen by size of the gray triangle.

## Supply Curve

Similarly, shifts in the supply curve are also directly related to the amount of potential surplus. Decreases in the supply curve will cause decreases in producer surplus. Increases in the supply curve will cause increases in producer surplus.

At an initial supply represented by the "Supply (1)" curve, producer surplus is the blue triangle made of  $P_1$ ,  $Q_1$ , and  $P_2$ . If supply increases, represented by the "Supply (2)" curve, producer surplus is the larger gray triangle made of  $P_2$ ,  $Q_2$ , and  $P_1$ .

## Price Elasticity of Supply

Price elasticity of supply is the relationship between price and quantity changes. It measures how quantity supplied is affected by changes in price. When supply is elastic, producers can increase production without much price or cost change. When supply is inelastic, producers cannot change production easily.

When supply is perfectly elastic, it is depicted as a horizontal line. Producer surplus is zero because the price is not flexible. Producers cannot provide a higher price than market price.

When supply is perfectly inelastic, it is depicted as a vertical line. Producer surplus is infinite because the price is completely flexible.

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# **5: Consumer Choice and Utility**



# 5.1: The Demand Curve and Utility

## 5.1.1: Defining Utility

Utility is an economic measure of how valuable, or useful, a good or service is to a consumer.

### Learning Objective

Define Utility

### Key Points

- Utility is measured by comparing multiple options.
- Utility can be positive and negative.
- Ordinal utility ranks a series of preferences without measuring how much more valuable one option is than another. Cardinal utility measures how much more preferable one option is in comparison to another.
- Ordinal utility is generally the preferred method of measuring utility.

### Key Terms

cardinal

Describing a "natural" number used to indicate quantity (e.g., one, two, three), as opposed to an ordinal number indicating relative position.

utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

ordinal

Of a number, indicating position in a sequence.

Utility is a term used by economists to describe the measurement of "useful-ness" that a consumer obtains from any good or service. Utility may measure how much one enjoys a movie or the sense of security one gets from buying a deadbolt. The utility of any object or circumstance can be considered. Some examples include the utility from eating an apple, from living in a certain house, from voting for a specific candidate, or from having a given wireless phone plan. In fact, every decision that an individual makes in their daily life can be viewed as a comparison between the utility gained from pursuing one option or another .



## Apples and Oranges

Utility allows you to compare apples and oranges based on which you prefer.

Utility may be positive or negative with no effect on its interpretation. If one option gives utility and another gives , selecting the second is not, as it might seem, the "lesser of two evils," but can only be interpreted as the better option.

Utility can be measured in one of two ways:

- Ordinal utility ranks a series of options in order of preference. This ranking does not show how much more valuable one option is than

another, only that one option is preferable over another. An example of a statement reflecting ordinal utility is that "I would rather read than watch television. " Generally, ordinal utility is the preferred method for gauging utility.

- Cardinal utility also ranks a series of options in order of preference, but it also measures the magnitude of the utility differences. An example of a statement reflecting cardinal utility is "I would enjoy reading three times more than watching television. " Given how difficult it is to precisely measure preference, cardinal utility is rarely used.

## **5.1.2: Theory of Utility**

The theory of utility states that, all else equal, a rational person will always choose the option that has the highest utility.

### **Learning Objective**

Explain the Theory of Utility

### **Key Points**

- The rationality assumption gives a basis for modeling human behavior and decision making.
- Utility includes every element of a decision.
- Rationality is dependent on a person's individual preferences. Therefore, what might be a rational decision for one person may not be a rational decision for another.

### **Key Term**

Rational individual

A person who chooses the option that, all else equal, gives the greatest utility.

The theory of utility is based on the assumption of that individuals are rational. Rationality has a different meaning in economics than it does in common parlance. In economics, an individual is "rational" if that individual maximizes utility in their decisions. Whenever an individual is to choose between a group of options, they are rational if they choose the option that, all else equal, gives the greatest utility. Recalling that utility includes every element of a decision, this assumption is not particularly difficult to accept. If, when everything is taken into account, one decision provides the greatest utility, which is equivalent to meaning that it is the most preferred, then we would expect the individual to take that most preferred option. This should not necessarily be taken to mean that individuals who fail to quantify and measure every decision they make are behaving irrationally. Rather, this means that a rational individual is one who always selects that option that they prefer the most .



## **Consumer making a decision**

When making an economically rational purchasing decision, a consumer must consider all of their personal preferences.

It is important to emphasize how rationality relates to a person's individual preferences. People prioritize different things. For example one person may prioritize flavor while another person may value making healthy choices more. As a result the first person may choose a sugary cereal while the second may choose granola. Based on their preferences, both made the economically rational choice.

The rationality assumption gives a basis for modeling human behavior and decision making. If we could not assume rationality, it would be impossible to say what, when presented with a set of choices, an individual would select. The notion of rationality is therefore central to any understanding of microeconomics.

### **5.1.3: Marginal Utility**

Marginal utility of a good or service is the gain from an increase or loss from a decrease in the consumption of that good or service.

#### **Learning Objective**

Define Marginal Utility

#### **Key Points**

- Marginal utility is measured on a per unit basis.
- Since an individual's utility is rarely measured using cardinal means, calculating a product's marginal value for an individual may be difficult.
- Instead of trying to calculate a product's marginal value for an individual, economists assign dollar values to products based on their market price. This allows economists to estimate a product's marginal value based on all the consumer's preferences.
- The idea of marginal value is an important consideration when making production or purchasing decisions. A person should produce or purchase an additional item when the marginal utility exceeds the marginal cost.

#### **Key Terms**

marginal

Of, relating to, or located at or near a margin or edge; also figurative usages of location and margin (edge).

cardinal

Describing a "natural" number used to indicate quantity (e.g., one, two, three), as opposed to an ordinal number indicating relative position.

In economic terms, marginal utility of a good or service is the gain from an increase or loss from a decrease in the consumption of that good or service. The idea of marginal value is an important consideration when making production or purchasing decisions. A person should produce or purchase an additional item when the marginal utility exceeds the marginal cost .



## **Marginal Utility of Housing**

The marginal utility of owning a second house is likely less than the marginal utility of owning the first house.

Marginal utility is measured on a per unit basis. When evaluating the marginal utility of any item, it is important to know in what unit utility is measured. The unit is based on the type of activity that you are trying to measure. If you are a consumer of potato chips, you might measure utility based on whether to buy another bag or have another hand full with your lunch. If you are a producer of potato chips, your marginal value might be defined by a pallet of potato chips. In general, marginal value should be measured based on the smallest unit of consumption or production related to the product in question.

It is also important to remember that utility is difficult to quantify since preferences vary based on the individual. Utility is rarely measured in terms of magnitude; utility is normally just about determining which option is the best choice. Since utility is rarely measured using cardinal means, it may seem difficult to determine a product's marginal value. Economists get around this by substituting dollar values. While this may fail to capture a specific individual's preferences and utility, it offers a good approximation based on everyone's collective preferences as defined by the market.

### **5.1.4: Principle of Diminishing Marginal Utility**

The principle of diminishing marginal utility states that as more of a good or service is consumed, the marginal benefit of the next unit decreases.

#### **Learning Objective**

Explain diminishing marginal utility

#### **Key Points**

- If you consume too much, the marginal utility of a good or service can become negative.
- In some circumstances, the marginal utility of producing or consuming an additional unit will increase for a short period of time. Generally there will be a "tipping point" at which marginal utility will then decrease.
- Generally these exceptions occur when what is being consumed is a component of a larger whole.

#### **Key Terms**

utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

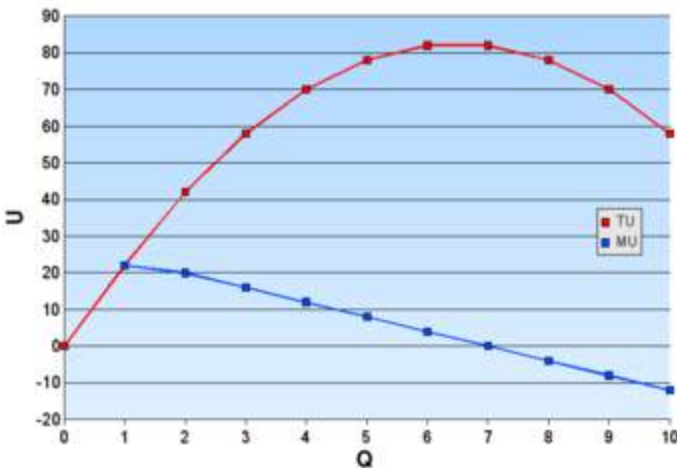


## marginal benefit

The extra benefit received from a small increase in the consumption of a good or service. It is calculated as the increase in total benefit divided by the increase in consumption.

The principle of diminishing marginal utility states that as an individual consumes more of a good, the marginal benefit of each additional unit of that good decreases.

The concept of diminishing marginal utility is easy to understand since there are numerous examples of it in everyday life. Imagine it is a hot summer day and you are hungry, so you get some ice cream. The first bite is great and so is the second. But with each spoonful, your hunger decreases and you become cooler. So while the last bite might still be good, it is probably not as satisfying as the first. This is a simple illustration of diminishing marginal utility .



## Total and marginal utility

As you can see in the chart, the more of a good you consume, the further its marginal utility decreases.

## Negative Marginal Utility

While there are some circumstances where there will always be some marginal utility to producing or consuming more of a good, there are also circumstances where marginal utility can become negative. For example, while some antibiotics may be useful in curing diseases. However, if you take too much you can become sick or resistant to the drugs which could lead to future illnesses being incurable. So it is important to remember that "diminishing" does not necessarily mean to zero; you can have too much of a good thing.

## Exceptions to the General Rule

This concept suggests a uniform steady decline of marginal utility, but that may not always be the case. There can be situations in which one might gain more utility from consuming a later unit of a good than from earlier consumption. If you are going on a date, for example, getting one ticket to a concert will have some utility but the second arguably has more because it enhances the value of the first.

Generally these exceptions occur when what is being consumed is a component of a larger whole. While utility may increase for a period, there is usually a "tipping point" where afterwards marginal utility decreases. Getting a third ticket for your date will have low marginal utility than the second.

## Attributions

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# 5.2: Theory of Consumer Choice

## 5.2.1: Introducing the Budget Constraint

Budget constraints represent the plausible combinations of products and services a buyer can purchase with the available capital on hand.

### Learning Objective

Discuss the role of the budget set and indifference curve in determining the choice that gives a consumer maximum satisfaction

### Key Points

- Consumers analyze the optimal way in which to leverage their purchasing power to maximize their utility and minimize opportunity costs through employing trade-offs.
- The way economists demonstrate this arithmetically and visually is through generating budget curves and indifference curves.
- Budget curves indicate the relationship between two goods relative to opportunity costs, which defines the value of each good relative to one another.
- Indifference curves underline the way in which a given consumer interprets the value of each good relative to one another, demonstrating how much of 'good 1' is equivalent in utility to a certain quantity of 'good 2' (and vice versa).
- Through utilizing these economic tools, economists can predict consumer behavior and consumers can maximize their overall utility based upon their budget constraints.

### Key Terms

Trade-offs

Any situation in which the quality or quantity of one thing must be decreased for another to be increased.

utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

## **Example**

- Pretend you have \$100 to spend on food for the month. You have a wide variety of options, but some will provide you with higher opportunity costs than others. You could purchase enough bread, rice, milk and eggs to feed yourself for the full month or you could buy premium cut steak and store-prepared dinners by the pound (which would last about one week). The opportunity cost of the former is the high quality foods which have the convenience factor of already being prepared for you while the opportunity cost of the latter is having enough food to feed yourself for the entire month. In this circumstance the decision is easy, and the trade off will be sacrificing convenience and high quality food for the ability to have enough food on the table over the course of the whole month.

The concept of budget constraints in the field of economics revolves around the idea that a given consumer is limited in consumption relative to the amount of capital they possess. As a result, consumers analyze the optimal way in which to leverage their purchasing power to maximize their utility and minimize opportunity costs. This is achieved through using budget constraints, which represent the plausible combinations of products and/or services a buyer is capable of purchasing with their capital on hand.

## **Trade-offs**

To expand upon this definition further, the business concept of opportunity cost via trade-offs is a central building block in understanding budget constraints. An opportunity cost is defined as the foregone value of the next best alternative in a given action. To apply this to a real-life situation,

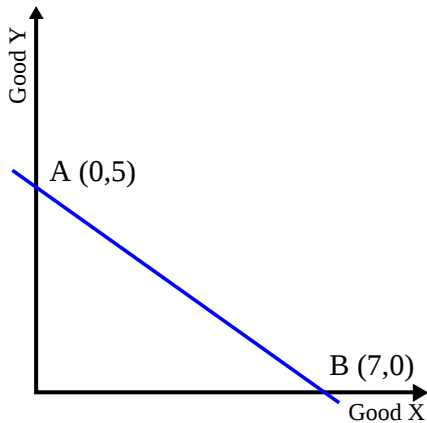
pretend you have \$100 to spend on food for the month. You have a wide variety of options, but some will provide you with higher opportunity costs than others. You could purchase enough bread, rice, milk and eggs to feed yourself for the full month or you could buy premium cut steak and store-prepared dinners by the pound (which would last about one week). The opportunity cost of the former is the high quality foods which have the convenience factor of already being prepared for you while the opportunity cost of the latter is having enough food to feed yourself for the entire month. In this circumstance the decision is easy, and the trade off will be sacrificing convenience and high quality food for the ability to have enough food on the table over the course of the whole month.

## **Budget Curves and Indifference Curves**

Understanding these trade-offs underlines the true function of budget constraints in economics, which is identifying which consumer behaviors will maximize utility. Consumers are inherently equipped with an infinite demand and a finite pool of resources, and therefore must make budgetary decisions based on their preferences. The way economists demonstrate this arithmetically and visually is through generating budget curves and indifference curves.

Budget curves: This indicates the relationship between two goods relative to opportunity costs, which defines the value of each good relative to one another. For example, on the figure provided a quantity of 5 for 'good 1' is identical in price (economic value) as a quantity of 7 for 'good 2'. This demonstrates the trade-off ratio between the two available products or services. It is important to keep in mind that prices and valuations of goods are constantly changing, and that the ratio between any two goods is not fixed over the long-term for most products/services.

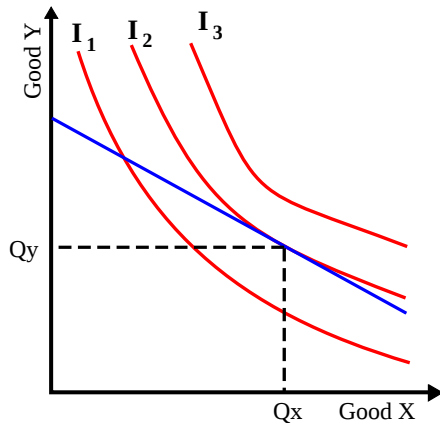




## Budget Curve

A budget curve demonstrates the relationship between two goods relative to opportunity costs, essentially deriving the relative value of each good based on quantity and utility. Keep in mind that moving from one point on the in to another is trading off ' ' amount of one good for ' ' amount of another.

Indifference curves: Indifference curves underline the way in which a given consumer interprets the value of each good relative to one another, demonstrating how much of 'good ' is equivalent in utility to a certain quantity of 'good ' (and vice versa). Any point along the indifference curve will represent indifference to the consumer, or simply put equivalent preference for one combination of goods or the other. In the figure it is clear that the budget curve has been included in conjunction with the indifference curves, which allows insight as to the ideal actual quantity of each good is optimal for this specific consumer.



## Indifference Curves

Indifference curves are designed to represent an equal perception of overall value in a given basket of goods relative to a specific consumer. That is to say that each point along the curve is considered by the consumer of equivalent value despite alterations in the quantity of each good, as these trade-offs are considered of equal value and thus indifferent.

Through utilizing these economic tools, economists can predict consumer behavior and consumers can maximize their overall utility based upon their budget constraints.

### 5.2.2: Mapping Preferences with Indifference Curves

Economists mapping consumer preferences use indifference curves to illustrate a series of goods that represent equivalent utility.

#### Learning Objective

Describe the indifference curves for goods that are perfect substitutes and complements

#### Key Points

- Indifference curves illustrate bundles of goods that provide the same utility.
- An economist can derive conclusions based upon the properties of the illustration. In framing these implications it is useful to identify the two potential extremes of substitute goods and complementary goods.
- The comparison between the goods demonstrates the relative utility one has compared to another, and the way in which consumers will act when posed with a decision between various products and services.
- The comparison between the goods demonstrates the relative utility one has compared to another, and the way in which consumers will act when posed with a decision between various products and services.

## Key Terms

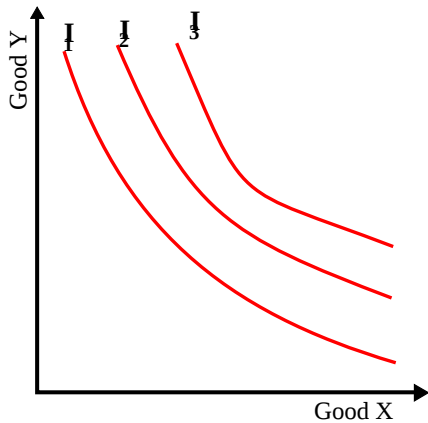
substitute

A good with a positive cross elasticity of demand, meaning the good's demand is increased when the price of another is increased.

Complement

A good with a negative cross elasticity of demand, meaning the good's demand is increased when the price of another good is decreased.

A critical input to understanding consumer purchasing behaviors and the general demand present in a given market or economy for specific goods and services is the identification of consumer preferences. Consumer preference varies substantially from individual to individual and market to market, requiring comprehensive economic observation of consumer choices and behaviors. One of the primary tools leveraged by economists mapping consumer preferences is the indifference curve, which illustrates a series of bundled goods in which a consumer is indifferent. A consumer would be just as happy with any combination of Good X and Good Y on the curve. This could be synonymous to saying baskets of goods that provide the same utility.



## Indifference Curve

A consumer will be just as happy with any combination of Good X and Y on indifference curve I1, though s/he will prefer any bundle on indifference curve I2 or I3.

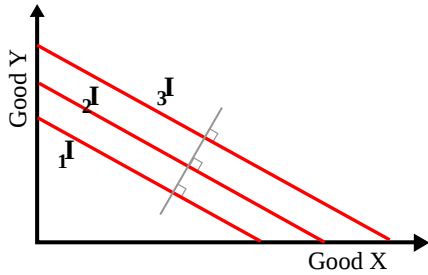
These indifference curves, when mapped graphically alongside other curves, is called an indifference map. A key consideration in creating any indifference map is what relative preferences should be isolated. While it is possible to create a complex array of preference maps to compare more than two products/services, each specific standard indifference map will be about creating a benchmark between two. For example one could compare relatively similar goods/services (i.e. apples vs. oranges) or dramatically different goods/services (i.e. university training vs. automobile purchasing). These two items being compared represent the x and y axis of a indifference map. A consumer will always prefer to be on the indifference curve farthest from the origin.

## Implications of Indifference Maps

After constructing the required inputs to generate a comprehensive indifference map, an economist can derive conclusions based upon the properties of the illustration. In framing these implications it is useful to identify the two potential extremes that can be outlined via with indifference curves:

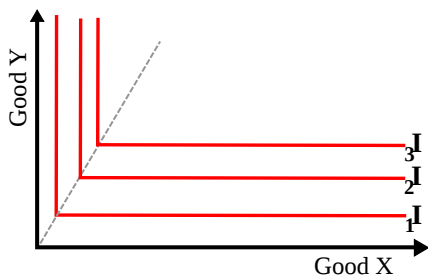
- **Perfect Substitutes:** To understand what an indifference curve will look like when products are perfect substitutes, please see . These lines are essentially perfectly straight, and that demonstrates that the relative utility of 'Good X' compared to that of 'Good Y' is equivalent regardless of the amount in question. It is reasonable to assume in this scenario that purchasing all of one or all of the other will not decrease the overall satisfaction of the consumer. Perfect substitutes are often homogeneous goods. A consumer with no preference between Burger King and McDonald's, for example, might consider them perfect substitutes and be indifferent to spending all of their fast food money on one or the other.
- **Perfect Complements:** The opposite of a perfect substitute is a perfect complement (see ), which is illustrated graphically through curves with perfect right angles at the center. These right angles, and the subsequent straight horizontal and vertical lines, demonstrate that 'Good X' and 'Good Y' are inherently tied to one another and that the consumption of one is dependent upon the consumption of the other. An example of complementary goods might be university tuition and academic textbook purchases, an automobile and automobile insurance, or a cable and a television.

Combining an understanding of these inputs with the extremes demonstrated an indifference map, economists are able to draw meaningful conclusions regarding consumer choices and purchasing behaviors in the context of two goods. The comparison between the goods demonstrates the relative utility one has compared to another, and the way in which consumers will act when posed with a decision between various products and services.



## Perfect Substitute Indifference Curve

In this particular series of indifference curves it is clear that 'Good X' and 'Good Y' are perfect substitutes for one another. That is to say that the utility of one is identical to the utility of the other across all quantities represented on the map.



## Perfect Complement Indifference Curve

The perfect right angle in this series of indifference curves implies that the utility of 'Good X' and 'Good Y' are entirely interdependent. This is to say that in order to enjoy one good it is necessary to also have the other.

### 5.2.3: Properties of Indifference Curves

Almost all indifference curves will be negatively sloped, convex, and will not intersect.

#### Learning Objective

Analyze the properties that are common to many indifference curves

## Key Points

- The concept of an indifference curve is predicated on the idea that a given consumer has rational preferences in regard to the purchase of groupings of goods, with a series of key properties that define the process of mapping these curves.
- Indifference curves only reside in the non-negative quadrant of a two-dimensional graphical illustration (or the upper right).
- Indifference curves are always negatively sloped. Essentially this assumes that the marginal rate of substitution is always positive.
- All curves projected on the indifference map must not intersect in order to ensure transitivity.
- Nearly all indifference lines will be convex, or curving inwards at the center (towards the bottom left).

## Key Terms

Transitive

Having the property that if an element  $x$  is related to  $y$  and  $y$  is related to  $z$ , then  $x$  is necessarily related to  $z$ .

utility

The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity.

Indifference curves trace the combination of goods that would give a consumer a certain level of utility. The indifference curve itself represents a series of combinations of quantities of goods (generally two) that a consumer would be indifferent between, or would value each of them equally in regards to overall utility. Indifference curves allow economists to predict consumer purchasing behaviors based upon utility maximization for a bundle of goods within the context of a given consumer's budget constraints and preferences.

## Properties of Indifference Curves

The concept of an indifference curve is predicated on the idea that a given consumer has rational preferences in regard to the purchase of groupings of goods, with a series of key properties that define the process of mapping these curves:

- Indifference curves only reside in the non-negative quadrant of a two-dimensional graphical illustration (or the upper right). This assumes that negative quantities are meaningless - one can't consume a negative amount of a good.
- Indifference curves are always negatively sloped. This is based on the assumption that a consumer is always better off consuming more of a good, so as quantity consumed of one good increases, total satisfaction would increase if not offset by a decrease in the quantity consumed of another good. This also assumes that the marginal rate of substitution is always positive.
- All curves projected on the indifference map must also be transitive to ensure that if  $A$  is preferred to  $B$  and  $B$  is preferred to  $C$ ,  $A$  is not also preferred to  $C$ . This is manifested in indifference curves that never intersect.
- Nearly all indifference lines will be convex, or curving inwards at the center (towards the bottom left). This demonstrates that increasingly high quantities of one good over another have a cost in respect to their overall utility per unit (diminishing returns). It is technically possible for indifference curves to be perfectly straight as well, which would imply that the two goods are identical (perfect substitutes).

Combining these various properties, one can highlight a number of critical implications of consumer purchasing behavior and the concept of utility. Consumers naturally desire a bundle of goods that is varied (hence the convex curves for most comparisons) in order to maximize their utility. Similarly, all indifference curves will naturally identify diminishing rates of substitution as the quantity increases for a certain good compared to another, and can create demand projections of prospective supply.

## **5.2.4: Impact of Income on Consumer Choices**



One of the central considerations for a consumer's consumption choice is income or wage levels, and thus their budgetary constraints.

## **Learning Objective**

Break down changes in consumption into the income effect and the wealth effect

## **Key Points**

- The basic premise behind the income effect is that varying income levels will determine different quantities and balanced baskets along the provided indifference curves for any two goods being compared.
- These differences in quantity reflect the increase or decrease in a given individual's purchasing power, thus the income effect could be summarized as the increase in relative utility captured by a consumer with more monetary power.
- Income effects on consumer choice grow more complex as the type of good changes, as different products and services demonstrate different properties relative to both other products/services and a consumer's preferences and utility.
- The four key types of goods to consider are normal goods, inferior goods, complements and substitutes.

## **Key Terms**

Inferior goods

A good that decreases in demand when consumer income rises; having a negative income elasticity of demand.

Income Effect

The change in consumption choices due to changes in the amount of money available for an individual to spend.

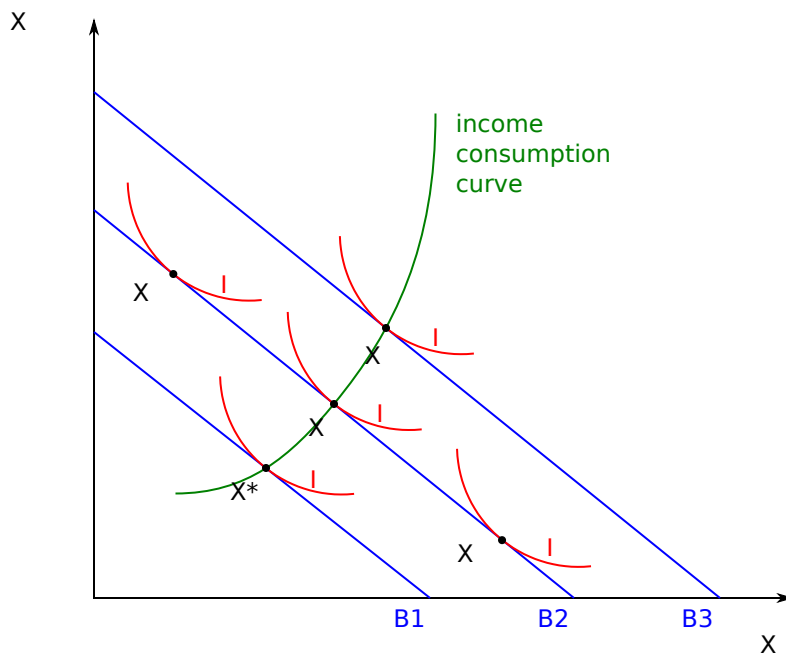
Wealth Effect

The change in an individual's consumption choices due to changes in perception of how rich s/he is.

Consumer choices are predicated on various economic circumstances, and recognizing the relationship between these circumstances and an individual's purchasing behavior allows economists to recognize and predict consumer choice trends. One of the central considerations for a consumer in deciding upon their purchasing behaviors is their overall income or wage levels, and thus their budgetary constraints. These budgetary constraints, when applied to a series of products and services, can be optimized to capture the most utility for the consumer based on their purchasing power.

## **Income from a Consumer Theory Perspective**

The simplest way to demonstrate the effects of income on overall consumer choice, from the viewpoint of Consumer Theory, is via an income-consumption curve for a normal good(see ). The basic premise behind this curve is that the varying income levels (as illustrated by the green income line curving upwards) will determine different quantities and balanced baskets along the provided indifference curves for the two goods being compared in this graph. These differences in quantity reflect the increase or decrease an a given individual's purchasing power, thus the income effect could be summarized as the increase in relative utility captured by a consumer with more monetary power.



## Income-Consumption Curve

Simply put, increases or decreases in income will alter the optimal quantity (and thus relative utility) of a given basket of goods for a specific consumer.

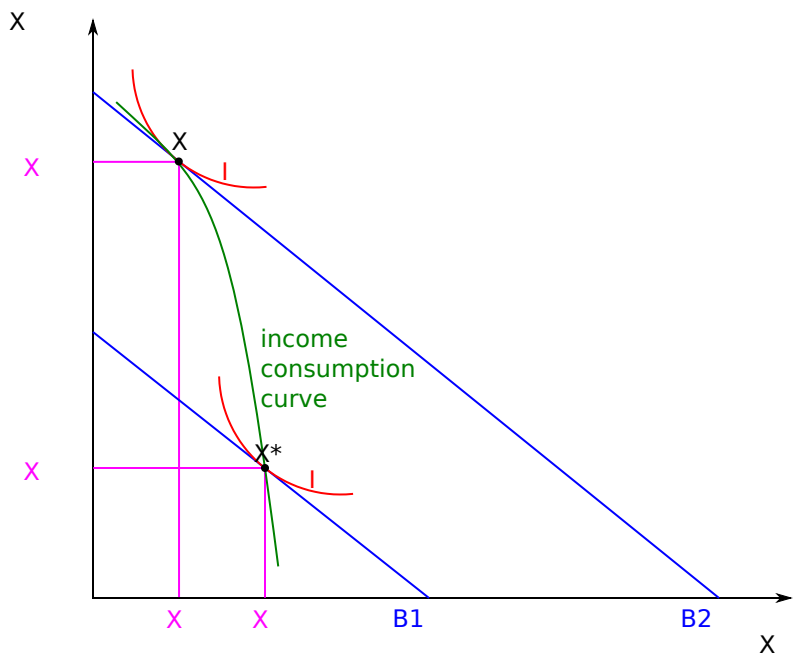
The wealth effect differs slightly from the income effect. The wealth effect reflects changes in consumer choice based on *perceived* wealth, not actual income. For example, if a person owns a stock that appreciates in price, they perceive that they are wealthier and may spend more, even though they have not realized those gains so their income has not increased.

## Effects of Income on Different Goods

Income effects on consumer choice grow more complex as the type of good changes, as different product and services demonstrate different properties relative to both other products/services and a consumers preferences and utility. As a result, it is useful to outline the differences in income effects on normal, inferior, complementary and substitute goods:

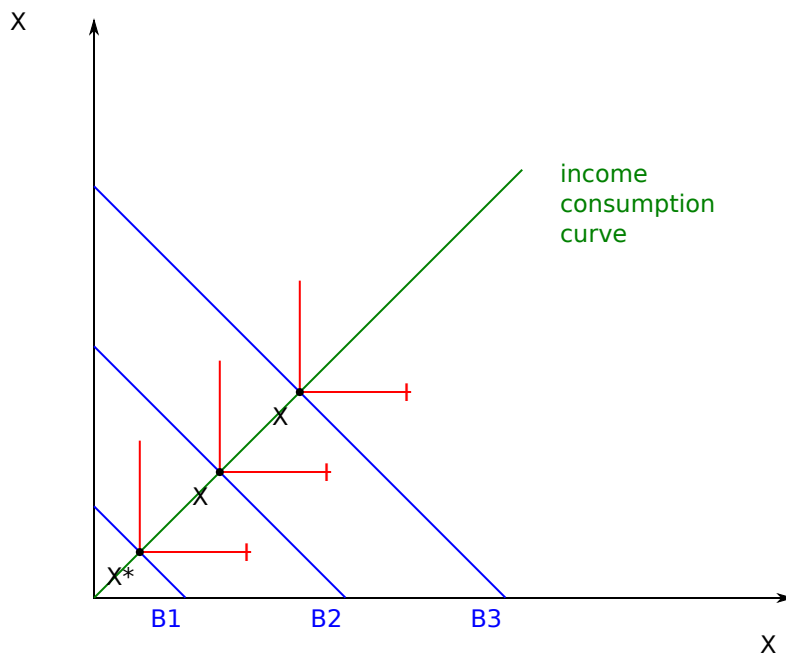
- Normal: A normal good is a good with incremental increases or decreases in utility as quantity changes, demonstrating a predictable and simple linear relationship as income increases or decreases. demonstrates a graphical representation of the effects of income changes upon preference map.
- Inferior: Inferior goods, or goods that are less preferable, will demonstrate inverse relationships with income compared to normal goods. That is to say that an increase in income will not necessarily result in an increase in quantity for the inferior good, as the consumer derives minimal utility in purchasing the inferior good compared to other goods. Inferior goods are often sacrificed as income rises and consumers gain more choice/options. This can be represented in .
- Complementary: Complementary goods are goods that are interdependent in consumption, or essentially goods that require simultaneous consumption by the consumer. An example of this would be like purchasing an automobile and car insurance, the consumption of one requires the consumption of the other. As income increases, these will increase relative to one another (as a ratio). demonstrates this concept in graphical form.
- Substitutes: Perfect substitutes are essentially interchangeable goods, where the consumption of one compared to another has no meaningful impact on the consumer's utility derived. Substitutes are goods that a consumer cannot differentiate between in terms of the need being filled and the satisfaction obtained. Income increases will thus affect the consumption of these goods interchangeably, resulting in increase in the quantity of either or both.

In merging Consumer Theory and consumer choices with income level, the primary takeaway is that an increase in income will increase the prospective utility that consumer can acquire in the market. Understanding how this applies in a general fashion, alongside the specific circumstances dictating specific types of goods, it becomes fairly straight-forward to predict consumer purchasing behaviors at differing income levels.



## Income Levels and Inferior Goods

This graph demonstrates the inverse relationship between income and the consumption of inferior goods. As income rises, the quantity consumed of 'X1' decreases. This illustrates increased variance in consumer choice as income rises.



## Income Effect on Complementary Goods

In this graphical depiction of income increases, the consumption of these two goods are complementary and thus interdependent.

### 5.2.5: Impact of Price on Consumer Choices

The demand curve shows how consumer choices respond to changes in price.

#### Learning Objective

Construct the demand curve using changes in consumption due to price changes

#### Key Points

- For normal goods or services, demand is illustrated with a downward sloping curve, where the quantity on the x-axis will generally increase

- as the price on the y-axis decreases (and vice versa).
- As the demand curve implies, price is the central driving force behind a decision to purchase a given product or service.
  - A critical consideration of product/service pricing is the price elasticity of a given good, which indicates how responsive demand is to a change in price.
  - Using demand curves, economists can project the impact of a price change on the consumer choices in a given market.
  - The quantity demanded may change in response to both to shifts in demand (and the creation of a new demand curve, as demonstrated in ) and movements along the established demand curve.

## **Key Term**

elasticity

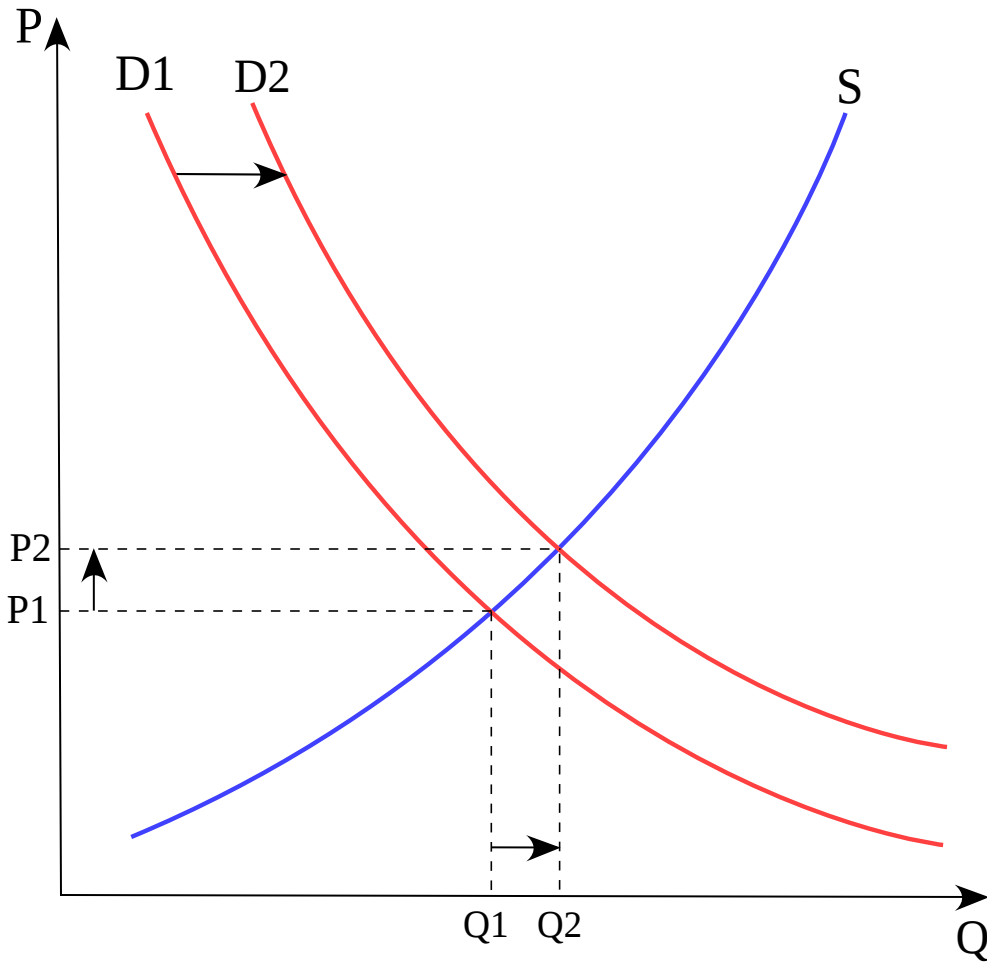
The sensitivity of changes in a quantity with respect to changes in another quantity.

In almost all cases, consumer choices are driven by prices. As price goes up, the quantity that consumers demand goes down. This correlation between the price of goods and the willingness to make purchases is represented clearly by the generation of a demand curve (with price as the y-axis and quantity as the x-axis). The construction of demand, which shows exactly how much of a good consumers will purchase at a given price, is defining of consumer choice theory.

## **Deriving Overall Demand**

The generation of a demand curve is done by calculating what price consumers are willing to pay for a given quantity of a good or service. For normal goods or services, demand is illustrated with a downward sloping curve, where the quantity on the x-axis will generally increase as the price on the y-axis decreases (and vice versa). The quantity demanded may change in response to both to shifts in demand (and the creation of a new demand curve, as demonstrated in ) and movements along the established demand curve. A demand shift usually takes place when an external factor

increases or decreases demand across the board, while a movement upwards or downwards on the curve is indicative of a change in the good's price.



## Demand Shifts

This graph demonstrates a shift in overall demand in the market, where the generation of a new parallel demand curve is required to accurately represent consumer choices.

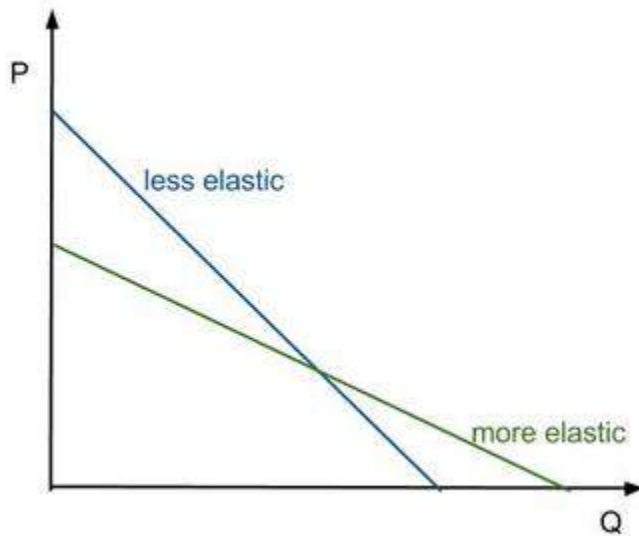
As the demand curve implies, price is often the central driving force behind a decision to purchase a given product or service. Consumers must weigh the overall utility they can capture by making a purchase and benchmark that against their overall monetary resources to optimize their purchasing decisions. This practice regulates the price companies can set for their



products and services, as the income effects and the prospective substitutions (substitution effect) will drive consumer purchase towards purchases that create the most value for themselves.

## **Price Elasticity**

A critical consideration of product/service pricing is the price elasticity of a given good, which indicates how responsive demand is to a change in price. Price elasticity is essentially a measurement of how much any deviations in price will drive the overall quantity purchased up or down, underlining to what extent consumer purchasing decisions will be dictated by pricing. The figure pertaining to price elasticity shows how the slope of the demand curve will change depending on the degree of price sensitivity in the marketplace for a good. A highly elastic good will see consumers much less likely to purchase when prices are high and much more likely to purchase when prices are low, while a good with low elasticity will see consumers purchasing the same quantity regardless of small price changes.



## Price Elasticity

As this graph demonstrates, the slope of the demand curve will vary as a direct result of how elastic consumer purchasing behaviors will be compared to price changes.

Using demand curves, economists can project the impact of a price change on the consumer choices in a given market.

### 5.2.6: Deriving the Demand Curve

The law of demand pursues the derivation of a demand curve for a given product that benchmarks the relative prices and quantities desired.

#### Learning Objective

Explain how Giffen goods violate the law of demand

#### Key Points

- The derivation of demand is a useful tool in this pursuit, often combined with a supply curve in order to determine equilibrium prices

and understand the relationship between consumer needs and what is readily available in the market.

- The inherent relationship between the price of a good and the relative amount of that good consumers will demand is the fulcrum of recognizing demand curves in the broader context of consumer choice and purchasing behavior.
- Generally speaking, normal goods will demonstrate a higher demand as a result of lower prices and vice versa.
- Giffen goods are a situation where the income effect supersedes the substitution effect, creating an increase in demand despite a rise in price.
- Neutral goods, unlike Giffen goods, demonstrate complete ambivalence to price. That is to say that consumer will pay any price to get a fixed quantity.

## **Key Terms**

### Derivation

The operation of deducing one function from another according to some fixed law, called the law of derivation, as the of differentiation or of integration.

### Giffen good

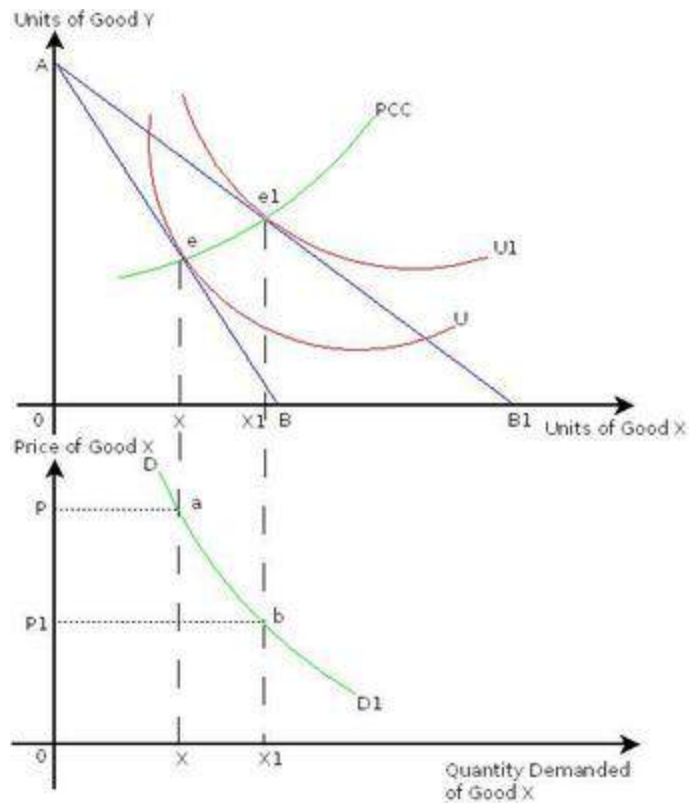
A good which people consume more of as only the price rises; Having a positive price elasticity of demand.

The law of demand in economics pertains to the derivation and recognition of a consumer's relative desire for a product or service coupled with a willingness and ability to pay for or purchase that good. Consumer purchasing behavior is a complicated process weighing varying products/services against a constantly evolving economic backdrop. The derivation of demand is a useful tool in this pursuit, often combined with a supply curve in order to determine equilibrium prices and understand the relationship between consumer needs and what is readily available in the market.

## Deriving Demand Curves

Despite a wide array of prospective goods and services in a constantly altering economic environment, the law of demand pursues the derivation of a demand curve for a given product that benchmarks the relative prices and quantities desired by consumers in a given marketplace. The inherent relationship between the price of a good and the relative amount of that good consumers will demand is the fulcrum of recognizing demand curves in the broader context of consumer choice and purchasing behavior.

Generally speaking, normal goods will demonstrate a higher demand as a result of lower prices and vice versa. The derivation of demand curves for normal goods is therefore relatively predictable in respect to the direction of the slope on a graph (see ). The downward slope represented in this figure underline the critical principle that a given price point will reflect a given quantity demanded by a given marketplace, allowing suppliers and economists to measure the value of a product/service based on a price/quantity analysis of consumer purchasing behaviors.



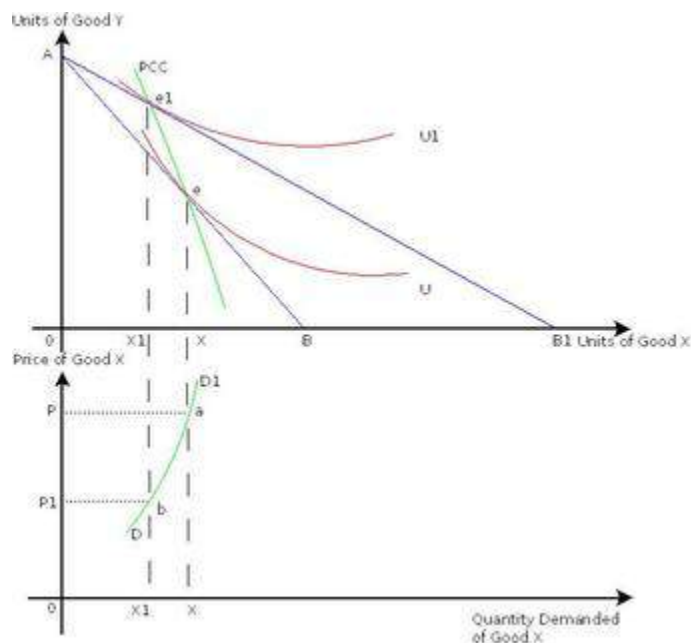
## Deriving the Demand Curve (Normal Goods)

This illustration demonstrates the way in which economists can identify a series of prices and quantities for goods demanded, which ultimately represents the overall demand curve for a given product/service.

One important consideration in demand curve derivation is the differentiation between demand curve shifts and movement along the curve itself. Movement along the curve itself is the identification of what quantity will be purchased at different price points. This means that the factors that underlie consumer desire for the product remains constant and consistent, but the quantity or price alters to a new point along the established curve. Alternatively, sometimes external factors can shift the actual demand for a given good, pushing the demand curve outwards to the right and up or inwards down and left. This represents a substantial change in the actual demand for that product, as opposed to a quantity or price shift at a fixed demand level.

## Exceptions: Giffen Goods and Neutral Goods

With the concept of general demand curves in mind, it is important to recognize that some goods do not conform to the traditional assumption that higher prices will always demonstrate lower demand. Giffen goods and neutral goods break this rule, with the former demonstrating an increase in demand as a result of a price rise (see ) and the latter demonstrating indifference to price in regards to the quantity demanded (illustrated as a completely vertical demand curve):



## Demand Curve for Giffen Goods

Giffen goods are essentially goods that demonstrate an increase in demand as a result of an increase in price, generally considered counter-intuitive in traditional economic models. This graph illustrates the derivation of a demand curve for these goods.

- *Giffen Goods* - Giffen goods are a situation where the income effect supersedes the substitution effect, creating an increase in demand despite a rise in price. Goods such as high-end luxury items like expensive fashion often demonstrate this type of counter-intuitive

trend, where the high price of an item is attractive to the consumer for the sake of displaying wealth.

- *Neutral Goods* - Neutral goods, unlike Giffen goods, demonstrate complete ambivalence to price. That is to say that consumers will pay any price to get a fixed quantity. These goods are often necessities, defying the standard law of demand due to the fact that they must be purchased regardless of price/situation. A good example of this is water or healthcare, where not getting what is required will have dramatic consequences.

## 5.2.7: Applications of Principles on Consumer Choices

The income effect and substitution effect combine to create a labor supply curve to represent the consumer trade-off of leisure and work.

### Learning Objective

Explain the labor-leisure tradeoff in terms of income and substitution effects

### Key Points

- Economics assumes a population of rational consumers, subjected to the complexities of modern economics while they attempt to maximize the utility obtainable within their income range.
- The income effect says that a consumers overall income level will have an effect on the quantities of goods that consumer will purchase.
- The substitution effect, similar to the income effect, identifies ways in which consumer purchasing power will alter the relative quantities of goods/services purchased by consumers at varying income levels and budgetary constraints.
- Combining the substitution effect and the income effect, one can derive an overall labor-leisure trade-off based on a given consumers purchasing power (income) relative to the price of necessary bundles of goods (substitution effect).

- A rational consumer will begin to work less hours after meeting their consumption requirements in order to capture the value of leisure (and enjoy their income in a meaningful way).

## **Key Terms**

substitution effect

The change in demand for one good that is due to the relative prices and availability of substitute goods.

purchasing power

The amount of goods and services that can be bought with a unit of currency or by consumers.

Income Effect

The change in consumption resulting from a change in real income.

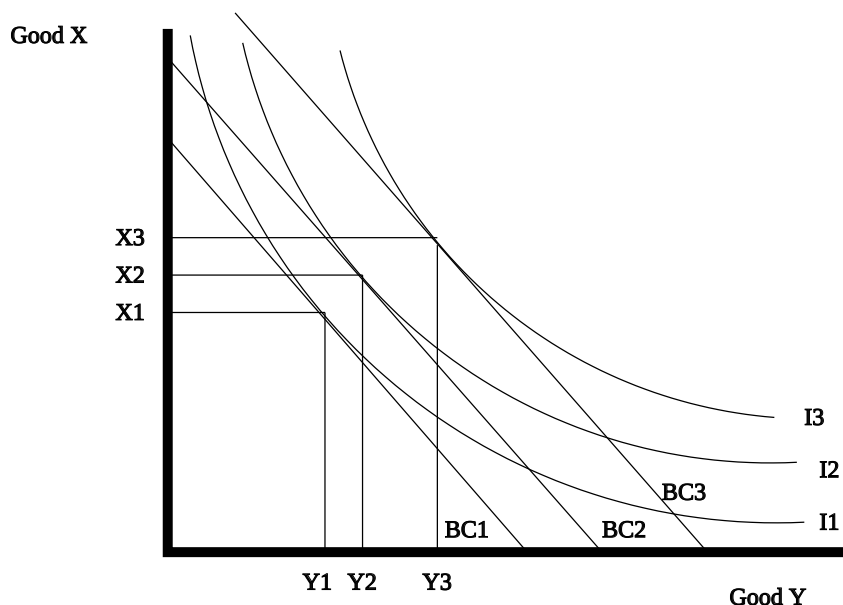
Economics assumes a population of rational consumers, subjected to the complexities of modern economics while they attempt to maximize the utility obtainable within their income range. Central principles to analyzing consumer actions and choices are income effect and the substitution effect, which ultimately generate a labor supply to illustrate the labor-leisure trade-off for consumers.

## **Income Effect**

The income effect needs two simple inputs: the average price of goods and the consumer's income level. This creates a relative buying power, which will play a substantial role in the quantity of goods purchased. Predicting consumer choice requires inputs on consumer purchasing power and the goods in which they are deciding between. In we are comparing 'Good X' and 'Good Y' to identify how a change in income will alter the overall amount of each good would likely be purchased along a series of indifference curves (see Boundless atom on 'Indifference Curves'). This



graphical representation of a consumer's income (I) and budget constraints (BC) underlines the variance in quantity of 'Good X' and 'Good Y' that will be demanded dependent upon income circumstance. Naturally, a higher income will result in a shift towards increase in quantity for many consumable goods/services.



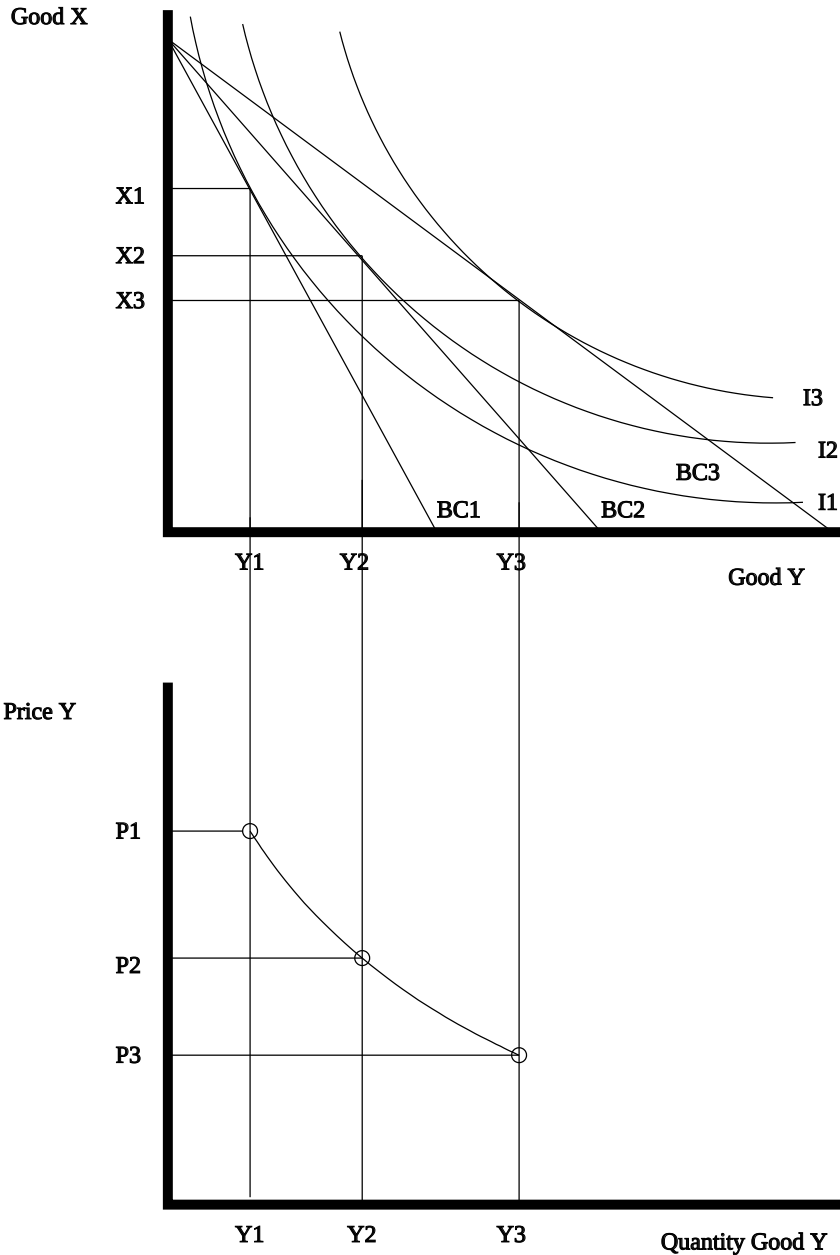
## Income Effects on Consumption and Budget Constraints

This graphical representation of a consumer's income (I) and budget constraints (BC) underlines the variance in quantity of 'Good X' and 'Good Y' that will be demanded dependent upon income circumstance. Naturally, a higher income will result in a shift towards increase in quantity for many consumable goods/services.

## Substitution Effect

The substitution effect is closely related to that of the income effect, where the price of goods and a consumer's income will play a role in the decision-making process. In the substitution effect, a lower purchasing power will generally result in a shift towards more affordable goods (substituting cheaper in place of more expensive goods) while a higher purchasing power

often results in substituting more expensive goods for cheaper ones. This shows the relationship between two graphs, pointing out how the substitution effect identifies the relationship between the price of a given good and the quantity purchased by a given consumer. As the bottom half of the figure implies, a higher price will dictate a lower quantity consumer for 'Good Y', while a lower price will create a higher quantity. This translates to the graph above as the consumer makes choices to maximize utility when comparing the price of different goods to a given income level, substituting cheaper goods and more expensive goods dependent upon purchasing power.



## Substitution Effect

This two-part graphical representation of the substitution effect identifies the relationship between the price of a given good and the quantity purchased by a given consumer. As the bottom half effectively highlights, a higher price will dictate a lower quantity consumer for 'Good Y', while a lower price will create a higher quantity. This translates to the graph above

as the consumer makes choices to maximize utility when comparing the price of different goods to a given income level.

## Types of Goods

One additional important component of consumer choice is the way in which different goods demonstrate different reactions to income alterations and price changes:

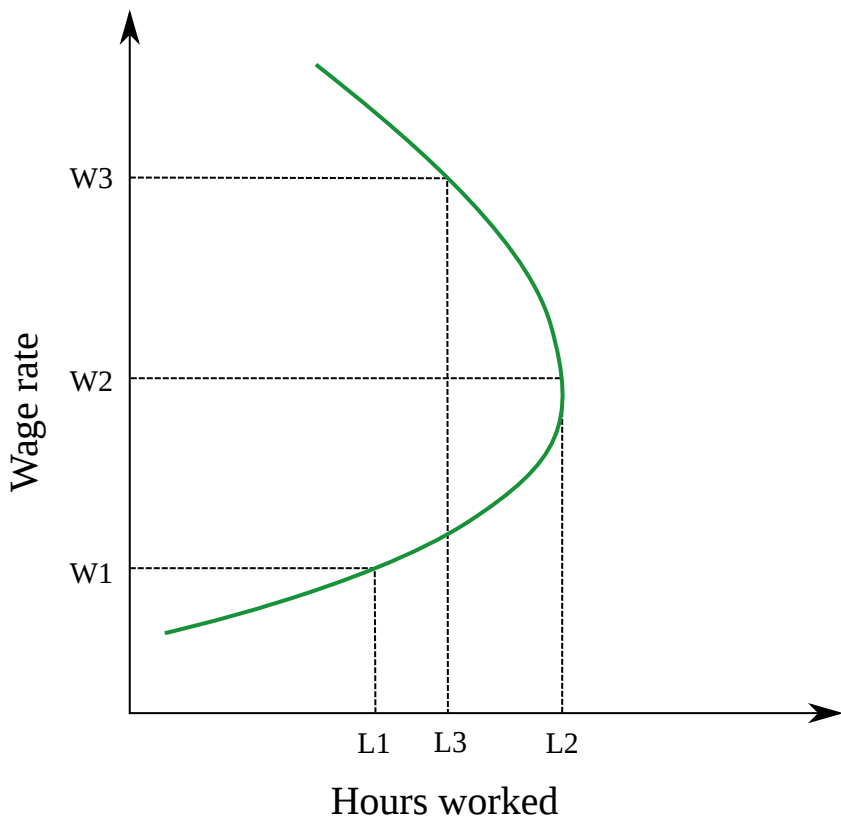
- **Income Changes:** When income changes rises or falls, consumption of certain types of goods will have a positive or negative correlation with these changes. With normal goods, an increase of income will correlate with a higher quantity of consumption while a decrease in income will see a decrease in consumption. Inferior goods, on the other hand, will demonstrate an inverse relationship. A rise in income will cause a decrease in their consumption and vice versa.
- **Price Changes:** When price rises or falls, consumption of certain types of good will either demonstrate positive or negative correlations to these shifts in regard to quantity consumed. *Ordinary goods* will demonstrate the intuitive situation, where a rise in price will result in a decrease in quantity consumer. Inversely, Giffen goods demonstrate a positive relationship, where the price rises will result in higher demand for the good and high consumption.

## Labor Supply Curve

These concepts of income versus required monetary inputs (prices) for goods/services generates a relationship between how much an individual will choose to work and how much an individual can take in terms of leisure time. Simply put, desired labor and leisure time are dependent upon income and prices for goods. The relationship between the number of hours worked and the overall wage levels results in something of a boomerang effect, with hours worked as the x-axis and wages as the y-axis.

Graphically represented, the labor supply curve looks like a backwards-bending curve , where an increase in wages from  $W_1$  to  $W_2$  will result in

more hours being worked and an increase from W2 to W3 will result in less. This is primarily due to the fact that there is a certain amount of capital attained by consumers where they will be satisfied with their monetary utility, at which point working more has diminishing returns on their satisfaction. A rational consumer will begin to work less hours after meeting their consumption requirements in order to capture the value of leisure (and enjoy their income in a meaningful way).



## Labor Supply Curve

The concept of labor supply economics is most efficiently communicated via the following graphical representation. This graph demonstrates the relationship between hours work and overall wage rates, demonstrating the shift in utility as wages increase.

To apply this to the concept of different types of goods above, one can view wage rates and leisure time as consumer goods. Depending on which point on the backwards-bending curve we are on, the trade-offs and thus the

consumer decision will change. If a worker choose to work more when the wage rate rises, leisure is an ordinary good.

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# **6: Elasticity and its Implications**

# 6.1: Price Elasticity of Demand

## 6.1.1: Defining Price Elasticity of Demand

The price elasticity of demand (PED) measures the change in demand for a good in response to a change in price.

### Learning Objective

Define the price elasticity of demand.

### Key Points

- The PED is the percentage change in quantity demanded in response to a one percent change in price.
- The PED coefficient is usually negative, although economists often ignore the sign.
- Demand for a good is relatively inelastic if the PED coefficient is less than one (in absolute value).
- Demand for a good is relatively elastic if the PED coefficient is greater than one (in absolute value).
- Demand for a good is unit elastic when the PED coefficient is equal to one.

### Key Terms

Unit Elastic

Demand for a good is unit elastic when the percentage change in quantity demanded is equal to the percentage change in price.

elastic

Demand for a good is elastic when a change in price has a relatively large effect on the quantity of the good demanded.

inelastic

Demand for a good is inelastic when a change in price has a relatively small effect on the quantity of the good demanded.

The price elasticity of demand (PED) is a measure that captures the responsiveness of a good's quantity demanded to a change in its price. More specifically, it is the percentage change in quantity demanded in response to a one percent change in price when all other determinants of demand are held constant.

The formula for the coefficient of PED is:

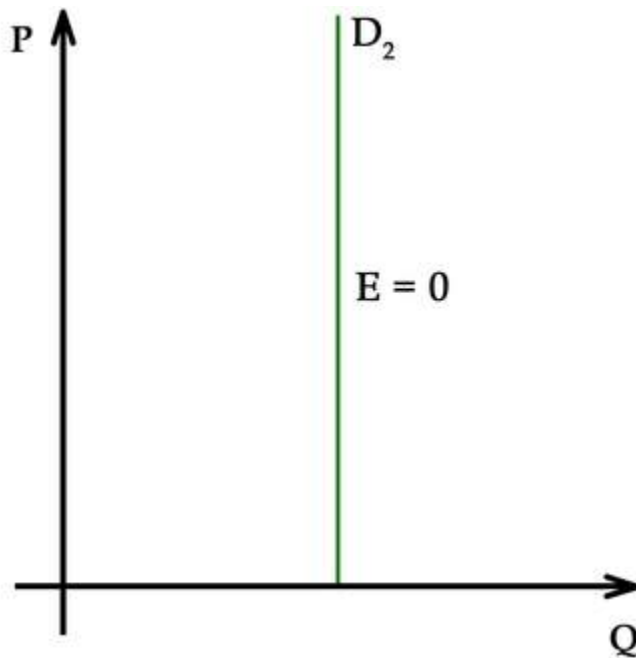
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The law of demand states that there is an inverse relationship between price and demand for a good. As a result, the PED coefficient is almost always negative. However, economists tend to ignore the sign in everyday use. Only goods that do not conform to the law of demand, such as Veblen and Giffen goods, have a positive PED.

The numerical values for the PED coefficient could range from zero to infinity. In general, the demand for a good is said to be inelastic (or relatively inelastic) when the PED is less than one (in absolute value): that is, changes in price have a less than proportional effect on the quantity of the good demanded. The demand for a good is said to be elastic (or relatively elastic) when its PED is greater than one. In this case, changes in price have a more than proportional effect on the quantity of a good demanded.

A PED coefficient equal to one indicates demand that is unit elastic; any change in price leads to an exactly proportional change in demand (i.e. a 1% reduction in demand would lead to a 1% reduction in price).

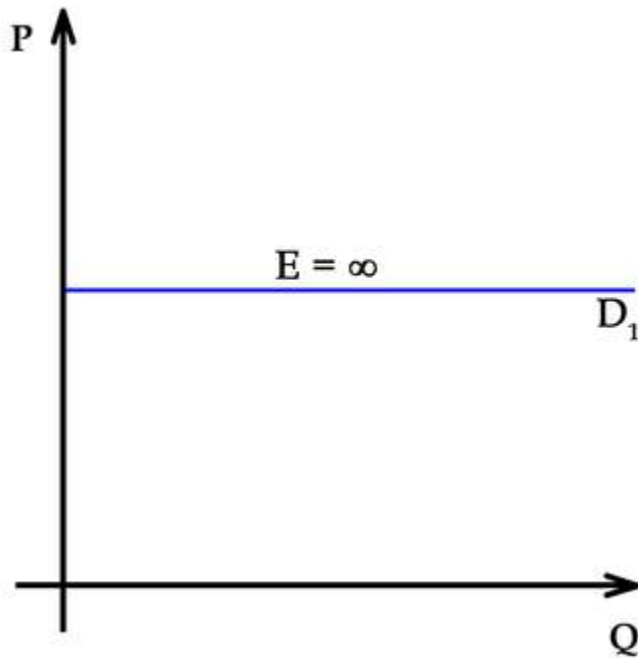
A PED coefficient equal to zero indicates perfectly inelastic demand. This means that demand for a good does not change in response to price .



## Perfectly Inelastic Demand

When demand is perfectly inelastic, quantity demanded for a good does not change in response to a change in price.

Finally, demand is said to be perfectly elastic when the PED coefficient is equal to infinity. When demand is perfectly elastic, buyers will only buy at one price and no other .



## Perfectly Elastic Demand

When the demand for a good is perfectly elastic, any increase in the price will cause the demand to drop to zero.

### 6.1.2: Measuring the Price Elasticity of Demand

The price elasticity of demand (PED) is calculated by dividing the percentage change in quantity demanded by the percentage change in price.

#### Learning Objective

Calculate the own-price elasticity of demand

#### Key Points

- PED captures the change in quantity demanded in response to a change in the good's own price (as opposed to the price of some other good).
- The formula for price elasticity yields a value that is negative, pure, and ranges from zero to negative infinity.

- The result provided by the formula will be accurate only if the changes in price and quantity demanded are small.

## Key Terms

### Cross-price elasticity of demand

Measures the responsiveness of the demand for a good to a change in the price of another good.

### Own-price elasticity of demand

Responsiveness of quantity demanded to a change in the good's own price

The price elasticity of demand (PED) captures how price-sensitive consumers are for a given product or service by measuring the responsiveness of quantity demanded to changes in the good's own price. This is in contrast to measuring the responsiveness of the good's demand to a change in price for some other good (a complement or substitute), which is called the cross-price elasticity of demand. The own-price elasticity of demand is often simply called the price elasticity.

The following formula is used to calculate the own-price elasticity of demand:

---

The formula above usually yields a negative value because of the inverse relationship between price and quantity demanded. However, economists often disregard the negative sign and report the elasticity as an absolute value. For example, if the price of a good increases by 5 percent and the quantity demanded decreases by 5 percent, then the elasticity at the initial price and quantity is  $-5\%/5\% = -1$ . This number is likely to be reported simply as 1.





## Sale

There is an inverse relationship between price and quantity demanded, so the elasticity coefficient is almost always negative.

There are a few other important points to note about the coefficient value provided by this formula. First, the elasticity coefficient is a pure number, meaning that it does not have units of measurement associated with it. Second, the coefficient value can range from zero to negative infinity. Finally, the result provided by the formula will be accurate only when the changes in price and quantity are small. The result will be less accurate when the changes are large.

Since PED is based off of percent changes, the starting nominal quantity and price matter. At low prices and high quantities, the PED is therefore more inelastic. For example, a drop in the price of \$1 from a starting price of \$100 is a 1% drop, but if the starting price is \$10, it is a 10% drop. Similarly, at high prices and low quantities, PED is more elastic .

## Price Elasticity of Demand and Revenue

PED is based off of percent changes, so the starting nominal values of price and quantity are significant.

### 6.1.3: Interpretations of Price Elasticity of Demand

The price elasticity of demand (PED) explains how much changes in price affect changes in quantity demanded.

#### Learning Objective

Describe the relationship between price elasticity and the shape of the demand curve.

#### Key Points

- Elastic PED can be interpreted as consumers being very sensitive to changes in price.
- Inelastic PED can be interpreted as consumers being insensitive to changes in price.
- Firms use PED to figure out how to change their prices in order to increase revenue.
- PED varies along a straight demand curve.

#### Key Term

Price elasticity of demand

The percent change in quantity demanded due to a 1% change in price.

The price elasticity of demand (PED) is a measure of the responsiveness of the quantity demanded of a good to a change in its price. It can be

calculated from the following formula:

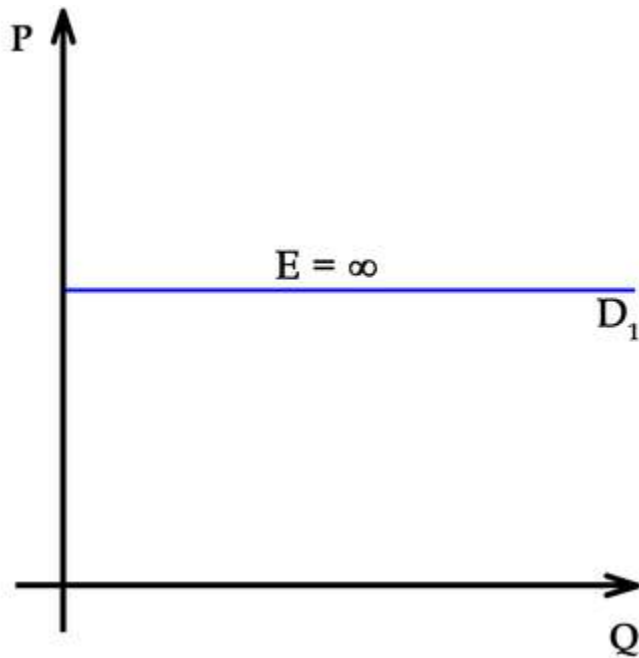
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When PED is greater than one, demand is elastic. This can be interpreted as consumers being very sensitive to changes in price: a 1% increase in price will lead to a drop in quantity demanded of more than 1%.

When PED is less than one, demand is inelastic. This can be interpreted as consumers being insensitive to changes in price: a 1% increase in price will lead to a drop in quantity demanded of less than 1%.

The effect of price changes on total revenue PED may be important for businesses attempting to distinguish how to maximize revenue. For example, if a business finds out its PED is very inelastic, it may want to raise its prices because it knows that it can sell its products for a higher price without losing many sales. Conversely, if a business finds that its PED is very elastic, it may wish to lower its prices. This would allow the business to dramatically increase the number of units sold without losing much revenue per unit.

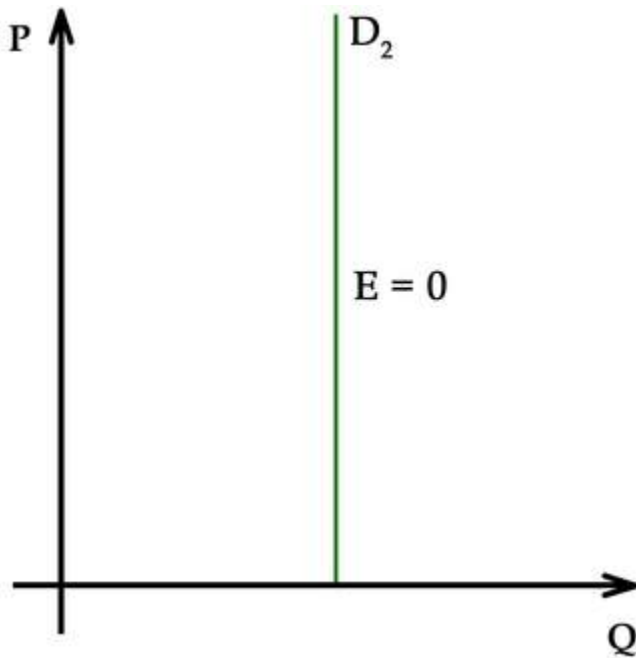
There are two notable cases of PED. The first is when demand is perfectly elastic. Perfectly elastic demand is represented graphically as a horizontal line. In this case, any increase in price will lead to zero units demanded.



## Perfectly Elastic Demand

Perfectly elastic demand is represented graphically by a horizontal line. In this case the PED value is the same at every point of the demand curve.

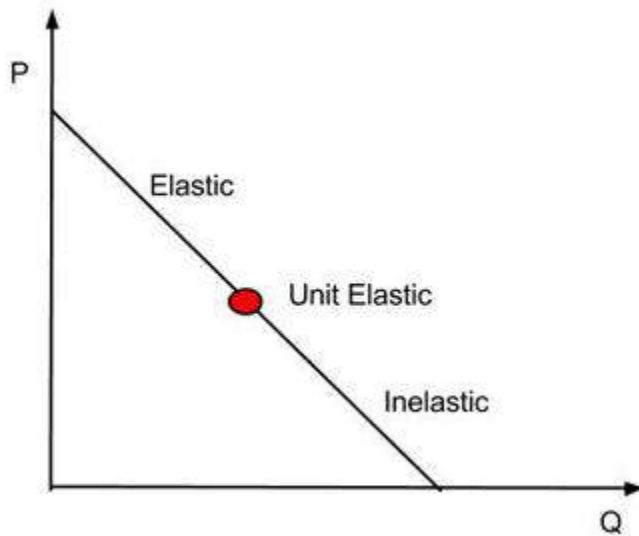
The second is perfectly inelastic demand. Perfectly inelastic demand is graphed as a vertical line and indicates a price elasticity of zero at every point of the curve. This means that the same quantity will be demanded regardless of the price.



## Perfectly Inelastic Demand

Perfectly inelastic demand is graphed as a vertical line. The PED value is the same at every point of the demand curve.

Since PED is measured based on percent changes in price, the nominal price and quantity mean that demand curves have different elasticities at different points along the curve. Elasticity along a straight line demand curve varies from zero at the quantity axis to infinity at the price axis . Below the midpoint of a straight line demand curve, elasticity is less than one and the firm wants to raise price to increase total revenue. Above the midpoint, elasticity is greater than one and the firm wants to lower price to increase total revenue. At the midpoint,  $E=1$ , elasticity is equal to one, or unit elastic.



## Elasticity and the Demand Curve

The price elasticity of demand for a good has different values at different points on the demand curve.

### 6.1.4: Determinants of Price Elasticity of Demand

A good's price elasticity of demand is largely determined by the availability of substitute goods.

#### Learning Objective

Explain how a good's price elasticity of demand may be different in the short term than in the long term

#### Key Points

- A good with more close substitutes will likely have a higher elasticity.
- The higher the percentage of a consumer's income used to pay for the product, the higher the elasticity tends to be.
- For non-durable goods, the longer a price change holds, the higher the elasticity is likely to be.

- The more necessary a good is, the lower the price elasticity of demand.

## Key Term

### Substitute Good

A good that fulfills a consumer need in a way that is similar to another good.

The price elasticity of demand (PED) is a measure of how much the quantity demanded changes with a change in price. The PED for a given good is determined by one or a combination of the following factors:

- Availability of substitute goods: The more possible substitutes there are for a given good or service, the greater the elasticity. When several close substitutes are available, consumers can easily switch from one good to another even if there is only a small change in price . Conversely, if no substitutes are available, demand for a good is more likely to be inelastic.
- Proportion of the purchaser's budget consumed by the item: Products that consume a large portion of the purchaser's budget tend to have greater elasticity. The relative high cost of such goods will cause consumers to pay attention to the purchase and seek substitutes. In contrast, demand will tend to be inelastic when a good represents only a negligible portion of the budget.
- Degree of necessity: The greater the necessity for a good, the lower the elasticity. Consumers will attempt to buy necessary products (e.g. critical medications like insulin) regardless of the price. Luxury products, on the other hand, tend to have greater elasticity. However, some goods that initially have a low degree of necessity are habit-forming and can become "necessities" to consumers (e.g. coffee or cigarettes).
- Duration of price change: For non-durable goods, elasticity tends to be greater over the long-run than the short-run. In the short-term it may be difficult for consumers to find substitutes in response to a price change, but, over a longer time period, consumers can adjust their behavior. For example, if there is a sudden increase in gasoline prices,

consumers may continue to fuel their cars with gas in the short-run, but may lower their demand for gas by switching to public transportation, carpooling, or buying more fuel-efficient vehicles over a longer period of time. However, this tendency does not hold for consumer durables. The demand for durables (cars, for example) tends to be less elastic, as it becomes necessary for consumers to replace them with time.

- Breadth of definition of a good: The broader the definition of a good, the lower the elasticity. For example, potato chips have a relatively high elasticity of demand because many substitutes are available. Food in general would have an extremely low PED because no substitutes exist.
- Brand loyalty: An attachment to a certain brand (either out of tradition or because of proprietary barriers) can override sensitivity to price changes, resulting in more inelastic demand.

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# 6.2: Other Demand Elasticities

## 6.2.1: Cross-Price Elasticity of Demand

The cross-price elasticity of demand measures the change in demand for one good in response to a change in price of another good.

### Learning Objective

Use the cross elasticity of demand to describe a good

### Key Points

- Complementary goods have a negative cross-price elasticity: as the price of one good increases, the demand for the second good decreases.
- Substitute goods have a positive cross-price elasticity: as the price of one good increases, the demand for the other good increases.
- Independent goods have a cross-price elasticity of zero: as the price of one good increases, the demand for the second good is unchanged.

### Key Terms

substitute

A good with a positive cross elasticity of demand, meaning the good's demand is increased when the price of another is increased.

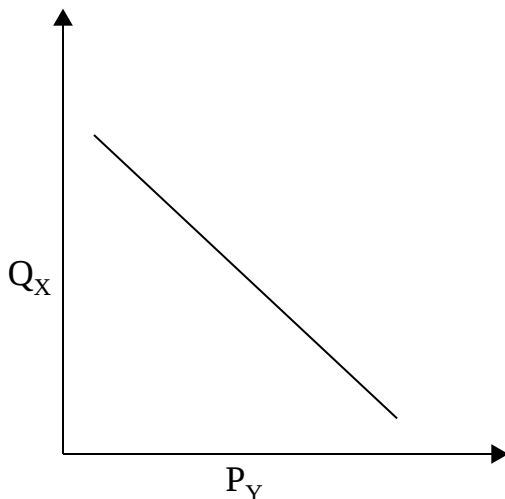
Complement

A good with a negative cross elasticity of demand, meaning the good's demand is increased when the price of another good is decreased.

The cross-price elasticity of demand shows the relationship between two goods or services. More specifically, it captures the responsiveness of the quantity demanded of one good to a change in price of another good. Cross-Price Elasticity of Demand ( $E_{A,B}$ ) is calculated with the following formula:

---

The cross-price elasticity may be a positive or negative value, depending on whether the goods are complements or substitutes. If two products are complements, an increase in demand for one is accompanied by an increase in the quantity demanded of the other. For example, an increase in demand for cars will lead to an increase in demand for fuel. If the price of the complement falls, the quantity demanded of the other good will increase. The value of the cross-price elasticity for complementary goods will thus be negative .

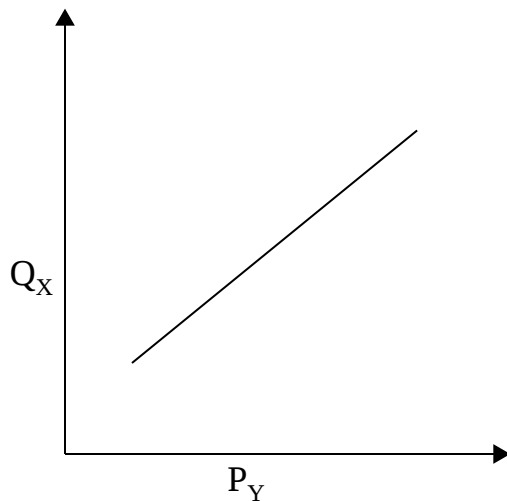


## Complements

Two goods that complement each other have a negative cross elasticity of demand: as the price of good Y rises, the demand for good X falls.

A positive cross-price elasticity value indicates that the two goods are substitutes. For substitute goods, as the price of one good rises, the demand

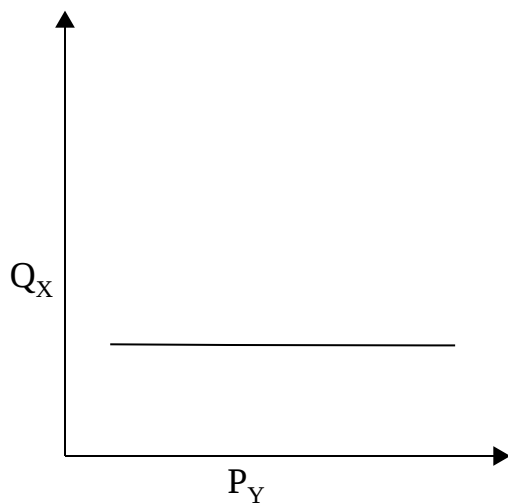
for the substitute good increases. For example, if the price of coffee increases, consumers may purchase less coffee and more tea. Conversely, the demand for a substitute good falls when the price of another good is decreased. In the case of perfect substitutes, the cross elasticity of demand will be equal to positive infinity .



## Substitutes

Two goods that are substitutes have a positive cross elasticity of demand: as the price of good Y rises, the demand for good X rises.

Two goods may also be independent of each other. In this instance, if the price of one good changes, demand for the other good will stay constant. For independent goods, the cross-price elasticity of demand is zero : the change in the price of one good with not be reflected in the quantity demanded of the other.



## Independent

Two goods that are independent have a zero cross elasticity of demand: as the price of good Y rises, the demand for good X stays constant.

## 6.2.2: Income Elasticity of Demand

The income elasticity of demand measures the responsiveness of the demand for a good or service to a change in income.

### Learning Objective

Analyze the characteristics of the income elasticity of demand.

### Key Points

- The income elasticity of demand is the ratio of the percentage change in demand to the percentage change in income.
- Normal goods have a positive income elasticity of demand (as income increases, the quantity demanded increases).
- Inferior goods have a negative income elasticity of demand (as income increases, the quantity demanded decreases).

## Key Terms

### Superior Good

A type of normal good. Demand increases more than proportionally as income rises.

### Necessary Good

A type of normal good. An increase in income leads to a smaller than proportional increase in the quantity demanded.

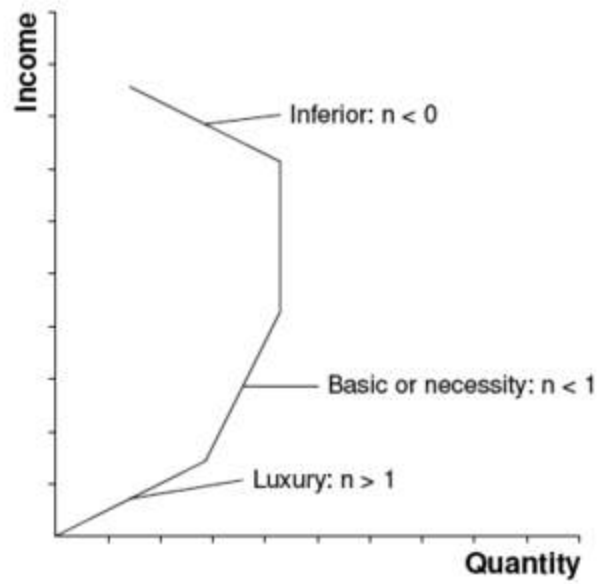
The income elasticity of demand (YED) measures the responsiveness of demand for a good to a change in the income of the people demanding that good, *ceteris paribus*. It is calculated as the ratio of the percentage change in demand to the percentage change in income:

---

If an increase in income leads to an increase in demand, the income elasticity of that good or service is positive. A positive income elasticity is associated with normal goods. In contrast, if a rise in income leads to a decrease in demand, the good or service has a negative income elasticity of demand. A negative income elasticity is associated with inferior goods.

In all, there are five types of income elasticity of demand :





## Income Elasticity of Demand

Income elasticity of demand measures the percentage change in quantity demanded as income changes.

- High income elasticity of demand ( $YED > 1$ ): An increase in income is accompanied by a proportionally larger increase in quantity demanded. This is typical of a luxury or superior good.
- Unitary income elasticity of demand ( $YED = 1$ ): An increase in income is accompanied by a proportional increase in quantity demanded.
- Low income elasticity of demand ( $YED < 1$ ): An increase in income is accompanied by less than a proportional increase in quantity demanded. This is characteristic of a necessary good.
- Zero income elasticity of demand ( $YED = 0$ ): A change in income has no effect on the quantity bought. These are called sticky goods.
- Negative income elasticity of demand ( $YED < 0$ ): An increase in income is accompanied by a decrease in the quantity demanded. This is an inferior good (all other goods are normal goods). The consumer may be selecting more luxurious substitutes as a result of the increase in income.

### 6.2.3: Calculating Elasticities

The basic elasticity formula has shortcomings which can be minimized by using the midpoint method or calculating the point elasticity.

## **Learning Objective**

Calculate price elasticity of demand with the midpoint method

## **Key Points**

- When changes in price and quantity are big, the arc elasticity or point elasticity formulas provide a more accurate elasticity coefficient than the basic elasticity formula.
- The arc elasticity captures the responsiveness of one variable to another between two given points.
- The midpoint method can be used if just two points on the demand curve are known. You do not need to know the function relating price and quantity demanded to use this method.
- The point elasticity captures the change in quantity demanded to a tiny change in price. To calculate the point elasticity, you must have a function for the relationship between price and quantity.

## **Key Terms**

Arc elasticity

The elasticity of one variable with respect to another between two given points.

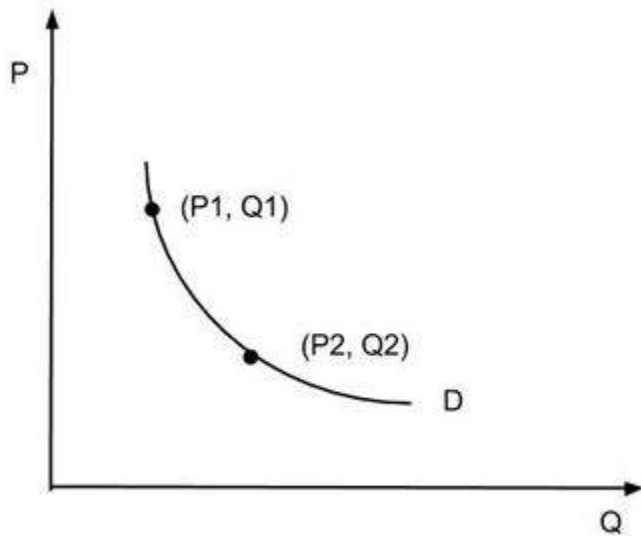
Point elasticity

The measure of the change in quantity demanded to a very small change in price.

The basic formula for the price elasticity of demand (percentage change in quantity demanded divided by the percentage change in price) yields an accurate result when the changes in quantity and price are small. As the difference between the two prices or quantities increases, however, the

accuracy of the formula decreases. This happens because the price elasticity of demand often varies at different points along the demand curve and because the percentage change is not symmetric. Instead, the percentage change between any two values depends on which is chosen as the starting value. For example, when the quantity demanded increases from 10 units to 15 units, the percentage change is 50%. If the quantity demanded decreases from 15 units to 10 units, the percentage change is -33.3%. Two alternative elasticity measures can be used to avoid or minimize the shortcomings of the basic elasticity formula.

The midpoint method calculates the arc elasticity, which is the elasticity of one variable with respect to another between two given points on the demand curve. This measure requires just two points for quantity demanded and price to be known; it does not require a function for the relationship. The midpoint method uses the midpoint rather than the initial point for calculating percentage change, so it is symmetric with respect to the two prices and quantities demanded. The arc elasticity is obtained using this formula:



## Arc Elasticity

To calculate the arc elasticity, you need to know two points on the demand curve. The calculation does not require a function for the relationship between price and quantity demanded.

---

Suppose that the price of hot dogs changes from \$3 to \$1, leading to a change in quantity demanded from 80 to 120. The formula provided above would yield an elasticity of  $0.4/(-1) = -0.4$ . As elasticity is often expressed without the negative sign, it can be said that the demand for hot dogs has an elasticity of 0.4.

The point elasticity is the measure of the change in quantity demanded to a tiny change in price. It is the limit of the arc elasticity as the distance between the two points approaches zero, and hence is defined as a single point. In contrast to the midpoint method, calculating the point elasticity requires a defined function for the relationship between price and quantity demanded. The point elasticity can be calculated with the following formula:

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In the formula above,  $dQ/dP$  is the partial derivative of quantity with respect to price, and P and Q are price and quantity, respectively, at a given point on the demand curve.

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# 6.3: Price Elasticity of Supply

## 6.3.1: Definition of Price Elasticity of Supply

The price elasticity of supply is the measure of the responsiveness in quantity supplied to a change in price for a specific good.

### Learning Objective

Differentiate between the price elasticity of demand for elastic and inelastic goods

### Key Points

- Elasticity is defined as a proportionate change in one variable over the proportionate change in another variable:  

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- The impact that a price change has on the elasticity of supply also directly impacts the elasticity of demand.
- Inelastic goods are often described as necessities, while elastic goods are considered luxury items.
- The elasticity of a good will be labelled as perfectly elastic, relatively elastic, unit elastic, relatively inelastic, or perfectly inelastic.

### Key Terms

demand

The desire to purchase goods and services.

supply

The amount of some product that producers are willing and able to sell at a given price, all other factors being held constant.



luxury

Something very pleasant but not really needed in life.

In economics, elasticity is a summary measure of how the supply or demand of a particular good is influenced by changes in price. Elasticity is defined as a proportionate change in one variable over the proportionate change in another variable:

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The price elasticity of supply (PES) is the measure of the responsiveness in quantity supplied (QS) to a change in price for a specific good ( $\% \text{ Change QS} / \% \text{ Change in Price}$ ). There are numerous factors that directly impact the elasticity of supply for a good including stock, time period, availability of substitutes, and spare capacity. The state of these factors for a particular good will determine if the price elasticity of supply is elastic or inelastic in regards to a change in price.

The price elasticity of supply has a range of values:

- $PES > 1$ : Supply is elastic.
- $PES < 1$ : Supply is inelastic.
- $PES = 0$ : The supply curve is vertical; there is no response of demand to prices. Supply is "perfectly inelastic."
- $PES = \infty$  (i.e., infinity): The supply curve is horizontal; there is extreme change in demand in response to very small change in prices. Supply is "perfectly elastic."

Inelastic goods are often described as necessities. A shift in price does not drastically impact consumer demand or the overall supply of the good because it is not something people are able or willing to go without. Examples of inelastic goods would be water, gasoline, housing, and food.

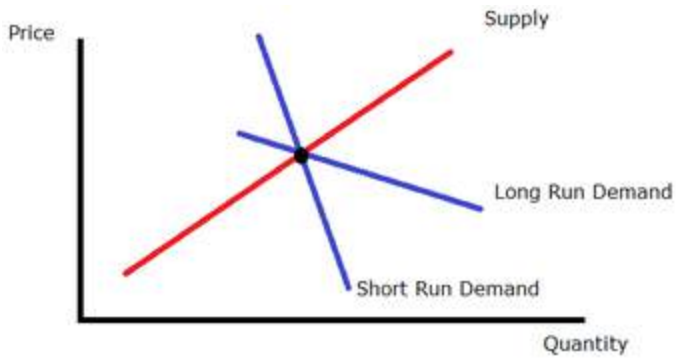
Elastic goods are usually viewed as luxury items. An increase in price for an elastic good has a noticeable impact on consumption. The good is viewed as something that individuals are willing to sacrifice in order to save

money. An example of an elastic good is movie tickets, which are viewed as entertainment and not a necessity.

The price elasticity of supply is determined by:

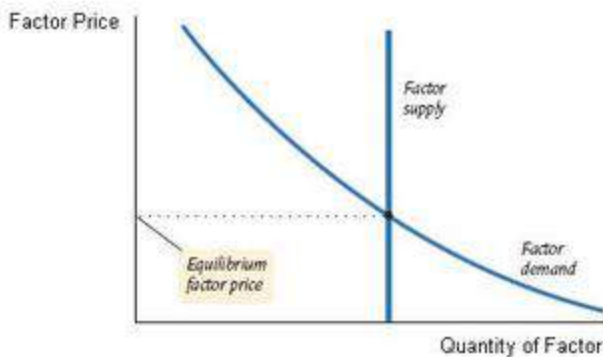
- Number of producers: ease of entry into the market.
- Spare capacity: it is easy to increase production if there is a shift in demand.
- Ease of switching: if production of goods can be varied, supply is more elastic.
- Ease of storage: when goods can be stored easily, the elastic response increases demand.
- Length of production period: quick production responds to a price increase easier.
- Time period of training: when a firm invests in capital the supply is more elastic in its response to price increases.
- Factor mobility: when moving resources into the industry is easier, the supply curve is more elastic.
- Reaction of costs: if costs rise slowly it will stimulate an increase in quantity supplied. If cost rise rapidly the stimulus to production will be choked off quickly.

The result of calculating the elasticity of the supply and demand of a product according to price changes illustrates consumer preferences and needs. The elasticity of a good will be labelled as perfectly elastic, relatively elastic, unit elastic, relatively inelastic, or perfectly inelastic.



## Price elasticity over time

This graph illustrates how the supply and demand of a product are measured over time to show the price elasticity.



## Perfectly Inelastic Supply

A graphical representation of perfectly inelastic supply.

### 6.3.2: Measuring the Price Elasticity of Supply

The price elasticity of supply is the measure of the responsiveness of the quantity supplied of a particular good to a change in price.

#### Learning Objective

Calculate elasticities and describe their meaning

## Key Points

- The price elasticity of supply = % change in quantity supplied / % change in price.
- When calculating the price elasticity of supply, economists determine whether the quantity supplied of a good is elastic or inelastic.
- $PES > 1$ : Supply is elastic.  $PES < 1$ : Supply is inelastic.  $PES = 0$ : if the supply curve is vertical, and there is no response to prices.  $PES = \infty$ : if the supply curve is horizontal.

## Key Terms

mobility

The ability for economic factors to move between actors or conditions.

capacity

The maximum that can be produced on a machine or in a facility or group.

The price elasticity of supply (PES) is the measure of the responsiveness of the quantity supplied of a particular good to a change in price ( $PES = \% \text{ Change in QS} / \% \text{ Change in Price}$ ). The intent of determining the price elasticity of supply is to show how a change in price impacts the amount of a good that is supplied to consumers. The price elasticity of supply is directly related to consumer demand.

## Elasticity

The elasticity of a good provides a measure of how sensitive one variable is to changes in another variable. In this case, the price elasticity of supply determines how sensitive the quantity supplied is to the price of the good.

# Calculating the PES

When calculating the price elasticity of supply, economists determine whether the quantity supplied of a good is elastic or inelastic. The percentage of change in supply is divided by the percentage of change in price. The results are analyzed using the following range of values:

- $PES > 1$ : Supply is elastic.
- $PES < 1$ : Supply is inelastic.
- $PES = 0$ : Supply is perfectly inelastic. There is no change in quantity if prices change.
- $PES = \text{infinity}$ : Supply is perfectly elastic. An decrease in prices will lead to zero units produced.

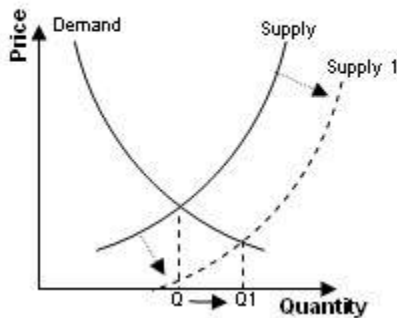
## Factors that Influence the PES

There are numerous factors that impact the price elasticity of supply including the number of producers, spare capacity, ease of switching, ease of storage, length of production period, time period of training, factor mobility, and how costs react.

The price elasticity of supply is calculated and can be graphed on a demand curve to illustrate the relationship between the supply and price of the good

.

Figure 5 – “Supply and Demand”  
Curves



## Supply and Demand Curves

A demand curve is used to graph the impact that a change in price has on the supply and demand of a good.

### 6.3.3: Applications of Elasticities

In economics, elasticity refers to how the supply and demand of a product changes in relation to a change in the price.

#### Learning Objective

Give examples of inelastic and elastic supply in the real world

#### Key Points

- To determine the elasticity of a product, the proportionate change of one variable is placed over the proportionate change of another variable (Elasticity = % change of supply or demand / % change in price).
- For elastic demand, a change in price significantly impacts the supply and demand of the product.
- For inelastic demand, a change in the price does not substantially impact the supply and demand of the product.
- Economists use demand curves in order to document and study elasticity.

## Key Terms

elastic

Sensitive to changes in price.

supply

The amount of some product that producers are willing and able to sell at a given price, all other factors being held constant.

inelastic

Not sensitive to changes in price.

demand

The desire to purchase goods and services.

## Example

- If the per gallon price of water increases from \$10 to \$11, there is a 10% increase in price. As a result of the price increase, the demand for water drops from 100 gallons to 99 gallons of water per day, which is a 1% decrease. In this case, the price increase of water is inelastic because it does not substantially impact the supply and demand (there is only a 1/10 change in demand).

In economics, elasticity refers to the responsiveness of the demand or supply of a product when the price changes.

The technical definition of elasticity is the proportionate change in one variable over the proportionate change in another variable. For example, to determine how a change in the supply or demand of a product is impacted by a change in the price, the following equation is used:  $\text{Elasticity} = \frac{\% \text{ change in supply or demand}}{\% \text{ change in price}}$ .

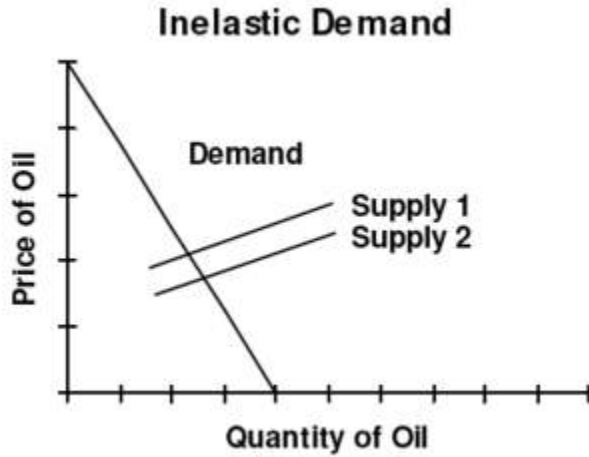
The price is a variable that can directly impact the supply and demand of a product. If a change in the price of a product significantly influences the supply and demand, it is considered "elastic." Likewise, if a change in product price does not significantly change the supply and demand, it is considered "inelastic."

For elastic demand, when the price of a product increases the demand goes down. When the price decreases the demand goes up. Elastic products are usually luxury items that individuals feel they can do without. An example would be forms of entertainment such as going to the movies or attending a sports event. A change in prices can have a significant impact on consumer trends as well as economic profits. For companies and businesses, an increase in demand will increase profit and revenue, while a decrease in demand will result in lower profit and revenue.

For inelastic demand, the overall supply and demand of a product is not substantially impacted by an increase in price. Products that are usually inelastic consist of necessities like food, water, housing, and gasoline. Whether or not a product is elastic or inelastic is directly related to consumer needs and preferences. If demand is perfectly inelastic, then the same amount of the product will be purchased regardless of the price.

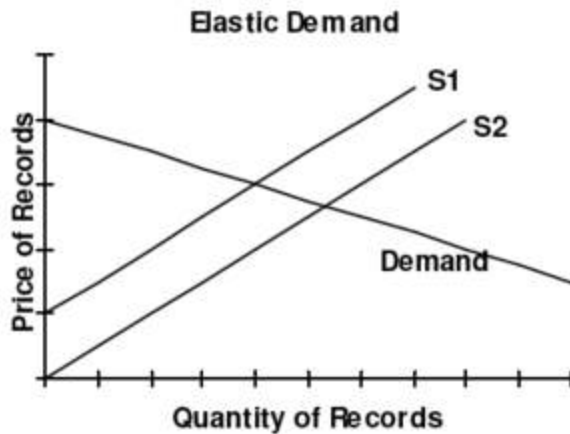
Economists study elasticity and use demand curves in order to diagram and study consumer trends and preferences. An elastic demand curve shows that an increase in the supply or demand of a product is significantly impacted by a change in the price. An inelastic demand curve shows that an increase in the price of a product does not substantially change the supply or demand of the product.





## Inelastic Demand

For inelastic demand, when there is an outward shift in supply and prices fall, there is no substantial change in the quantity demanded.



## Elastic Demand

For elastic demand, when there is an outward shift in supply, prices fall which causes a large increase in quantity demanded.

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# **7: Market Failure: Externalities**

# 7.1: Introducing Market Failure

## 7.1.1: Defining Market Failure

Market failure occurs when the price mechanism fails to account for all of the costs and benefits necessary to provide and consume a good.

### Learning Objective

Identify common market failures and governmental responses

### Key Points

- Prior to market failure, the supply and demand within the market do not produce quantities of the goods where the price reflects the marginal benefit of consumption.
- The structure of market systems contributes to market failure. In the real world, it is not possible for markets to be perfect due to inefficient producers, externalities, environmental concerns, and lack of public goods.
- Government responses to market failure include legislation, direct provision of merit goods and public goods, taxation, subsidies, tradable permits, extension of property rights, advertising, and international cooperation among governments.

### Key Terms

merit good

A commodity which is judged that an individual or society should have on the basis of some concept of need, rather than ability and willingness to pay.

public good

A good that is both non-excludable and non-rivalrous in that individuals cannot be effectively excluded from use and where use by one individual does not reduce availability to others.

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

Market failure occurs when the price mechanism fails to account for all of the costs and benefits necessary to provide and consume a good. The market will fail by not supplying the socially optimal amount of the good.

Prior to market failure, the supply and demand within the market do not produce quantities of the goods where the price reflects the marginal benefit of consumption. The imbalance causes allocative inefficiency, which is the over- or under-consumption of the good.

The structure of market systems contributes to market failure. In the real world, it is not possible for markets to be perfect due to inefficient producers, externalities, environmental concerns, and lack of public goods. An externality is an effect on a third party which is caused by the production or consumption of a good or service .



## **Air pollution**

Air pollution is an example of a negative externality. Governments may enact tradable permits to try and reduce industrial pollution.

During market failures the government usually responds to varying degrees. Possible government responses include:

- legislation - enacting specific laws. For example, banning smoking in restaurants, or making high school attendance mandatory.
- direct provision of merit and public goods - governments control the supply of goods that have positive externalities. For example, by supplying high amounts of education, parks, or libraries.
- taxation - placing taxes on certain goods to discourage use and internalize external costs. For example, placing a 'sin-tax' on tobacco products, and subsequently increasing the cost of tobacco consumption.
- subsidies - reducing the price of a good based on the public benefit that is gained. For example, lowering college tuition because society benefits from more educated workers. Subsidies are most appropriate to encourage behavior that has positive externalities.
- tradable permits - permits that allow firms to produce a certain amount of something, commonly pollution. Firms can trade permits with other firms to increase or decrease what they can produce. This is the basis behind cap-and-trade, an attempt to reduce of pollution.

- extension of property rights - creates privatization for certain non-private goods like lakes, rivers, and beaches to create a market for pollution. Then, individuals get fined for polluting certain areas.
- advertising - encourages or discourages consumption.
- international cooperation among governments - governments work together on issues that affect the future of the environment.

## 7.1.2: Causes of Market Failure

Market failure occurs due to inefficiency in the allocation of goods and services.

### Learning Objective

Explain some common causes of market failure

### Key Points

- A price mechanism fails to account for all of the costs and benefits involved when providing or consuming a specific good. When this happens, the market will not produce the supply of the good that is socially optimal – it will be over or under produced.
- Due to the structure of markets, it may be impossible for them to be perfect.
- Reasons for market failure include: positive and negative externalities, environmental concerns, lack of public goods, underprovision of merit goods, overprovision of demerit goods, and abuse of monopoly power.

### Key Terms

free rider

One who obtains benefit from a public good without paying for it directly.

public good



A good that is both non-excludable and non-rivalrous in that individuals cannot be effectively excluded from use and where use by one individual does not reduce availability to others.

monopoly

A market where one company is the sole supplier.

Market failure occurs due to inefficiency in the allocation of goods and services. A price mechanism fails to account for all of the costs and benefits involved when providing or consuming a specific good. When this happens, the market will not produce the supply of the good that is socially optimal – it will be over or under produced.

In order to fully understand market failure, it is important to recognize the reasons why a market can fail. Due to the structure of markets, it is impossible for them to be perfect. As a result, most markets are not successful and require forms of intervention.

Reasons for market failure include:

- Positive and negative externalities: an externality is an effect on a third party that is caused by the consumption or production of a good or service . A positive externality is a positive spillover that results from the consumption or production of a good or service. For example, although public education may only directly affect students and schools, an educated population may provide positive effects on society as a whole. A negative externality is a negative spillover effect on third parties. For example, secondhand smoke may negatively impact the health of people, even if they do not directly engage in smoking.
- Environmental concerns: effects on the environment as important considerations as well as sustainable development.
- Lack of public goods: public goods are goods where the total cost of production does not increase with the number of consumers. As an example of a public good, a lighthouse has a fixed cost of production that is the same, whether one ship or one hundred ships use its light. Public goods can be underproduced; there is little incentive, from a private standpoint, to provide a lighthouse because one can wait for

someone else to provide it, and then use its light without incurring a cost. This problem - someone benefiting from resources or goods and services without paying for the cost of the benefit - is known as the free rider problem.

- Underproduction of merit goods: a merit good is a private good that society believes is under consumed, often with positive externalities. For example, education, healthcare, and sports centers are considered merit goods.
- Overprovision of demerit goods: a demerit good is a private good that society believes is over consumed, often with negative externalities. For example, cigarettes, alcohol, and prostitution are considered demerit goods.
- Abuse of monopoly power: imperfect markets restrict output in an attempt to maximize profit.

When a market fails, the government usually intervenes depending on the reason for the failure.

### **7.1.3: Introducing Externalities**

An externality is a cost or benefit that affects an otherwise uninvolved party who did not choose to be subject to the cost or benefit.

#### **Learning Objective**

Give examples of externalities that exist in different parts of society

#### **Key Points**

- In regards to externalities, the cost and benefit to society is the sum of the benefits and costs for all parties involved.
- Market failure occurs when the price mechanism fails to consider all of the costs and benefits necessary for providing and consuming a good.
- In regards to externalities, one way to correct the issue is to internalize the third party costs and benefits. However, in many cases, internalizing the costs is not feasible. When externalities exist, it is possible that the particular industry will experience market failure.

- In many cases, the government intervenes when there is market failure.

## Key Terms

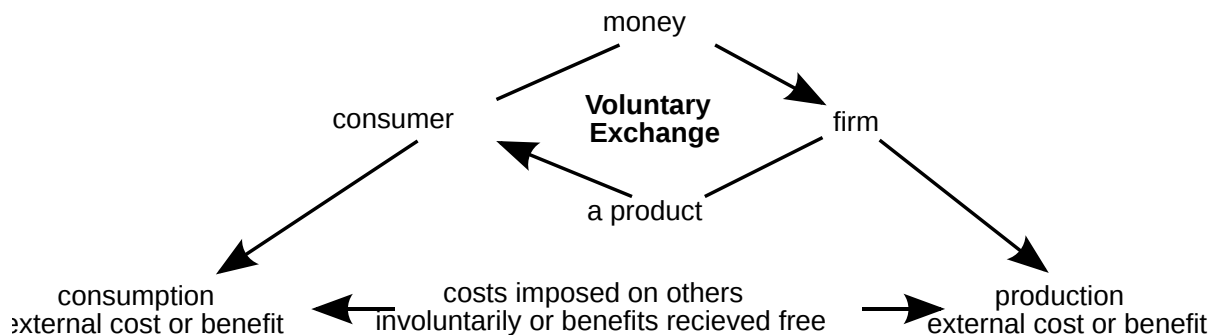
externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

intervene

To interpose; as, to intervene to settle a quarrel; get involved, so as to alter or hinder an action.

In economics, an externality is a cost or benefit resulting from an activity or transaction, that affects an otherwise uninvolved party who did not choose to be subject to the cost or benefit . An example of an externality is pollution. Health and clean-up costs from pollution impact all of society, not just individuals within the manufacturing industries. In regards to externalities, the cost and benefit to society is the sum of the value of the benefits and costs for all parties involved.



## Externality

An externality is a cost or benefit that results from an activity or transaction and that affects an otherwise uninvolved party who did not choose to incur that cost or benefit.

Negative vs. Positive

A negative externality is an result of a product that inflicts a negative effect on a third party . In contrast, positive externality is an action of a product that provides a positive effect on a third party.



## **Negative Externality**

Air pollution caused by motor vehicles is an example of a negative externality.

Externalities originate within voluntary exchanges. Although the parties directly involved benefit from the exchange, third parties can experience additional effects. For those involuntarily impacted, the effects can be negative (pollution from a factory) or positive (domestic bees kept for honey production, pollinate the neighboring crops).

Economic Strain

Neoclassical welfare economics explains that under plausible conditions, externalities cause economic results that are not ideal for society. The third parties who experience external costs from a negative externality do so without consent, while the individuals who receive external benefits do not pay a cost. The existence of externalities can cause ethical and political problems within society.

In regards to externalities, one way to correct the issue is to internalize the third party costs and benefits. However, in many cases, internalizing the costs is not financially possible. Governments may step in to correct such market failures.

## **7.1.4: Externality Impacts on Efficiency**

Economic efficiency is the use resources to maximize the production of goods; externalities are imperfections that limit efficiency.

### **Learning Objective**

Analyze the effects of externalities on efficiency

### **Key Points**

- An economically efficient society can produce more goods or services than another society without using more resources.
- An externality is a cost or benefit that results from an activity or transaction and affects a third party who did not choose to incur the cost or benefit. Externalities are either positive or negative depending on the nature of the impact on the third party.
- Neoclassical welfare economics states that the existence of externalities results in outcomes that are not ideal for society as a whole.
- In order to maximize economic efficiency, regulations are needed to reduce market failures and imperfections, like internalizing externalities. When market imperfections exist, the efficiency of the market declines.
- In order for economic efficiency to be achieved, one defining rule is that no one can be made better off without making someone else worse

off. When externalities are present, not everyone benefits from the production of the good or service.

## **Key Terms**

efficient

Making good, thorough, or careful use of resources; not consuming extra. Especially, making good use of time or energy.

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

## **Economic Efficiency**

In economics, the term "economic efficiency" is defined as the use of resources in order to maximize the production of goods and services. An economically efficient society can produce more goods or services than another society without using more resources.

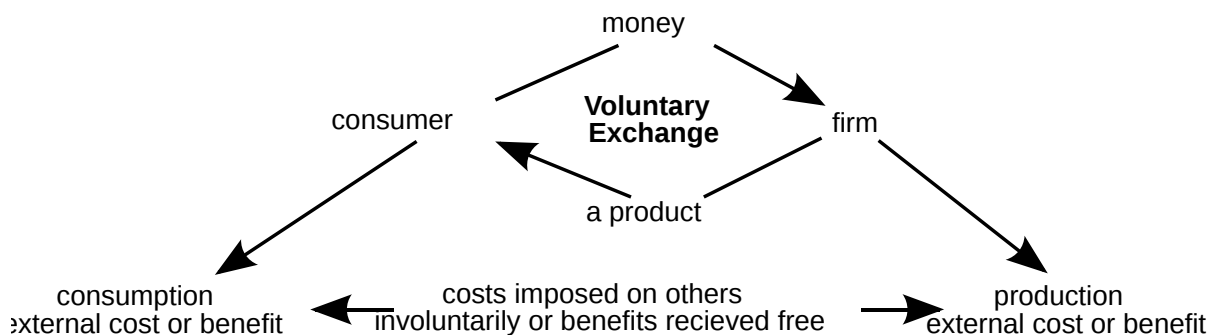
A market is said to be economically efficient if:

- No one can be made better off without making someone else worse off.
- No additional output can be obtained without increasing the amounts of inputs.
- Production proceeds at the lowest possible cost per unit.

## **Externalities**

An externality is a cost or benefit that results from an activity or transaction and affects a third party who did not choose to incur the cost or benefit . Externalities are either positive or negative depending on the nature of the impact on the third party. An example of a negative externality is pollution. Manufacturing plants emit pollution which impacts individuals living in the surrounding areas. Third parties who are not involved in any aspect of the

manufacturing plant are impacted negatively by the pollution. An example of a positive externality would be an individual who lives by a bee farm. The third parties' flowers are pollinated by the neighbor's bees. They have no cost or investment in the business, but they benefit from the bees.



## Externality

This diagram shows the voluntary exchange that takes place within a market system. It also shows the economic costs that are associated with externalities.

## Externalities and Efficiency

Positive and negative externalities both impact economic efficiency. Neoclassical welfare economics states that the existence of externalities results in outcomes that are not ideal for society as a whole. In the case of negative externalities, third parties experience negative effects from an activity or transaction in which they did not choose to be involved. In order to compensate for negative externalities, the market as a whole is reducing its profits in order to repair the damage that was caused which decreases efficiency. Positive externalities are beneficial to the third party at no cost to them. The collective social welfare is improved, but the providers of the benefit do not make any money from the shared benefit. As a result, less of the good is produced or profited from which is less optimal society and decreases economic efficiency.

In order to deal with externalities, markets usually internalize the costs or benefits. For costs, the market has to spend additional funds in order to make

up for damages incurred. Benefits are also internalized because they are viewed as goods produced and used by third parties with no monetary gain for the market. Internalizing costs and benefits is not always feasible, especially when the monetary value of a good or service cannot be determined.

Externalities directly impact efficiency because the production of goods is not efficient when costs are incurred due to damages. Efficiency also decreases when potential money earned is lost on non-paying third parties.

In order to maximize economic efficiency, regulations are needed to reduce market failures and imperfections, like internalizing externalities. When market imperfections exist, the efficiency of the market declines.

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# 7.2: Externalities in Depth

## 7.2.1: Negative Externalities

Negative externalities are costs caused by an activity that affect an otherwise uninvolved party who did not choose to incur that cost.

### Learning Objective

Describe the impact of a negative externality on society

### Key Points

- The reason these negative externalities, otherwise known as social costs, occur is that these expenses are generally not included in calculating the costs of production.
- Government intervention is necessary to help "price" negative externalities. They do this through regulations or by instituting market-based policies such as taxes, subsidies, or permit systems.
- Graphically, social costs will be lower than private costs because they do not take into account the additional costs of negative externalities. As a result, firms may produce more units than is optimal from a societal standpoint.
- Graphically, social costs will be lower than private costs because they do not take into account the additional costs of negative externalities. As a result, firms may produce more units than is optimal from a societal standpoint.

### Key Term

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

## **Example**

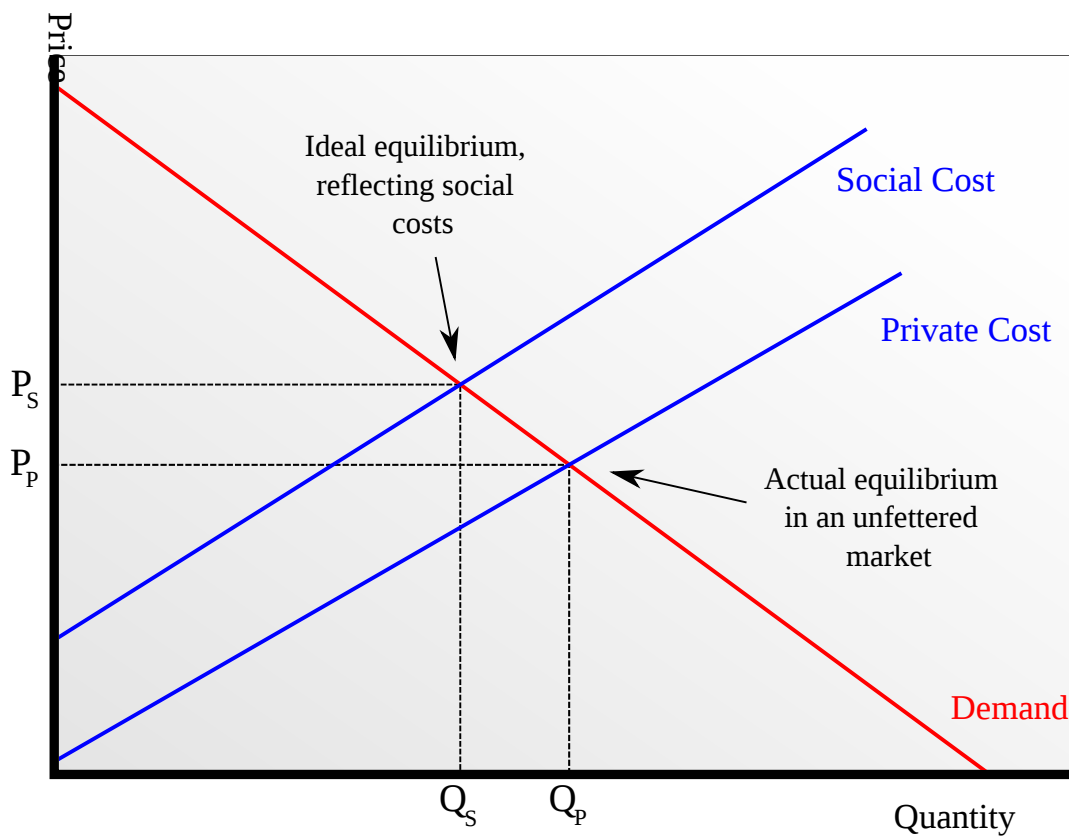
- Smoking creates negative externalities because the secondhand smoke affects third parties that were otherwise not involved in the transaction.

A negative externality is a cost that results from an activity or transaction and that affects an otherwise uninvolved party who did not choose to incur that cost.

## **Reasons for Negative Externalities**

The reason these negative externalities, otherwise known as social costs, occur is that these expenses are generally not included in calculating the costs of production. Production decisions are generally based on financial data and most social costs are not measured that way. For example, when a firm decides to open up a new factory, it will not account for the cost that residents accrue by drinking water from a river the factory polluted. As a result, a product that shouldn't be produced, because the total expenses exceed the return, are made because social costs were not considered.

In other words, the costs of production represent individual, or private, marginal costs. The private marginal costs are lower than societal marginal costs, which also capture the true costs of the negative externalities. As a result, producers will overestimate the ideal quantity of the good to produce .



## Negative Externality

Graphically, negative externalities occur when social costs are lower than private costs, and firms produce more units than is socially optimal. The ideal equilibrium quantity that reflects negative externalities is  $Q_s$ , but firms may produce at  $Q_p$ .

## Government Solutions for Negative Externalities

In these cases, government intervention is necessary to help "price" negative externalities. Governments can either use regulation (e.g. outlaw an action) or use market solutions. By instituting policies such as pollution penalties, permitting civil lawsuits by private parties to recover damages for negligent actions, and levying environmental taxes, governments can achieve two things. First, these regulations recover funds to help fix the damage caused

by negative externalities. Second, these acts help put a financial price on social costs. With that information, businesses can arrive at a more accurate figure for the costs of production. Businesses can then avoid producing products whose financial and social costs exceed the financial return.



## **Cigarette smoke**

Secondhand smoke is an example of a negative externality; a person chooses to smoke, but others who do not choose to smoke are harmed.

## **7.2.2: Positive Externalities**

Positive externalities are benefits caused by activities that affect an otherwise uninvolved party who did not choose to incur that benefit.

### **Learning Objective**

Use an example to discuss the concept of a positive externality

### **Key Points**

- Externalities occur all the time because economic events do not occur within a vacuum. Transactions often require the use of common resources that are shared with parties are not involved with the

exchange. The use of these resources in turn impacts the uninvolved parties.

- The problem with positive externalities is that the people who create the externality cannot charge the beneficiaries; the beneficiaries can "free ride," or benefit without paying.
- Free riding results in a suboptimal result, because the producers of the externality will generally create less of the benefit than the larger community needs.

## Key Terms

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

free rider

One who obtains benefit from a public good without paying for it directly.

Positive externalities are benefits caused by transactions that affect an otherwise uninvolved party who did not choose to incur that benefit. Externalities occur all the time because economic events do not occur within a vacuum. Transactions often require the use of common resources that are shared with parties are not involved with the exchange. The use of these resources, in turn, impacts the uninvolved parties.

In the case of positive externalities, a transaction has *positive* side effects for non-related parties. Let's take a look at some example:

- A homeowner keeps his house maintained, the neighborhood benefits through higher home values. The homeowner's neighbors benefit from a positive externality.
- A person may keep bees for her own enjoyment, but gardeners in the area benefit because their flowers are pollinated . The beekeeper's transaction of purchasing bees ends up positively affecting parties who are not involved in the transaction.

- A person becomes inoculated against a disease, those around him benefit because they cannot catch the disease from him. There was an exchange between the doctor and the patient, but others also benefit.

In each of these cases, the people taking action are presumably not doing it for the sake of the community, but for their own purposes. The people taking the action may also enjoy the additional benefits described above, but initiators of actions are not considered beneficiaries of externalities.

The problem with positive externalities is that the people who create these advantages cannot charge the beneficiaries; the beneficiaries can "free ride," or benefit without paying. For example, assume everyone in a community, except one person, got a flu shot. That one person could choose to abstain from receiving the shot; since everyone else got inoculated, he can't get the disease from the others because they can't catch the flu. That person would be a free rider since he would benefit from inoculations without incurring any cost.

Since parties that create the externality aren't compensated, they do not have any incentive to create more. This results in a suboptimal result, because the producers of the externality will generally create less of the benefit than the larger community needs.

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# 7.3: Government Policy Options

## 7.3.1: Regulation

The government can respond to externalities through command-and-control policies or market-based policies.

### Learning Objective

Describe the role of government regulation in addressing externalities

### Key Points

- Command-and-control regulation requires or forbids certain behaviors with the goal of addressing an externality.
- Regulation is difficult to implement and enforce correctly.
- Command-and-control regulation can come in the form of government-imposed standards, targets, process requirements, or outright bans.
- The allocation of tradable permits is a market-based policy that has been primarily used to combat pollution.

### Key Term

#### Negative Externality

A detrimental effect suffered by a party due to a transaction it was not a part of.

The government can respond to externalities in two ways. The government can use command-and-control policies to regulate behavior directly. Alternatively, it can implement market-based policies such as taxes and subsidies to incentivize private decision makers to change their own behavior.

Command-and-control regulation can come in the form of government-imposed standards, targets, process requirements, or outright bans. Such measures make certain behaviors either required or forbidden with the goal of addressing the externality. For example, the government may make it illegal for a company to dump certain chemicals in a river. By doing so, the government hopes to protect the environment or other companies or individuals that use the river that would otherwise suffer a negative impact.



## No Smoking

The prohibition of smoking in certain areas is a regulation designed to reduce the negative externalities suffered by non-smokers when they are around smokers.

In practice, implementing regulation effectively is difficult. It requires the regulator to have in-depth knowledge of a certain industry or sphere of economic activity. If done incorrectly, regulation can introduce inefficiency. For example, if the government makes it illegal to dump in the river, the companies and their customers may suffer because the products must be produced using less efficient methods. On the other hand, if the government allows too much to be dumped in the river, they have failed to mitigate the negative externality.

If the government is unsure of how to effectively regulate the market, it should seek other methods of mitigating the externality. Advocates of

market-based policies for reducing negative externalities point to the difficulty of creating and enforcing effective regulation for reasons why the government should create systems of incentives and disincentives instead of using the force of regulation.

## **7.3.2: Tax**

Corrective taxes incentivize economic actors to reduce the production of goods or services generating negative externalities.

### **Learning Objective**

Describe the role of taxes in addressing externalities

### **Key Points**

- A corrective tax is a market-based policy option used by the government to address negative externalities.
- Taxes increase the cost of producing goods or services generating the externality, thus encouraging firms to produce less output.
- The tax should be set equal to the value of the negative externality, which is very difficult to do in practice.
- Corrective taxes increase efficiency and provide the government with revenues as well.

### **Key Term**

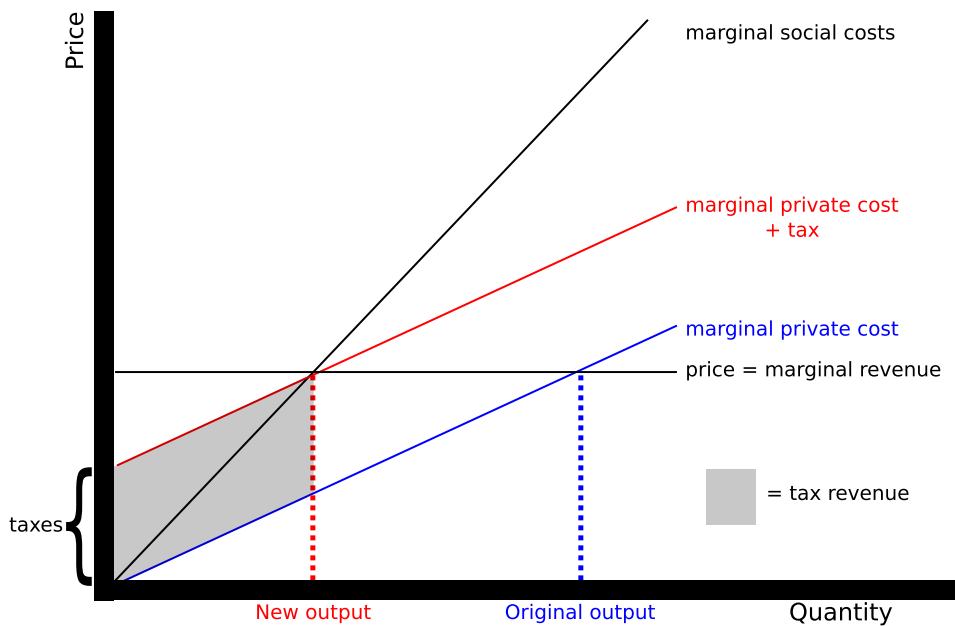
Pigovian tax

A tax applied to a market activity that is generating negative externalities (costs for somebody else).

Taxes are a market-based policy option available to the government to address externalities. A corrective tax (also called a Pigovian tax) is applied to a market activity that is generating negative externalities (costs for a third

party). The tax is set equal to the value of the negative externality and provides incentives for allocation of resources closer to the social optimum.

In the case of negative externalities, the social cost of an activity is greater than the private cost of the activity. In such a case, the market outcome is not efficient and may lead to overproduction of the good. Taxes make it more expensive for firms to produce the good or service generating the externality, thus providing an incentive to produce less of it. As the figure demonstrates, a tax shifts the marginal private cost curve up. In response, producers change the output to the socially-optimum level.



## Corrective Tax

A tax shifts the marginal private cost curve up by the amount of the tax. This gives producers an incentive to reduce output to the socially optimum level.

Take environmental pollution as an example. The private cost of pollution to a polluter is less than its social cost. If the government levies a tax on pollution, it increases the polluter's private cost. The polluter now has an incentive to generate less pollution.

The level of the corrective tax is intended to counterbalance the externality. In practice, however, it is extremely difficult for the government to determine the appropriate level for the tax. Moreover, in determining the tax level, the government might come under pressure from various interest groups that would benefit from a higher or lower taxation level. Nevertheless, by introducing corrective taxes in response to negative externalities the government can not only increase efficiency, but raise revenues as well.

### **7.3.3: Quotas**

Tradable permits are a market-based approach allowing the government to limit negative externalities produced by a group of firms.

#### **Learning Objective**

Evaluate a permit system as a method to address externalities

#### **Key Points**

- A permit is a right to produce a certain amount of a negative externality, such as pollution.
- Permits are traded among firms. Firms that are able to cheaply reduce production of the externality can sell permits to firms that are unable to make such reductions and are willing to pay for the permits.
- Regardless of the initial allocation of permits, the market for permits achieves an outcome that is more efficient for society.

#### **Key Terms**

Permit

The right to produce a given amount of a negative externality (for example, the right to emit a specific volume of a pollutant).

quota

A restriction on the import of something to a specific quantity.

## **Example**

- To prevent over-fishing, a negative externality, governments may impose individual fishing quotas (IFQs), which set an allowable catch limit for fisheries.

To address the problem of negative externalities, governments may use a quota system to try and limit them. In a quota system, the negative externality is capped at a certain amount. In the example of pollution, the government may put a quota on the amount of pollution a factory can produce by issuing tradable permits.

Tradable permits are one of the market-based approaches the government can use to address externalities. In the past tradable permits have been primarily used to control pollution .



## **Emissions Trading**

Emissions trading or "cap and trade" is a market-based approach used to control pollution by providing economic incentives for reducing the emissions of pollutants.

When pursuing this approach the government sets a limit or cap on the amount of a pollutant that may be emitted. It then allocates emissions permits up to the specified limit among firms. The permits represent the right to emit or discharge a specific volume of a specified pollutant. Firms are required to hold a number of permits equivalent to their emissions. Firms that need to increase their volume of emissions must buy permits from firms that require fewer of them. This transfer is referred to as a trade. In effect, the buyer is paying a charge for polluting, while the seller is being rewarded for having reduced emissions. The outcome achieved by the market for permits is more efficient, regardless of the initial allocation of permits.

The market for tradable permits creates incentives for firms to produce less pollution. Firms that have a high cost of reducing emissions are willing to pay for the permits, while those that can reduce emissions in the most cost-efficient manner will do so and sell their permits. Tradable permits thus



achieve a desired level of the externality by allowing the market to determine which market actors can create the externality.

There are several active trading programs for air pollutants. For greenhouse gases the largest is the European Union Emission Trading Scheme. In the United States there is a national market for sulfur dioxide emissions to reduce acid rain. Markets for other pollutants tend to be smaller and more localized.

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# 7.4: Private Solutions

## 7.4.1: Types of Private Solutions

Private actors will sometimes effectively address externalities and reach efficient outcomes without government intervention.

### Learning Objective

Evaluate how effective private solutions may be in solving market failures produced by externalities

### Key Points

- Private solutions to externalities include moral codes, charities, and business mergers or contracts in the self interest of relevant parties.
- The Coase theorem states that when transaction cost are low, two parties will be able to bargain and reach an efficient outcome in the presence of an externality.
- In practice, private parties often fail to resolve the problem of externalities on their own.

### Key Terms

Transaction cost

The cost incurred in making an economic exchange, such as the costs required to come to an acceptable agreement with the other party to the transaction, drawing up an appropriate contract and so on.

Coase Theorem

The theorem states that private economic actors can solve the problem of externalities among themselves.

Government intervention is not always necessary to address externalities. Private actors will sometimes arrive at their own solutions.

There are several types of private solutions to market failures:

- **Moral codes:** Moral codes guide individuals' behavior. Individuals know that certain actions are simply not "the right thing to do" or would elicit disapproving reactions from others. This is illustrated in the case of littering. The likelihood of being fined may be small, but moral codes provide an incentive to refrain from littering.
- **Charities:** Charities channel donations from private individuals towards fighting to limit behaviors that result in negative externalities or promoting behaviors that generate positive externalities. The former can be seen in the case of organizations that protect the environment, while the latter is exemplified through organizations that raise money for education.
- **Business mergers or contracts in the self interest of relevant parties:** Two businesses that offer positive externalities to each other can merge or enter into a contract that makes both parties better off .

The Coase theorem, which was developed by Ronald Coase, posits that two parties will be able to bargain with each other to reach an agreement that efficiently addresses externalities. However, the theorem notes several conditions in order for such a solution to occur, including low transaction costs (the costs the parties incur by negotiating and coming to agreement) and well-defined property rights. If the conditions are met, the bargaining parties are expected to reach an agreement where everyone is better off. In practice, however, transaction costs do exist, and the bargaining process does not always run smoothly. As a result, private individuals often fail to resolve problems.

## **7.4.2: The Coase Theorem**

The Coase theorem states that private parties can find efficient solutions to externalities without government intervention.

### **Learning Objective**

Explain the usefulness and shortcomings of the Coase Theorem.

## **Key Points**

- According to the theorem, the parties affected by an externality will bargain to reach an outcome that will be more efficient.
- Transaction costs must be low in order for parties to arrive at a more efficient outcome.
- In the real world, transaction costs are rarely low, so the Coase theorem is often inapplicable.

## **Key Term**

Transaction cost

The cost incurred in making an economic exchange, such as the costs required to come to an acceptable agreement with the other party to the transaction, drawing up an appropriate contract and so on.

The Coase Theorem, named after Nobel laureate Ronald Coase, states that in the presence of an externality, private parties will arrive at an efficient outcome without government intervention. According to the theorem, if trade in an externality is possible and there are no transaction costs, bargaining among private parties will lead to an efficient outcome regardless of the initial allocation of property rights .



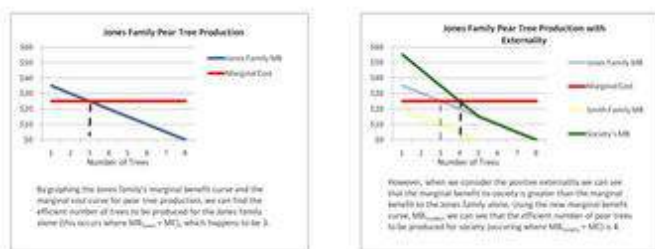
## Efficient Solution

According to the Coase theorem, two private parties will be able to bargain with each other and find an efficient solution to an externality problem.

Imagine a farm and a ranch next to each other. The rancher's cows occasionally wander over to the farm and damage the farmer's crops. The farmer has an incentive to bargain with the rancher to find a more efficient solution. If it is more efficient to prevent cattle trampling a farmer's field by fencing in the farm, rather than fencing in the cattle, the outcome of the bargaining will be the fence around the farm.

Take another example. The Jones family plants pear trees on their property which is adjacent to the Smith family. The Smith family gets an external benefit from the Jones family's pear trees because they pick up the pears that fall on the ground on their side of the property line (see ). This is an

externality because the Smith family does not pay the Jones family for the utility received from gathering fallen pears. As a result, the Jones family plants too few pear trees. In response, the Jones family can put up a net that will prevent pears from falling on the Smith's side of the property line, eliminating the externality. Alternatively, the Jones could impose a cost on the Smith family if they want to continue to enjoy the pears from the pear trees. Both parties will be better off if they can agree to the second scenario, as the Smith family will continue to enjoy pears and the Jones family can increase the production of pears.



## Effects of Externalities

This graph exemplifies how Coase's Theorem functions in a practical manner, underlining the effects of an externality in an economic model.

In practice, transaction costs are rarely low enough to allow for efficient bargaining and hence the theorem is almost always inapplicable to economic reality.

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# **8: Market Failure: Public Goods and Common Resources**

# 8.1: Public Goods

## 8.1.1: Defining a Good

There are four types of goods in economics, which are defined based on excludability and rivalrousness in consumption.

### Learning Objective

Define a good

### Key Points

- Private goods are excludable and rival. Examples of private goods include food and clothes.
- Common goods are non-excludable and rival. A classic example is fish stocks in international waters.
- Club goods are excludable but non-rival. Cable television is an example.
- Public goods are non-excludable and non-rival. They include public parks and the air we breathe.

### Key Terms

Rival

A good whose consumption by one consumer prevents simultaneous consumption by other consumers

Excludable

A good for which it is possible to prevent consumers who have not paid for it from having access to it.

There are four categories of goods in economics, which are defined based on two attributes. The first attribute is excludability, or whether people can be prevented from using the good. The second is whether a good is rival in consumption: whether one person's use of the good reduces another person's ability to use it.

National defense provides an example of a good that is non-excludable. America's national defense establishment offers protection to everyone in the country. Items on sale in a store, on the other hand, are excludable. The store owner can prevent a customer from obtaining a good unless the customer pays for it. National defense also provides an example of a good that is non-rivalrous. One person's protection does not prevent another person from receiving protection. In contrast, shoes are rivalrous. Only one person can wear a pair of shoes at a time.

Combinations of these two attributes create four categories of goods :

	Excludable	Non-Excludable
Rivalrous	<b>Private Goods</b> food, clothing, cars, personal electronics	<b>Common Goods</b> fish stocks, timber, coal
Non-Rivalrous	<b>Club Goods</b> cinemas, private parks, satellite tv	<b>Public Goods</b> air, national defense

## Four Types of Goods

There are four categories of goods in economics, based on whether the goods are excludable and/or rivalrous in consumption.

- **Private goods:** Private goods are excludable and rival. Examples of private goods include food, clothes, and flowers. There are usually limited quantities of these goods, and owners or sellers can prevent other individuals from enjoying their benefits. Because of their relative scarcity, many private goods are exchanged for payment.
- **Common goods:** Common goods are non-excludable and rival. Because of these traits, common goods are easily over-consumed,

leading to a phenomenon called "tragedy of the commons. " In this situation, people withdraw resources to secure short-term gains without regard for the long-term consequences. A classic example of a common good are fish stocks in international waters. No one is excluded from fishing, but as people withdraw fish without limits being imposed, the stocks for later fishermen are depleted.

- Club goods: Club goods are excludable but non-rival. This type of good often requires a "membership" payment in order to enjoy the benefits of the goods. Non-payers can be prevented from access to the goods. Cable television is a classic example. It requires a monthly fee, but is non-rival after the payment.
- Public goods: Public goods are non-excludable and non-rival. Individuals cannot be effectively excluded from using them, and use by one individual does not reduce the good's availability to others. Examples of public goods include the air we breathe, public parks, and street lights. Public goods may give rise to the "free rider problem. " A free-rider is a person who receives the benefit of a good without paying for it. This may lead to the under-provision of certain goods or services.

## **8.1.2: Private Goods**

A private good is both excludable and rivalrous.

### **Learning Objective**

Define a private good

### **Key Points**

- The owners or sellers of private goods exercise private property rights over them.
- A consumer generally has to pay for a private good.
- Generally, the market will efficiently allocate resources for the production of private goods.

## Key Terms

### Excludable

A good for which it is possible to prevent consumers who have not paid for it from having access to it.

### Rivalrous

A good whose consumption by one consumer prevents simultaneous consumption by other consumers.

In economics, a private good is defined as an asset that is both excludable and rivalrous. It is excludable in that it is possible to exercise private property rights over it, preventing those who have not paid from using the good or consuming its benefits. For example, person A may have the means and will to pay \$20 for a t-shirt. Person B may not wish to pay \$20 or may not be able to do so. Person B would not be able to purchase the t-shirt. Additionally, the private good is rivalrous in that its consumption by one person necessarily prevents consumption by another. When person A purchases and drinks a bottle of water, the same bottle of water is not available for person B to purchase and consume.

A private good is a scarce economic resource, which causes competition for it. Generally, people have to pay to enjoy the benefits of a private good. Because people have to pay to obtain it, private goods are much less likely to encounter a free-rider problem than public goods. Thus, generally, the market will efficiently allocate resources to produce private goods.

In daily life, examples of private goods abound, including food, clothing, and most other goods that can be purchased in a store. Take an example of an ice cream cone. It is both excludable and rivalrous. It is possible to prevent someone from consuming the ice cream by simply refusing to sell it to them. Additionally, it can be consumed only once, so its consumption by one individual would definitely reduce others' ability to consume it.



## **Ice Cream Cone**

An ice cream cone is an example of a private good. It is excludable and rival.

### **8.1.3: Public Goods**

Individuals cannot be excluded from using a public good, and one individual's use of it does not limit its availability to others.

#### **Learning Objective**

Define a public good

## Key Points

- A public good is both non-excludable and non-rivalrous.
- Pure public goods are perfectly non-rival in consumption and non-excludable. Impure public goods satisfy those conditions to some extent, but not perfectly.
- Public goods provide an example of market failure. Because of the free-rider problem, they may be underproduced.

## Key Terms

free rider

Someone who enjoys the benefits of a good without paying for it

Non-excludable

Non-paying consumers cannot be prevented from accessing a good

Non-rivalrous

A good whose consumption by one consumer does not prevent simultaneous consumption by other consumers

A public good is a good that is both non-excludable and non-rivalrous. This means that individuals cannot be effectively excluded from its use, and use by one individual does not reduce its availability to others. Examples of public goods include fresh air, knowledge, lighthouses, national defense, flood control systems, and street lighting .





## Streetlight

A streetlight is an example of a public good. It is non-excludable and non-rival in consumption.

Public goods can be pure or impure. Pure public goods are those that are perfectly non-rivalrous in consumption and non-excludable. Impure public goods are those that satisfy the two conditions to some extent, but not fully.

The production of public goods results in positive externalities for which producers don't receive full payment. Consumers can take advantage of public goods without paying for them. This is called the "free-rider problem." If too many consumers decide to "free-ride," private costs to producers will exceed private benefits, and the incentive to provide the good or service through the market will disappear. The market will thus fail to provide enough of the good or service for which there is a need.

For example, a local public radio station relies on support from listeners to operate. The station holds pledge drives several times a year, asking listeners to make contributions or face possible reduction in programming. Yet only a small percentage of the audience makes contributions. Some audience members may even listen to the station for years without ever making a payment. Those listeners who do not make a contribution are "free-riders." If the station relies solely on funds contributed by listeners, it would under-produce programming. It must obtain additional funding from other sources (such as the government) in order to continue to operate.

## 8.1.4: Optimal Quantity of a Public Good

The government is providing an efficient quantity of a public good when its marginal benefit equals its marginal cost.

### Learning Objective

Explain the optimal quantity of a public good

### Key Points

- Collective demand for a public good is the vertical summation of individual demand curves. It shows the price society is willing to pay for a given quantity of a public good.
- The demand curve for a public good is downward sloping, due to the law of diminishing marginal utility. The supply curve is upward sloping, due to the law of diminishing returns.
- The optimal quantity of a public good occurs where the demand (marginal benefit) curve intersects the supply (marginal cost) curve.
- The government uses cost-benefit analysis to decide whether to provide a particular good. If MB is greater than MC there is an underallocation of a public good. If MC is greater than MB there is an overallocation of a public good. When  $MC = MB$  then there is an optimal allocation of public goods.

### Key Term

Cost-benefit analysis

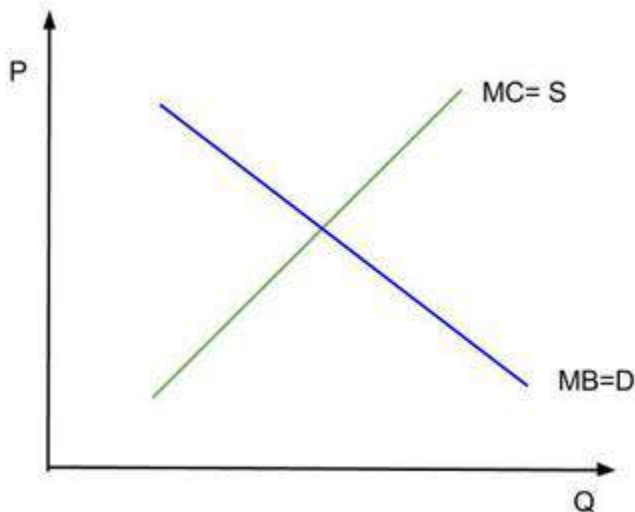
A systematic process for calculating and comparing the marginal benefits and marginal costs of a project or activity.

To determine the optimal quantity of a public good, it is necessary to first determine the demand for it. Demand for public goods is represented through price-quantity schedules, which show the price someone is willing to pay for the extra unit of each possible quantity. Unlike the market

demand curve for private goods, where individual demand curves are summed horizontally, individual demand curves for public goods are summed vertically to get the market demand curve. As a result, the market demand curve for public goods gives the price *society* is willing to pay for a given quantity. It is equal to the marginal benefit curve. Due to the law of diminishing marginal utility, the demand curve is downward sloping.

Often, the government supplies the public good. The supply curve for a public good is equal to its marginal cost curve. Because of the law of diminishing returns, the marginal cost increases as the quantity of the good produced increases. The supply curve therefore has an upward slope.

As already noted, the demand curve is equal to the marginal benefit curve, while the supply curve is equal to the marginal cost curve. The optimal quantity of the public good occurs where MB (society's marginal benefit) equals MC (provider's marginal cost), or where the two curves intersect . When  $MB = MC$ , resources have been allocated efficiently.



## Optimal Quantity of a Public Good

The optimal quantity of public good occurs where  $MB = MC$ .

The public good provider uses cost-benefit analysis to decide whether to provide a particular good by comparing marginal costs and marginal benefits. Cost-benefit analysis can also help the provider decide the extent to which a project should be pursued. Output activity should be increased as long as the marginal benefit exceeds the marginal cost. An activity should not be pursued when the marginal benefit is less than the marginal cost. An activity should be stopped at the point where MB equals MC. This is the  $MC=MB$  rule, by which the provider of the public good can determine which plan, will give society maximum net benefit.

### **8.1.5: Demand for Public Goods**

The aggregate demand curve for a public good is the vertical summation of individual demand curves.

#### **Learning Objective**

Analyze the demand for a public good.

#### **Key Points**

- For public goods, aggregate demand is the sum of marginal benefits to each person at each quantity of the good provided.
- As for private goods, the individual demand curves show the price someone is willing to pay for an extra unit of each possible quantity of a good.
- The efficient quantity of a public good is the quantity at which marginal benefit equals marginal cost.
- The efficient quantity of a public good is the quantity at which marginal benefit equals marginal cost.

#### **Key Term**

public good

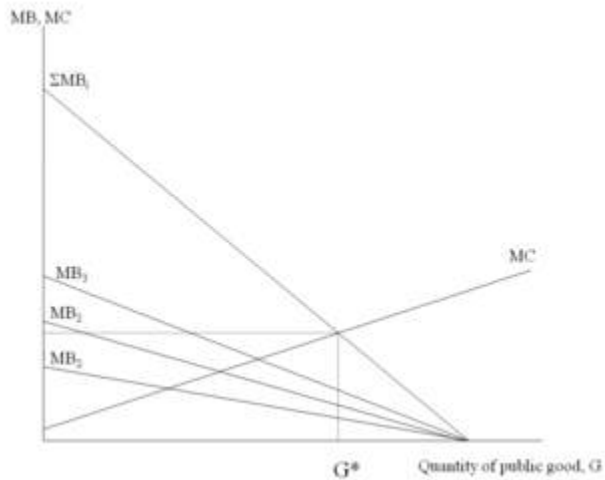
A good that is non-rivalrous and non-excludable.

The aggregate demand for a public good is derived differently from the aggregate demand for private goods.

To an individual consumer, the total benefit of a public good is the dollar value that he or she places on a given level of provision of the good. The marginal benefit for an individual is the increase in the total benefit that results from a one-unit increase in the quantity provided. The marginal benefit of a public good diminishes as the level of the good provided increases.

Public goods are non-rivalrous, so everyone can consume each unit of a public good. They also have a fixed market quantity: everyone in society must agree on consuming the same amount of the good. However, each individual's willingness to pay for the quantity provided may be different. The individual demand curves show the price someone is willing to pay for an extra unit of each possible quantity of the public good.

The aggregate demand for a public good is the sum of marginal benefits to each person at each quantity of the good provided. The economy's marginal benefit curve (demand curve) for a public good is thus the vertical sum of all individual's marginal benefit curves. The vertical summation of individual demand curves for public goods also gives the aggregate willingness to pay for a given quantity of the good.



## Demand for a Public Good

The sum of the individual marginal benefit curves (MB) represent the aggregate willingness to pay or aggregate demand ( $\Sigma MB$ ). The intersection of the aggregate demand and the marginal cost curve (MC) determines the amount of the good provided.

This is in contrast to the aggregate demand curve for a private good, which is the horizontal sum of the individual demand curves at each price. Unlike public goods, society does not have to agree on a given quantity of a private good, and any one person can consume more of the private good than another at a given price.

The efficient quantity of a public good is the quantity that maximizes net benefit (total benefit minus total cost), which is the same as the quantity at which marginal benefit equals marginal cost.

### 8.1.6: Cost-Benefit Analysis

The government uses cost-benefit analysis to decide whether to provide a public good.

#### Learning Objective

Explain how to determine the net cost/benefit of providing a public good

## **Key Points**

- Cost-benefit analysis is a systematic way of calculating the costs and benefits of a project to society as a whole.
- Benefits and costs are expressed in monetary terms and are adjusted for the time-value of money.
- Financial costs are much easier to capture in the analysis than non-financial welfare impacts, such as impacts on human life or the environment.
- The government should provide a public good if the benefits to society outweigh the costs.

## **Key Term**

net present value

The present value of a project determined by summing the discounted incoming and outgoing future cash flows resulting from the decision.

The government uses cost-benefit analysis to decide whether to provide a particular public good and how much of it to provide. Cost-benefit analysis, which is also sometimes called benefit-cost analysis, is a systematic process for calculating the benefits and costs of a project to society as a whole.

The positive and negative effects captured by cost-benefit analysis may include effects on consumers, effects on non-consumers, externality effects, or other social benefits or costs. The guiding principle is to list all parties affected by a project and add a negative or positive value that they ascribe to the project's effect on their welfare. Benefits and costs are expressed in monetary terms, and are adjusted for the time value of money, so that all flows of benefits and costs over time are expressed on a common basis in terms of their net present value. Financial costs tend to be most thoroughly represented in cost-benefit analyses due to relatively abundant market data. It is much more difficult to capture non-financial welfare impacts. For

example, it is very difficult to place a dollar value on human life, consumers' time, or environmental impact.

Imagine that the government is considering a project to widen a highway . The benefits side of the analysis might include time savings for passengers who can now avoid traffic, an increase in the number of passenger trips (as more people could now use the road), and lives saved by dint of fewer car accidents. The cost side of the analysis would include the cost of land that must be acquired prior to construction, construction, and maintenance. These costs and benefits will need to be translated into monetary terms for the sake of analysis.



## **The Highway as a Public Good**

The benefits of a highway expansion project might include time savings for passengers, additional passenger trips, and saved lives. Costs might include construction and maintenance.

The procedure for conducting cost-benefit analysis is as follows:

1. Identify project(s) to be analyzed.
2. Estimate all costs and benefits to society associated with the project(s) over a relevant time horizon.
3. Assign a monetary value to all costs and benefits.
4. Calculate the net benefit of the project (total benefit minus total cost).



5. Adjust for inflation and apply the discount rate to calculate present value of the project.
6. Calculate the net present value for the project(s).
7. Make recommendation about project(s). If the benefit outweighs the cost, then the government should proceed with the project.

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# 8.2: Common Resources

## 8.2.1: The Tragedy of the Commons

The tragedy of the commons is the overexploitation of a common good by individual, rational actors.

### Learning Objective

Describe the tragedy of the commons

### Key Points

- Common goods are non-excludable and rivalrous.
- When individuals act independently and rationally, they may collectively trade long-term benefit for short-term gain.
- Enlightened self-interest and government intervention are two ways that the tragedy of the commons may be avoided.

### Key Terms

Common good

Goods which are rivalrous and non-excludable.

Enlightened Self-Interest

The ability for individuals to realize when their actions, collectively, will trade long-term benefit for short-term gain.

### Example

- The population of tuna may be depleted if fishermen are allowed to catch as much as they want. To make more profit, fishermen must

catch more fish, which leads to overfishing. To prevent the tragedy of the commons, governments may implement market-based solutions.

## **Common Goods**

Common goods are goods that are rivalrous and non-excludable. This means that anyone has access to the good, but that the use of the good by one person reduces the ability of someone else to use it. A classic example of a common good are fish stocks in international waters; no one is excluded from fishing, but as people withdraw fish without limits being imposed, the stocks for later fishermen are potentially depleted.

## **Tragedy of Commons**

The tragedy of the commons is the depletion of a common good by individuals who are acting independently and rationally according to each one's self-interest. Consider, the example of fish in international waters. Each individual fisherman, acting independently, will rationally choose to catch some of the fish to sell. This makes sense: there is a resource that the fisherman is able to use to generate a profit. However, when a lot of fishermen, all thinking this way, catch the fish, the total stock of fish may be depleted. When the stock of fish is depleted, none of the fishermen are able to continue fishing, even though, in the long run, each fisherman would have preferred that the fish not be depleted. The tragedy of the commons describes such situations in which people withdraw resources to secure short-term gains without regard for the long-term consequences.

Not all common goods, however, suffer from the tragedy of the commons. If individuals have enlightened self-interest, they will realize the negative long-term effects of their short-term decisions. This would be the same as the fishermen realizing that they should limit their fishing to preserve the stock of fish in the long-term.

In the absence of enlightened self-interest, the government may step in and impose regulations or taxes to discourage the behavior that leads to the

tragedy of the commons. This would be like the government imposing limits on the amount of fish that can be caught.



## **Bluefin Tuna Caught in Net**

Fish populations are at risk of becoming fully extinct due to overfishing. The Food and Agriculture Association estimated 70% of the world's fish species are either fully exploited or depleted.

### **8.2.2: The Free-Rider Problem**

The free-rider problem is when individuals benefit from a public good without paying their share of the cost.

#### **Learning Objective**

Describe the Free-Rider Problem

#### **Key Points**

- Public goods are non-excludable, but have a cost, so those who don't pay their share of the cost can still easily benefit from the good.
- Free-riders have an incentive to free ride because they can benefit from a good at a reduced personal cost.

- The providers of public goods often create enforcement mechanisms to mitigate the free-rider problem.

## Key Term

public good

A good that is non-rivalrous and non-excludable.

It is easy to think about public goods as free. In your everyday life, you benefit from public goods such as roads and bridges even though no transaction occurs when you use them. However, even public goods need to be paid for. In the case of roads and bridges, everyone pays taxes to the government, who then uses the taxes to pay for public goods .



## Roads

Free riders are able to use roads without paying their taxes because roads are a non-excludable public good.

Public goods, as you may recall, are both non-rivalrous and non-excludable. It is the second trait- the non-excludability- that leads to what is called the free-rider problem. The free-rider problem is that some people may benefit from a public good without paying their share of the cost.



Since public goods are non-excludable, free-riders not only can't be prevented from using the good, but actually have an incentive to continue to free-ride. If they will be able to use the public good whether they pay their share of the costs, they might as well not pay.

Take the military, for example. National security is a public good: it is both non-rivalrous and non-excludable. In order to have such a public good, everyone pays taxes which are then used by the government to finance the military. However, there are undoubtedly people who have not paid their taxes. These people, without having paid their share of the cost of having a military, still benefit from the protection the military provides. They are free-riders.

Of course, there are commonly regulations that attempt to discourage free-riding. For government-provided public goods, the government makes sure that everyone pays their share of the costs by enforcing tax laws. The threat of fines or jail time are enough of a threat that most people find it more appealing (in the US, at least) to pay their share of public goods via taxes than to free-ride.

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# 9: Production

# 9.1: The Production Function

## 9.1.1: Defining the Production Function

The production function relates the maximum amount of output that can be obtained from a given number of inputs.

### Learning Objective

Define the production function

### Key Points

- The production function describes a boundary or frontier representing the limit of output obtainable from each feasible combination of inputs.
- Firms use the production function to determine how much output they should produce given the price of a good, and what combination of inputs they should use to produce given the price of capital and labor.
- The production function also gives information about increasing or decreasing returns to scale and the marginal products of labor and capital.

### Key Terms

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

Production function

Relates physical output of a production process to physical inputs or factors of production.

output

Production; quantity produced, created, or completed.

In economics, a production function relates physical output of a production process to physical inputs or factors of production. It is a mathematical function that relates the maximum amount of output that can be obtained from a given number of inputs - generally capital and labor. The production function, therefore, describes a boundary or frontier representing the limit of output obtainable from each feasible combination of inputs.

Firms use the production function to determine how much output they should produce given the price of a good, and what combination of inputs they should use to produce given the price of capital and labor (). When firms are deciding how much to produce they typically find that at high levels of production, their marginal costs begin increasing. This is also known as diminishing returns to scale - increasing the quantity of inputs creates a less-than-proportional increase in the quantity of output. If it weren't for diminishing returns to scale, supply could expand without limits without increasing the price of a good.



## Factory Production

Manufacturing companies use their production function to determine the optimal combination of labor and capital to produce a certain amount of output.

Increasing marginal costs can be identified using the production function. If a firm has a production function  $Q=F(K,L)$  (that is, the quantity of output ( $Q$ ) is some function of capital ( $K$ ) and labor ( $L$ )), then if  $2Q < F(2K,2L)$ , the production function has increasing marginal costs and diminishing returns to scale. Similarly, if  $2Q > F(2K,2L)$ , there are increasing returns to scale, and if  $2Q = F(2K,2L)$ , there are constant returns to scale.

## Examples of Common Production Functions

One very simple example of a production function might be  $Q=K+L$ , where  $Q$  is the quantity of output,  $K$  is the amount of capital, and  $L$  is the amount of labor used in production. This production function says that a firm can produce one unit of output for every unit of capital or labor it employs. From this production function we can see that this industry has constant returns to scale - that is, the amount of output will increase proportionally to any increase in the amount of inputs.

Another common production function is the Cobb-Douglas production function. One example of this type of function is  $Q=K^{0.5}L^{0.5}$ . This describes a firm that requires the least total number of inputs when the combination of inputs is relatively equal. For example, the firm could produce 25 units of output by using 25 units of capital and 25 of labor, or it could produce the same 25 units of output with 125 units of labor and only one unit of capital.

Finally, the Leontief production function applies to situations in which inputs must be used in fixed proportions; starting from those proportions, if usage of one input is increased without another being increased, output will not change. This production function is given by  $Q=\text{Min}(K,L)$ . For example, a firm with five employees will produce five units of output as long as it has at least five units of capital.

## 9.1.2: The Law of Diminishing Returns

The law of diminishing returns states that adding more of one factor of production will at some point yield lower per-unit returns.

### Learning Objective

Explain the Law of Diminishing Returns

### Key Points

- One consequence of the law of diminishing returns is that producing one more unit of output will eventually cost increasingly more, due to inputs being used less and less effectively.
- The marginal cost curve will initially be downward sloping, representing added efficiency as production increases. If the law of diminishing returns holds, however, the marginal cost curve will eventually slope upward and continue to rise.
- The SRAC is typically U-shaped with its minimum at the point where it intersects the marginal cost curve. This is caused by the first increasing, and then decreasing, marginal returns to labor.

- The typical LRAC curve is also U-shaped, reflecting increasing returns of scale where negatively-sloped, constant returns to scale where horizontal and decreasing returns where positively sloped.

## Key Terms

returns to scale

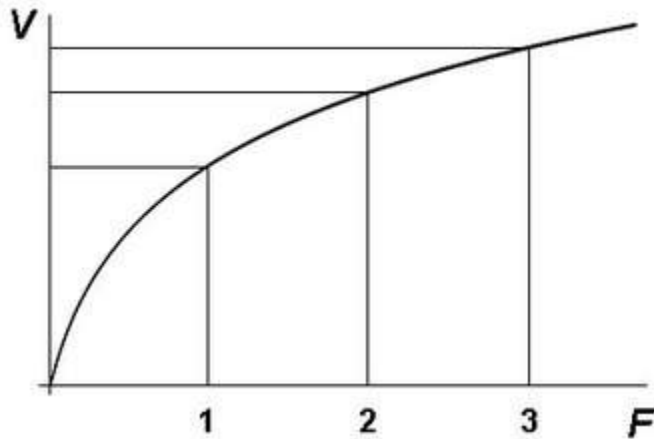
A term referring to changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor).

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

In economics, diminishing returns (also called diminishing marginal returns) is the decrease in the marginal output of a production process as the amount of a single factor of production is increased, while the amounts of all other factors of production stay constant. The law of diminishing returns states that in all productive processes, adding more of one factor of production, while holding all others constant ("ceteris paribus"), will at some point yield lower per-unit returns. The law of diminishing returns does not imply that adding more of a factor will decrease the total production, a condition known as negative returns, though in fact this is common.





## Diminishing Returns

As a factor of production ( $F$ ) increases, the resulting gain in the volume of output ( $V$ ) gets smaller and smaller.

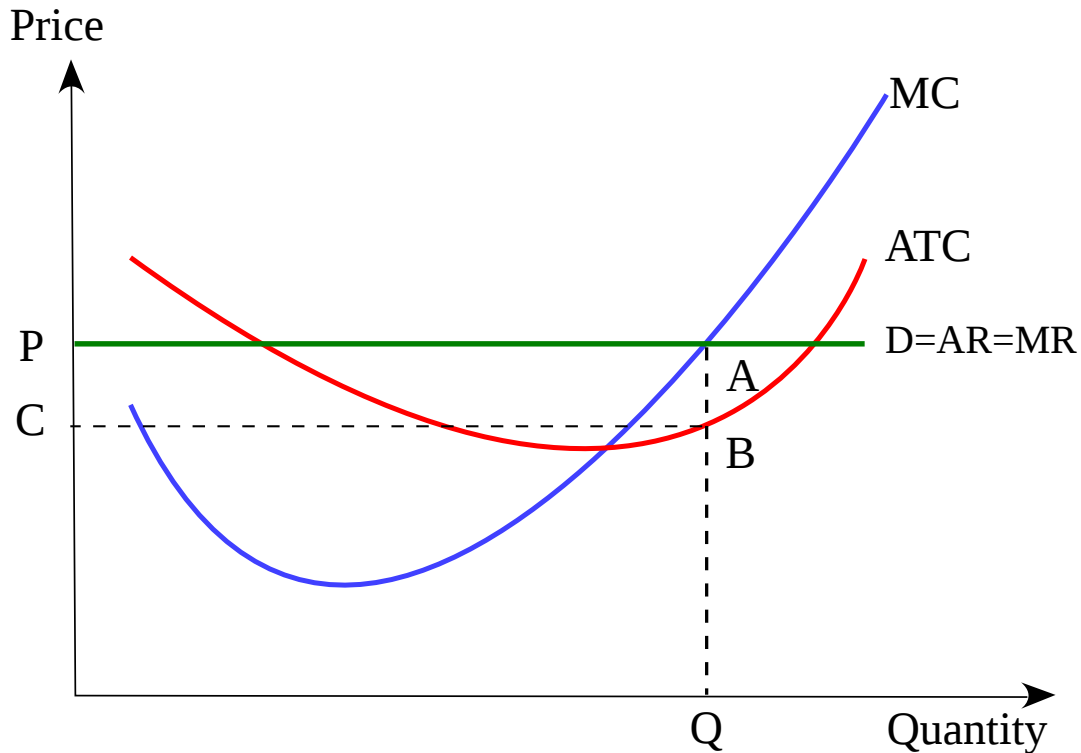
For example, the use of fertilizer improves crop production on farms and in gardens; but at some point, adding more and more fertilizer improves the yield less per unit of fertilizer, and excessive quantities can even reduce the yield. A common sort of example is adding more workers to a job, such as assembling a car on a factory floor. At some point, adding more workers causes problems such as workers getting in each other's way or frequently finding themselves waiting for access to a part. In all of these processes, producing one more unit of output will eventually cost increasingly more, due to inputs being used less and less effectively.

This increase in the marginal cost of output as production increases can be graphed as the marginal cost curve, with quantity of output on the x axis and marginal cost on the y axis. For many firms, the marginal cost curve will initially be downward sloping, representing added efficiency as production increases. If the law of diminishing returns holds, however, the marginal cost curve will eventually slope upward and continue to rise, representing the higher and higher marginal costs associated with additional output.

# The Law of Diminishing Returns and Average Cost

The average total cost of production is the total cost of producing all output divided by the number of units produced. For example, if the car factory can produce 20 cars at a total cost of \$200,000, the average cost of production is \$10,000. Average total cost is interpreted as the the cost of a typical unit of production. So in our example each of the 20 cars produced had a typical cost per unit of \$10,000. Average total cost can also be graphed with quantity of output on the x axis and average cost on the y-axis.

What will this average total cost curve look like? In the short run, a firm has a set amount of capital and can only increase or decrease production by hiring more or less labor. The fixed costs of capital are high, but the variable costs of labor are low, so costs increase more slowly than output as production increases. As long as the marginal cost of production is lower than the average total cost of production, the average cost is decreasing. However, as marginal costs increase due to the law of diminishing returns, the marginal cost of production will eventually be higher than the average total cost and the average cost will begin to increase. The short run average total cost curve (SRAC) will therefore be U-shaped for most firms .



## Cost Curves in the Short Run

Both marginal cost and average cost are U-shaped due to first increasing, and then diminishing, returns. Average cost begins to increase where it intersects the marginal cost curve.

The long-run average cost curve (LRAC) depicts the cost per unit of output in the long run—that is, when all productive inputs' usage levels can be varied. The typical LRAC curve is also U-shaped but for different reasons: it reflects increasing returns to scale where negatively-sloped, constant returns to scale where horizontal, and decreasing returns (due to increases in factor prices) where positively sloped.

### 9.1.3: Inputs and Outputs of the Function

In the basic production function, inputs are typically capital and labor and output is whatever good the firm produces.

## Learning Objective

Describe the inputs and outputs in a generalized production function

## Key Points

- Capital refers to the material objects necessary for production. In the short run, economists assume that the level of capital is fixed.
- Labor refers to the human work that goes into production. Typically economists assume that labor is a variable factor of production.
- The marginal product of an input is the amount of output that is gained by using one additional unit of that input. It can be found by taking the derivative of the production function in terms of the relevant input.

## Key Terms

rental rate

The price of capital.

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings (structures).

marginal product

The extra output that can be produced by using one more unit of the input.

A production function relates the input of factors of production to the output of goods. In the basic production function inputs are typically capital and labor, though more expansive and complex production functions may include other variables such as land or natural resources. Output may be any consumer good produced by a firm. Cars, clothing, sandwiches, and toys are all examples of output.

Capital refers to the material objects necessary for production. Machinery, factory space, and tools are all types of capital. In the short run, economists assume that the level of capital is fixed - firms can't sell machinery the moment it's no longer needed, nor can they build a new factory and start producing goods there immediately. When looking at the production function in the short run, therefore, capital will be a constant rather than a variable. Although in reality a firm may own the capital that it uses, economists typically refer to the ongoing cost of employing capital as the rental rate because the opportunity cost of employing capital is the income that a firm could receive by renting it out. Thus, the price of capital is the rental rate.



## Capital Goods

Capital equipment, like these motor graders, can vary in the long run but are fixed in the short run.

Labor refers to the human work that goes into production. Typically economists assume that labor is a variable factor of production; it can be increased or decreased in the short run in order to produce more or less output. The price of labor is the prevailing wage rate, since wages are the cost of hiring an additional unit of capital.

The marginal product of an input is the amount of output that is gained by using one additional unit of that input. It can be found by taking the derivative of the production function in terms of the relevant input. For

example, if the production function is  $Q=3K+2L$  (where K represents units of capital and L represents units of labor), then the marginal product of capital is simply three; every additional unit of capital will produce an additional three units of output. Inputs are typically subject to the law of diminishing returns: as the amount of one factor of production increases, after a certain point the marginal product of that factor declines.

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# 9.2: Production Cost

## 9.2.1: Types of Costs

Variable costs change according to the quantity of goods produced; fixed costs are independent of the quantity of goods being produced.

### Learning Objective

Differentiate fixed costs and variable costs

### Key Points

- Total cost is the sum of fixed and variable costs.
- Variable costs change according to the quantity of a good or service being produced. The amount of materials and labor that is needed for to make a good increases in direct proportion to the number of goods produced. The cost "varies" according to production.
- Fixed costs are independent of the quality of goods or services produced. Fixed costs (also referred to as overhead costs) tend to be time related costs including salaries or monthly rental fees.
- Fixed costs are only short term and do change over time. The long run is sufficient time of all short-run inputs that are fixed to become variable.

### Key Terms

fixed cost

Business expenses that are not dependent on the level of goods or services produced by the business.

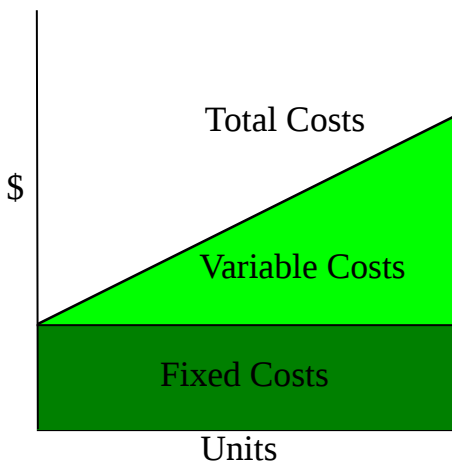
variable cost



A cost that changes with the change in volume of activity of an organization.

## Total Cost

In economics, the total cost (TC) is the total economic cost of production. It consists of variable costs and fixed costs. Total cost is the total opportunity cost of each factor of production as part of its fixed or variable costs .



## Calculating total cost

This graphs shows the relationship between fixed cost and variable cost. The sum of the two equal the total cost.

## Variable Costs

Variable cost (VC) changes according to the quantity of a good or service being produced. It includes inputs like labor and raw materials. Variable costs are also the sum of marginal costs over all of the units produced (referred to as normal costs). For example, in the case of a clothing manufacturer, the variable costs would be the cost of the direct material (cloth) and the direct labor. The amount of materials and labor that is needed for each shirt increases in direct proportion to the number of shirts produced. The cost "varies" according to production.

## **Fixed Costs**

Fixed costs (FC) are incurred independent of the quantity of goods or services produced. They include inputs (capital) that cannot be adjusted in the short term, such as buildings and machinery. Fixed costs (also referred to as overhead costs) tend to be time related costs, including salaries or monthly rental fees. An example of a fixed cost would be the cost of renting a warehouse for a specific lease period. However, fixed costs are not permanent. They are only fixed in relation to the quantity of production for a certain time period. In the long run, the cost of all inputs is variable.

## **Economic Cost**

The economic cost of a decision that a firm makes depends on the cost of the alternative chosen and the benefit that the best alternative would have provided if chosen. Economic cost is the sum of all the variable and fixed costs (also called accounting cost) plus opportunity costs.

## **9.2.2: Average and Marginal Cost**

Marginal cost is the change in total cost when another unit is produced; average cost is the total cost divided by the number of goods produced.

### **Learning Objective**

Distinguish between marginal and average costs

### **Key Points**

- The marginal cost is the cost of producing one more unit of a good.
- Marginal cost includes all of the costs that vary with the level of production. For example, if a company needs to build a new factory in order to produce more goods, the cost of building the factory is a marginal cost.
- Economists analyze both short run and long run average cost. Short run average costs vary in relation to the quantity of goods being produced.

Long run average cost includes the variation of quantities used for all inputs necessary for production.

- When the average cost declines, the marginal cost is less than the average cost. When the average cost increases, the marginal cost is greater than the average cost. When the average cost stays the same (is at a minimum or maximum), the marginal cost equals the average cost.

## **Key Terms**

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

average cost

In economics, average cost or unit cost is equal to total cost divided by the number of goods produced.

## **Marginal Cost**

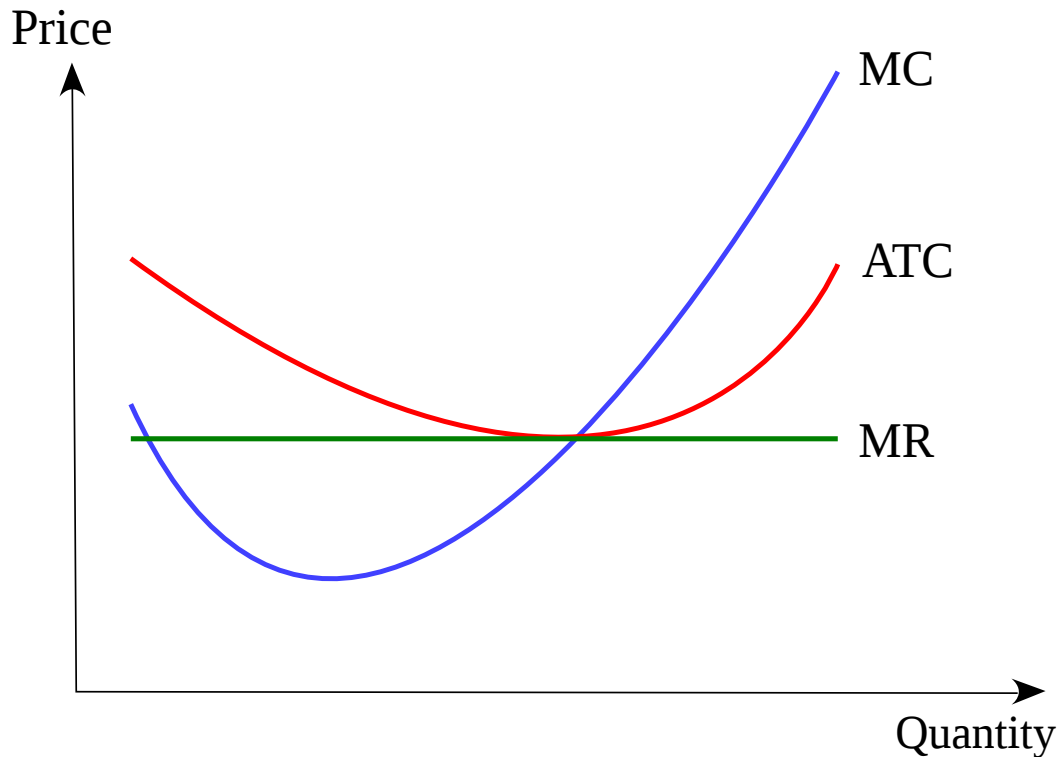
In economics, marginal cost is the change in the total cost when the quantity produced changes by one unit. It is the cost of producing one more unit of a good. Marginal cost includes all of the costs that vary with the level of production. For example, if a company needs to build a new factory in order to produce more goods, the cost of building the factory is a marginal cost. The amount of marginal cost varies according to the volume of the good being produced. Economic factors that impact the marginal cost include information asymmetries, positive and negative externalities, transaction costs, and price discrimination. Marginal cost is not related to fixed costs. An example of calculating marginal cost is: the production of one pair of shoes is \$30. The total cost for making two pairs of shoes is \$40. The marginal cost of producing the second pair of shoes is \$10.

## **Average Cost**

The average cost is the total cost divided by the number of goods produced. It is also equal to the sum of average variable costs and average fixed costs. Average cost can be influenced by the time period for production (increasing production may be expensive or impossible in the short run). Average costs are the driving factor of supply and demand within a market. Economists analyze both short run and long run average cost. Short run average costs vary in relation to the quantity of goods being produced. Long run average cost includes the variation of quantities used for all inputs necessary for production.

## **Relationship Between Average and Marginal Cost**

Average cost and marginal cost impact one another as production fluctuate :



## Cost curve

This graph is a cost curve that shows the average total cost, marginal cost, and marginal revenue. The curves show how each cost changes with an increase in product price and quantity produced.

- When the average cost declines, the marginal cost is less than the average cost.
- When the average cost increases, the marginal cost is greater than the average cost.
- When the average cost stays the same (is at a minimum or maximum), the marginal cost equals the average cost.

### 9.2.3: Short Run and Long Run Costs

Long run costs have no fixed factors of production, while short run costs have fixed factors and variables that impact production.

## Learning Objective

Explain the differences between short and long run costs

## Key Points

- In the short run, there are both fixed and variable costs.
- In the long run, there are no fixed costs.
- Efficient long run costs are sustained when the combination of outputs that a firm produces results in the desired quantity of the goods at the lowest possible cost.
- Variable costs change with the output. Examples of variable costs include employee wages and costs of raw materials.
- The short run costs increase or decrease based on variable cost as well as the rate of production. If a firm manages its short run costs well over time, it will be more likely to succeed in reaching the desired long run costs and goals.

## Key Terms

fixed cost

Business expenses that are not dependent on the level of goods or services produced by the business.

variable cost

A cost that changes with the change in volume of activity of an organization.

In economics, "short run" and "long run" are not broadly defined as a rest of time. Rather, they are unique to each firm.

## Long Run Costs

Long run costs are accumulated when firms change production levels over time in response to expected economic profits or losses. In the long run there

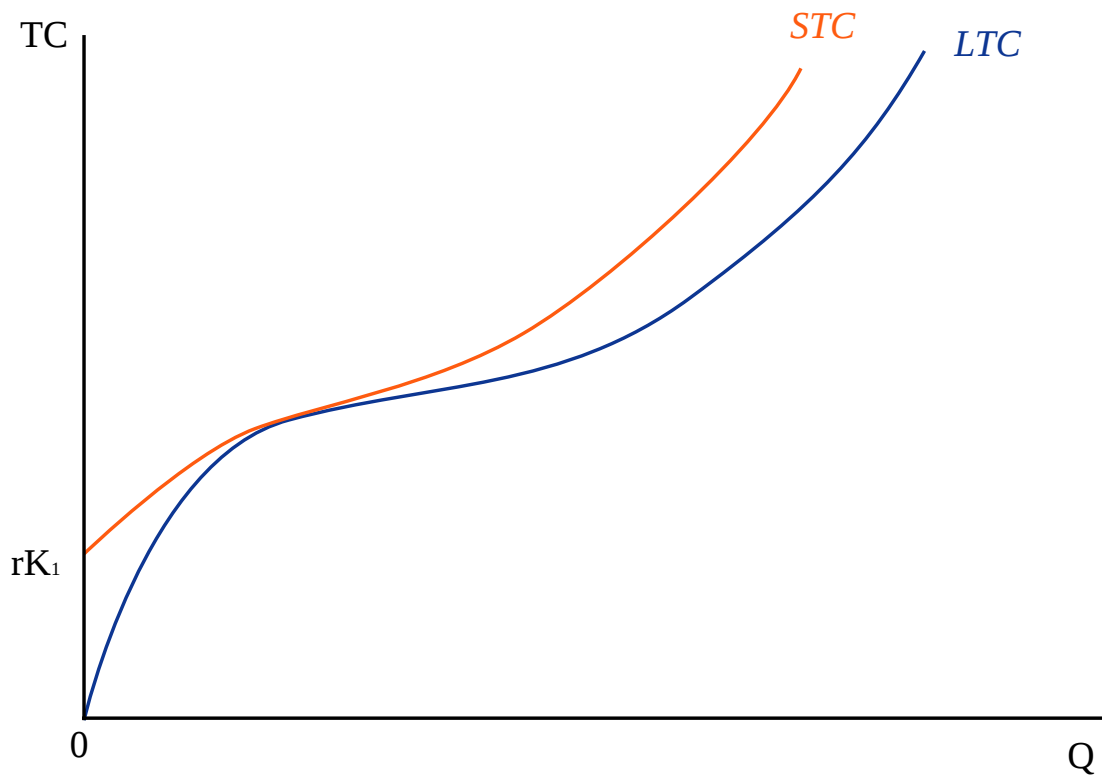
are no fixed factors of production. The land, labor, capital goods, and entrepreneurship all vary to reach the the long run cost of producing a good or service. The long run is a planning and implementation stage for producers. They analyze the current and projected state of the market in order to make production decisions. Efficient long run costs are sustained when the combination of outputs that a firm produces results in the desired quantity of the goods at the lowest possible cost. Examples of long run decisions that impact a firm's costs include changing the quantity of production, decreasing or expanding a company, and entering or leaving a market.

## **Short Run Costs**

Short run costs are accumulated in real time throughout the production process. Fixed costs have no impact of short run costs, only variable costs and revenues affect the short run production. Variable costs change with the output. Examples of variable costs include employee wages and costs of raw materials. The short run costs increase or decrease based on variable cost as well as the rate of production. If a firm manages its short run costs well over time, it will be more likely to succeed in reaching the desired long run costs and goals.

## **Differences**

The main difference between long run and short run costs is that there are no fixed factors in the long run; there are both fixed and variable factors in the short run . In the long run the general price level, contractual wages, and expectations adjust fully to the state of the economy. In the short run these variables do not always adjust due to the condensed time period. In order to be successful a firm must set realistic long run cost expectations. How the short run costs are handled determines whether the firm will meet its future production and financial goals.



## Cost curve

This graph shows the relationship between long run and short run costs.

## 9.2.4: Economies and Diseconomies of Scale

Increasing, constant, and diminishing returns to scale describe how quickly output rises as inputs increase.

### Learning Objective

Identify the three types of returns to scale and describe how they occur

### Key Points



- In economics, returns to scale describes what happens when the scale of production increases over the long run when all input levels are variable (chosen by the firm).
- Increasing returns to scale (IRS) refers to a production process where an increase in the number of units produced causes a decrease in the average cost of each unit.
- Constant returns to scale (CRS) refers to a production process where an increase in the number of units produced causes no change in the average cost of each unit.
- Diminishing returns to scale (DRS) refers to production where the costs for production do not decrease as a result of increased production. The DRS is the opposite of the IRS.

## Key Terms

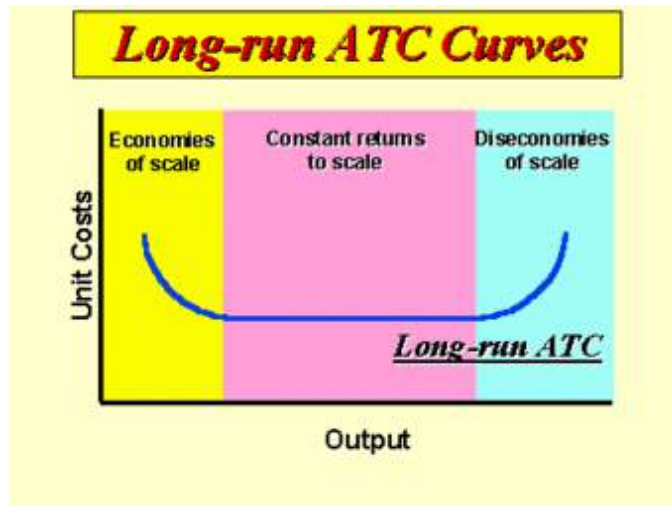
average cost

In economics, average cost or unit cost is equal to total cost divided by the number of goods produced.

return to scale

A term referring to changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor).

In economics, returns to scale describes what happens when the scale of production increases over the long run when all input levels are variable (chosen by the firm). Returns to scale explains how the rate of increase in production is related to the increase in inputs in the long run. There are three stages in the returns to scale: increasing returns to scale (IRS), constant returns to scale (CRS), and diminishing returns to scale (DRS). Returns to scale vary between industries, but typically a firm will have increasing returns to scale at low levels of production, decreasing returns to scale at high levels of production, and constant returns to scale at some point in the middle .



## Long Run ATC Curves

This graph shows that as the output (production) increases, long run average total cost curve decreases in economies of scale, constant in constant returns to scale, and increases in diseconomies of scale.

### Increasing Returns to Scale

The first stage, increasing returns to scale (IRS) refers to a production process where an increase in the number of units produced causes a decrease in the average cost of each unit. In other words, a firm is experiencing IRS when the cost of producing an additional unit of output decreases as the volume of its production increases. IRS may take place, for example, if the cost of production of a manufactured good would decrease with the increase in quantity produced due to the production materials being obtained at a cheaper price.

### Constant Return to Scale

The second stage, constant returns to scale (CRS) refers to a production process where an increase in the number of units produced causes no change in the average cost of each unit. If output changes proportionally with all the inputs, then there are constant returns to scale.

## Diminishing Return to Scale

The final stage, diminishing returns to scale (DRS) refers to production for which the average costs of output increase as the level of production increases. The DRS is the opposite of the IRS. DRS might occur if, for example, a furniture company was forced to import wood from further and further away as its operations increased.

### 9.2.5: Economic Costs

The economic cost is based on the cost of the alternative chosen and the benefit that the best alternative would have provided if chosen.

#### Learning Objective

Break down the components of a firm's economic costs

#### Key Points

- Economic cost takes into account costs attributed to the alternative chosen and costs specific to the forgone opportunity.
- Components of economic cost include total cost, variable cost, fixed cost, average cost, and marginal cost.
- Cost curves - a graph of the costs of production as a function of total quantity produced. In a free market economy, firms use cost curves to find the optimal point of production (to minimize cost). Maximizing firms use the curves to decide output quantities to achieve production goals.
- Average cost (AC) - total costs divided by output ( $AC = TFC/q + TVC/q$ ).
- Marginal cost (MC) - the change in the total cost when the quantity produced changes by one unit.
- Cost curves - a graph of the costs of production as a function of total quantity produced. In a free market economy, firms use cost curves to find the optimal point of production (to minimize cost). Maximizing

firms use the curves to decide output quantities to achieve production goals.

## **Key Terms**

economic cost

The accounting cost plus opportunity cost.

cost

A negative consequence or loss that occurs or is required to occur.

Opportunity cost

The cost of any activity measured in terms of the value of the next best alternative forgone (that is not chosen).

## **Example**

- An example of economic cost would be the cost of attending college. The accounting cost includes all charges such as tuition, books, food, housing, and other expenditures. The opportunity cost includes the salary or wage the individual could be earning if he was employed during his college years instead of being in school. So, the economic cost of college is the accounting cost plus the opportunity cost.

## **Economic Cost**

Throughout the production of a good or service, a firm must make decisions based on economic cost. The economic cost of a decision is based on both the cost of the alternative chosen and the benefit that the best alternative would have provided if chosen. Economic cost includes opportunity cost when analyzing economic decisions.

An example of economic cost would be the cost of attending college. The accounting cost includes all charges such as tuition, books, food, housing,

and other expenditures. The opportunity cost includes the salary or wage the individual could be earning if he was employed during his college years instead of being in school. So, the economic cost of college is the accounting cost plus the opportunity cost.

## Components of Economic Costs

Economic cost takes into account costs attributed to the alternative chosen and costs specific to the forgone opportunity. Before making economic decisions, there are a series of components of economic costs that a firm will take into consideration. These components include:

- Total cost (TC): total cost equals total fixed cost plus total variable costs ( $TC = TFC + TVC$ ).
- Variable cost (VC): the cost paid to the variable input. Inputs include labor, capital, materials, power, land, and buildings. Variable input is traditionally assumed to be labor.
- Total variable cost (TVC): same as variable costs.
- Fixed cost (FC): the costs of the fixed assets (those that do not vary with production).
- Total fixed cost (TFC): same as fixed cost.
- Average cost (AC): total costs divided by output ( $AC = TFC/q + TVC/q$ ).
- Average fixed cost (AFC): the fixed costs divided by output ( $AFC = TFC/q$ ). The average fixed cost function continuously declines as production increases.
- Average variable cost (AVC): variable costs divided by output ( $AVC = TVC/q$ ). The average variable cost curve is normally U-shaped. It lies below the average cost curve, starting to the right of the y axis.
- Marginal cost (MC): the change in the total cost when the quantity produced changes by one unit.
- Cost curves: a graph of the costs of production as a function of total quantity produced. In a free market economy, firms use cost curves to find the optimal point of production (to minimize cost). Maximizing firms use the curves to decide output quantities to achieve production goals.

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# 9.3: Economic Profit

## 9.3.1: Difference Between Economic and Accounting Profit

Economic profit consists of revenue minus implicit (opportunity) and explicit (monetary) costs; accounting profit consists of revenue minus explicit costs.

### Learning Objective

Distinguish between economic profit and accounting profit

### Key Points

- Explicit costs are monetary costs a firm has. Implicit costs are the opportunity costs of a firm's resources.
- Accounting profit is the monetary costs a firm pays out and the revenue a firm receives. It is the bookkeeping profit, and it is higher than economic profit. Accounting profit = total monetary revenue - total costs.
- Economic profit is the monetary costs and opportunity costs a firm pays and the revenue a firm receives. Economic profit = total revenue - (explicit costs + implicit costs).

### Key Terms

explicit cost

A direct payment made to others in the course of running a business, such as wages, rent, and materials, as opposed to implicit costs, which are those where no actual payment is made.

implicit cost

The opportunity cost equal to what a firm must give up in order to use factors which it neither purchases nor hires.

economic profit

The difference between the total revenue received by the firm from its sales and the total opportunity costs of all the resources used by the firm.

accounting profit

The total revenue minus costs, properly chargeable against goods sold.

## **Example**

- Consider a simplified example of a firm. In one year, it cost \$60,000 to maintain production, but earned \$100,000 in revenue. The accounting profit would be \$40,000 (\$100,000 in revenue - \$60,000 in explicit costs). However, if the firm could have made \$50,000 by renting its land and capital, its economic profit would be a loss of \$10,000 (\$100,000 in revenue - \$60,000 in explicit costs - \$50,000 in opportunity costs).

The term "profit" may bring images of money to mind, but to economists, profit encompasses more than just cash. In general, profit is the difference between costs and revenue, but there is a difference between accounting profit and economic profit. The biggest difference between accounting and economic profit is that economic profit reflects explicit and implicit costs, while accounting profit considers only explicit costs.

## **Explicit and Implicit Costs**

Explicit costs are costs that involve direct monetary payment. Wages paid to workers, rent paid to a landowner, and material costs paid to a supplier are all examples of explicit costs.

In contrast, implicit costs are the opportunity costs of factors of production that a producer already owns. The implicit cost is what the firm must give up in order to use its resources; in other words, an implicit cost is any cost that results from using an asset instead of renting, selling, or lending it. For example, a paper production firm may own a grove of trees. The implicit cost of that natural resource is the potential market price the firm could receive if it sold it as lumber instead of using it for paper production.

## **Accounting Profit**

Accounting profit is the difference between total monetary revenue and total monetary costs, and is computed by using generally accepted accounting principles (GAAP). Put another way, accounting profit is the same as bookkeeping costs and consists of credits and debits on a firm's balance sheet. These consist of the explicit costs a firm has to maintain production (for example, wages, rent, and material costs). The monetary revenue is what a firm receives after selling its product in the market.

Accounting profit is also limited in its time scope; generally, accounting profit only considers the costs and revenue of a single period of time, such as a fiscal quarter or year.

## **Economic Profit**

Economic profit is the difference between total monetary revenue and total costs, but total costs include both explicit and implicit costs. Economic profit includes the opportunity costs associated with production and is therefore lower than accounting profit. Economic profit also accounts for a longer span of time than accounting profit. Economists often consider long-term economic profit to decide if a firm should enter or exit a market.



## Economic vs. Accounting Profit

The biggest difference between economic and accounting profit is that economic profit takes implicit, or opportunity, costs into consideration.

### 9.3.2: Sources and Determinants of Profit

Whether economic profit exists or not depends how competitive the market is, and the time horizon that is being considered.

#### Learning Objective

Describe sources of economic profit

#### Key Points

- Economic profit = total revenue - (explicit costs + implicit costs).  
Accounting profit = total revenue - explicit costs.
- Economic profit can be positive, negative, or zero. If economic profit is positive, there is incentive for firms to enter the market. If profit is negative, there is incentive for firms to exit the market. If profit is zero, there is no incentive to enter or exit.
- For a competitive market, economic profit can be positive in the short run. In the long run, economic profit must be zero, which is also

- known as normal profit. Economic profit is zero in the long run because of the entry of new firms, which drives down the market price.
- For an uncompetitive market, economic profit can be positive. Uncompetitive markets can earn positive profits due to barriers to entry, market power of the firms, and a general lack of competition.

## Key Term

normal profit

The opportunity cost of an entrepreneur to operate a firm; the next best amount the entrepreneur could earn doing another job.

## Example

- Consider a shoe production firm that is in a competitive market. In one year, the firm earns a total revenue of \$50,000, while spending \$15,000 on production (explicit costs) and having \$10,000 in foregone wages, rent, and interest (opportunity costs). Consequently, the firm earns \$25,000 in economic profit. Attracted by the potential to earn profit, other firms enter the market. Eventually, the firm's revenue will fall as market price decreases, until the total revenue just covers production costs and opportunity costs, and economic profit equals zero.

Economic profit is total revenue minus explicit and implicit (opportunity) costs. In contrast, accounting profit is the difference between total revenue and explicit costs- it does not take opportunity costs into consideration, and is generally higher than economic profit.

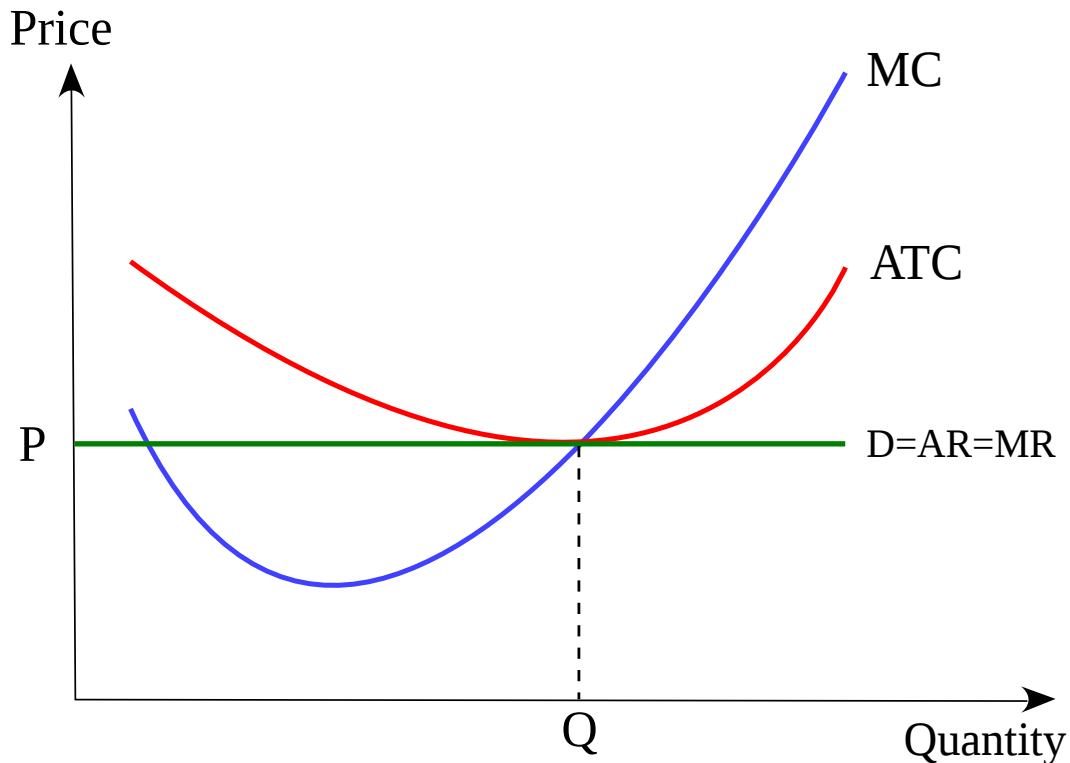
Economic profits may be positive, zero, or negative. If economic profit is positive, other firms have an incentive to enter the market. If profit is zero, other firms have no incentive to enter or exit. When economic profit is zero, a firm is earning the same as it would if its resources were employed in the next best alternative. If the economic profit is negative, firms have the incentive to leave the market because their resources would be more profitable elsewhere. The amount of economic profit a firm earns is largely

dependent on the degree of market competition and the time span under consideration.

## **Competitive Markets**

In competitive markets, where there are many firms and no single firm can affect the price of a good or service, economic profit can differ in the short-run and in the long-run.

In the short run, a firm can make an economic profit. However, if there is economic profit, other firms will want to enter the market. If the market has no barriers to entry, new firms will enter, increase the supply of the commodity, and decrease the price. This decrease in price leads to a decrease in the firm's revenue, so in the long-run, economic profit is zero . An economic profit of zero is also known as a normal profit. Despite earning an economic profit of zero, the firm may still be earning a positive accounting profit.



## Long-Run Profit for Perfect Competition

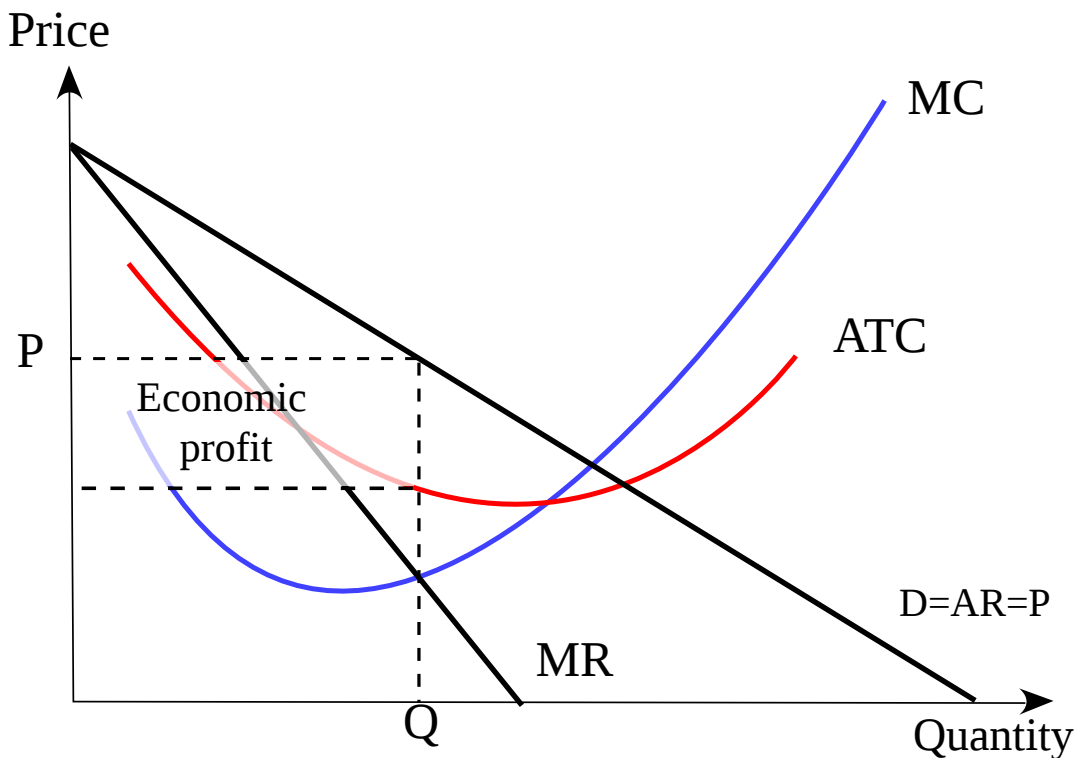
In the long run for a firm in a competitive market, there is zero economic profit. Graphically, this is seen at the intersection of the price level with the minimum point of the average total cost (ATC) curve. If the price level were set above ATC's minimum point, there would be positive economic profit; if the price level were set below ATC's minimum, there would be negative economic profit.

## Uncompetitive Markets

Unlike competitive markets, uncompetitive markets - characterized by firms with market power or barriers to entry - can make positive economic profits. The reasons for the positive economic profit are barriers to entry, market power, and a lack of competition.

- Barriers to entry prevent new firms from easily entering the market, and sapping short-run economic profits.

- Market power, or the ability to affect market prices, allows firms to set a price that is higher than the equilibrium price of a competitive market. This allows them to make profits in the short run and in the long run. This situation can occur if the market is dominated by a monopoly (a single firm), oligopoly (a few firms with significant market control), or monopolistic competition (firms have market power due to having differentiated products).
- Lack of competition keeps prices higher than the competitive market equilibrium price. For example, firms can collude and work together to restrict supply to artificially keep prices high.



## Long-Run Profit for Monopoly

In the long run, a monopoly, because of its market power, can set a price above the competitive equilibrium and earn economic profit. If price were set equal to the minimum point of the average total cost (ATC) curve, the monopoly would earn zero economic profit. If the price were set lower than the minimum of ATC, the firm would earn negative economic profit.



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# **10: Competitive Markets**

# 10.1: Perfect Competition

## 10.1.1: Definition of Perfect Competition

Perfect competition is a market structure that leads to the Pareto-efficient allocation of economic resources.

### Learning Objective

Describe degrees of competition in different market structures

### Key Points

- The major types of market structure include monopoly, monopolistic competition, oligopoly, and perfect competition.
- Perfect competition is an industry structure in which there are many firms producing homogeneous products. None of the firms are large enough to influence the industry.
- The characteristics of a perfectly competitive market include insignificant contributions from the producers, homogenous products, perfect information about products, no transaction costs, and no long-term economic profits.
- In practice, very few industries can be described as perfectly competitive, though agriculture comes close.

### Key Terms

oligopoly

An economic condition in which a small number of sellers exert control over the market of a commodity.

Monopolistic competition

A market structure in which there is a large number of firms, each having a small proportion of the market share and slightly differentiated products.

monopoly

A situation, by legal privilege or other agreement, in which solely one party (company, cartel etc. ) exclusively provides a particular product or service, dominating that market and generally exerting powerful control over it.

Market structure is determined by the number and size distribution of firms in a market, entry conditions, and the extent of product differentiation. The major types of market structure include the following:

- **Monopoly:** An industry structure where a single firm produces a product for which there are no close substitutes. Monopolists are price makers. Barriers to entry and exit exist, and, in order to ensure profits, a monopoly will attempt to maintain them.
- **Monopolistic competition:** A market structure in which there is a large number of firms, each having a small portion of the market share and slightly differentiated products. There are close substitutes for the product of any given firm, so competitors have slight control over price. There are relatively insignificant barriers to entry or exit, and success invites new competitors into the industry.
- **Oligopoly:** An industry structure in which there are a few firms producing products that range from slightly differentiated to highly differentiated. Each firm is large enough to influence the industry. Barriers to entry exist.
- **Perfect competition:** An industry structure in which there are many firms, none large enough to influence the industry, producing homogeneous products. Firms are price takers. There are no barriers to entry. Agriculture comes close to being perfectly competitive.

Perfect competition leads to the Pareto-efficient allocation of economic resources. Because of this it serves as a natural benchmark against which to contrast other market structures. However, in practice, very few industries

can be described as perfectly competitive. Nevertheless, it is used because it provides important insights.

A perfectly competitive market has several important characteristics:

- All producers contribute insignificantly to the market. Their own production levels do not change the supply curve.
- All producers are price takers. They cannot influence the market. If a firm tries to raise its price consumers would buy from a competitor with a lower price instead.
- Products are homogeneous. The characteristics of a good or service do not vary between suppliers.
- Producers enter and exit the market freely.
- Both buyers and sellers have perfect information about the price, utility, quality, and production methods of products.
- There are no transaction costs. Buyers and sellers do not incur costs in making an exchange of goods in a perfectly competitive market.
- Producers earn zero economic profits in the long run.

## 10.1.2: Conditions of Perfect Competition

A firm in a perfectly competitive market may generate a profit in the short-run, but in the long-run it will have economic profits of zero.

### Learning Objective

Calculate total revenue, average revenue, and marginal revenue for a firm in a perfectly competitive market

### Key Points

- A perfectly competitive market is characterized by many buyers and sellers, undifferentiated products, no transaction costs, no barriers to entry and exit, and perfect information about the price of a good.
- The total revenue for a firm in a perfectly competitive market is the product of price and quantity ( $TR = P * Q$ ). The average revenue is calculated by dividing total revenue by quantity. Marginal revenue is

calculated by dividing the change in total revenue by change in quantity.

- A firm in a competitive market tries to maximize profits. In the short-run, it is possible for a firm's economic profits to be positive, negative, or zero. Economic profits will be zero in the long-run.
- In the short-run, if a firm has a negative economic profit, it should continue to operate if its price exceeds its average variable cost. It should shut down if its price is below its average variable cost.

## Key Term

economic profit

The difference between the total revenue received by the firm from its sales and the total opportunity costs of all the resources used by the firm.

The concept of perfect competition applies when there are many producers and consumers in the market and no single company can influence the pricing. A perfectly competitive market has the following characteristics:

- There are many buyers and sellers in the market.
- Each company makes a similar product.
- Buyers and sellers have access to perfect information about price.
- There are no transaction costs.
- There are no barriers to entry into or exit from the market.

All goods in a perfectly competitive market are considered perfect substitutes, and the demand curve is perfectly elastic for each of the small, individual firms that participate in the market. These firms are price takers--if one firm tries to raise its price, there would be no demand for that firm's product. Consumers would buy from another firm at a lower price instead.

## Firm Revenues

A firm in a competitive market wants to maximize profits just like any other firm. The profit is the difference between a firm's total revenue and its total

cost. For a firm operating in a perfectly competitive market, the revenue is calculated as follows:

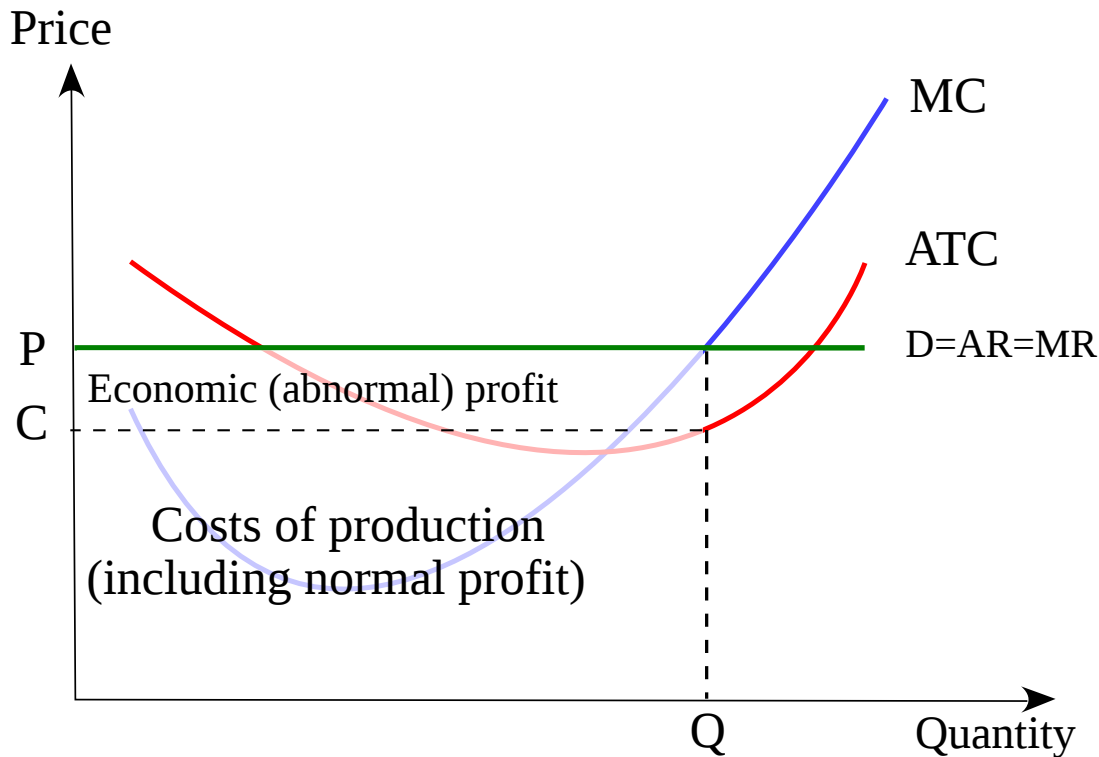
- Total Revenue = Price \* Quantity
- AR (Average Revenue) = Total Revenue / Quantity
- MR (Marginal Revenue) = Change in Total Revenue / Change in Quantity

The average revenue (AR) is the amount of revenue a firm receives for each unit of output. The marginal revenue (MR) is the change in total revenue from an additional unit of output sold. For all firms in a competitive market, both AR and MR will be equal to the price.

## **Profit Maximization**

In order to maximize profits in a perfectly competitive market, firms set marginal revenue equal to marginal cost (MR=MC). MR is the slope of the revenue curve, which is also equal to the demand curve (D) and price (P). In the short-term, it is possible for economic profits to be positive, zero, or negative . When price is greater than average total cost, the firm is making a profit. When price is less than average total cost, the firm is making a loss in the market.





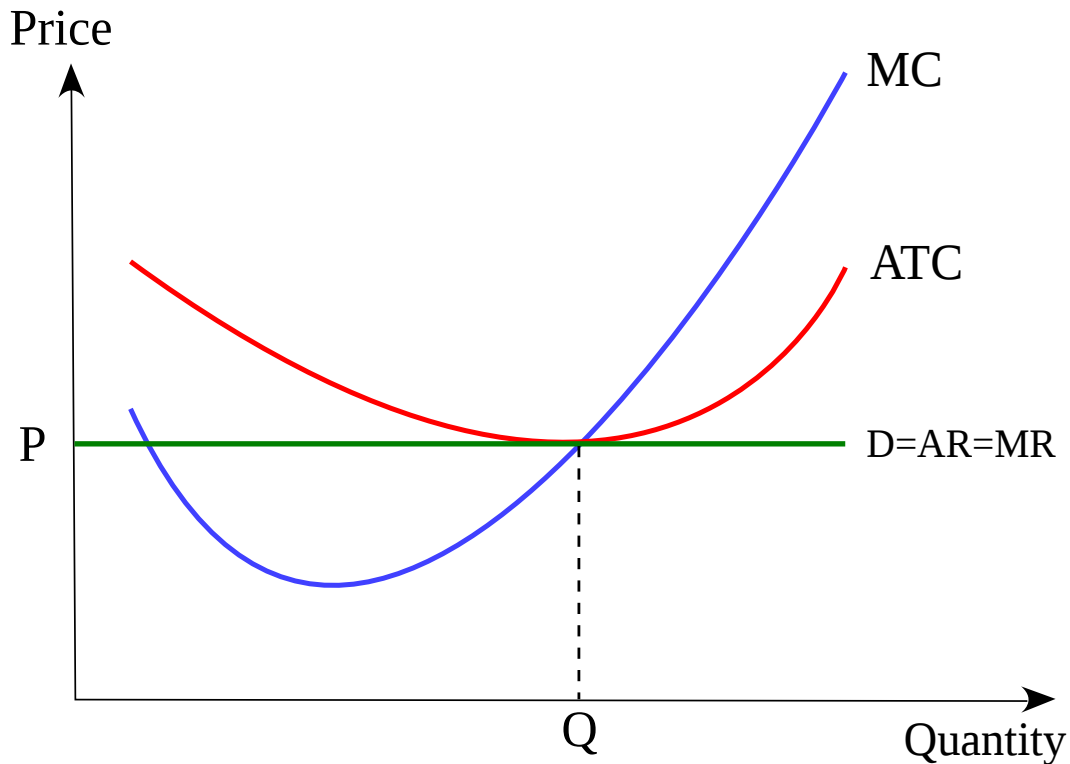
## Perfect Competition in the Short Run

In the short run, it is possible for an individual firm to make an economic profit. This scenario is shown in this diagram, as the price or average revenue, denoted by P, is above the average cost denoted by C .

Over the long-run, if firms in a perfectly competitive market are earning positive economic profits, more firms will enter the market, which will shift the supply curve to the right. As the supply curve shifts to the right, the equilibrium price will go down. As the price goes down, economic profits will decrease until they become zero.

When price is less than average total cost, firms are making a loss. Over the long-run, if firms in a perfectly competitive market are earning negative economic profits, more firms will leave the market, which will shift the supply curve left. As the supply curve shifts left, the price will go up. As the price goes up, economic profits will increase until they become zero.

In sum, in the long-run, companies that are engaged in a perfectly competitive market earn zero economic profits. The long-run equilibrium point for a perfectly competitive market occurs where the demand curve (price) intersects the marginal cost (MC) curve and the minimum point of the average cost (AC) curve.



## Perfect Competition in the Long Run

In the long-run, economic profit cannot be sustained. The arrival of new firms in the market causes the demand curve of each individual firm to shift downward, bringing down the price, the average revenue and marginal revenue curve. In the long-run, the firm will make zero economic profit. Its horizontal demand curve will touch its average total cost curve at its lowest point.

### 10.1.3: The Demand Curve in Perfect Competition

A perfectly competitive firm faces a demand curve is a horizontal line equal to the equilibrium price of the entire market.

## **Learning Objective**

Describe the demand for goods in perfectly competitive markets

## **Key Points**

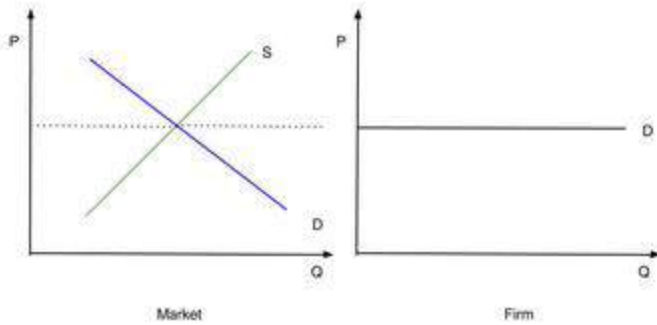
- In a perfectly competitive market individual firms are price takers. The price is determined by the intersection of the market supply and demand curves.
- The demand curve for an individual firm is different from a market demand curve. The market demand curve slopes downward, while the firm's demand curve is a horizontal line.
- The firm's horizontal demand curve indicates a price elasticity of demand that is perfectly elastic.

## **Key Term**

Perfectly elastic

Describes a situation when any increase in the price, no matter how small, will cause demand for a good to drop to zero.

In a perfectly competitive market the market demand curve is a downward sloping line, reflecting the fact that as the price of an ordinary good increases, the quantity demanded of that good decreases. Price is determined by the intersection of market demand and market supply; individual firms do not have any influence on the market price in perfect competition. Once the market price has been determined by market supply and demand forces, individual firms become price takers. Individual firms are forced to charge the equilibrium price of the market or consumers will purchase the product from the numerous other firms in the market charging a lower price (keep in mind the key conditions of perfect competition). The demand curve for an individual firm is thus equal to the equilibrium price of the market .



## Demand Curve for a Firm in a Perfectly Competitive Market

The demand curve for an individual firm is equal to the equilibrium price of the market. The market demand curve is downward-sloping.

The demand curve for a firm in a perfectly competitive market varies significantly from that of the entire market. The market demand curve slopes downward, while the perfectly competitive firm's demand curve is a horizontal line equal to the equilibrium price of the entire market. The horizontal demand curve indicates that the elasticity of demand for the good is perfectly elastic. This means that if any individual firm charged a price slightly above market price, it would not sell any products.

A strategy often used to increase market share is to offer a firm's product at a lower price than the competitors. In a perfectly competitive market, firms cannot decrease their product price without making a negative profit. Instead, assuming that the firm is a profit-maximizer, it will sell its goods at the market price.

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# 10.2: Production Decisions in Perfect Competition

## 10.2.1: Relationship Between Output and Revenue

Output is the amount of a good produced; revenue is the amount of income made from sales minus all business expenses.

### Learning Objective

Describe the relationship between output and revenue

### Key Points

- In economics, output is defined as the quantity of goods or services produce in a certain period of time by a firm, industry, or country. Output can be consumed or used for further production.
- Revenue, also known as turnover, is the income that a company receives from normal business activities, usually from the sale of goods and services. Companies can also receive revenue from interest, royalties, and other fees.
- The performance of a company is determined by how its asset inflows (revenues) compare with its asset outflows (expenses). Revenue is a direct indication of earning quality.

### Key Terms

revenue

The total income received from a given source.

output



Production; quantity produced, created, or completed.

## **Output**

In economics, output is defined as the quantity of goods or services produced in a certain period of time by a firm, industry, or country. Output can be consumed or used for further production. Output is important on a business and national scale because it is output, not large sums of money, that makes a company or country wealthy.

There are many factors that influence the level of output including changes in labor, capital, and the efficiency of the factors of production. Anything that causes one of the factors to increase or decrease will change the output in the same manner.

## **Revenue**

Revenue, also known as turnover, is the income that a company receives from normal business activities, usually from the sale of goods and services. Revenue is the money that is made as a result of output, or amount of goods produced. Companies can also receive revenue from interest, royalties, and other fees.

Revenue can refer to general business income, but it can also refer to the amount of money made during a specific time period. When companies produce a certain quantity of a good (output), the revenue is the amount of income made from sales during a set time period.

Businesses analyze revenue in their financial statements. The performance of a company is determined by how its asset inflows (revenues) compare with its asset outflows (expenses). Revenue is an important financial indicator, though it is important to note that companies are profit maximizers, *not* revenue maximizers.

## **Importance of Output and Revenue**

In order for a company or firm to be successful, it must focus on both the output and revenue. The quantity of goods produced must meet public demand, but the company must also be able to sell those goods in order to generate revenue. The production of goods carries a cost, so companies want to find a level of output that maximizes profit, not revenue .



## Output and Revenue

Krispy Kreme's output is donuts. It generates revenue by selling its output. It is however, a profit maximizer, not an output or revenue maximizer.

### 10.2.2: Marginal Cost Profit Maximization Strategy

In order to maximize profit, the firm should set marginal revenue (MR) equal to the marginal cost (MC).

#### Learning Objective

Calculate marginal costs and marginal revenues

#### Key Points

- Marginal cost is the increase in total cost from producing one additional unit.
- The marginal revenue is the increase in revenue from the sale of one additional unit.
- One way to determine how to generate the largest profit is to use the marginal revenue-marginal cost perspective. This strategy is based on the fact that the total profit reaches its maximum point where marginal revenue equals marginal profit.

## **Key Terms**

marginal cost

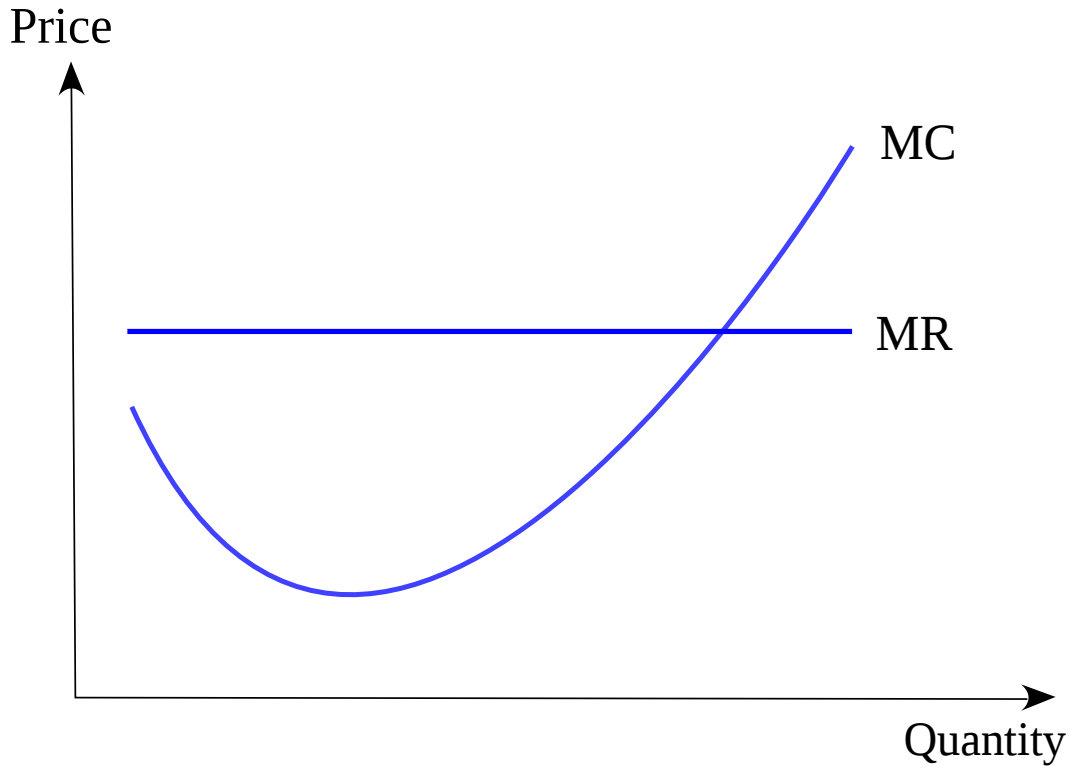
The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

marginal revenue

The additional profit that will be generated by increasing product sales by one unit.

## **Marginal Cost**

Marginal cost is the change in the total cost that occurs when the quantity produced is increased by one unit . It is the cost of producing one more unit of a good. When more goods are produced, the marginal cost includes all additional costs required to produce the next unit. For example, if producing one more car requires the building of an additional factory, the marginal cost of producing the additional car includes all of the costs associated with building the new factory.



## Marginal cost curve

This graph shows a typical marginal cost (MC) curve with marginal revenue (MR) overlaid.

Marginal cost is the change in total cost divided by the change in output.

An example of marginal cost is evident when the cost of making one pair of shoes is \$30. The cost of making two pairs of shoes is \$40. Therefore the marginal cost of the second shoe is  $\$40 - \$30 = \$10$ .

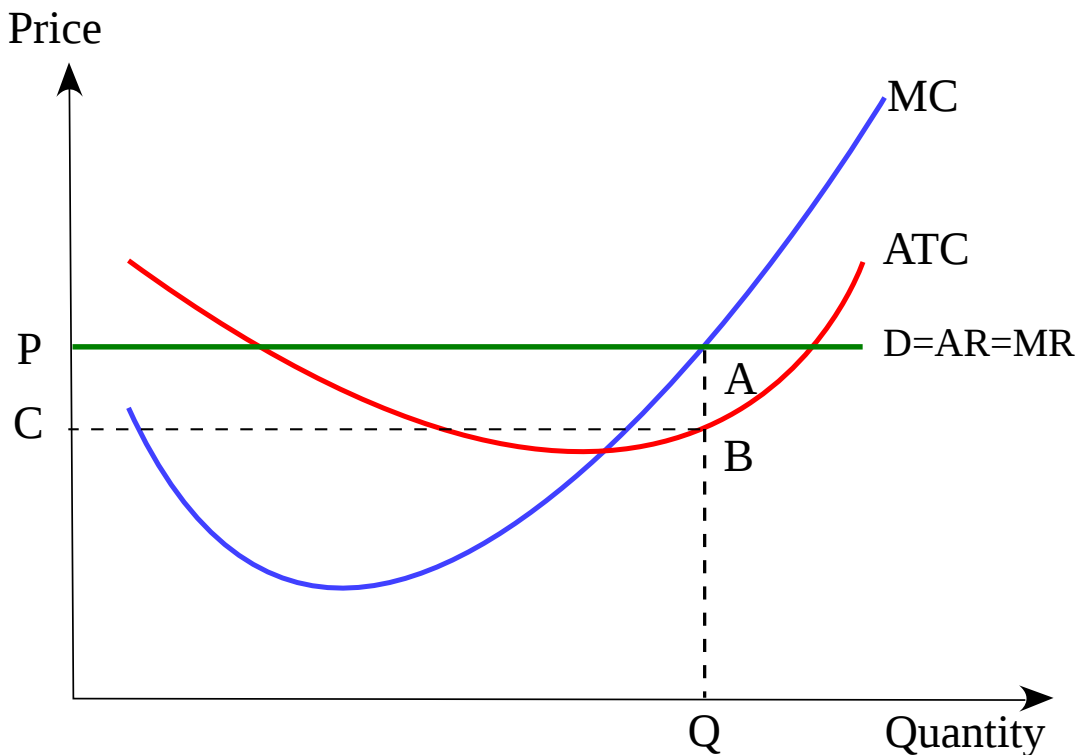
## Marginal Revenue

Marginal revenue is the additional revenue that will be generated by increasing product sales by one unit. In a perfectly competitive market, the price of the product stays the same when another unit is produced. Marginal revenue is calculated by dividing the change in total revenue by the change in output quantity.

For example, if the price of a good in a perfectly competitive market is \$20, the marginal revenue of selling one additional unit is \$20.

## Marginal Cost-Marginal Revenue Perspective

Profit maximization is the short run or long run process by which a firm determines the price and output level that will result in the largest profit. Firms will produce up until the point that marginal cost equals marginal revenue. This strategy is based on the fact that the total profit reaches its maximum point where marginal revenue equals marginal profit. This is the case because the firm will continue to produce until marginal profit is equal to zero, and marginal profit equals the marginal revenue (MR) minus the marginal cost (MC).



## Marginal profit maximization

This graph shows profit maximization using the marginal cost perspective.

Another way of thinking about the logic is of producing up until the point of  $MR=MC$  is that if  $MR>MC$ , the firm should make more units: it is earning a profit on each. If  $MR<MC$ , then the firm should produce less: it is making a loss on each additional product it sells.

### **10.2.3: Shut Down Case**

A firm will implement a production shutdown if the revenue from the sale of goods produced cannot cover the variable costs of production.

#### **Learning Objective**

Apply shutdown conditions to determine a firm's production status

#### **Key Points**

- Economic shutdown occurs within a firm when the marginal revenue is below average variable cost at the profit-maximizing output.
- When a shutdown is required the firm failed to achieve a primary goal of production by not operating at the level of output where marginal revenue equals marginal cost.
- If the revenue the firm is making is greater than the variable cost ( $R>VC$ ) then the firm is covering its variable costs and there is additional revenue to partially or entirely cover the fixed costs.
- If the variable cost is greater than the revenue being made ( $VC>R$ ) then the firm is not even covering production costs and it should be shutdown.
- The decision to shutdown production is usually temporary. If the market conditions improve, due to prices increasing or production costs falling, then the firm can resume production.
- When a shutdown lasts for an extended period of time, a firm has to decide whether to continue to business or leave the industry.

#### **Key Terms**

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

marginal revenue

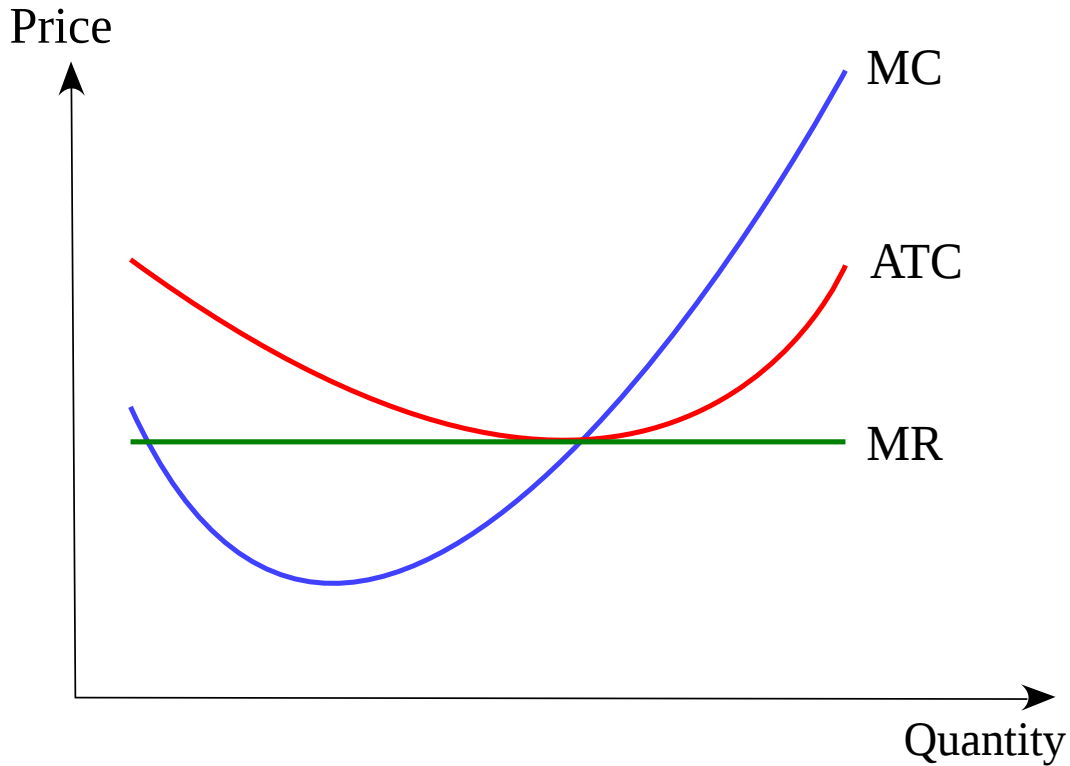
The additional profit that will be generated by increasing product sales by one unit.

variable cost

A cost that changes with the change in volume of activity of an organization.

## **Economic Shutdown**

A firm will choose to implement a production shutdown when the revenue received from the sale of the goods or services produced cannot cover the variable costs of production. In this situation, a firm will lose more money when it produces goods than if it does not produce goods at all. Producing a lower output would only add to the financial losses, so a complete shutdown is required. If a firm decreased production it would still acquire variable costs not covered by revenue as well as fixed costs (costs inevitably incurred). By stopping production the firm only loses the fixed costs .



## Shutdown Condition

Firms will produce as long as marginal revenue (MR) is greater than average total cost (ATC), even if it is less than the variable, or marginal cost (MC)

Economic shutdown occurs within a firm when the marginal revenue is below average variable cost at the profit-maximizing output. The goal of a firm is to maximize profits and minimize losses. When a shutdown is required the firm failed to achieve a primary goal of production by not operating at the level of output where marginal revenue equals marginal cost.

## The Shutdown Rule

In the short run, a firm that is operating at a loss (where the revenue is less than the total cost or the price is less than the unit cost) must decide to operate or temporarily shutdown. The shutdown rule states that "in the short



run a firm should continue to operate if price exceeds average variable costs. "

When determining whether to shutdown a firm has to compare the total revenue to the total variable costs. If the revenue the firm is making is greater than the variable cost ( $R > VC$ ) then the firm is covering its variable costs and there is additional revenue to partially or entirely cover the fixed costs. On the other hand, if the variable cost is greater than the revenue being made ( $VC > R$ ) then the firm is not even covering production costs and it should be shutdown immediately.

## **Implications of a Shutdown**

The decision to shutdown production is usually temporary. It does not automatically mean that a firm is going out of business. If the market conditions improve, due to prices increasing or production costs falling, then the firm can resume production. Shutdowns are short run decisions. When a firm shuts down it still retains capital assets, but cannot leave the industry or avoid paying its fixed costs.

A firm cannot incur losses indefinitely which impacts long run decisions. When a shutdown last for an extended period of time, a firm has to decide whether to continue to business or leave the industry. The decision to exit is made over a period of time. A firm that exits an industry does not earn any revenue, but is also does not incur fixed or variable costs.

## **10.2.4: The Supply Curve in Perfect Competition**

The total revenue-total cost perspective and the marginal revenue-marginal cost perspective are used to find profit maximizing quantities.

### **Learning Objective**

Use cost curves to find profit-maximizing quantities

### **Key Points**

- In a free market economy, firms use cost curves to find the optimal point of production (minimizing cost).
- Profit maximization is the process that a firm uses to determine the price and output level that returns the greatest profit when producing a good or service.
- The total revenue-total cost perspective recognizes that profit is equal to the total revenue (TR) minus the total cost (TC).
- The marginal revenue-marginal cost perspective relies on the understanding that for each unit sold, the marginal profit equals the marginal revenue (MR) minus the marginal cost (MC).

## **Key Terms**

marginal revenue

The additional profit that will be generated by increasing product sales by one unit.

Total Revenue

The profit from each item multiplied by the number of items sold.

## **Cost Curve**

In economics, a cost curve is a graph that shows the costs of production as a function of total quantity produced. In a free market economy, firms use cost curves to find the optimal point of production (minimizing cost). By locating the optimal point of production, firms can decide what output quantities are needed. The various types of cost curves include total, average, marginal curves. Some of the cost curves analyze the short run, while others focus on the long run.

## **Profit Maximization**

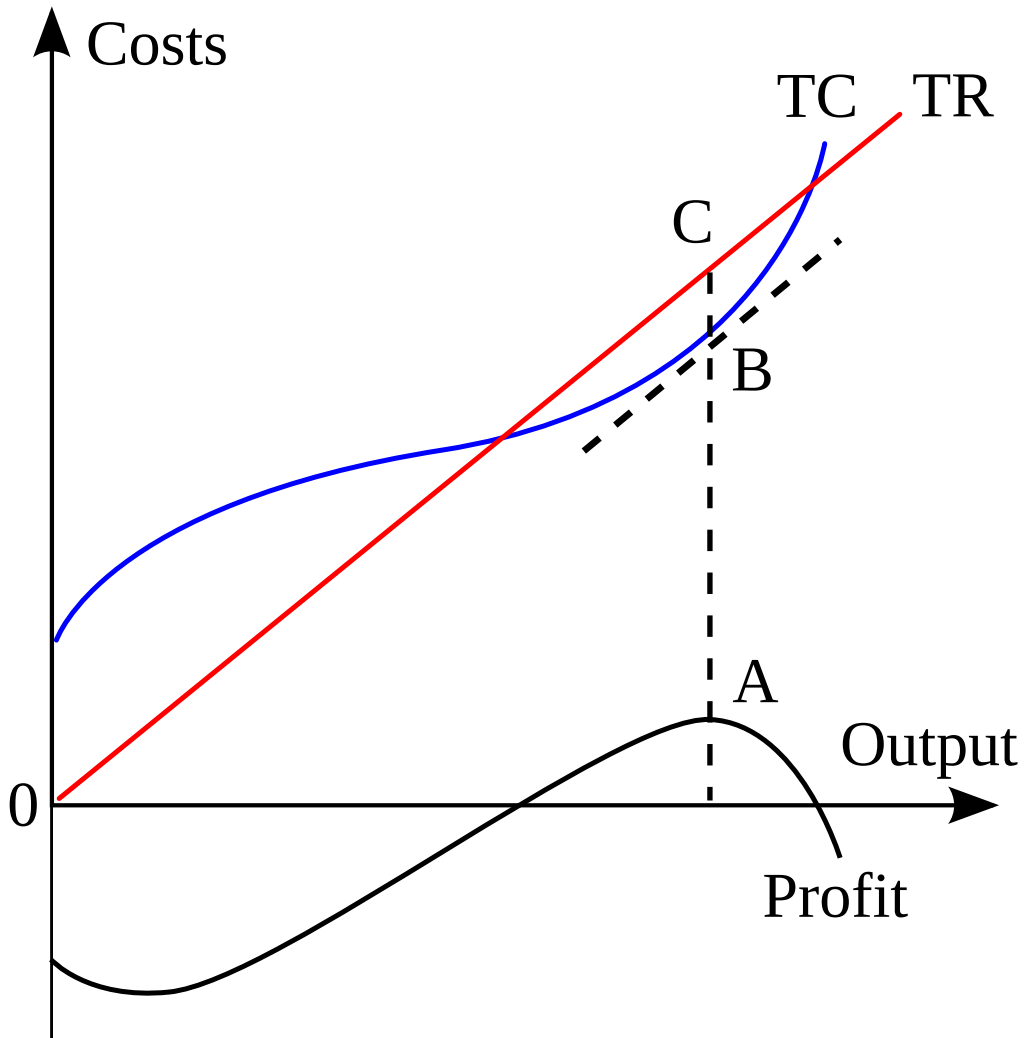
Profit maximization is the short run or long run process that a firm uses to determine the price and output level that returns the greatest profit when

producing a good or service.

## **Graphing Profit Maximization**

There are two ways in which cost curves can be used to find profit maximizing quantities: the total revenue-total cost perspective and the marginal revenue-marginal cost perspective.

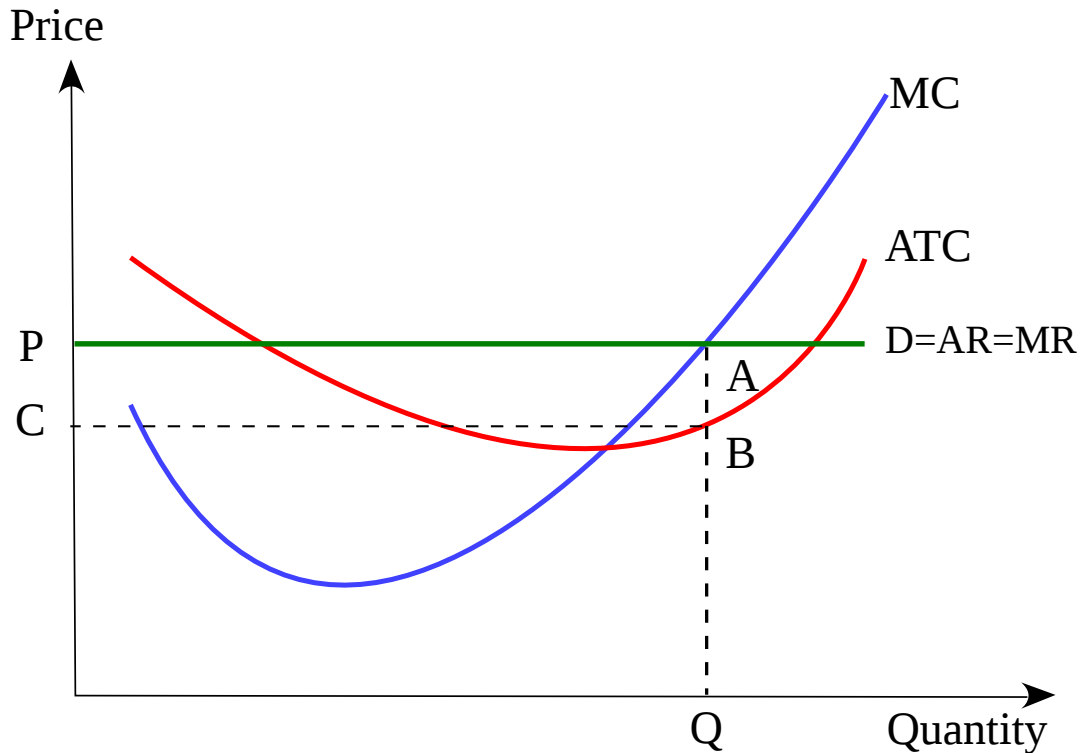
The total revenue-total cost perspective recognizes that profit is equal to the total revenue (TR) minus the total cost (TC). When a table of costs and revenues is available, a firm can plot the data onto a profit curve. The profit maximizing output is the one at which the profit reaches its maximum .



## Total cost curve

This graph depicts profit maximization on a total cost curve.

The marginal revenue-marginal cost perspective relies on the understanding that for each unit sold, the marginal profit equals the marginal revenue (MR) minus the marginal cost (MC). If the marginal revenue is greater than the marginal cost, then the marginal profit is positive and a greater quantity of the good should be produced. Likewise, if the marginal revenue is less than the marginal cost, the marginal profit is negative and a lesser quantity of the good should be produced.



## Marginal cost curve

This graph shows profit maximization using a marginal cost curve.

Profit maximization directly impacts the supply and demand of a product. Supply curves are used to show an estimation of variables within a market economy, one of which is the general price level of the product.

## 10.2.5: Short Run Firm Production Decision

The short run is the conceptual time period where at least one factor of production is fixed in amount while other factors are variable.

### Learning Objective

Compare factors that lead to short-run shut downs or long-run exits

### Key Points

- Fixed costs have no impact on a firm's short run decisions. However, variable costs and revenues affect short run profits.
- When a firm is transitioning from short run to long run it will consider the current and future equilibrium for supply and demand.
- A firm will implement a production shutdown when the revenue coming in from the sale of goods cannot cover the variable costs of production.
- A short run shutdown is designed to be temporary. When a firm is shutdown for the short run, it still has to pay fixed costs and cannot leave the industry. However, a firm cannot incur losses indefinitely. Exiting an industry is a long term decision.

## **Key Terms**

variable cost

A cost that changes with the change in volume of activity of an organization.

profit

Total income or cash flow minus expenditures. The money or other benefit a non-governmental organization or individual receives in exchange for products and services sold at an advertised price.

shutdown

The action of stopping operations; a closing, of a computer, business, event, etc.

## **Short Run Profit**

In an economic market all production in real time occurs in the short run. The short run is the conceptual time period where at least one factor of production is fixed in amount while other factors are variable in amount. Fixed costs have no impact on a firm's short run decisions. However, variable costs and revenues affect short run profits. In the short run, a firm

could potentially increase output by increasing the amount of the variable factors. An example of a variable factor being increased would be increasing labor through overtime.

In the short run, a firm that is maximizing its profits will:

- Increase production if the marginal cost is less than the marginal revenue.
- Decrease production if marginal cost is greater than marginal revenue.
- Continue producing if average variable cost is less than price per unit.
- Shut down if average variable cost is greater than price at each level of output.

## **Transition from Short Run to Long Run Profit**

When a firm is transitioning from the short run to the long run it will consider the current and future equilibrium for supply and demand. The firm will also take adjustments into account that can disturb equilibrium such as the sales tax rate. The transition involves analyzing the current state of the market as well as revenue and combining the results with long run market projections.

## **Short Run Shutdown vs. Long Run Exit**

The goal of a firm is to maximize profits by minimizing losses. In economics, a firm will implement a production shutdown when the revenue coming in from the sale of goods cannot cover the variable costs of production. The firm would experience higher loss if it kept producing goods than if it stopped production for a period of time. Revenue would not cover the variable costs associated with production. Instead, during a shutdown the firm is only paying the fixed costs.

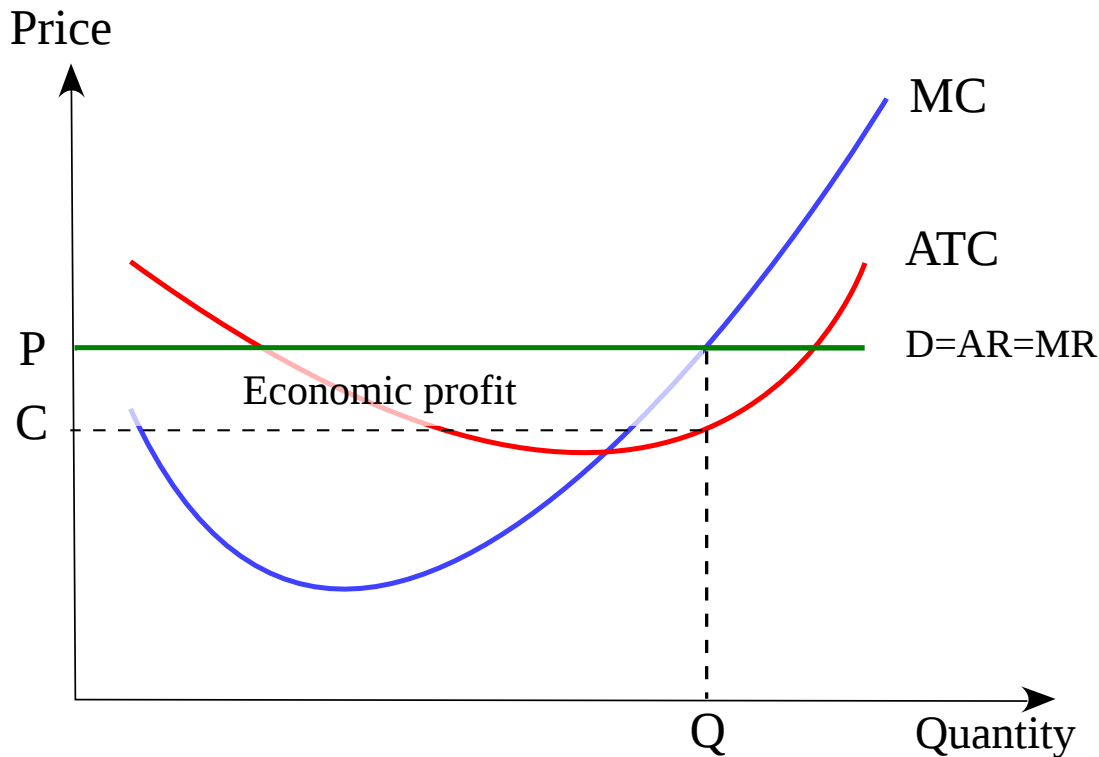
A short run shutdown is designed to be temporary: it does not mean that the firm is going out of business. If market conditions improve, due to prices increasing or production costs falling, the firm can restart production. When a firm is shut down in the short run, it still has to pay fixed costs and cannot

leave the industry. However, a firm cannot incur losses indefinitely. Exiting an industry is a long term decision. If market conditions do not improve a firm can exit the market. By exiting the industry, the firm earns no revenue but incurs no fixed or variable costs.

## **Short Run Supply Curve**

In a perfectly competitive market, the short run supply curve is the marginal cost (MC) curve at and above the shutdown point. The portions of the marginal cost curve below the shutdown point are no part of the supply curve because the firm is not producing in that range. The short run supply curve is used to graph a firm's short run economic state .





## Short run supply curve

This graph shows a short run supply curve in a perfect competitive market. The short run supply curve is the marginal cost curve at and above the shutdown point. The portions of the marginal cost curve below the shutdown point are not part of the supply curve because the firm is not producing in that range.

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# 10.3: Long-Run Outcomes

## 10.3.1: Long Run Supply Decisions

The long-run supply curve in a perfectly competitive market has three parts; a downward sloping curve, a flat portion, and an upwards sloping curve.

### Learning Objective

Describe the long-run market supply curve of a perfectly competitive market

### Key Points

- The long-run supply curves of a market is the sum of a series of that market's short-run supply curves.
- Most supply curves are composed of three periods of production: a period of increasing returns to scale, constant returns to scale, and decreasing returns to scale.
- A long-run supply curve connects the points of constant returns to scales of a markets' short-run supply curves.

### Key Terms

constant returns to scale

Changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor). If output increases by that same proportional change then there are constant returns to scale (CRS).

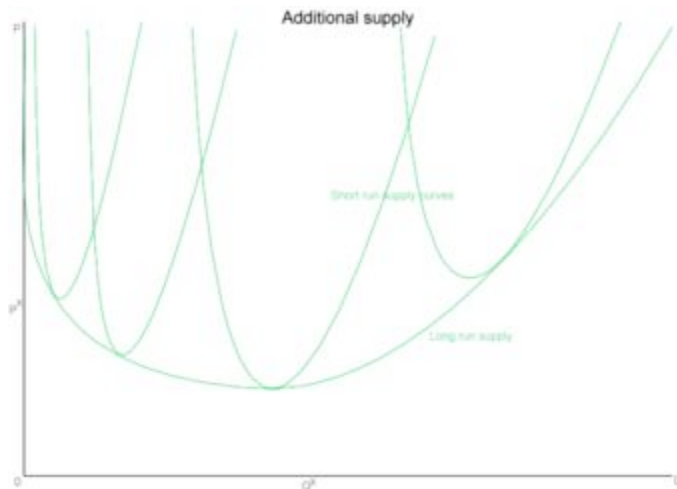
decreasing returns to scale

Changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor). If output increases by less than the proportional change then there are decreasing returns to scale.

increasing returns to scale

The characteristic of production in which output increases by more than the proportional increase in inputs.

The long-run supply curve of a market is the sum of a series of short-run supply curves in the market (). Prior to determining how the long-run supply curve looks, its important to understand short-run supply curves.



## Long-run Supply Curve

As the chart demonstrates, a market's long-run supply curve is the sum of a series of short-run supply curves in a given market.

## Short-Run Supply Curves

While most people focus on the second half of a supply curve, which has a positive slope, that is not how the supply and pricing decision works in practice. As you can see from the chart, the first items that are produced start out with a very high price. This is because it is very expensive for a

producer to manufacture one item. The producer has to incur fixed costs, such as learning the necessary skills to produce the item and purchasing new tools. These initial fixed costs make the cost of producing one good very expensive.

However, as more goods are produced, those initial fixed costs are spread out over more items. This decreases the price of per unit of each good produced for a period of time. As a result, in the early stages of production the supply curve is sloping downward as you can see in the chart. This period of supply is known as "increasing returns to scale," because a proportional increase in resources yields a greater proportional increase in output.

At some point, the per unit share of fixed costs becomes less than the variable costs of producing one more item. Variable expenses include purchasing more raw materials to manufacture another item. When this occurs, the supply curve slopes upward. Thus, in the short-run, a market's supply curve looks like an oddly shaped "u." This period of supply is known as "decreasing returns to scale," because a proportional increase in resources yields a smaller proportional increase in its amount in output. Between these two periods is the "constant returns to scale," where a proportion increase in resources yields an equal proportional increase in the amount of output.

## **Long-Run Supply Curves**

A market's long-run supply curve is the sum of the market's short-run supply curves taken at different points of time. As a result, a long-run supply curve for a market will look very similar to short-run supply curves for a market, but more stretched out; the long-term market curve will a wider "u." A long-run supply curve connects the points of constant returns to scales of a markets' short-run supply curves. ; the bottom of each short-term supply curve's "u." Consider the attached chart.

The first short-run supply curve reflects what happens when a firm enters into a new market for the first time. When it does, it should make an economic profit. In a perfectly competitive market, firms can freely enter

and exit an industry. When other business notice that the first firm is making it profit, they will enter the market to capture some of that profit and because there is nothing preventing them from doing so. In the early stages of the market, where only one or a few firms are producing goods, the market experiences increasing returns to scale, similar to what an individual firm would experience.

As more firms enter the market and time passes, production yields less and less returns in comparison to the production. Eventually the market reaches a state of constant returns to scale. How long this period of constant returns is varies by industry. Agriculture has a longer period of constant returns while technology has shorter.

Eventually, production of goods in a market yields less of a return than the amount of goods that go into product, which causes the market to enter into a period of decreasing returns to scale and the market's supply curve slopes upward.

## **10.3.2: Long Run Market Equilibrium**

The long-run equilibrium of a perfectly competitive market occurs when marginal revenue equals marginal costs, which is also equal to average total costs.

### **Learning Objective**

Describe the long-run market equilibrium

### **Key Points**

- In a perfectly competitive market, demand is perfectly elastic. This means the demand curve is a horizontal line.
- Once equilibrium has been achieved, firms in a perfectly competitive market can't achieve economic profit; it can only break even.
- A perfectly competitive market in equilibrium is productively and allocatively efficient.



## Key Term

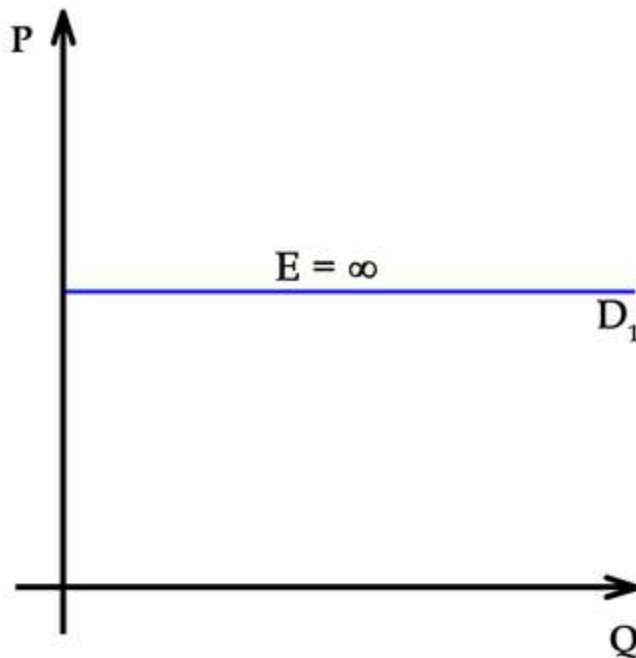
long-run

The conceptual time period in which there are no fixed factors of production.

The long-run is the period of time where there are no fixed variables of production. As with any other economic equilibrium, it is defined by demand and supply.

## Demand

In a perfect market, demand is perfectly elastic . The demand curve also represents marginal revenue, which is important to remember later when we calculate quantity supplied. That means regardless of how much is produced by the suppliers, the price will remain constant.



## Perfectly Elastic Demand

In a perfectly competitive market, demand is perfectly elastic.

# Supply

In a perfectly competitive market, it is assumed that all of the firms participating in production are trying to maximize their profits. So a firm will produce goods until the marginal costs of production equal the marginal revenues from sales. In a perfectly competitive market in the long-term, this is taken one step further. In a perfectly competitive market, long-run equilibrium will occur when the marginal costs of production equal the average costs of production which also equals marginal revenue from selling the goods. So the equilibrium will be set, graphically, at a three-way intersection between the demand, marginal cost and average total cost curves.

## Repercussions of Equilibrium

A perfectly competitive market in equilibrium has several important characteristics.

- Firms can't make economic profit; the best they can do is break even so that their revenues equals their costs.
- The market is productively and allocatively efficient. This means that not only is the market using all of its resources efficiently, it is using its resources in a way that maximizes the social welfare.
- Economic surplus is maximized, which means there is no deadweight loss. Attempting to improve the conditions of one group would harm the interests of the other.

### 10.3.3: Productive Efficiency

Productive efficiency occurs when production of a good is achieved at the lowest resource cost possible, given the level of production of other goods.

#### Learning Objective

Describe the efficiency of production in perfectly competitive markets

## Key Points

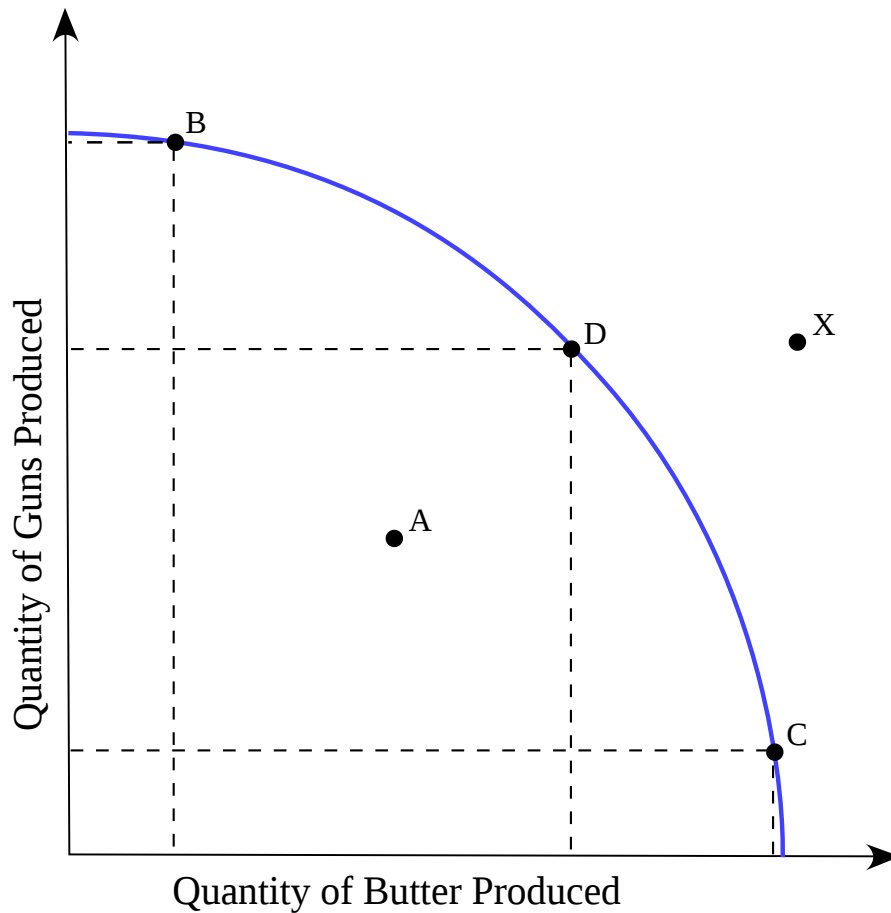
- An equilibrium may be productively efficient without being allocatively efficient.
- Another way to define productive efficiency is that it occurs when the highest possible output of one good is produced, given the production level of the other good(s).
- Productive efficiency requires that all firms operate using best-practice technological and managerial processes.
- Productive efficiency requires that all firms operate using best-practice technological and managerial processes.

## Key Term

### Productive Efficiency

An economic status that occurs when when the highest possible output of one good is produced, given the production level of the other good(s).

Productive efficiency occurs when the economy is getting maximum output from its resources . The concept is illustrated on a production possibility frontier (PPF) where all points on the curve are points of maximum productive efficiency (i.e., no more output can be achieved from the given inputs). An equilibrium may be productively efficient without being allocatively efficient. In other words, just because a market maximizes the output it generates, that doesn't mean that social welfare is maximized.



## Production Possibilities on Frontier Curve

This chart shows production possibilities for production of guns and butter. Points B, C, and D are productively efficient and point A is not. Point X is only possible if the means of production improve.

Production efficiency occurs when production of one good is achieved at the lowest resource (input) cost possible, given the level of production of the other good(s). Another way to define productive efficiency is that it occurs when the highest possible output of one good is produced, given the production level of the other good(s). In long-run equilibrium for perfectly competitive markets, productive efficiency occurs at the base of the average total cost curve, or where marginal cost equals average total cost.

Productive efficiency requires that all firms operate using best-practice technological and managerial processes. By improving these processes, an

economy or business can extend its production possibility frontier outward, so that efficient production yields more output.

Monopolistic companies may not be productively efficient because companies operating in a monopoly have less of an incentive to maximize output due to lack of competition. However, due to economies of scale, it may be possible for the profit-maximizing level of output of monopolistic companies to occur with a lower price to the consumer than perfectly competitive companies. So, consumers may pay less with a monopoly, but a monopolistic market would not achieve productive efficiency.

### **10.3.4: Allocative Efficiency**

Free markets iterate towards higher levels of allocative efficiency, aligning the marginal cost of production with the marginal benefit for consumers.

#### **Learning Objective**

Explain resource allocation in terms of consumer and producer surplus and market equilibrium

#### **Key Points**

- Allocative efficiency occurs where a good or service's marginal benefit is equal to its marginal cost. At this point the social surplus is maximized with no deadweight loss.
- Free markets that are perfectly competitive are generally allocatively efficient.
- Allocative efficiency is the main means to measure the degree markets and public policy improve or harm society or other specific subgroups.
- Under these basic premises, the goal of maximizing allocative efficiency can be defined according to some neutral principle where some allocations are objectively better than others.

#### **Key Term**

## Allocative efficiency

A state of the economy in which production represents consumer preferences; in particular, every good or service is produced up to the point where the last unit provides a marginal benefit to consumers equal to the marginal cost of producing.

Allocative efficiency is the degree to which the marginal benefits consumers receive from goods are as close as possible to the marginal costs of producing them. At the optimal level of allocative efficiency in a given market, the last unit's marginal cost would be perfectly equal to the marginal benefit it provides consumers, resulting in no deadweight loss.

The amount of value generated in a market that efficient equals the social value of the produced output minus the value of resources used in production. Optimal efficiency is higher in free markets, though reality always has some limitations and imperfections to detract from completely perfect allocative efficiency. Markets are not efficient if it is subject to:



## Final goods

When an economy has allocative efficiency, it produces goods and services that have the highest demand and that society finds most desirable. For example, for the U.S. to achieve an allocative efficient market, it would need to produce a lot of coffee.

- monopolies,
- monopsonies,
- externalities,
- public goods which construe market failure, or
- price controls which construe government failure in addition to taxation.

Allocative efficiency is the main means to measure the degree markets and public policy improve or harm society or other specific subgroups.

Although there are different standards of evaluation for the concept of allocative efficiency, the basic principle asserts that in any economic system, choices in resource allocation produce both "winners" and "losers" relative to the choice being evaluated. The principles of rational choice, individual maximization, utilitarianism, and market theory further suppose that the outcomes for winners and losers can be identified, compared, and measured.

Under these basic premises, the goal of maximizing allocative efficiency can be defined according to some neutral principle where some allocations are objectively better than others. For example, an economist might say that a change in policy increases allocative efficiency as long as those who benefit from the change (winners) gain more than the losers lose.

### **10.3.5: Entry and Exit of Firms**

The absence of barriers of entry and exit is a necessary condition for a market to be perfectly competitive.

#### **Learning Objective**

Explain the entry and exit of firms in perfectly competitive markets.

#### **Key Points**

- Barriers to entry are obstacles that make it difficult to enter a given market. The term can refer to hindrances a firm faces in trying to enter

a market or industry. Barriers can be obstacles an individual faces in trying to enter into a profession, such as education or licensing requirements.

- Because firms are able to freely enter and exit in response to potential profit, this means that in the long-run firms cannot make economic profit; they can only break even.
- Barriers to exit are obstacles in the path of a firm which wants to leave a given market or industrial sector.

## **Key Terms**

barriers to exit

Obstacles in the path of a firm that want to leave a market or industrial sector.

Barriers to entry

Obstacles that make it difficult to enter a given market. The term can refer to hindrances a firm faces in trying to enter a market or industry, such as government regulation, or a large, established firm taking advantage of economies of scale.

Barriers to entry and exit are an important characteristics to consider when analyzing a market. In perfectly competitive markets, there are no barriers to entry or exit. This is a critical characteristic of perfectly competitive markets because firms are able to freely enter and exit in response to potential profit. Therefore, in the long-run firms cannot make economic profit but can only break even.

However, in most other types of markets barriers do exist. These types of barriers, defined below, prevent free entry to or exit from markets.

## **Barriers to Entry**

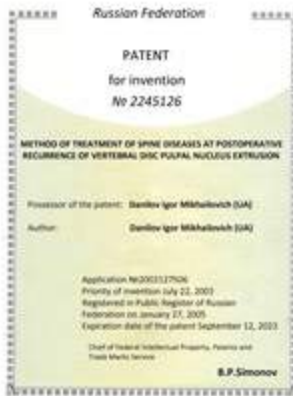
Barriers to entry are obstacles that make it difficult to enter a given market. The term can refer to hindrances a firm faces in trying to enter a market or



industry. Barriers can also be obstacles an individual faces in trying to gain entrance to a profession, such as education or licensing requirements.

Because barriers to entry protect incumbent firms and restrict competition in a market, they can distort prices. Monopolies are often aided by barriers to entry. Examples of barriers to entry include:

- Capital: need the capital to start up such as equipment, building, and raw materials.
- Customer loyalty: Large incumbent firms may have existing customers loyal to established products. The presence of established strong brands within a market can be a barrier to entry in this case.
- Economy of scale: The increase in efficiency of production as the number of goods being produced increases. Cost advantages can sometimes be quickly reversed by advances in technology.
- Intellectual property: Potential entrant requires access to equally efficient production technology as the incumbent monopolist in order to freely enter a market. Patents give a firm the legal right to stop other firms producing a product for a given period of time, and so restrict entry into a market. Patents are intended to encourage invention and technological progress by guaranteeing proceeds as an incentive. Similarly, trademarks and service marks may represent a kind of entry barrier for a particular product or service if the market is dominated by one or a few well-known names .



## A patent is an example of an intangible asset with a limited life.

Patents are an example of intellectual property. If a firm does not own intellectual property relevant to the industry, that could prove to be a significant barrier to entry into that market.

## Barriers to Exit

Barriers to exit are obstacles in the path of a firm which wants to leave a given market or industrial sector. These obstacles often cost the firm financially to leave the market and may prohibit it doing so. If the barriers of exit are significant; a firm may be forced to continue competing in a market, as the costs of leaving may be higher than those incurred if they continue competing in the market. The factors that may form a barrier to exit include:

- High investment in non-transferable fixed assets: This is particularly common for manufacturing companies that invest heavily in capital equipment which is specific to one task.
- High redundancy costs: If a company has a large number of employees, employees with high salaries, or contracts with employees which stipulate high redundancy payments, then the firm may face significant cost if it wishes to leave the market.

- Other closure costs: Contract contingencies with suppliers or buyers and any penalty costs incurred from cutting short tenancy agreements.
- Potential upturn: Firms may be influenced by the potential of an upturn in their market that may reverse their current financial situation.

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# 11: Monopoly

# 11.1: Introduction to Monopoly

## 11.1.1: Defining Monopoly

A monopoly is an economic market structure where a specific person or enterprise is the only supplier of a particular good.

### Learning Objective

Differentiate monopolies and competitive markets

### Key Points

- A monopoly market is characterized by the profit maximizer, price maker, high barriers to entry, single seller, and price discrimination.
- Monopoly characteristics include profit maximizer, price maker, high barriers to entry, single seller, and price discrimination.
- Sources of monopoly power include economies of scale, capital requirements, technological superiority, no substitute goods, control of natural resources, legal barriers, and deliberate actions.
- There are a few similarities between a monopoly and competitive market: the cost functions are the same, both minimize cost and maximize profit, the shutdown decisions are the same, and both are assumed to have perfectly competitive market factors.
- Differences between the two market structures including: marginal revenue and price, product differentiation, number of competitors, barriers to entry, elasticity of demand, excess profits, profit maximization, and the supply curve.
- The most significant distinction is that a monopoly has a downward sloping demand instead of the "perceived" perfectly elastic curve of the perfectly competitive market.

### Key Terms


monopoly

A market where one company is the sole supplier.

differentiation

The act of distinguishing a product from the others in the market.

A monopoly is a specific type of economic market structure. A monopoly exists when a specific person or enterprise is the only supplier of a particular good. As a result, monopolies are characterized by a lack of competition within the market producing a good or service .

 Monopoly

## Monopoly

The graph shows a monopoly and the price (P) and change in price (P reg) as well as the output (Q) and output change (Q reg).

## Characteristics of a Monopoly

A monopoly can be recognized by certain characteristics that set it aside from the other market structures:

- Profit maximizer: a monopoly maximizes profits. Due to the lack of competition a firm can charge a set price above what would be charged in a competitive market, thereby maximizing its revenue.
- Price maker: the monopoly decides the price of the good or product being sold. The price is set by determining the quantity in order to demand the price desired by the firm (maximizes revenue).
- High barriers to entry: other sellers are unable to enter the market of the monopoly.
- Single seller: in a monopoly one seller produces all of the output for a good or service. The entire market is served by a single firm. For practical purposes the firm is the same as the industry.



- Price discrimination: in a monopoly the firm can change the price and quantity of the good or service. In an elastic market the firm will sell a high quantity of the good if the price is less. If the price is high, the firm will sell a reduced quantity in an elastic market.

## **Sources of Monopoly Power**

In a monopoly, specific sources generate the individual control of the market. Sources of power include:

- Economies of scale
- Capital requirements
- Technological superiority
- No substitute goods
- Control of natural resources
- Network externalities
- Legal barriers
- Deliberate actions

## **Monopoly vs. Competitive Market**

Monopolies and competitive markets mark the extremes in regards to market structure. There are a few similarities between the two including: the cost functions are the same, both minimize cost and maximize profit, the shutdown decisions are the same, and both are assumed to have perfectly competitive market factors.

However, there are noticeable differences between the two market structures including: marginal revenue and price, product differentiation, number of competitors, barriers to entry, elasticity of demand, excess profits, profit maximization, and the supply curve. The most significant distinction is that a monopoly has a downward sloping demand instead of the "perceived" perfectly elastic curve of the perfectly competitive market.

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# 11.2: Barriers to Entry: Reasons for Monopolies to Exist

## 11.2.1: Resource Control

Control over a natural resource that is critical to the production of a final good is one source of monopoly power.

### Learning Objective

Explain the relationship between resource control and monopolies

### Key Points

- Single ownership over a resource gives the owner the power to raise the market price of a good over marginal cost without losing customers to competitors.
- De Beers is a classic example of a monopoly based on a natural resource. De Beers had a lot of market power in the world market for diamonds over the course of the 20th century, keeping the price of diamonds high.
- In practice, monopolies rarely arise because of control over natural resources.

### Key Terms

market power

The ability of a firm to profitably raise the market price of a good or service over marginal cost. A firm with total market power can raise prices without losing any customers to competitors.

economic rent

The portion of income paid to a factor of production in excess of its opportunity cost.

Control over natural resources that are critical to the production of a good is one source of monopoly power. Single ownership over a resource gives the owner of the resource the power to raise the market price of a good over marginal cost without losing customers to competitors. In other words, resource control allows the controller to charge economic rent. This is a classic outcome of imperfectly competitive markets.

A classic example of a monopoly based on resource control is De Beers . De Beers Consolidated Mines were founded in 1888 in South Africa as an amalgamation of a number of individual diamond mining operations. De Beers had a monopoly over the production of diamonds for most of the 20th century, and it used its dominant position to manipulate the international diamond market. It convinced independent producers to join its single channel monopoly. In instances when producers refused to join, De Beers flooded the market with diamonds similar to the ones they were producing. De Beers also purchased and stockpiled diamonds produced by other manufacturers in order to control prices through supply. The De Beers model changed at the turn of the 21st century, when diamond producers from Russia, Canada, and Australia started to distribute diamonds outside of the De Beers channel. The sale of diamonds also suffered from rising awareness about blood diamonds. De Beers' market share fell from as high as 90 percent in the 1980s to less than 40 percent in 2012.



## **Diamonds**

For most of the 20th century, De Beers had monopoly power over the world market for diamonds.

In practice, monopolies rarely arise because of control over natural resources. Economies are large, usually with multiple people owning resources. International trade is an additional source of competition for owners of natural resources.

### **11.2.2: Economies of Scale and Network Externalities**

Economies of scale and network externalities discourage potential competitors from entering a market.

#### **Learning Objective**

Define Economies of Scale., Explain why economies of scale are desirable for monopolies

#### **Key Points**

- Economies of scale are cost advantages that large firms gain because of their size.
- Natural monopolies arise as a result of economies of scale. Natural monopolies have overwhelming cost advantages over potential competitors.
- Network effects occur when the value of a good or service increases because many other people are using it. This makes competing goods or services with lower levels of adoption unattractive to new customers.

## Key Terms

### economies of scale

The characteristics of a production process in which an increase in the scale of the firm causes a decrease in the long run average cost of each unit.

### Network externalities

Are evident when the value of a product or service is dependent on the number of other people using it.

### Natural monopoly

Occurs when a firm is able to serve the entire market demand at a lower cost than any combination of two or more smaller, more specialized firms.

Economies of scale and network externalities are two types of barrier to entry. They discourage potential competitors from entering a market, and thus contribute to the monopolistic power of some firms.

Economies of scale are cost advantages that large firms obtain due to their size. They occur because the cost per unit of output decreases with increasing scale, as fixed costs are spread over more units of output. Economies of scale are also gained through bulk-buying of materials with long-term contracts, the increased specialization of managers, ability to

obtain lower interest rates when borrowing from banks, access to a greater range of financial instruments, and spreading the cost of marketing over a greater range of output. Each of these factors contributes to reductions in the long-run average cost of production.



## **Economies of Scale**

Large firms obtain economies of scale in part because fixed costs are spread over more units of output.

A natural monopoly arises as a result of economies of scale. For natural monopolies, the average total cost declines continually as output increases, giving the monopolist an overwhelming cost advantage over potential competitors. It becomes most efficient for production to be concentrated in a single firm.

Network externalities (also called network effects) occur when the value of a good or service increases as a result of many people using it. Because of network effects, certain goods or services that are adopted widely will appear to be much more attractive to new customers than competing goods or services. This is evident in online social networks. Social networks with the largest memberships are more attractive to new users, because new users know that their friends or colleagues are more likely to be on these networks. It is also evident with certain software programs. For example, most people use Microsoft word processing software. While other word processing programs may be available, an individual would risk running

into compatibility problems when sending files to people or machines using the mainstream software. This makes it difficult for new companies to enter the market and to gain market share.

### **11.2.3: Government Action**

There are two types of government-initiated monopoly: a government monopoly and a government-granted monopoly.

#### **Learning Objective**

Discuss different types of monopolies initiated by government

#### **Key Points**

- Government-granted monopolies and government monopolies differ in the decision-making structure of the monopolist. In a government-granted monopoly, business decisions are made by a private firm. In a government monopoly, decisions are made by a government agency.
- In a government-granted monopoly, the government gives a private individual or a firm the right to be a sole provider of a good or service.
- In a government monopoly, an agency under the direct authority of the government itself holds the monopoly.
- In both types of government-initiated monopoly competition is kept out of the market through laws, regulations, and other mechanisms of government enforcement.

#### **Key Terms**

Government monopoly

A form of monopoly in which a government agency is the sole provider of a particular good or service and competition is prohibited by law.

Government-granted monopoly



A form of monopoly in which a government grants exclusive rights to a private individual or firm to be the sole provider of a good or service.

## **Monopoly Creation**

There are instances in which the government initiates monopolies, creating a government-granted monopoly or a government monopoly. Government-granted monopolies often closely resemble government monopolies in many respects, but the two are distinguished by the decision-making structure of the monopolist. In a government monopoly, the holder of the monopoly is formally the government itself and the group of people who make business decisions is an agency under the government's direct authority. In a government-granted monopoly, on the other hand, the monopoly is enforced through the law, but the holder of the monopoly is formally a private firm, which makes its own business decisions.

## **Government-Granted Monopoly**

In a government-granted monopoly, the government gives a private individual or a firm the right to be a sole provider of a good or service. Potential competitors are excluded from the market by law, regulation, or other mechanisms of government enforcement. Intellectual property rights such as copyright and patents are government-granted monopolies. Additionally, the Dutch East India Company provides a historical example of a government-granted monopoly. It was granted exclusive trading privileges with colonial possessions under mercantilist economic policy.

## **Government Monopoly**

In a government monopoly, an agency under the direct authority of the government itself holds the monopoly, and the monopoly is sustained by the enforcement of laws and regulations that ban competition or reserve exclusive control over factors of production to the government. The state-owned petroleum companies that are common in oil-rich developing countries (such as Aramco in Saudi Arabia or PDVSA in Venezuela) are examples of government monopolies created through nationalization of

resources and existing firms. The United States Postal Service is another example of a government monopoly . It was created through laws that ban potential competitors from offering certain types of services, such as first-class and standard mail delivery. Around the world, government monopolies on public utilities, telecommunications systems, and railroads have historically been common.



## Postal Service

The postal service operates as a government monopoly in many countries, including the United States.

### 11.2.4: Legal Barriers

The government creates legal barriers through patents, copyrights, and granting exclusive rights to companies.

#### Learning Objective

Identify the legal conditions that lead to monopolistic power.

#### Key Points

- Intellectual property rights are an example of legal barriers that give rise to monopolies.
- A copyright gives the creator of an original creative work exclusive rights to it for a limited time. This provides an incentive for the continued creation of innovative goods.

- A patent is a limited property right the government gives inventors in exchange for the details of their invention being made public.
- The government can provide exclusive or special rights to companies that legally allow them to be monopolies.

## **Key Terms**

### patent

A declaration issued by a government agency declaring the inventor of a new product has the privilege of stopping others from making, using or selling the claimed invention for a limited time.

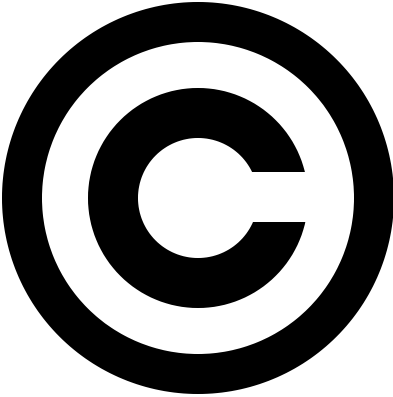
### Copyright

A legal concept that gives the creator of an original work exclusive rights to it, usually for a limited time, with the intention of enabling the creator to be compensated for his or her work.

In some cases, the government will grant a person or firm exclusive rights to produce a good or service, enabling them to monopolize the market for this good or service. Intellectual property rights, including copyright and patents, are an important example of legal barriers that give rise to monopolies.

## **Copyright**

Copyright gives the creator of an original creative work (such as a book, song, or film) exclusive rights to it, usually for a limited time, with the intention of enabling the creator to be compensated for his or her work . The intent behind copyright is to promote the creation of new works by providing creators the opportunity to profit from their works. The copyright holder receives the right to be credited for the work, to determine who may adapt the work to other forms, who may perform the work, and who may financially benefit from it, along with other related rights. When the copyright on a work expires, the work is transferred to the public domain, enabling others to repurpose and build on the work.



## **Copyright**

Copyright is an example of a temporary legal monopoly granted to creators of original creative works.

## **Patent**

A patent is a limited property right the government gives inventors in exchange for their agreement to share the details of their invention with the public. During the term of the patent, the patent holder has the right to exclude others from making, using, or selling the patented invention. The patent provides incentives (1) to invent in the first place, (2) to disclose the invention once it is made, (3) to make the necessary investments in research and development, production, and bringing the invention to market, and (4) to innovate by designing around or improving upon earlier patents. When a patent expires and the invention enters the public domain, others can build on the invention.

For example, when a pharmaceutical company first markets a drug, it is usually under a patent, and only the pharmaceutical company can sell it until the patent expires. This allows the company to recoup the cost of developing this particular drug. After the patent expires, any pharmaceutical company can manufacture and sell a generic version of the drug, bringing down the price of the original drug to compete with new versions.

## **Government Granted Monopoly**

It is also possible that there is a monopoly because the government has granted a single company exclusive or special rights. The water utility company, for example, is a monopoly in your area because it is the only organization granted the right to provide water. Another example is that the Digital Millennium Copyright Act the proprietary Macrovision copy prevention technology is required for analog video recorders. Though other forms of copy prevention aren't prohibited, requiring Macrovision effectively gives it a monopoly and prevents more effective copy prevention methods from being developed.

## **11.2.5: Natural Monopolies**

Natural monopolies occur when a single firm can serve the entire market at a lower cost than a combination of two or more firms.

### **Learning Objective**

Demonstrate an understanding of how a natural monopoly is created

### **Key Points**

- A natural monopoly's cost structure is very different from that of most industries. For a natural monopoly, the average total cost continues to shrink as output increases.
- Natural monopolies tend to form in industries where there are high fixed costs. A firm with high fixed costs requires a large number of customers in order to have a meaningful return on investment.
- Other firms are discouraged from entering the market because of the high initial costs and the difficulty of obtaining a large enough market share to achieve the same low costs as the monopolist.

### **Key Terms**

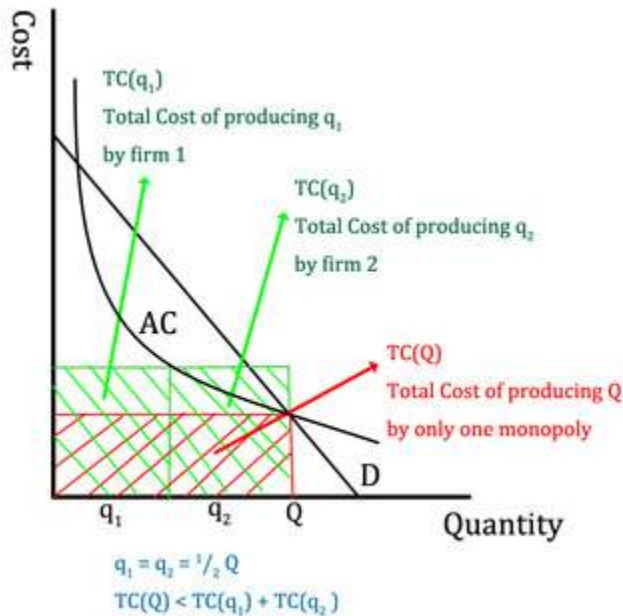
economies of scale

The characteristics of a production process in which an increase in the scale of the firm causes a decrease in the long run average cost of each unit.

### Natural monopoly

Occurs when a firm is able to serve the entire market demand at a lower cost than any combination of two or more smaller, more specialized firms.

Natural monopolies occur when a single firm is able to serve the entire market demand at a lower cost than any combination of two or more smaller firms. For example, imagine there are two firms in a natural monopoly's market and each of them produces half of the quantity that the monopoly produces. The total cost of the natural monopoly is lower than the sum of the total costs of two firms producing the same quantity .



## Natural Monopoly

The total cost of the natural monopoly's production is lower than the sum of the total costs of two firms producing the same quantity.

## **Cost Structure**

A natural monopoly's cost structure is very different from that of most industries. In other industries, the marginal cost initially decreases due to economies of scale, then increases as the company experiences growing pains (as employees become overworked, the firm's bureaucracy expands, etc.). Along with this, the average cost of production decreases and then increases. In contrast, a natural monopoly will have a marginal cost that is constant or declining, and an average total cost that drops as the quantity of output increases.

## **Fixed Costs**

Natural monopolies tend to form in industries where there are high fixed costs. A firm with high fixed costs requires a large number of customers in order to have a meaningful return on investment. As it gains market share and increases its output, the fixed cost is divided among a larger number of customers. Therefore, in industries with large initial investment requirements, average total costs decline as output increases. Once a natural monopoly has been established, there will be high barriers to entry for other firms because of the large initial cost and because it would be difficult for the entrant to capture a large enough part of the market to achieve the same low costs as the monopolist.

Examples of natural monopolies are water and electricity services. For both of these, fixed costs of building the necessary infrastructure are high. The cost of constructing a competing transmission network and delivering service will be so high that it effectively bars potential competitors from entering the monopolist's market.

### **11.2.6: Other Barriers to Entry**

Firms gain monopolistic power as a result of markets' barriers to entry, which discourage potential competitors.

### **Learning Objective**

Identify the common conditions that lead to monopolistic power

## **Key Points**

- There are several different types of barriers to entry, including a firm's control over scarce natural resources, high capital requirements for an industry, economies of scale, network effects, legal barriers, and government backing.
- Some industries require large investments in capital or research and development, making it difficult for new firms to enter.
- Monopolies benefit from economies of scale, which give them a cost advantage over their competitors.
- The legal system can grant firms monopoly rights over a resource or production of a good.

## **Key Terms**

Barriers to entry

Circumstances that prevent or greatly impede a potential competitor's ability to compete in the market.

Network effects

When the value of a product or service is dependent on the number of people using it.

Monopolies derive their market power from barriers to entry: circumstances that prevent or greatly impede a potential competitor's ability to compete in the market. There are several different types of barriers to entry.

## **Control Over Natural Resources**

The supply of natural resources such as precious metals or oil deposits is limited, giving their owners monopoly powers. For example, De Beers controls the vast majority of the world's diamond reserves, allowing only a



certain number of diamonds to be mined each year and keeping the price of diamonds high .



## **Diamond**

De Beers controls the majority of the world's diamond reserves, preventing other players from entering the industry and setting a high price for diamonds.

## **High Capital Requirements**

Some production processes require large investments in capital or large research and development costs that make it difficult for new companies to enter an industry. Examples include steel production, pharmaceuticals, and space transport.

## **Economies of Scale**

Monopolies exhibit decreasing costs as output increases. Decreasing costs coupled with large initial costs give monopolies a cost advantage in production over would-be competitors. Market entrants have not yet achieved economies of scale, so their output simply costs so much more than the incumbent firms that market entry is difficult.

## **Network Effects**

The use of a product by other people can increase its value to a person . One example is Microsoft spreadsheet and word processing software, which is still used widely. This is because when a person uses software that is used by so many others, he or she is less likely to run into compatibility problems in the course of work or other activities. This tendency to use what everyone else is using makes it difficult for new companies to develop and sell competing software.



## **Facebook**

Network effects are one reason why it's so difficult for new companies to compete against Facebook: they simply will have difficulty establishing a network of users to compete.

## **Legal Barriers**

Legal rights can provide an opportunity to monopolize a market for a good. Intellectual property rights, such as patents and copyright, give the rights holder exclusive control over the production and sale of certain goods. Property rights may give a company exclusive control of the materials

necessary to produce a good. The granting of permits or professional licenses can also favor certain firms, while setting standards that are difficult for new firms to meet.

## Government Backing

There are cases in which a government agency is the sole provider of a particular good or service and competition is prohibited by law. For example, in many countries, the postal system is run by the government with competition forbidden by law in some or all services. Government monopolies in public utilities, telecommunications systems, and railroads have also historically been common. In other instances, the government may be an invested partner in a monopoly rather than a sole owner. This will still make it difficult for competitors to operate on equal footing.

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# 11.3: Monopoly Production and Pricing Decisions and Profit Outcome

## 11.3.1: Market Differences Between Monopoly and Perfect Competition

Monopolies, as opposed to perfectly competitive markets, have high barriers to entry and a single producer that acts as a price maker.

### Learning Objective

Distinguish between monopolies and competitive firms

### Key Points

- In a perfectly competitive market, there are many producers and consumers, no barriers to exit and entry into the market, perfectly homogenous goods, perfect information, and well-defined property rights.
- Perfectly competitive producers are price takers that can choose how much to produce, but not the price at which they can sell their output.
- A monopoly exists when there is only one producer and many consumers.
- Monopolies are characterized by a lack of economic competition to produce the good or service and a lack of viable substitute goods.

### Key Terms

perfect competition

A type of market with many consumers and producers, all of whom are price takers

network externality

The effect that one user of a good or service has on the value of that product to other people

perfect information

The assumption that all consumers know all things, about all products, at all times, and therefore always make the best decision regarding purchase.

A market can be structured differently depending on the characteristics of competition within that market. At one extreme is perfect competition. In a perfectly competitive market, there are many producers and consumers, no barriers to enter and exit the market, perfectly homogeneous goods, perfect information, and well-defined property rights. This produces a system in which no individual economic actor can affect the price of a good - in other words, producers are price takers that can choose how much to produce, but not the price at which they can sell their output. In reality there are few industries that are truly perfectly competitive, but some come very close. For example, commodity markets (such as coal or copper) typically have many buyers and multiple sellers. There are few differences in quality between providers so goods can be easily substituted, and the goods are simple enough that both buyers and sellers have full information about the transaction. It is unlikely that a copper producer could raise their prices above the market rate and still find a buyer for their product, so sellers are price takers.

A monopoly, on the other hand, exists when there is only one producer and many consumers. Monopolies are characterized by a lack of economic competition to produce the good or service and a lack of viable substitute goods. As a result, the single producer has control over the price of a good - in other words, the producer is a price maker that can determine the price level by deciding what quantity of a good to produce. Public utility companies tend to be monopolies. In the case of electricity distribution, for

example, the cost to put up power lines is so high it is inefficient to have more than one provider. There are no good substitutes for electricity delivery so consumers have few options. If the electricity distributor decided to raise their prices it is likely that most consumers would continue to purchase electricity, so the seller is a price maker.



## **Electricity Distribution**

The cost of electrical infrastructure is so expensive that there are few or no competitors for electricity distribution. This creates a monopoly.

## **Sources of Monopoly Power**

Monopoly power comes from markets that have high barriers to entry. This can be caused by a variety of factors:

- Increasing returns to scale over a large range of production
- High capital requirements or large research and development costs
- Production requires control over natural resources
- Legal or regulatory barriers to entry
- The presence of a network externality - that is, the use of a product by a person increases the value of that product for other people

## **Monopoly Vs. Perfect Competition**

Monopoly and perfect competition mark the two extremes of market structures, but there are some similarities between firms in a perfectly competitive market and monopoly firms. Both face the same cost and production functions, and both seek to maximize profit. The shutdown decisions are the same, and both are assumed to have perfectly competitive factors markets.

However, there are several key distinctions. In a perfectly competitive market, price equals marginal cost and firms earn an economic profit of zero. In a monopoly, the price is set above marginal cost and the firm earns a positive economic profit. Perfect competition produces an equilibrium in which the price and quantity of a good is economically efficient. Monopolies produce an equilibrium at which the price of a good is higher, and the quantity lower, than is economically efficient. For this reason, governments often seek to regulate monopolies and encourage increased competition.

### **11.3.2: Marginal Revenue and Marginal Cost Relationship for Monopoly Production**

For monopolies, marginal cost curves are upward sloping and marginal revenues are downward sloping.

#### **Learning Objective**

Analyze how marginal and marginal costs affect a company's production decision

## Key Points

- Firm typically have marginal costs that are low at low levels of production but that increase at higher levels of production.
- While competitive firms experience marginal revenue that is equal to price - represented graphically by a horizontal line - monopolies have downward-sloping marginal revenue curves that are different than the good's price.
- For monopolies, marginal revenue is always less than price.

## Key Terms

marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

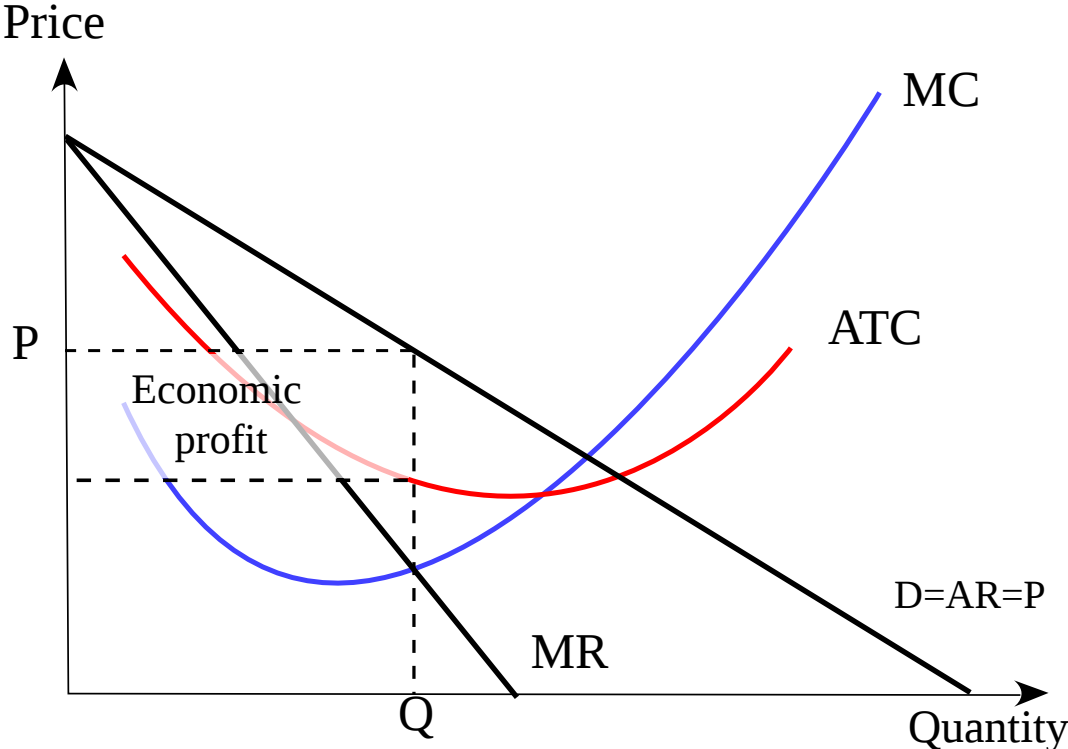
marginal revenue

The additional profit that will be generated by increasing product sales by one unit.

## Profit Maximization

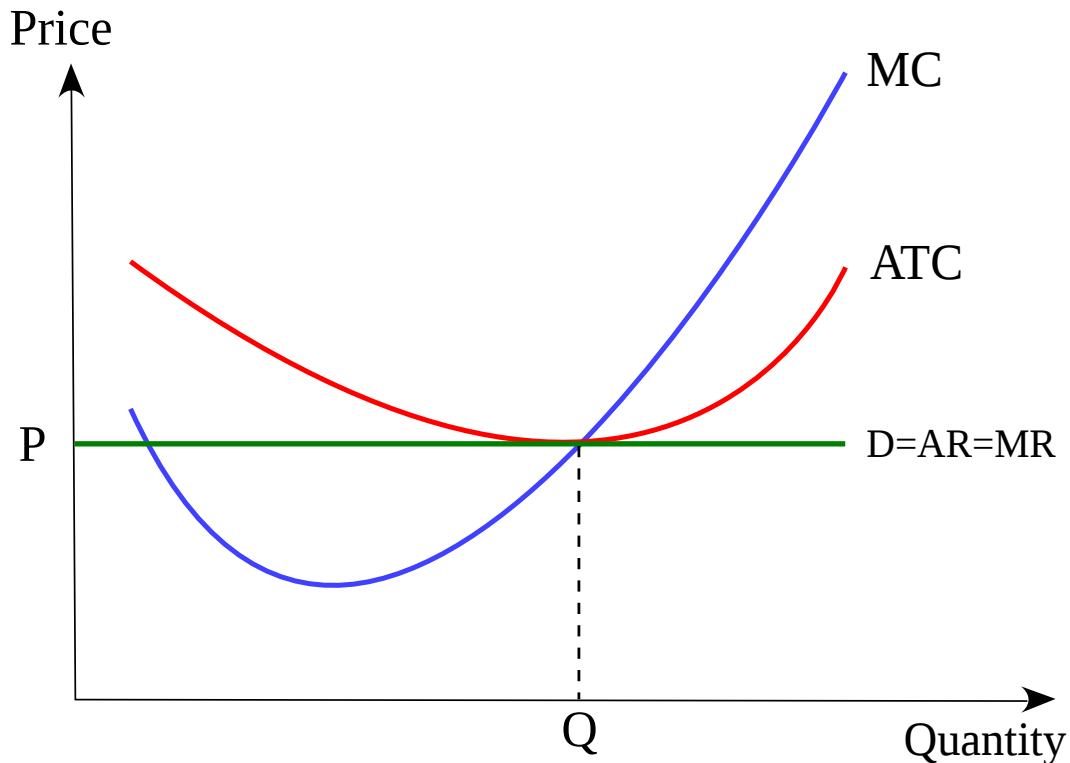
In traditional economics, the goal of a firm is to maximize their profits. This means they want to maximize the difference between their earnings, i.e. revenue, and their spending, i.e. costs. To find the profit maximizing point, firms look at marginal revenue (MR) - the total additional revenue from selling one additional unit of output - and the marginal cost (MC) - the total additional cost of producing one additional unit of output. When the marginal revenue of selling a good is greater than the marginal cost of producing it, firms are making a profit on that product. This leads directly into the marginal decision rule, which dictates that a given good should continue to be produced if the marginal revenue of one unit is greater than its marginal cost. Therefore, the maximizing solution involves setting marginal revenue equal to marginal cost.

This is relatively straightforward for firms in perfectly competitive markets, in which marginal revenue is the same as price. Monopoly production, however, is complicated by the fact that monopolies have demand curves and MR curves that are distinct, causing price to differ from marginal revenue.



## Monopoly

In a monopoly market, the marginal revenue curve and the demand curve are distinct and downward-sloping. Production occurs where marginal cost and marginal revenue intersect.



## Perfect Competition

In a perfectly competitive market, the marginal revenue curve is horizontal and equal to demand, or price. Production occurs where marginal cost and marginal revenue intersect.

## Monopoly Profit Maximization

The marginal cost curves faced by monopolies are similar to those faced by perfectly competitive firms. Most will have low marginal costs at low levels of production, reflecting the fact that firms can take advantage of efficiency opportunities as they begin to grow. Marginal costs get higher as output increases. For example, a pizza restaurant can easily double production from one pizza per hour to two without hiring additional employees or buying more sophisticated equipment. When production reaches 50 pizzas per hour, however, it may be difficult to grow without investing a lot of money in more skilled employees or more high-tech ovens. This trend is reflected in the upward-sloping portion of the marginal cost curve.

The marginal revenue curve for monopolies, however, is quite different than the marginal revenue curve for competitive firms. While competitive firms experience marginal revenue that is equal to price - represented graphically by a horizontal line - monopolies have downward-sloping marginal revenue curves that are different than the good's price.

### **11.3.3: Profit Maximization Function for Monopolies**

Monopolies set marginal cost equal to marginal revenue in order to maximize profit.

#### **Learning Objective**

Explain the monopolist's profit maximization function

#### **Key Points**

- The first-order condition for maximizing profits in a monopoly is  $0 = \partial q = p(q) + qp'(q) - c'(q)$ , where  $q$  = the profit-maximizing quantity.
- A monopoly's profits are represented by  $\pi = p(q)q - c(q)$ , where revenue =  $pq$  and cost =  $c$ .
- Monopolies have the ability to limit output, thus charging a higher price than would be possible in competitive markets.

#### **Key Terms**

deadweight loss

A loss of economic efficiency that can occur when an equilibrium is not Pareto optimal.

first-order condition

A mathematical relationship that is necessary for a quantity to be maximized or minimized.



Monopolies have much more power than firms normally would in competitive markets, but they still face limits determined by demand for a product. Higher prices (except under the most extreme conditions) mean lower sales. Therefore, monopolies must make a decision about where to set their price and the quantity of their supply to maximize profits. They can either choose their price, or they can choose the quantity that they will produce and allow market demand to set the price.

Since costs are a function of quantity, the formula for profit maximization is written in terms of quantity rather than in price. The monopoly's profits are given by the following equation:

$$\pi = p(q)q - c(q)$$

In this formula,  $p(q)$  is the price level at quantity  $q$ . The cost to the firm at quantity  $q$  is equal to  $c(q)$ . Profits are represented by  $\pi$ . Since revenue is represented by  $pq$  and cost is  $c$ , profit is the difference between these two numbers. As a result, the first-order condition for maximizing profits at quantity  $q$  is represented by:

$$0 = \frac{\partial \pi}{\partial q} = p(q) + qp'(q) - c'(q)$$

The above first-order condition must always be true if the firm is maximizing its profit - that is, if  $p(q) + qp'(q) - c'(q)$  is not equal to zero, then the firm can change its price or quantity and make more profit.

Marginal revenue is calculated by  $p(q) + qp'(q)$ , which is derived from the term for revenue,  $pq$ . The term  $c'(q)$  is marginal cost, which is the derivative of  $c(q)$ . Monopolies will produce at quantity  $q$  where marginal revenue equals marginal cost. Then they will charge the maximum price  $p(q)$  that market demand will respond to at that quantity.

Consider the example of a monopoly firm that can produce widgets at a cost given by the following function:

$$c(q) = 2 + 3q + q^2$$

If the firm produces two widgets, for example, the total cost is  $2+3(2)+2^2=12$ . The price of widgets is determined by demand:

$$p(q)=24-2q$$

When the firm produces two widgets it can charge a price of  $24-2(2)=20$  for each widget. The firm's profit, as shown above, is equal to the difference between the quantity produces multiplied by the price, and the total cost of production:  $p(q)q-c(q)$ . How can we maximize this function?

Using the first order condition, we know that when profit is maximized,  $0=p(q)+qp'(q)-c'(q)$ . In this case:

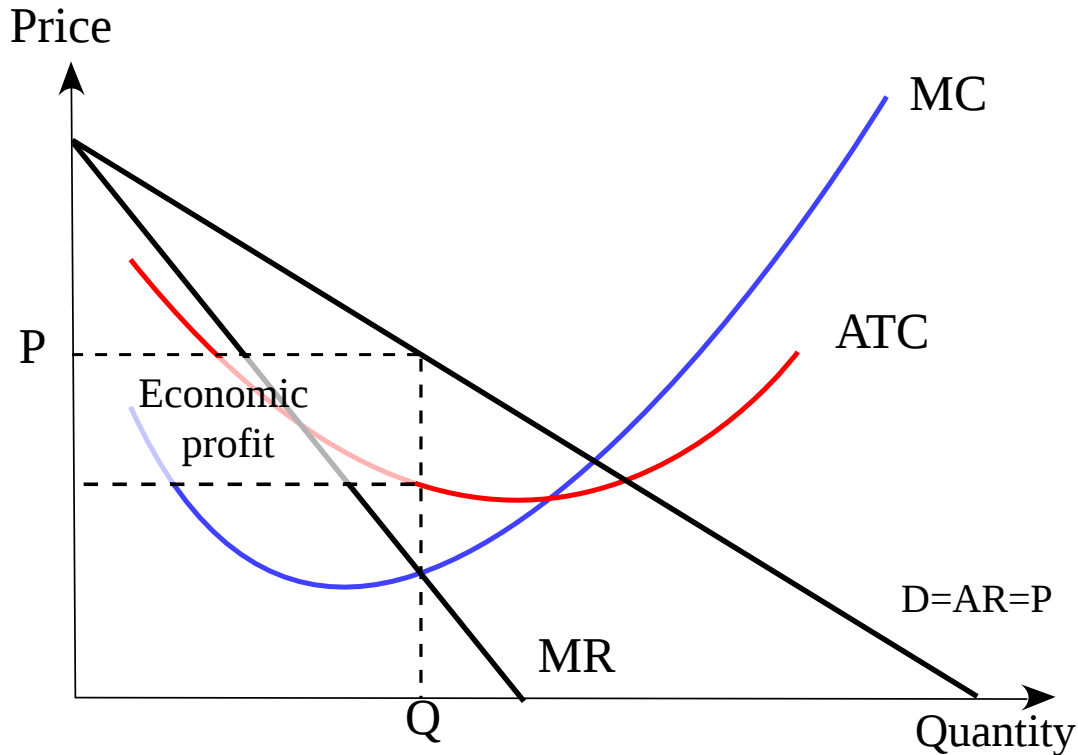
$$0=(24-2q)+q(-2)-(3+2q)=21-6q$$

Rearranging the equation shows that  $q=3.5$ . This is the profit maximizing quantity of production.

Consider the diagram illustrating monopoly competition . The key points of this diagram are fivefold.

1. First, marginal revenue lies below the demand curve. This occurs because marginal revenue is the demand,  $p(q)$ , plus a negative number.
2. Second, the monopoly quantity equates marginal revenue and marginal cost, but the monopoly price is higher than the marginal cost.
3. Third, there is a deadweight loss, for the same reason that taxes create a deadweight loss: The higher price of the monopoly prevents some units from being traded that are valued more highly than they cost.
4. Fourth, the monopoly profits from the increase in price, and the monopoly profit is illustrated.
5. Fifth, since—under competitive conditions—supply equals marginal cost, the intersection of marginal cost and demand corresponds to the competitive outcome.

We see that the monopoly restricts output and charges a higher price than would prevail under competition.



## Monopoly Diagram

This graph illustrates the price and quantity of the market equilibrium under a monopoly.

### 11.3.4: Monopoly Production Decision

To maximize output, monopolies produce the quantity at which marginal supply is equal to marginal cost.

#### Learning Objective

Explain how to identify the monopolist's production point

#### Key Points

- Unlike a competitive company, a monopoly can decrease production in order to charge a higher price.
- Because of this, rather than finding the point where the marginal cost curve intersects a horizontal marginal revenue curve (which is equivalent to good's price), we must find the point where the marginal cost curve intersect a downward-sloping marginal revenue curve.
- Monopolies have downward sloping demand curves and downward sloping marginal revenue curves that have the same y-intercept as demand but which are twice as steep.
- The shape of the curves shows that marginal revenue will always be below demand.

## Key Terms

### marginal cost

The increase in cost that accompanies a unit increase in output; the partial derivative of the cost function with respect to output. Additional cost associated with producing one more unit of output.

### marginal revenue

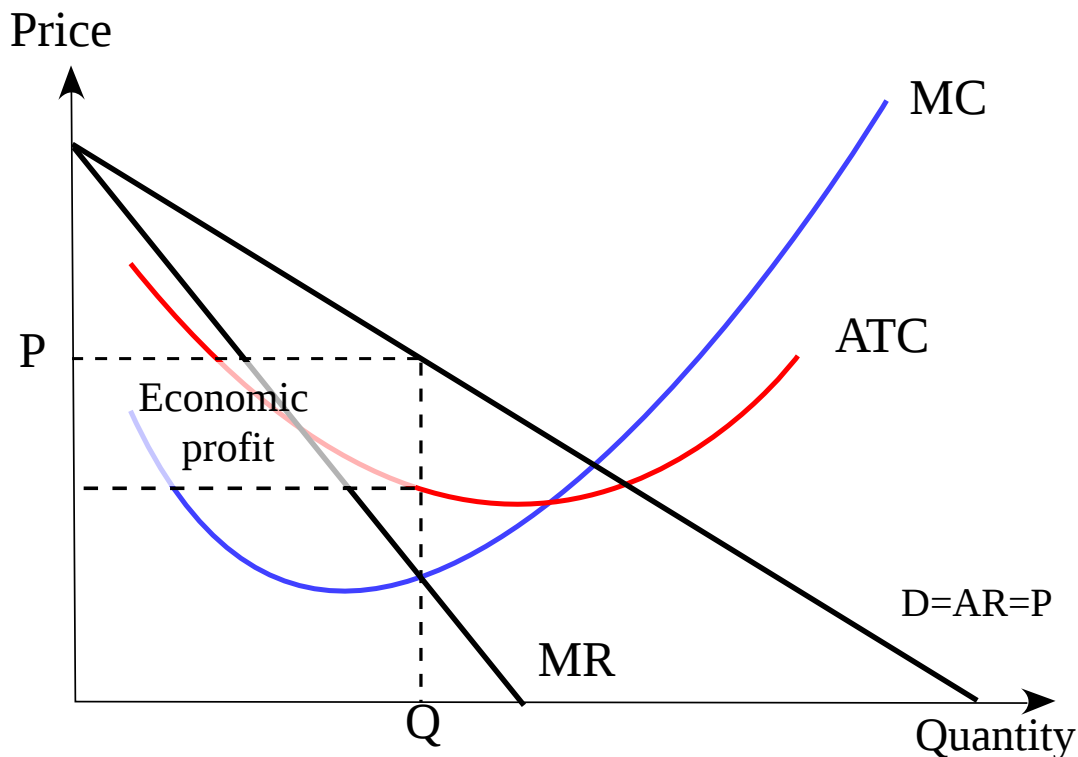
The additional profit that will be generated by increasing product sales by one unit.

## Monopoly Production

A pure monopoly has the same economic goal of perfectly competitive companies - to maximize profit. If we assume increasing marginal costs and exogenous input prices, the optimal decision for all firms is to equate the marginal cost and marginal revenue of production. Nonetheless, a pure monopoly can – unlike a firm in a competitive market – alter the market price for its own convenience: a decrease of production results in a higher price. Because of this, rather than finding the point where the marginal cost curve intersects a horizontal marginal revenue curve (which is equivalent to good's price), we must find the point where the marginal cost curve intersect a downward-sloping marginal revenue curve.

## Monopoly Production Point

Like non-monopolies, monopolists will produce the at the quantity such that marginal revenue (MR) equals marginal cost (MC). However, monopolists have the ability to change the market price based on the amount they produce since they are the only source of products in the market. When a monopolist produces the quantity determined by the intersection of MR and MC, it can charge the price determined by the market demand curve at the quantity. Therefore, monopolists produce less but charge more than a firm in a competitive market .



## Monopoly Production

Monopolies produce at the point where marginal revenue equals marginal costs, but charge the price expressed on the market demand curve for that quantity of production.

In short, three steps can determine a monopoly firm's profit-maximizing price and output:

1. Calculate and graph the firm's marginal revenue, marginal cost, and demand curves
2. Identify the point at which the marginal revenue and marginal cost curves intersect and determine the level of output at that point
3. Use the demand curve to find the price that can be charged at that level of output

### **11.3.5: Monopoly Price and Profit**

Monopolies can influence a good's price by changing output levels, which allows them to make an economic profit.

#### **Learning Objective**

Analyze the final price and resulting profit for a monopolist

#### **Key Points**

- Typically a monopoly selects a higher price and lesser quantity of output than a price-taking company.
- A monopoly, unlike a perfectly competitive firm, has the market all to itself and faces the downward-sloping market demand curve.
- Graphically, one can find a monopoly's price, output, and profit by examining the demand, marginal cost, and marginal revenue curves.

#### **Key Terms**

economic profit

The difference between the total revenue received by the firm from its sales and the total opportunity costs of all the resources used by the firm.

demand

The desire to purchase goods and services.

Monopolies, unlike perfectly competitive firms, are able to influence the price of a good and are able to make a positive economic profit. While a perfectly competitive firm faces a single market price, represented by a horizontal demand/marginal revenue curve, a monopoly has the market all to itself and faces the downward-sloping market demand curve. An important consequence is worth noticing: typically a monopoly selects a higher price and lesser quantity of output than a price-taking company; again, less is available at a higher price.

Imagine that the market demand for widgets is  $Q=30-2P$ . This says that when the price is one, the market will demand 28 widgets; when the price is two, the market will demand 26 widgets; and so on. The monopoly's total revenue is equal to the price of the widget multiplied by the quantity sold:  $P(30-2P)$ . This can also be rearranged so that it is written in terms of quantity: total revenue equals  $Q(30-Q)/2$ .

The firm can produce widgets at a total cost of  $2Q^2$ , that is, it can produce one widget for \$2, two widgets for \$8, three widgets for \$18, and so on. We know that all firms maximize profit by setting marginal costs equal to marginal revenue. Finding this point requires taking the derivative of total revenue and total cost in terms of quantity and setting the two derivatives equal to each other. In this case:

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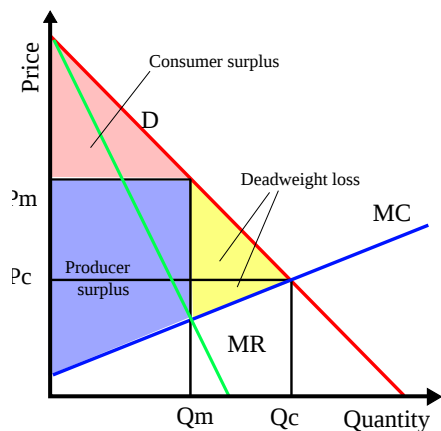
Setting these equal to each other:

So the profit maximizing point occurs when  $Q=3$ .

At this point, the price of widgets is \$13.50, the monopoly's total revenue is \$40.50, the total cost is \$18, and profit is \$22.50. For comparison, it is easy to see that if the firm produced two widgets price would be \$14 and profit would be \$20; if it produced four widgets price would be \$13 and profit

would again be \$20.  $Q=3$  must be the profit-maximizing output for the monopoly.

Graphically, one can find a monopoly's price, output, and profit by examining the demand, marginal cost, and marginal revenue curves. Again, the firm will always set output at a level at which marginal cost equals marginal revenue, so the quantity is found where these two curves intersect. Price, however, is determined by the demand for the good when that quantity is produced. Because a monopoly's marginal revenue is always below the demand curve, the price will always be above the marginal cost at equilibrium, providing the firm with an economic profit .



## Monopoly Pricing

Monopolies create prices that are higher, and output that is lower, than perfectly competitive firms. This causes economic inefficiency.

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# 11.4: Impacts of Monopoly on Efficiency

## 11.4.1: Reasons for Efficiency Loss

A monopoly generates less surplus and is less efficient than a competitive market, and therefore results in deadweight loss.

### Learning Objective

Evaluate the economic inefficiency created by monopolies

### Key Points

- The monopoly pricing creates a deadweight loss because the firm forgoes transactions with the consumers.
- Monopolies can become inefficient and less innovative over time because they do not have to compete with other producers in a marketplace.
- In the case of monopolies, abuse of power can lead to market failure. Market failure occurs when the price mechanism fails to take into account all of the costs and/or benefits of providing and consuming a good.
- A monopoly is an imperfect market that restricts output in an attempt to maximize profit. Without the presence of market competitors it can be challenging for a monopoly to self-regulate and remain competitive over time.

### Key Terms

monopoly

A market where one company is the sole supplier.

market failure

A concept within economic theory describing when the allocation of goods and services by a free market is not efficient.

inefficient

Incapable of, or indisposed to, effective action; habitually slack or remiss; effecting little or nothing; as, inefficient workers; an inefficient administrator.

## **Monopoly**

A monopoly exists when a specific enterprise is the only supplier of a particular commodity. Monopolies have little to no competition when producing a good or service. A monopoly is a business entity that has significant market power (the power to charge high prices).

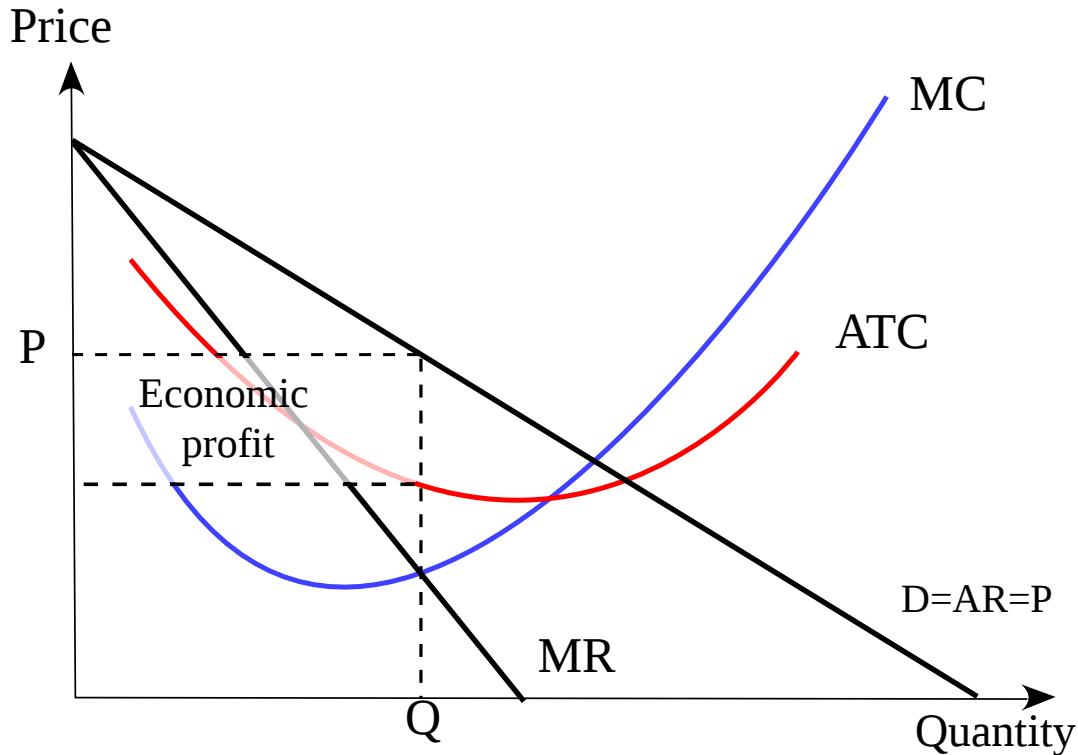
## **Inefficiency in a Monopoly**

In a monopoly, the firm will set a specific price for a good that is available to all consumers. The quantity of the good will be less and the price will be higher (this is what makes the good a commodity). The monopoly pricing creates a deadweight loss because the firm forgoes transactions with the consumers. The deadweight loss is the potential gains that did not go to the producer or the consumer. As a result of the deadweight loss, the combined surplus (wealth) of the monopoly and the consumers is less than that obtained by consumers in a competitive market. A monopoly is less efficient in total gains from trade than a competitive market.

Monopolies can become inefficient and less innovative over time because they do not have to compete with other producers in a marketplace. For private monopolies, complacency can create room for potential competitors to overcome entry barriers and enter the market. Also, long term substitutes in other markets can take control when a monopoly becomes inefficient.

# Market Failure

When a market fails to allocate its resources efficiently, market failure occurs. In the case of monopolies, abuse of power can lead to market failure. Market failure occurs when the price mechanism fails to take into account all of the costs and/or benefits of providing and consuming a good. As a result, the market fails to supply the socially optimal amount of the good. A monopoly is an imperfect market that restricts output in an attempt to maximize profit. Market failure in a monopoly can occur because not enough of the good is made available and/or the price of the good is too high. Without the presence of market competitors it can be challenging for a monopoly to self-regulate and remain competitive over time.



## Imperfect competition

This graph shows the short run equilibrium for a monopoly. The gray box illustrates the abnormal profit, although the firm could easily be losing money. A monopoly is an imperfect market that restricts the output in an attempt to maximize its profits.

### 11.4.2: Understanding and Finding the Deadweight Loss

In economics, deadweight loss is a loss of economic efficiency that occurs when equilibrium for a good or service is not Pareto optimal.

#### Learning Objective

Define deadweight loss, Explain how to determine the deadweight loss in a given market.

## Key Points

- When deadweight loss occurs, there is a loss in economic surplus within the market.
- Causes of deadweight loss include imperfect markets, externalities, taxes or subsidies, price ceilings, and price floors.
- In order to determine the deadweight loss in a market, the equation  $P=MC$  is used. The deadweight loss equals the change in price multiplied by the change in quantity demanded.

## Key Terms

equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

deadweight loss

A loss of economic efficiency that can occur when equilibrium for a good or service is not Pareto optimal.

## Deadweight Loss

In economics, deadweight loss is a loss of economic efficiency that occurs when equilibrium for a good or service is not Pareto optimal. When a good or service is not Pareto optimal, the economic efficiency is not at equilibrium. As a result, when resources are allocated, it is impossible to make any one individual better off without making at least one person worse off. When deadweight loss occurs, there is a loss in economic surplus within the market. Deadweight loss implies that the market is unable to naturally clear.

## Causes of Deadweight Loss

Deadweight loss is the result of a market that is unable to naturally clear, and is an indication, therefore, of market inefficiency. The supply and demand of a good or service are not at equilibrium. Causes of deadweight loss include:

- imperfect markets
- externalities
- taxes or subsidies
- price ceilings
- price floors

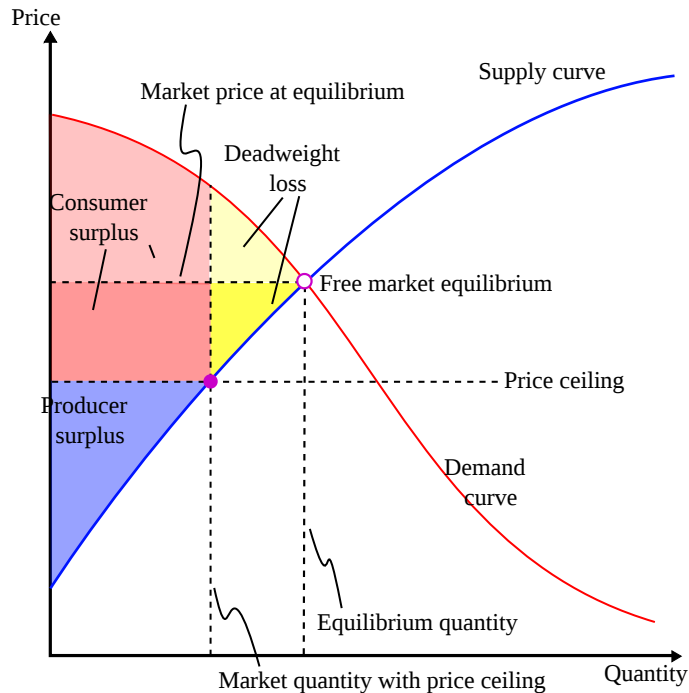
## Determining Deadweight Loss

In order to determine the deadweight loss in a market, the equation  $P=MC$  is used. The deadweight loss equals the change in price multiplied by the change in quantity demanded. This equation is used to determine the cause of inefficiency within a market.

For example, in a market for nails where the cost of each nail is \$0.10, the demand will decrease from a high demand for less expensive nails to zero demand for nails at \$1.10. In a perfectly competitive market, producers would charge \$0.10 per nail and every consumer whose marginal benefit exceeds the \$0.10 would have a nail. However, if one producer has a monopoly on nails they will charge whatever price will bring the largest profit. If they charge \$0.60 per nail, every party who has less than \$0.60 of marginal benefit will be excluded. When equilibrium is not achieved, parties who would have willingly entered the market are excluded due to the non-market price.

An example of deadweight loss due to taxation involves the price set on wine and beer. If a glass of wine is \$3 and a glass of beer is \$3, some consumers might prefer to drink wine. If the government decides to place a tax on wine at \$3 per glass, consumers might choose to drink the beer instead of the wine. At times, policy makers will place a binding constraint on items when they believe that the benefit from the transfer of surplus outweighs the adverse impact of deadweight loss .





## Deadweight loss

This graph shows the deadweight loss that is the result of a binding price ceiling. Policy makers will place a binding price ceiling when they believe that the benefit from the transfer of surplus outweighs the adverse impact of the deadweight loss.

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# 11.5: Price Discrimination

## 11.5.1: Elasticity Conditions for Price Discrimination

In a competitive market, price discrimination occurs when identical goods and services are sold at different prices by the same provider.

### Learning Objective

Examine the use of price discrimination in competitive markets

### Key Points

- In pure price discrimination, the seller will charge the buyer the absolute maximum price that he is willing to pay. Companies use price discrimination in order to make the most revenue possible from every customer.
- Price discrimination is used throughout industries and includes coupons, premium pricing, discounts based on occupation, retail incentives, gender based discounts, financial aid, and haggling.
- Industries known for using price discrimination to maximize revenue include airlines, pharmaceutical manufacturers, and textbook publishers.

### Key Terms

price discrimination

The practice of selling identical goods or services at different prices from the same provider.

revenue

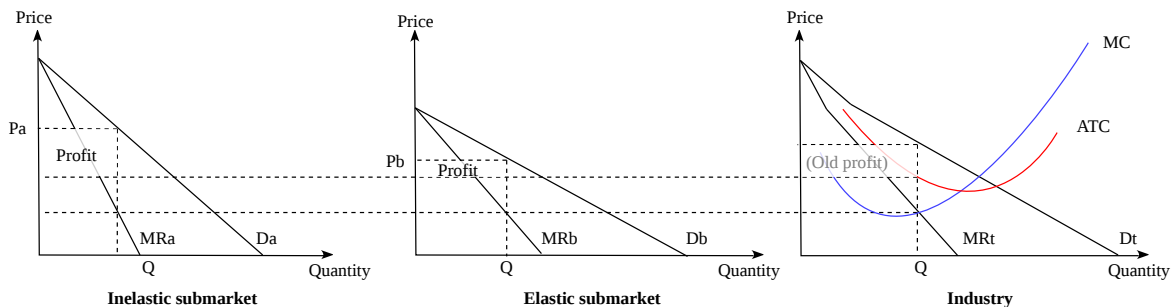
The total income received from a given source.

incentive

Something that motivates, rouses, or encourages.

## Price Discrimination

In a competitive market, price discrimination occurs when identical goods and services are sold at different prices by the same provider. In pure price discrimination, the seller will charge the buyer the absolute maximum price that he is willing to pay. Companies use price discrimination in order to make the most revenue possible from every customer. This allows the producer to capture more of the total surplus by selling to consumers at prices closer to their maximum willingness to pay.



## Price discrimination

A producer that can charge price  $P_a$  to its customers with inelastic demand and  $P_b$  to those with elastic demand can extract more total profit than if it had charged just one price.

An example of price discrimination would be the cost of movie tickets. Prices at one theater are different for children, adults, and seniors. The prices of each ticket can also vary based on the day and chosen show time. Ticket prices also vary depending on the portion of the country as well.

Industries use price discrimination as a way to increase revenue. It is possible for some industries to offer retailers different prices based solely on

the volume of products purchased. Price discrimination can also be based on age, location, desire for the product, and customer wage.

## **Forms of Price Discrimination**

There are a variety of ways in which industries legally use price discrimination. It is not important that pricing information be restricted, or that the price discriminated groups be unaware that others are being charged different prices:

- **Coupons:** coupons are used in retail as a way to distinguish customers by their reserve price. The assumption is that individuals who collect coupons are more sensitive to a higher price than those who don't. By offering coupons, a producer can charge a higher price to price-insensitive customers and provide a discount to price-sensitive individuals.
- **Premium pricing:** premium products are priced at a level that is well beyond their marginal cost. For example, a regular cup of coffee might be priced at \$1, while a premium coffee is \$2.50.
- **Discounts based on occupation:** many businesses offer reduced prices to active military members. This can increase sales to the target group and provide positive publicity for the business which leads to increased sales. Less publicized discounts are also offered to off duty service workers such as police.
- **Retail incentives:** retail incentives are used to increase market share or revenues. They include rebates, bulk and quantity pricing, seasonal discounts
- **Gender based discounts:** gender based discounts are offered in some countries including the United States. Examples include free drinks at bars for women on "Ladies Night," men often receive lower prices at the dry cleaners and hair salons than women because women clothes and hair generally take more time to work with. In contrast, men usually have higher car insurance rates than women based on the likelihood of being in an accident based on their age.
- **Financial aid:** financial aid is offered to college students based on either the student and/or the parents economic situation.

- **Haggling:** haggling is a form of price negotiation that requires knowledge and confidence from the customer.

## **Industries that Use Price Discrimination**

The airline industry uses price discrimination regularly when they sell travel tickets simultaneously to different market segments. Price discrimination is evident within individual airlines, but also in the industry as a whole. Tickets vary based on the location within the plane, the time and day of the flight, the time of year, and what city the aircraft is traveling to. Prices can vary greatly within an airline and also among airlines. Customers must search for the best priced ticket based on their needs. Airlines do offer other forms of price discrimination including discounts, vouchers, and member perks for individuals with membership cards.

The pharmaceutical industry experiences international price discrimination. Drug manufacturers charge more for drugs in wealthier countries than in poor ones. For example, the United States has the highest drug prices in the world. On average, Europeans pay 56% less than Americans do for the same prescription medications. However, in many countries with lower drug costs, the difference in price is absorbed into the taxes which results in lower average salaries when compared to those in the United States.

Academic textbooks are another industry known for price discrimination. Textbooks in the United States are more expensive than they are overseas. Because most of the textbooks are published in the United States, it is obvious that transportation costs do not raise the price of the books. In the United States price discrimination on textbooks is due to copyright protection laws. Also, in the United States textbooks are mandatory where as in other countries they are viewed as optional study aids.

### **11.5.2: Analysis of Price Discrimination**

Price discrimination is present in commerce when sellers adjust the price on the same product in order to make the most revenue possible.

#### **Learning Objective**

Analyze the use of price discrimination in commerce

## **Key Points**

- Three factors that must be met for price discrimination to occur: the firm must have market power, the firm must be able to recognize differences in demand, and the firm must have the ability to prevent arbitration, or resale of the product.
- First degree price discrimination - the monopoly seller of a good or service must know the absolute maximum price that every consumer is willing to pay.
- Second degree price discrimination - the price of a good or service varies according to the quantity demanded.
- Third degree price discrimination - the price varies according to consumer attributes such as age, sex, location, and economic status.
- Price discrimination is present throughout commerce. Examples include airline and travel costs, coupons, premium pricing, gender based pricing, and retail incentives.

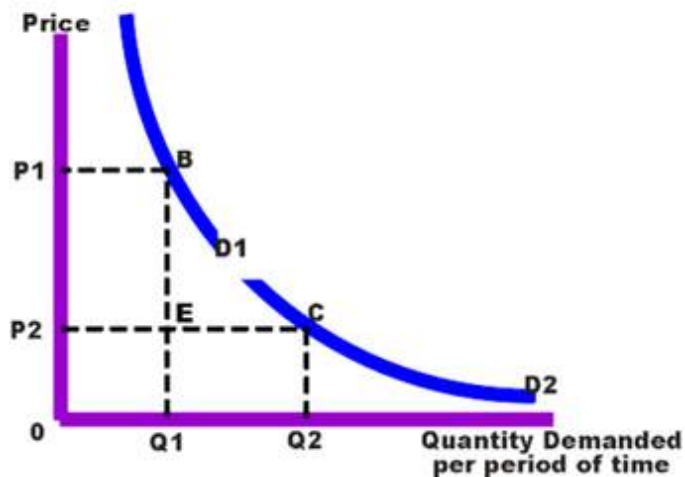
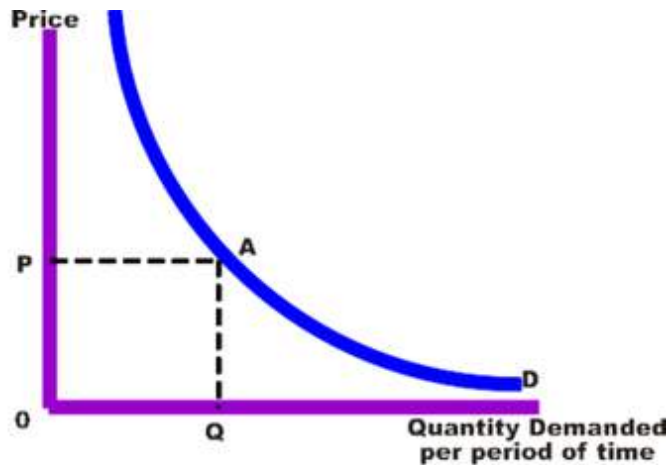
## **Key Term**

price discrimination

The practice of selling identical goods or services at different prices from the same provider.

## **Price Discrimination**

Price discrimination exists within a market when the sales of identical goods or services are sold at different prices by the same provider. The goal of price discrimination is for the seller to make the most profit possible . Although the cost of producing the products is the same, the seller has the ability to increase the price based on location, consumer financial status, product demand, etc.



## Sales Revenue

These graphs shows the difference in sales revenue with and without price discrimination. The intent of price discrimination is for the seller to make the most profit possible.

## Price Discrimination Criteria

Within commerce there are specific criteria that must be met in order for price discrimination to occur:

- The firm must have market power.
- The firm must be able to recognize differences in demand.



- The firm must have the ability to prevent arbitration, or resale of the product.

## **Types of Price Discrimination**

In commerce there are three types of price discrimination that exist. The exact price discrimination method that is used depends on the factors within the particular market.

- First degree price discrimination: the monopoly seller of a good or service must know the absolute maximum price that every consumer is willing to pay and can charge each customer that exact amount. This allows the seller to obtain the highest revenue possible.
- Second degree price discrimination: the price of a good or service varies according to the quantity demanded. Larger quantities are available at a lower price (higher discounts are given to consumers who buy a good in bulk quantities).
- Third degree price discrimination: the price varies according to consumer attributes such as age, sex, location, and economic status.

## **Examples of Price Discrimination**

Price discrimination is a driving force in commerce. It is evident throughout markets and generates the highest revenue possible by shifting the price of a product based on the consumer's willingness to pay, quantity demanded, and consumer attributes. Many examples of price discrimination are present throughout commerce including:

- Travel industry: airlines and other travel companies use price discrimination regularly in order to generate commerce. Prices vary according to seat selection, time of day, day of the week, time of year, and how close a purchase is made to the date of travel.
- Coupons: coupons are used in commerce to distinguish consumers by their reserve price. A manufacturer can charge a higher price for a product which most consumers will pay. Coupons attract sensitive consumers to the same product by offering a discount. By using price

discrimination, the seller makes more revenue, even off of the price sensitive consumers.

- Premium pricing: uses price discrimination to price products higher than the marginal cost of production. Regular coffee is priced at \$1 while premium coffee is \$2.50. The marginal cost of production is only \$0.90 and \$1.25. The difference in price results in increased revenue because consumers are willing to pay more for the specific product.
- Gender based prices: uses price discrimination based on gender. For example, bars that have Ladies Nights are price discriminating based on gender.
- Retail incentives: uses price discrimination to offer special discounts to consumers in order to increase revenue. Incentives include rebates, bulk pricing, seasonal discounts, and frequent buyer discounts.

### **11.5.3: Examples of Price Discrimination**

The purpose of price discrimination is to capture the market's consumer surplus and generate the most revenue possible for a good.

#### **Learning Objective**

Give examples of price discrimination in common industries

#### **Key Points**

- Price discrimination occurs when identical goods or services are sold at different prices from the same provider.
- Industries that commonly use price discrimination include the travel industry, pharmaceutical industry, and textbook publishers.
- Examples of forms of price discrimination include coupons, age discounts, occupational discounts, retail incentives, gender based pricing, financial aid, and haggling.

#### **Key Terms**

surplus

That which remains when use or need is satisfied, or when a limit is reached; excess; overplus.

price discrimination

The practice of selling identical goods or services at different prices from the same provider.

revenue

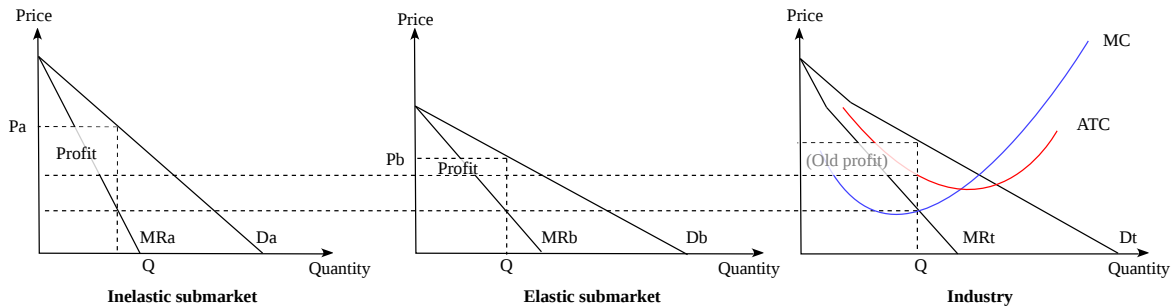
The total income received from a given source.

## **Price Discrimination**

Price discrimination occurs when identical goods or services are sold at different prices from the same provider. There are three types of price discrimination:

- First degree - the seller must know the absolute maximum price that every consumer is willing to pay.
- Second degree - the price of the good or service varies according to quantity demanded.
- Third degree - the price of the good or service varies by attributes such as location, age, sex, and economic status.

The purpose of price discrimination is to capture the market's consumer surplus. Price discrimination allows the seller to generate the most revenue possible for a good or service .



## Price discrimination

These graphs show multiple market price discrimination. Instead of supplying one price and taking the profit (labelled "(old profit)"), the total market is broken down into two sub-markets, and these are priced separately to maximize profit. The graph shows how a seller wants to generate the most revenue possible for a good or service. The elasticity of a market influences the profit.

## Examples of Price Discrimination

There are industries that conduct a substantial portion of their business using price discrimination:

- **Travel industry:** airlines and other travel companies use differentiated pricing often. Travel products and services are marketed to specific social segments. Airlines usually assign specific capacity to various booking classes. Also, prices fluctuate based on time of travel (time of day, day of the week, time of year). Prices fluctuate between companies as well as within each company.
- **Pharmaceutical industry:** price discrimination is common in the pharmaceutical industry. Drug-makers charge more for drugs in wealthier countries. For example, drug prices in the United States are some of the highest in the world. Europeans, on average, pay only 56% of what Americans pay for the same prescription drugs.
- **Textbooks (physical ones, not your Boundless book! ):** price discrimination is also prevalent within the publishing industry. Textbooks are much higher in the United States despite the fact that they are produced in the country. Copyright protection laws increase the

price of textbooks. Also, textbooks are mandatory in the United States while schools in other countries see them as study aids.

Price discrimination is prevalent in varying degrees throughout most markets. Methods of price discrimination include:

- **Coupons:** coupons are used to distinguish consumers by their reserve price. Companies increase the price of a good and individuals who are not price sensitive will pay the higher price. Coupons allow price sensitive consumers to receive a discount. At the same time the seller is still making increased revenue.
- **Age discounts:** age discounts are a form of price discrimination where the price of a good or admission to an event is based on age. Age discounts are usually broken down by child, student, adult, and senior. In some cases, children under a certain age are given free admission or eat for free. Examples of places where age discounts are given include restaurants, movies, and other forms of entertainment.
- **Occupational discounts:** price discrimination is present when individuals receive certain discounts based on their occupation. An example is when active military members receive discounts.
- **Retail incentives:** this includes rebates, discount coupons, bulk and quantity pricing, seasonal discounts, and frequent buyer discounts.
- **Gender based prices:** in certain markets prices are set based on gender. For example, a Ladies Night at a bar is a form of price discrimination.

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# 11.6: Monopoly in Public Policy

## 11.6.1: Social Impacts of Monopoly

A monopoly can diminish consumer choice, reduce incentives to innovate, and control supply to enforce inequitable prices in a society.

### Learning Objective

Outline the effect of a monopoly on producer, consumer, and total surplus

### Key Points

- In a perfectly competitive market, the antithesis of a monopoly, demand is completely elastic and the production quantity and price point align perfectly with marginal costs and actual costs.
- Perfect competition is a theoretical competitive framework. However, markets will naturally deviate to varying degrees (in order to capture profitable returns). As such, the perfect competition model is most useful in identifying and measuring deviations or departures from the competitive ideal.
- The accumulation of power and leverage on behalf of the suppliers largely revolves around the fact that monopolies can ultimately control supply in its entirety for a specified product or service.
- A monopoly with total control over the supply can charge any price that the consumer is willing to pay, and therefore can generate excessive margins while doing very little to improve their product/service or relevant processes.

### Key Term

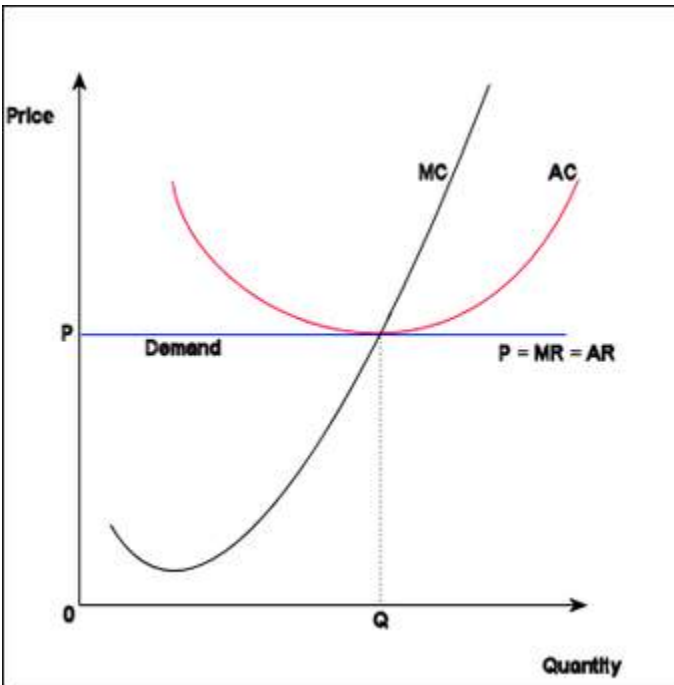
price discrimination



The practice of selling identical goods or services at different prices from the same provider.

## **The Value of Competition**

To understand why trends towards consolidation are so dangerous it is useful to frame why competition is of such critical value to equitable markets, particular from a consumer perspective. In a perfectly competitive market, the antithesis of a monopoly, demand is completely elastic and the production quantity and price point align perfectly with marginal costs and actual costs . This allows for revenues, costs, price, and quantity to achieve a balance where the consumer is provided with the optimal amount of a good at the most equitable price.



## Perfect Competition Economics

This is a graphical illustration of economics within the context of a perfectly competitive market (theoretically). Note that the overall returns derived, costs incurred, quantity produced, and price point all align perfectly to generate an equitable market position. While this is an idealistic representation of markets, it is useful as a frame of reference to identify departures from ideal competitive circumstances.

However, perfect competition is more of a theoretical competitive framework because markets will naturally deviate to varying degrees (in order to capture profitable returns). As such, the perfect competition model is most useful in identifying and measuring deviations or departures from the competitive ideal. The farther an industry or market moves from a perfectly competitive model the more value is potentially migrating from the consumers to the suppliers. In order to ensure that suppliers do not take on too much power (such as the case of monopolies and oligopolies), government regulations and antitrust laws are a necessary component of the economic perspective.

# Societal Risks of Monopolies

The accumulation of power and leverage on behalf of the suppliers largely revolves around the fact that monopolies can ultimately control supply in its entirety for a specified product or service. Through utilizing this control strategically, a profit-maximizing monopoly could create the following societal risks:

- **Price Discrimination:** This concept is often strongly emphasized as a potential economic risk of monopolies and the economic justification is easily illustrated. Picture a supply and demand chart, where supply and demand intersect to generate a fair price point and overall quantity provided. Now assume one company has the entire supply under its control, and can discriminate prices along the demand curve to capture higher prices than the available supply should allow. This allows monopolies to charge customers with a higher willingness to pay a higher price, while still charging consumers with a lower willingness to pay the standard prices. This is unfair to consumers, who will be forced to pay whatever is asked as a result of no alternative options.
- **Reduced Efficiency:** A less direct societal risk of monopolies is the fact that competition is closely linked to incentives. As a result, no competition will provide the monopoly very little reason to improve internal inefficiencies or cut costs. A competitive market will see constant strives to reduce costs in order to capture higher market share and provide goods at lower prices, while monopolies do not have this incentive.
- **Reduced Innovation:** A monopoly will also have limited motivation to innovate, as there is little value in differentiation in a thoroughly controlled market (for the only incumbent). As a result there is reduced improvements that could substantially improve the ability of the firm to fulfill the needs of the consumer.
- **Deadweight Loss:** A monopoly will choose to produce less and charge more than would occur in a perfectly competitive market. As a result, a monopoly causes deadweight loss, an inefficient economic outcome.

In summarizing these various societal drawbacks, monopolies pose the risk of reducing consumer choice and consumer power to incentivize companies

to innovate and reduce costs, as there is limited prospective returns on investment. A monopoly with total control over the supply can charge any price that the consumer is willing to pay, and therefore can generate excessive margins while doing very little to improve their product/service or relevant processes.

## **11.6.2: Antitrust Laws**

Antitrust laws ensure that competitive environments are preserved in order to maintain an efficient and equitable capitalistic system.

### **Learning Objective**

Discuss antitrust laws aimed to improve competition and prevent monopolies from becoming more powerful

### **Key Points**

- The concept of antitrust largely revolves around governmental restrictions that limit incumbents in any given industry from consolidating too much power.
- Organizations such as the World Trade Organization (WTO) attempt to garner international support for the establishment of global standards in competitive markets in conjunction with the internal competitive laws which govern each nation individually.
- In the U.S., antitrust policy finds its roots in 1890 with the Sherman Antitrust Act, and saw substantial expansion in 1914 via the Clayton Antitrust Act and the Federal Trade Commission Act.
- As capitalistic markets evolve they show some tendency towards consolidation, and this consolidation puts consumers at risk of hugely powerful corporate suppliers. Antitrust policy is designed to intervene on behalf of the consumer.
- As capitalistic markets evolve they show some tendency towards consolidation, and this consolidation puts consumers at risk of hugely powerful corporate suppliers. Antitrust policy is designed to intervene on behalf of the consumer.

## **Key Terms**

### Antitrust

A law opposed to or against the establishment or existence of trusts (monopolies), usually referring to legislation.

### monopoly

A situation, by legal privilege or other agreement, in which solely one party (company, cartel etc. ) exclusively provides a particular product or service, dominating that market and generally exerting powerful control over it.

### consolidation

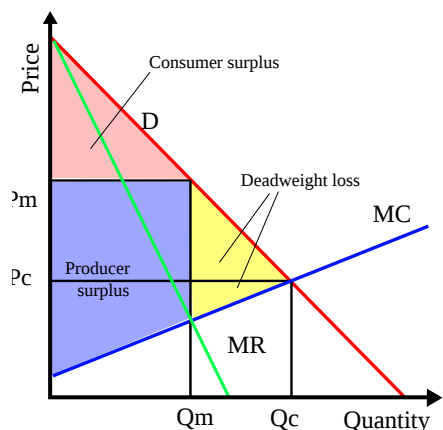
The combination of multiple businesses.

## **Example**

- There are a wide range of real-life examples of monopolies, though few more famous than Microsoft. Microsoft, through the effective strategic design and sale of their operating platform, attained a monopolistic hold on the computer industry. While 2001 marks the date Microsoft officially began dismantling their competitive monopoly on the market, the trial itself began in 1998 and the governmental investigations began as early as 1991. This process, though long and arduous, was enabled by the Sherman Act and Federal Trade Commission Act and substantially improved the competitive nature of the computer industry.

Antitrust laws perform the critical task of ensuring that competitive environments are preserved in order to maintain an efficient and equitable capitalistic system for firms to operate in. The concept of antitrust largely revolves around governmental restrictions that limit incumbents in any given industry from consolidating too much power.

The worst case scenario of consolidation results in a monopoly, which is when one company or organization becomes the sole supplier of a given product or service. In such a situation it is relatively easy for that provider to erect barriers to entry for new entrants and dictate price points through manipulating the supply. The adverse effects of these manipulations can be seen in , which underlines the economic threat monopolies pose the end consumer. Antitrust law is in place to ensure such circumstances do not arise, or when they do that they are regulated appropriate to minimize adverse societal effects.



## Monopolistic Effects on Price

This graph illustrates the way in which monopolistic incumbents can control economic factors, ultimately creating surpluses or shortages to garner advantage.

## Regulating Competition

The regulation of competitive markets has roots as far back as the Roman Empire, resulting in increasingly complex models as capitalism has evolved over time. Indeed, due to the increasingly international focus for many large corporations, antitrust laws and other competitive regulations must function not only at the country level but on a global level. Organizations such as the World Trade Organization (WTO) attempt to garner international support for the establishment of global standards in competitive markets in conjunction with the internal competitive laws which govern each nation

individually. While these antitrust laws differ from nation to nation, they can loosely be summarized in three components:

- Actively ensuring that no agreements in place are counter to a competitive market. This revolves largely around avoiding cartels, or collaboration between the big players which would allow for market manipulation.
- Regulating against strategic actions that may result in diminishing the competitive elements of a market. This is usually targeted at dominant players in an industry, who may have a tendency to price gauge or other manipulations.
- Overseeing mergers, acquisitions, joint ventures and other strategic alliances to avoid consolidation that may be damaging to free markets.

## **Relevant Statutes**

*European Union (EU)* - In the EU, competition law began in 1951 with the European Coal and Steel Community (ECSC), which included France, Italy, Belgium and the Netherlands. The purpose of this was to reduce the ability for one country/region to gain a monopoly on critical natural resources. Shortly after, in 1957, the European Economic Community (ECC) was established as a part of the Treaty of Rome. This document enacted provisions to eliminate anti-competitive agreements. This was more recently updated via the Treaty of Lisbon, which further addresses mergers and acquisitions and bans price fixing and collusion.

*United States (U.S.)* - In the U.S., antitrust policy finds its roots in 1890 with the Sherman Antitrust Act. While the basic premise was the same as modern day competitive law, it was fairly rudimentary in scale and scope. The Sherman Act dealt with avoiding or limiting the power of trusts, or essentially the creation of price-controlling cartels. This act was expanded upon in 1914, with two more competitive laws: The Clayton Antitrust Act and the Federal Trade Commission Act. Both of these acts sought to organize a governmental body equipped to protect consumers from unfair competitive practices.

## 11.6.3: Regulation of Natural Monopoly

Natural monopolies are conducive to industries where the largest supplier derives cost advantages and must be regulated to minimize risks.

### Learning Objective

Discuss the reasons for government regulation of monopolies

### Key Points

- A natural monopoly is defined by an incumbent in an industry where the largest supplier can theoretically create the lowest production prices, generally through economies of scale or economies of scope.
- Natural monopolistic conditions are therefore at high risk of creating actual monopolies, and society benefits from regulating these situations to even the playing field.
- Regulating industries to minimize monopolization and maintain competitive equality can be pursued through average cost pricing, price ceilings, rate of return regulations, taxes and subsidies.
- While the concept of a monopoly is generally perceived as a threat to free markets, there are specific circumstances where natural monopolies are either pragmatically useful (cost effective) or virtually unavoidable.

### Key Terms

economies of scale

The characteristics of a production process in which an increase in the scale of the firm causes a decrease in the long run average cost of each unit.

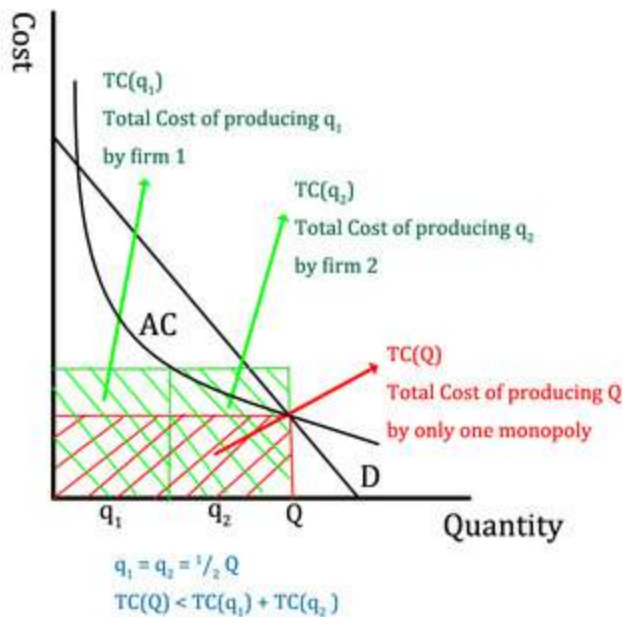
subsidy

Government assistance to a business or economic sector.



A monopoly is a business or organization that maintains exclusivity of the supply of a particular product or service, and can evolve naturally or be designed specifically based on the nature of a particular market or industry. Monopolies on the whole are governed under antitrust laws, both on a national level in most countries and on an international level via institutions such as the World Trade Organization (WTO).

The evolution of a monopoly is a critical component in recognizing which industries are at high risk of monopolization, and how these risks may be realized operationally. A natural monopoly is defined by an incumbent in an industry where the largest supplier can theoretically create the lowest production prices, generally through economies of scale or economies of scope . In this type of circumstance, the industry naturally lends itself to providing advantages for the single largest provider at the cost of allowing for competitive forces. Natural monopolistic conditions are therefore at high risk of creating actual monopolies, and society benefits from regulating these situations to even the playing field.



## Price Advantage for Natural Monopolies

While monopolies are generally poor economic constructs for creating value, natural monopolies are predicated on the fact that a single supplier can achieve the greatest economies of scale (cost advantages). This graph demonstrates this concept.

## Regulating Natural Monopolies

The consolidation of an industry into one sole supplier can represent a substantial threat to free markets and their consumers, as price can be easily manipulated through a thorough control of the supply. As a result, monopolies are generally viewed as illegal entities. Regulating industries to minimize monopolization and maintain competitive equality can be pursued in a number of ways:

- **Average cost pricing:** As the name implies, this regulatory approach is defined as enforcing a price point for a given product or service that matches the overall costs incurred by the company producing or providing. This reduces the pricing flexibility of a company and

ensures that the monopoly cannot capture margins above and beyond what is reasonable.

- **Price ceiling:** Another way a natural monopoly may be regulated is through the enforcement of a maximum potential price being charged. A price ceiling is a regulatory strategy of stating a specific product or service cannot be sold for above a certain price.
- **Rate of return regulations:** This is quite similar to average cost pricing, but deviates via allowing a model that can create consistent returns for the company involved. The percentage net profit brought in by a company must be below a government specified percentage to insure compliance with this regulatory approach (i.e. 5%).
- **Tax or subsidy:** The last way a governmental body can alleviate a natural monopoly is through higher taxes on larger players or subsidies for smaller players. In short, the government can provide financial support via subsidies to new entrants to ensure the competitive environment is more equitable.

As with most regulatory approaches, none of these are perfect solutions and consolidation within industries conducive to a natural monopoly will continue to arise. Antitrust laws and the careful control of mergers, acquisitions, joint ventures, and other strategic alliances are critical in the regulation of natural monopolies. In extreme circumstances it is also a viable option for governments to break up monopolies through the legal processes.

## **When A Monopoly Works**

While the concept of a monopoly is generally perceived as a threat to free markets, there are specific circumstances where natural monopolies are either pragmatically useful (cost effective) or virtually unavoidable. In these circumstances the regulatory approaches above (price ceilings, average cost pricing, etc.) are even more critical to ensuring consumers are protected. AT&T is a classic example of a government-backed monopoly in the middle of the 20th century, as the fixed investment of land lines for phones at that time was substantial. It was not practical to foster competition as a result, and the government recognized the necessity for a monopoly (until 1984, when AT&T was divested).

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# **12: Monopolistic Competition**

# 12.1: Monopolistic Competition

## 12.1.1: Defining Monopolistic Competition

Monopolistic competition is a type of imperfect competition such that many producers sell products that are differentiated from one another.

### Learning Objective

Evaluate the characteristics and outcomes of markets with imperfect competition

### Key Points

- Monopolistic competition is different from a monopoly. A monopoly exists when a person or entity is the exclusive supplier of a good or service in a market.
- Markets that have monopolistic competition are inefficient for two reasons. First, at its optimum output the firm charges a price that exceeds marginal costs. The second source of inefficiency is the fact that these firms operate with excess capacity.
- Monopolistic competitive markets have highly differentiated products; have many firms providing the good or service; firms can freely enter and exits in the long-run; firms can make decisions independently; there is some degree of market power; and buyers and sellers have imperfect information.

### Key Terms

monopoly

A market where one company is the sole supplier.

Monopolistic competition

A type of imperfect competition such that one or two producers sell products that are differentiated from one another as goods but not perfect substitutes (such as from branding, quality, or location).

## **Monopolistic Competition**

Monopolistic competition is a type of imperfect competition such that many producers sell products that are differentiated from one another as goods but not perfect substitutes (such as from branding, quality, or location). In monopolistic competition, a firm takes the prices charged by its rivals as given and ignores the impact of its own prices on the prices of other firms.

Unlike in perfect competition, firms that are monopolistically competitive maintain spare capacity. Models of monopolistic competition are often used to model industries. Textbook examples of industries with market structures similar to monopolistic competition include restaurants, cereal, clothing, shoes, and service industries in large cities .



## **Clothing**

The clothing industry is monopolistically competitive because firms have differentiated products and market power.



Monopolistic competition is different from a monopoly. A monopoly exists when a person or entity is the exclusive supplier of a good or service in a market. The demand is inelastic and the market is inefficient.

Monopolistic competitive markets:

- have products that are highly differentiated, meaning that there is a perception that the goods are different for reasons other than price;
- have many firms providing the good or service;
- firms can freely enter and exits in the long-run;
- firms can make decisions independently;
- there is some degree of market power, meaning producers have some control over price; and
- buyers and sellers have imperfect information.

## **Sources of Market Inefficiency**

Markets that have monopolistic competition are inefficient for two reasons. The first source of inefficiency is due to the fact that at its optimum output, the firm charges a price that exceeds marginal costs. The monopolistic competitive firm maximizes profits where marginal revenue equals marginal cost. A monopolistic competitive firm's demand curve is downward sloping, which means it will charge a price that exceeds marginal costs. The market power possessed by a monopolistic competitive firm means that at its profit maximizing level of production there will be a net loss of consumer and producer surplus.

The second source of inefficiency is the fact that these firms operate with excess capacity. The firm's profit maximizing output is less than the output associated with minimum average cost. All firms, regardless of the type of market it operates in, will produce to a point where demand or price equals average cost. In a perfectly competitive market, this occurs where the perfectly elastic demand curve equals minimum average cost. In a monopolistic competitive market, the demand curve is downward sloping. In the long run, this leads to excess capacity.

### **12.1.2: Product Differentiation**

Product differentiation is the process of distinguishing a product or service from others to make it more attractive to a target market.

## **Learning Objective**

Define product differentiation

## **Key Points**

- Differentiation occurs because buyers perceive a difference between products. Causes of differentiation include functional aspects of the product or service, how it is distributed and marketed, and who buys it.
- Differentiation affects performance primarily by reducing direct competition. As the product becomes more different, categorization becomes more difficult, and the product draws fewer comparisons with its competition.
- There are three types of product differentiation: simple, horizontal, and vertical.

## **Key Term**

product differentiation

Perceived differences between the product of one firm and that of its rivals so that some customers value it more.

One of the defining traits of a monopolistically competitive market is that there is a significant amount of non-price competition. This means that product differentiation is key for any monopolistically competitive firm. Product differentiation is the process of distinguishing a product or service from others to make it more attractive to a target market .



## **Kool-Aid**

Kool-Aid is an individual brand that competes with Kraft's other brand (Tang).

Although research in a niche market may result in changing a product in order to improve differentiation, the changes themselves are not differentiation. Marketing or product differentiation is the process of describing the differences between products or services, or the resulting list of differences; differentiation is not the process of creating the differences between the products. Product differentiation is done in order to demonstrate the unique aspects of a firm's product and to create a sense of value.

In economics, successful product differentiation is inconsistent with the conditions of perfect competition, which require products of competing firms to be perfect substitutes.

Consumers do not need to know everything about the product for differentiation to work. So long as the consumers perceive that there is a difference in the products, they do not need to know how or why one product might be of higher quality than another. For example, a generic brand of cereal might be exactly the same as a brand name in terms of

quality. However, consumers might be willing to pay more for the brand name despite the fact that they cannot identify why the more expensive cereal is of higher "quality. "

There are three types of product differentiation:

- Simple: the products are differentiated based on a variety of characteristics;
- Horizontal: the products are differentiated based on a single characteristic, but consumers are not clear on which product is of higher quality; and
- Vertical: the products are differentiated based on a single characteristic and consumers are clear on which product is of higher quality.

Differentiation occurs because buyers perceive a difference. Drivers of differentiation include functional aspects of the product or service, how it is distributed and marketed, and who buys it. The major sources of product differentiation are as follows:

- Differences in quality, which are usually accompanied by differences in price;
- Differences in functional features or design;
- Ignorance of buyers regarding the essential characteristics and qualities of goods they are purchasing;
- Sales promotion activities of sellers, particularly advertising; and
- Differences in availability (e.g. timing and location).

The objective of differentiation is to develop a position that potential customers see as unique. Differentiation affects performance primarily by reducing direct competition. As the product becomes more different, categorization becomes more difficult, and the product draws fewer comparisons with its competition. A successful product differentiation strategy will move the product from competing on price to competing on non-price factors.

### **12.1.3: Demand Curve**

The demand curve in a monopolistic competitive market slopes downward, which has several important implications for firms in this market.

## **Learning Objective**

Explain how the shape of the demand curve affects the firms that exist in a market with monopolistic competition

## **Key Points**

- The downward slope of a monopolistically competitive demand curve signifies that the firms in this industry have market power.
- Market power allows firms to increase their prices without losing all of their customers.
- The downward slope of the demand curve contributes to the inefficiency of the market, leading to a loss in consumer surplus, deadweight loss, and excess production capacity.

## **Key Terms**

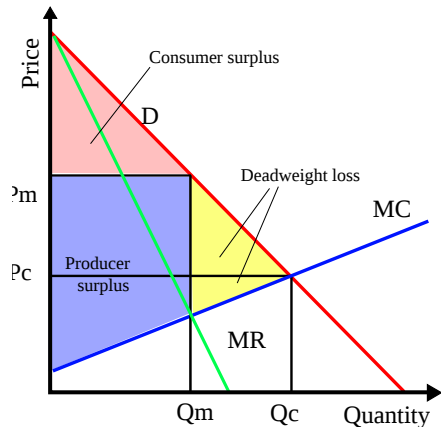
market power

The ability of a firm to profitably raise the market price of a good or service over marginal cost. A firm with total market power can raise prices without losing any customers to competitors.

elastic

Sensitive to changes in price.

The demand curve of a monopolistic competitive market slopes downward. This means that as price decreases, the quantity demanded for that good increases. While this appears to be relatively straightforward, the shape of the demand curve has several important implications for firms in a monopolistic competitive market.



## Monopolistic Competition

As you can see from this chart, the demand curve (marked in red) slopes downward, signifying elastic demand.

## Market Power

The demand curve for an individual firm is downward sloping in monopolistic competition, in contrast to perfect competition where the firm's individual demand curve is perfectly elastic. This is due to the fact that firms have market power: they can raise prices without losing all of their customers. In this type of market, these firms have a limited ability to dictate the price of its products; a firm is a price setter not a price taker (at least to some degree). The source of the market power is that there are comparatively fewer competitors than in a competitive market, so businesses focus on product differentiation, or differences unrelated to price. By differentiating its products, firms in a monopolistically competitive market ensure that its products are imperfect substitutes for each other. As a result, a business that works on its branding can increase its prices without risking its consumer base.

## Inefficiency in the Market

Monopolistically competitive firms maximize their profit when they produce at a level where its marginal costs equals its marginal revenues.

Because the individual firm's demand curve is downward sloping, reflecting market power, the price these firms will charge will exceed their marginal costs. Due to how products are priced in this market, consumer surplus decreases below the pareto optimal levels you would find in a perfectly competitive market, at least in the short run. As a result, the market will suffer deadweight loss. The suppliers in this market will also have excess production capacity.

## **12.1.4: Short Run Outcome of Monopolistic Competition**

Monopolistic competitive markets can lead to significant profits in the short-run, but are inefficient.

### **Learning Objective**

Examine the concept of the short run and how it applies to firms in a monopolistic competition

### **Key Points**

- The "short run" is the time period when one factor of production is fixed in terms of costs, while the other elements of production are variable.
- Like monopolies, the suppliers in monopolistic competitive markets are price makers and will behave similarly in the short-run.
- Also like a monopoly, a monopolastic competitive firm will maximize its profits when its marginal revenues equals its marginal costs.

### **Key Term**

short-run

The conceptual time period in which at least one factor of production is fixed in amount and others are variable in amount.

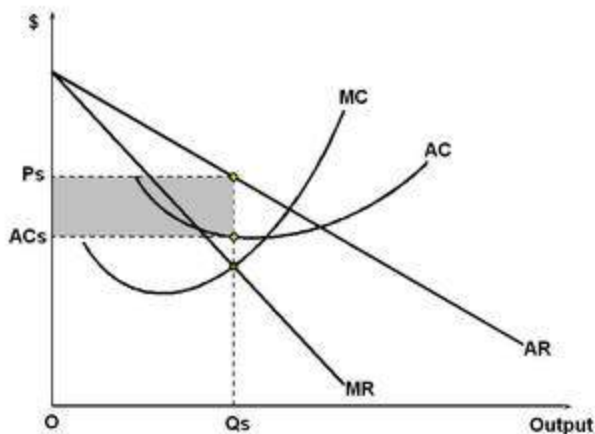
In terms of production and supply, the "short run" is the time period when one factor of production is fixed in terms of costs while the other elements of production are variable. The most common example of this is the production of a good that requires a factory. If demand spikes, in the short run you will only be able to produce the amount of good that the capacity of the factory allows. This is because it takes a significant amount of time to either build or acquire a new factory. If demand for the good plummets you can cut production in the factory, but will still have to pay the costs of maintaining the factory and the associated rent or debt associated with acquiring the factory. You could sell the factory, but again that would take a significant amount of time. The "short run" is defined by how long it would take to alter that "fixed" aspect of production.

In the short run, a monopolistically competitive market is inefficient. It does not achieve allocative nor productive efficiency. Also, since a monopolistic competitive firm has powers over the market that are similar to a monopoly, its profit maximizing level of production will result in a net loss of consumer and producer surplus, creating deadweight loss.

## **Setting a Price and Determining Profit**

Like monopolies, the suppliers in monopolistic competitive markets are price makers and will behave similarly in the short-run. Also like a monopoly, a monopolistic competitive firm will maximize its profits by producing goods to the point where its marginal revenues equals its marginal costs. The profit maximizing price of the good will be determined based on where the profit-maximizing quantity amount falls on the average revenue curve. The profit the firm makes is the the amount of the good produced multiplied by the difference between the price minus the average cost of producing the good. .





## Short Run Equilibrium Under Monopolistic Competition.

As you can see from the chart, the firm will produce the quantity ( $Q_s$ ) where the marginal cost (MC) curve intersects with the marginal revenue (MR) curve. The price is set based on where the  $Q_s$  falls on the average revenue (AR) curve. The profit the firm makes in the short term is represented by the grey rectangle, or the quantity produced multiplied by the difference between the price and the average cost of producing the good.

Since monopolistically competitive firms have market power, they will produce less and charge more than a firm would under perfect competition. This causes deadweight loss for society, but, from the producer's point of view, is desirable because it allows them to earn a profit and increase their producer surplus.

Because of the possibility of large profits in the short-run and relatively low barriers of entry in comparison to perfect markets, markets with monopolistic competition are very attractive to future entrants.

### 12.1.5: Long Run Outcome of Monopolistic Competition

In the long run, firms in monopolistic competitive markets are highly inefficient and can only break even.

## **Learning Objective**

Explain the concept of the long run and how it applies to a firms in monopolistic competition

## **Key Points**

- In terms of production and supply, the "long-run" is the time period when all aspects of production are variable and can therefore be adjusted to meet shifts in demand.
- Like monopolies, the suppliers in monopolistic competitive markets are price makers and will behave similarly in the long-run.
- Like a monopoly, a monopolastic competitive firm will maximize its profits by producing goods to the point where its marginal revenues equals its marginal costs.
- In the long-run, the demand curve of a firm in a monopolistic competitive market will shift so that it is tangent to the firm's average total cost curve. As a result, this will make it impossible for the firm to make economic profit; it will only be able to break even.

## **Key Term**

long-run

The conceptual time period in which there are no fixed factors of production.

In terms of production and supply, the "long-run" is the time period when there is no factor that is fixed and all aspects of production are variable and can therefore be adjusted to meet shifts in demand. Given a long enough time period, a firm can take the following actions in response to shifts in demand:

- Enter an industry;

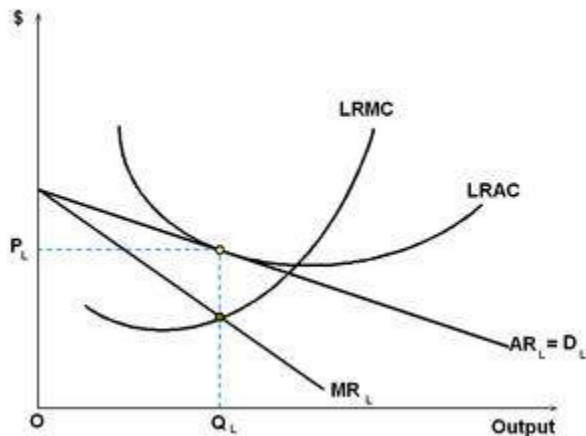
- Exit an industry;
- Increase its capacity to produce more; and
- Decrease its capacity to produce less.

In the long-run, a monopolistically competitive market is inefficient. It achieves neither allocative nor productive efficiency. Also, since a monopolistic competitive firm has power over the market that is similar to a monopoly, its profit maximizing level of production will result in a net loss of consumer and producer surplus.

## **Setting a Price and Determining Profit**

Like monopolies, the suppliers in monopolistic competitive markets are price makers and will behave similarly in the long-run. Also like a monopoly, a monopolistic competitive firm will maximize its profits by producing goods to the point where its marginal revenues equals its marginal costs. The profit maximizing price of the good will be determined based on where the profit-maximizing quantity amount falls on the average revenue curve.

While a monopolistic competitive firm can make a profit in the short-run, the effect of its monopoly-like pricing will cause a decrease in demand in the long-run. This increases the need for firms to differentiate their products, leading to an increase in average total cost. The decrease in demand and increase in cost causes the long run average cost curve to become tangent to the demand curve at the good's profit maximizing price. This means two things. First, that the firms in a monopolistic competitive market will produce a surplus in the long run. Second, the firm will only be able to break even in the long-run; it will not be able to earn an economic profit .



## Long Run Equilibrium of Monopolistic Competition

In the long run, a firm in a monopolistically competitive market will produce the amount of goods where the long run marginal cost (LRMC) curve intersects marginal revenue (MR). The price will be set where the quantity produced falls on the average revenue (AR) curve. The result is that in the long-term the firm will break even.

### 12.1.6: Monopolistic Competition Compared to Perfect Competition

The key difference between perfectly competitive markets and monopolistically competitive ones is efficiency.

#### Learning Objective

Differentiate between monopolistic competition and perfect competition

#### Key Points

- Perfectly competitive markets have no barriers of entry or exit. Monopolistically competitive markets have a few barriers of entry and

- exit.
- The two markets are similar in terms of elasticity of demand, a firm's ability to make profits in the long-run, and how to determine a firm's profit maximizing quantity condition.
  - In a perfectly competitive market, all goods are substitutes. In a monopolistically competitive market, there is a high degree of product differentiation.

## **Key Term**

perfect competition

A type of market with many consumers and producers, all of whom are price takers

## **Examples**

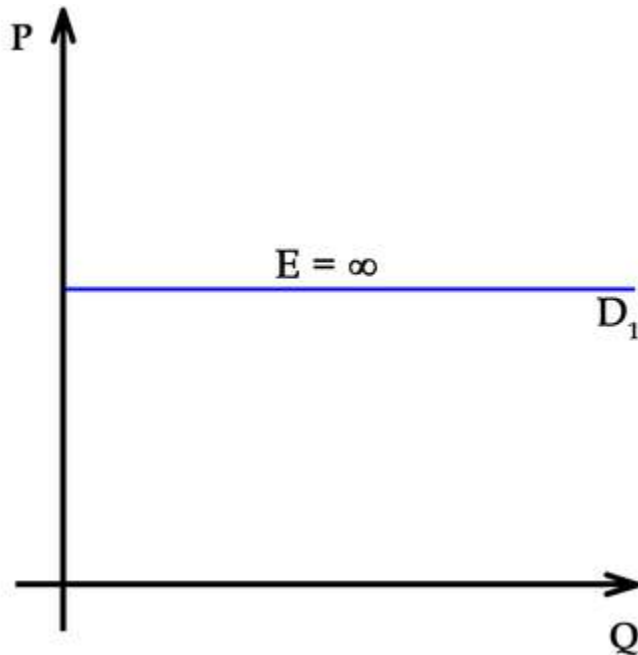
- The classic example of a monopoly is De Beers, who at one point in the 1980s reputedly owned 90% of all the diamond supply to major markets. This results in a high degree of price control, as a lack of competitive forces will enable De Beers to essentially set the going price for diamonds (granted the control their distribution).
- A good example of monopolistic competition, on the other hand, would be the Some modern day apps in the app store (this is NOT to say the app stores themselves, which are something of an oligopoly). There are thousands upon thousands of apps, some are free, some are paid, and some have free versions with microtransactions. The key is that demand is highly elastic, and supply is nearly infinite, allowing consumers a great deal of freedom in their purchasing decisions.

Perfect competition and monopolistic competition are two types of economic markets.

## **Similarities**

One of the key similarities that perfectly competitive and monopolistically competitive markets share is elasticity of demand in the long-run. In both

circumstances, the consumers are sensitive to price; if price goes up, demand for that product decreases. The two only differ in degree. Firm's individual demand curves in perfectly competitive markets are perfectly elastic, which means that an incremental increase in price will cause demand for a product to vanish ). Demand curves in monopolistic competition are not perfectly elastic: due to the market power that firms have, they are able to raise prices without losing all of their customers.



## **Demand curve in a perfectly competitive market**

This is the demand curve in a perfectly competitive market. Note how any increase in price would wipe out demand.

Also, in both sets of circumstances the suppliers cannot make a profit in the long-run. Ultimately, firms in both markets will only be able to break even by selling their goods and services.

Both markets are composed of firms seeking to maximize their profits. In both of these markets, profit maximization occurs when a firm produces goods to such a level so that its marginal costs of production equals its marginal revenues.

## Differences

One key difference between these two set of economic circumstances is efficiency. A perfectly competitive market is perfectly efficient. This means that the price is Pareto optimal, which means that any shift in the price would benefit one party at the expense of the other. The overall economic surplus, which is the sum of the producer and consumer surpluses, is maximized. The suppliers cannot influence the price of the good or service in question; the market dictates the price. The price of the good or service in a perfectly competitive market is equal to the marginal costs of manufacturing that good or service.

In a monopolistically competitive market the price is higher than the marginal cost of producing the good or service and the suppliers can influence the price, granting them market power. This decreases the consumer surplus, and by extension the market's economic surplus, and creates deadweight loss.

Another key difference between the two is product differentiation. In a perfectly competitive market products are perfect substitutes for each other. But in monopolistically competitive markets the products are highly differentiated. In fact, firms work hard to emphasize the non-price related differences between their products and their competitors'.

A final difference involves barriers to entry and exit. Perfectly competitive markets have no barriers to entry and exit; a firm can freely enter or leave an industry based on its perception of the market's profitability. In a monopolistic competitive market there are few barriers to entry and exit, but still more than in a perfectly competitive market.

### 12.1.7: Efficiency of Monopolistic Competition

Monopolistic competitive markets are never efficient in any economic sense of the term.

#### Learning Objective

Discuss the effect monopolistic competition has on overall market efficiency

## **Key Points**

- Because a good is always priced higher than its marginal cost, a monopolistically competitive market can never achieve productive or allocative efficiency.
- Suppliers in monopolistically competitive firms will produce below their capacity.
- Because monopolistic firms set prices higher than marginal costs, consumer surplus is significantly less than it would be in a perfectly competitive market. This leads to deadweight loss and an overall decrease in economic surplus.

## **Key Terms**

producer surplus

The amount that producers benefit by selling at a market price that is higher than the lowest price at which they would be willing to sell.

consumer surplus

The difference between the maximum price a consumer is willing to pay and the actual price they do pay.

Monopolistically competitive markets are less efficient than perfectly competitive markets.

## **Producer and Consumer Surplus**

In terms of economic efficiency, firms that are in monopolistically competitive markets behave similarly as monopolistic firms. Both types of firms' profit maximizing production levels occur when their marginal revenues equals their marginal costs. This quantity is less than what would

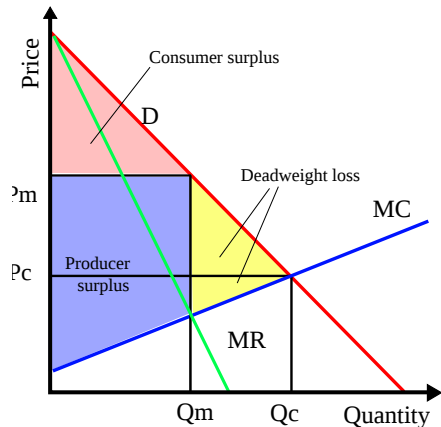


be produced in a perfectly competitive market. It also means that producers will supply goods below their manufacturing capacity.

Firms in a monopolistically competitive market are price setters, meaning they get to unilaterally charge whatever they want for their goods without being influenced by market forces. In these types of markets, the price that will maximize their profit is set where the profit maximizing production level falls on the demand curve. This price exceeds the firm's marginal costs and is higher than what the firm would charge if the market was perfectly competitive. This means two things:

- Consumers will have to pay a higher price than they would in a perfectly competitive market, leading to a significant decline in consumer surplus; and
- Producers will sell less of their goods than they would have in a perfectly competitive market, which could offset their gains from charging a higher price and could result in a decline in producer surplus.

Regardless of whether there is a decline in producer surplus, the loss in consumer surplus due to monopolistic competition guarantees deadweight loss and an overall loss in economic surplus .



## Inefficiency in Monopolistic Competition

Monopolistic competition creates deadweight loss and inefficiency, as represented by the yellow triangle. The quantity is produced when marginal revenue equals marginal cost, or where the green and blue lines intersect. The price is determined based on where the quantity falls on the demand curve, or the red line. In the short run, the monopolistic competition market acts like a monopoly.

## Productive and Allocative Efficiency

Productive efficiency occurs when a market is using all of its resources efficiently. This occurs when a product's price is set at its marginal cost, which also equals the product's average total cost. In a monopolistic competitive market, firms always set the price greater than their marginal costs, which means the market can never be productively efficient.

Allocative efficiency occurs when a good is produced at a level that maximizes social welfare. This occurs when a product's price equals its marginal benefits, which is also equal to the product's marginal costs. Again, since a good's price in a monopolistic competitive market always exceeds its marginal cost, the market can never be allocatively efficient.

### 12.1.8: Advertising and Brand Management in Monopolistic Competition

Advertising and branding help firms in monopolistic competitive markets differentiate their products from those of their competitors.

## **Learning Objective**

Evaluate whether advertising is beneficial or detrimental to consumers

## **Key Points**

- A company's brand can help promote quality in that company's products.
- Advertising helps inform consumers about products, which decreases selection costs.
- Costs associated with advertising and branding include higher prices, customers misled by false advertisements, and negative societal affects such as perpetuating stereotypes and spam.

## **Key Terms**

brand

The reputation of an organization, a product, or a person among some segment of the population.

advertising

Communication with the purpose of influencing potential customers about products and services

One of the characteristics of a monopolistic competitive market is that each firm must differentiate its products. Two ways to do this is through advertising and cultivating a brand. Advertising is a form of communication meant to inform, educate, and influence potential customers about products and services. Advertising is generally used by businesses to cultivate a brand . A brand is a company's reputation in relation to products or services sold under a specific name or logo.



**Gargle twice daily—keep well—stay on the job**

Don't be one of those thousands who every year suffer colds needlessly. Who pay the penalty in discomfort, lost health, and lost wages due to illness from colds.

Get plenty of rest. Don't overeat. Avoid severe exposure. And gargle with full strength Listerine morning and night every day. Because controlled tests on 102 persons show that Listerine's amazing ability to prevent colds and to reduce their severity, once contracted.

*As many colds* \*

While not infallible, full strength Listerine we believe, if used systematically through the winter months as directed above, will result in immeasurably better health. Let the tests speak for themselves:

Of 102 persons observed for a period of approximately days, one-third, known as "controls," did not gargle with Listerine at all; one-third gargled twice a day; the other third five times a day, the full strength solution.

Now, note these amazing results: Those who did not gargle, contracted more as many colds as those who gargled Listerine twice a day. The colds were four times as severe and lasted three times as long.

*Three times as many colds* Those who did not gargle Listerine had three times as many colds as those who gargled five times a day. The colds were four times as severe and lasted four times as long.

**The secret—germicidal action with safety**

Such results are due to Listerine's amazing germicidal action. Used full strength it kills germs in the fastest time accurately recorded by science, for it reduces mouth bacteria 98% or more, and maintains substantial reduction for hours.

Equally responsible for Listerine's effectiveness is its absolute safety; its freedom from irritating properties. Contrast Listerine's soothing and healing effect on tissue to that of harsh mouthwashes which actually irritate it, thus allowing germs easy entrance. Always ask for Listerine. It's safe. Lambert Pharmaceutical Company, St. Louis, Mo.

**EFFECTIVE BECAUSE SAFE**

## Listerine advertisement, 1932

From 1921 until the mid-1970s, Listerine was also marketed as preventive and a remedy for colds and sore throats. In 1976, the Federal Trade Commission ruled that these claims were misleading, and that Listerine had "no efficacy" at either preventing or alleviating the symptoms of sore throats and colds. Warner-Lambert was ordered to stop making the claims and to include in the next \$10.2 million dollars of Listerine ads specific mention that "contrary to prior advertising, Listerine will not help prevent colds or sore throats or lessen their severity. "

## Benefits of Advertising and Branding

The purpose of the brand is to generate an immediate positive reaction from consumers when they see a product or service being sold under a certain name in order to increase sales. A brand and the associated reputation are built on advertising and consumers' past experiences with the products associated with that brand.

Reputation among consumers is important to a monopolistically competitive firm because it is arguably the best way to differentiate itself from its competitors. However, for that reputation to be maintained, the firm must ensure that the products associated with the brand name are of the highest quality. This standard of quality must be maintained at all times because it only takes one bad experience to ruin the value of the brand for a segment of consumers. Brands and advertising can thus help guarantee quality products for consumers and society at large.

Advertising is also valuable to society because it helps inform consumers. Markets work best when consumers are well informed, and advertising provides that information. Advertising and brands can help minimize the costs of choosing between different products because of consumers' familiarity with the firms and their quality.

Finally, advertising allows new firms to enter into a market. Consumers might be hesitant to purchase products with which they are unfamiliar. Advertising can educate and inform those consumers, making them comfortable enough to give those products a try.

## **Costs of Advertising and Branding**

There are some concerns about how advertising can harm consumers and society as well. Some believe that advertising and branding induces customers to spend more on products because of the name associated with them rather than because of rational factors. Further, there is no guarantee that advertisements accurately describe products; they can mislead consumers. Finally, advertising can have negative societal effects such as the perpetuation of negative stereotypes or the nuisance of "spam. "

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# 13: Oligopoly

# 13.1: Prerequisites of Oligopoly

## 13.1.1: Few Sellers

An oligopoly - a market dominated by a few sellers - is often able to maintain market power through increasing returns to scale.

### Learning Objective

Explain how increasing returns to scale will cause a higher prevalence of oligopolies

### Key Points

- The existence of oligopoly requires that a few firms are able to gain significant market power, preventing other, smaller competitors from entering the market.
- Increasing returns to scale is a term that describes an industry in which the rate of increase in output is higher than the rate of increase in inputs. In other words, doubling the number of inputs will more than double the amount of output.
- Monopolies and oligopolies often form when an industry has increasing returns to scale at relatively high output levels.

### Key Terms

oligopoly

An economic condition in which a small number of sellers exert control over the market of a commodity.

returns to scale

A term referring to changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor).

## **Oligopoly Structure**

In an oligopoly market structure, a few large firms dominate the market, and each firm recognizes that every time it takes an action it will provoke a response among the other firms. These actions, in turn, will affect the original firm. Each firm, therefore, recognizes that it is interdependent with the other firms in the industry. This interdependence is unique to the oligopoly market structure; in perfect and monopolistic competition, we assume that each firm is small enough that the rest of the market will ignore its actions.

## **Increasing Returns to Scale**

The existence of oligopoly requires that a few firms are able to gain significant market power, preventing other, smaller competitors from entering the market. One source of this power is increasing returns to scale. Increasing returns to scale is a term that describes an industry in which the rate of increase in output is higher than the rate of increase in inputs. In other words, doubling the number of inputs will more than double the amount of output. Increasing returns to scale implies that larger firms will face lower average costs than smaller firms because they are able to take advantage of added efficiency at higher levels of production.

## **Types of Returns to Scale**

Most industries exhibit different types of returns to scale in different ranges of output. Typically in competitive markets, there could be increasing returns at relatively low output levels, decreasing returns at relatively high output levels, and constant returns at one output level between those ranges. Monopolies and oligopolies, however, often form when an industry has increasing returns to scale at relatively high output levels. When a few large firms already exist in this type of market, any new competitor will be smaller and therefore have higher average costs of production. This will

make it difficult to compete with the already-established firms. Therefore, the oligopoly firms have a built-in defense against new competition.

Take the example of the cell phone industry in the United States. As of the fourth quarter of 2008, Verizon, AT&T, Sprint, and T-Mobile together controlled 89% of the U.S. cell phone market. The cell phone industry has increasing returns to scale: the cost of providing cellular access to 100,000 people is more than half the cost of providing cellular access to 200,000 people. Any new entrant into the cell phone market will either need to pay one of the larger companies for access to its already-existing network, or try to build a network from scratch. Both options result in higher costs, higher prices, and difficulty in competing with the major networks .



## **Cell Phone Tower**

Cell phone companies have increasing returns to scale, which leads to a market dominated by only a few firms.

### **13.1.2: Product Differentiation**

Oligopolies can form when product differentiation causes decreased competition within an industry.

#### **Learning Objective**

Explain the relationship between product differentiation and the existence of an oligopoly

## Key Points

- Product differentiation is the process of distinguishing a product or service from others, to make it more attractive to a particular target market.
- The objective of differentiation is to develop a position that potential customers see as unique. This primarily affects performance through reducing competition.
- Many oligopolies make differentiated products: cigarettes, automobiles, computers, ready-to-eat breakfast cereal, and soft drinks.
- Although product differentiation is not required for an oligopoly to form, if a firm can successfully differentiate its products it will gain market power and resist competition more easily.

## Key Term

product differentiation

Perceived differences between the product of one firm and that of its rivals so that some customers value it more.

Product differentiation (or simply differentiation) is the process of distinguishing a product or service from others, to make it more attractive to a particular target market. This involves differentiating it from competitors' products as well as a firm's own products. In economics, successful product differentiation is inconsistent with the conditions for perfect competition, which include the requirement that the products of competing firms should be perfect substitutes.

Differentiation is due to buyers perceiving a difference; hence, causes of differentiation may be functional aspects of the product or service, how it is distributed and marketed, or who buys it. The major sources of product differentiation are as follows:

- Differences in quality which are usually accompanied by differences in price
- Differences in functional features or design

- Ignorance on the part of buyers regarding the essential characteristics and qualities of goods they are purchasing
- Sales promotion activities of sellers and, in particular, advertising
- Differences in availability (e.g. timing and location).

The objective of differentiation is to develop a position that potential customers see as unique. This primarily affects performance through reducing competition: As the product becomes more differentiated, categorization becomes more difficult and hence draws fewer comparisons with its competition. A successful product differentiation strategy will move a product from competing based primarily on price to competing on non-price factors (such as product characteristics, distribution strategy, or promotional variables).

## **Product Differentiation and Oligopolies**

While some oligopoly industries make standardized products - tools, copper, and steep pipes, for example - others make differentiated products: cars, cigarettes, soda, and cell phone manufacturers. Product differentiation is not necessary for the existence of an oligopoly, but if a firm can successfully engage in product differentiation it can more easily gain market power and dominate at least part of the industry.

For example, the soft drink industry in the US is an oligopoly dominated by the Coca-Cola Company, the Dr. Pepper Snapple Group, and PepsiCo. These companies are able to differentiate their products (e.g. by taste), and are therefore able to gain market power .





## Advertising for Product Differentiation

Some companies are able to use marketing to achieve product differentiation, encouraging the formation of oligopolies.

### 13.1.3: Entry Barriers

One important source of oligopoly power are barriers to entry: obstacles that make it difficult to enter a given market.

#### Learning Objective

Explain the necessity of entry barriers for the existence of an oligopoly

#### Key Points

- Because barriers to entry protect incumbent firms and restrict competition in a market, they can contribute to distortionary prices.
- The most important barriers are economies of scale, patents, access to expensive and complex technology, and strategic actions by incumbent firms designed to discourage or destroy new entrants.
- In industrialized economies, barriers to entry have resulted in oligopolies forming in many sectors, with unprecedented levels of competition fueled by increasing globalization.

## Key Terms

incumbent

A firm that is an established player in the market.

research and development

The process of discovering and creating new knowledge about scientific and technological topics in order to develop new products

patent

A declaration issued by a government agency declaring someone the inventor of a new invention and having the privilege of stopping others from making, using, or selling the claimed invention.

One important source of oligopoly power is barriers to entry. Barriers to entry are obstacles that make it difficult to enter a given market. The term can refer to hindrances a firm faces in trying to enter a market or industry—such as government regulation and patents, or a large, established firm taking advantage of economies of scale—or those an individual faces in trying to gain entrance to a profession—such as education or licensing requirements. Because barriers to entry protect incumbent firms and restrict competition in a market, they can contribute to distortionary prices.

The most important barriers are economies of scale, patents, access to expensive and complex technology, and strategic actions by incumbent firms designed to discourage or destroy new entrants. For example, microprocessing companies face high research and development costs before possibly making a profit. This means that new firms cannot enter the market whenever existing firms are making a positive economic profit, as is the case in perfect competition. Pharmaceutical manufacturers are one type of company that generally rely on patents, which makes competition irrelevant for a period of time after development: competitors can't legally begin manufacturing the product until the patent expires.

Additional sources of barriers to entry often result from government regulation favoring existing firms. For example, requirements for licenses and permits may raise the investment needed to enter a market, creating an effective barrier to entry.

In industrialized economies, barriers to entry have resulted in oligopolies forming in many sectors, with unprecedented levels of competition fueled by increasing globalization. For example, there are now only a small number of manufacturers of civil passenger aircraft. Oligopolies have also formed in heavily-regulated markets such as wireless communications: in some areas only two or three providers are licensed to operate .



## **Oligopoly in Aircraft Manufacturing**

Manufacturing commercial airplanes takes a very large initial investment in technology, equipment, and licensing. Consequently, the industry is dominated by two firms.

### **13.1.4: Price Leadership**

Price leadership is a form of tacit collusion that oligopolies may use to achieve a monopoly-like market outcome.

#### **Learning Objective**

Define price leadership within the context of an oligopoly

## **Key Points**

- Oligopolies are defined by one firm's interdependence on other firms within the industry. When one firm changes its price or level of output, other firms are directly affected.
- When firms collude, they use restrictive trade practices to voluntarily lower output and raise prices in much the same way as a monopoly, splitting the higher profits that result.
- An alternative to overt collusion is tacit collusion, an unwritten, unspoken understanding through which firms agree to limit their competition.
- One strategy is to follow the price leadership of a particular firm, raising or lowering prices when the leader makes such a change. The price leader may be the largest firm in the industry, or it may be a firm that has been particularly good at assessing changes in demand or cost.

## **Key Terms**

Price leadership

The action taken by a leader in an oligopolistic industry to determine prices for the entire industry.

collude

To act in concert with; to conspire.

Cartel

A group of businesses or nations that collude explicitly to limit competition within an industry or market.

## **Oligopoly**

Oligopolies are defined by one firm's interdependence on other firms within the industry. When one firm changes its price or level of output, other firms are directly affected. Unlike perfect competition and monopoly, uncertainty about how rival firms interact makes the specification of a single model of oligopoly impossible. Economists often simplify firm behavior into two strategies: firm can compete, in which case the market outcome will resemble that in perfect competition; or they can collude, in which case the market outcome will more closely resemble monopoly. When firms collude, they use restrictive trade practices to voluntarily lower output and raise prices in much the same way as a monopoly, splitting the higher profits that result.

## **Price Leadership**

Firms can collude explicitly, as in the case of cartels, but this type of behavior is illegal in many parts of the world. An alternative to overt collusion is tacit collusion, in which firms have an unspoken understanding that limits their competition. One way in which firms achieve this is price leadership, in which one firm serves as an industry leader and sets prices, while other firms raise and lower their prices to match. For example, the steel, cars, and breakfast cereals industries have all been accused of engaging in tacit collusion..

Tacit collusion can be difficult to identify. The fact that a price change by one firm is followed by similar price changes among other firms doesn't necessarily mean that tacit collusion exists. After all, in a perfectly competitive industry, economists expect prices to move together because all firms face similar changes in demand and the cost of inputs.

For example, imagine that a town has three gas stations. Without any way to communicate, all three will lower their prices in an attempt to capture the entire market, stopping only when marginal cost equals marginal revenue. If the firms could cooperate, however, they would be better off if all set the price of gas at \$0.20 above marginal cost. Each would have slightly lower sales but would have much higher revenue. Although explicit communication about prices is illegal, the firms might tacitly agree that whenever one station raises its prices, the other two will follow suit. In this

way, all three can receive the benefits of oligopoly . The gas station that first raises its prices, and that the other two follow, is called the price leader.



## Price Leadership and Gas Prices

Although companies cannot legally communicate to set prices, some accuse certain industries of using price leadership to accomplish the same goal.

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# 13.2: Oligopoly in Practice

## 13.2.1: Collusion and Competition

Firms in an oligopoly can increase their profits through collusion, but collusive arrangements are inherently unstable.

### Learning Objective

Assess the considerations involved in the oligopolist's decision about whether to compete or cooperate

### Key Points

- Firms in an oligopoly may collude to set a price or output level for a market in order to maximize industry profits. At an extreme, the colluding firms can act as a monopoly.
- Oligopolists pursuing their individual self-interest would produce a greater quantity than a monopolist, and charge a lower price.
- Collusive arrangements are generally illegal. Moreover, it is difficult for firms to coordinate actions, and there is a threat that firms may defect and undermine the others in the arrangement.
- Price leadership, which occurs when a dominant competitor sets the industry price and others follow suit, is an informal type of collusion which is generally legal.

### Key Terms

Price leadership

Occurs when one company, usually the dominant competitor among several, leads the way in determining prices, the others soon following.

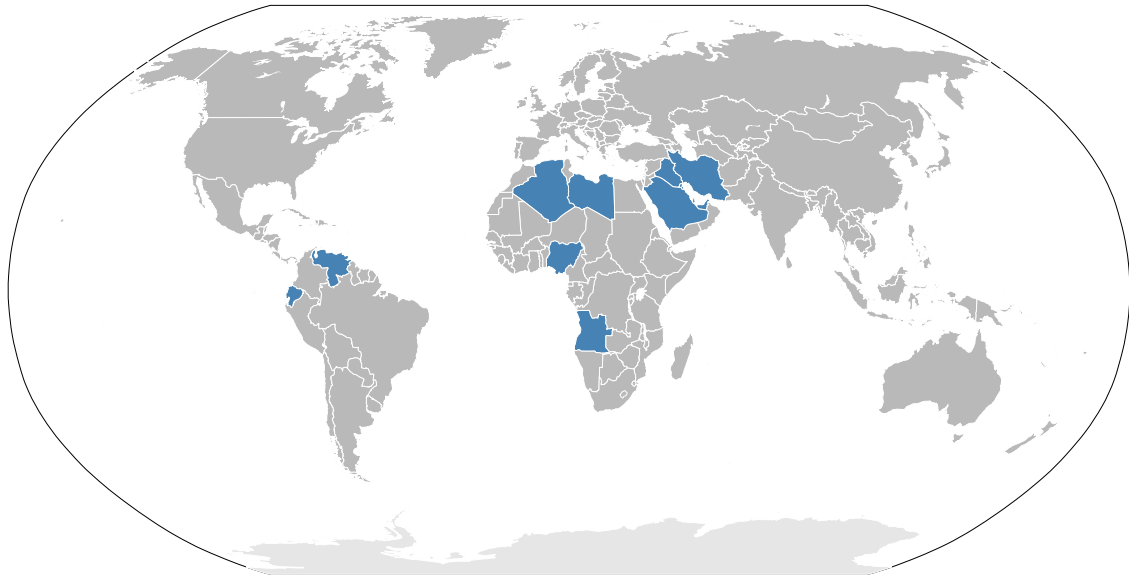
collusion

A secret agreement for an illegal purpose; conspiracy.

price fixing

An agreement between sellers to sell a product only at a fixed price, or maintain the market conditions such that the price is maintained at a given level by controlling supply.

Oligopoly is a market structure in which there are a few firms producing a product. When there are few firms in the market, they may collude to set a price or output level for the market in order to maximize industry profits. As a result, price will be higher than the market-clearing price, and output is likely to be lower. At the extreme, the colluding firms may act as a monopoly, reducing their individual output so that their collective output would equal that of a monopolist, allowing them to earn higher profits.



## **OPEC**

The oil-producing countries of OPEC have at times cooperated to raise world oil prices in order to secure a steady income for themselves.

If oligopolists individually pursued their own self-interest, then they would produce a total quantity greater than the monopoly quantity, and charge a

lower price than the monopoly price, thus earning a smaller profit. The promise of bigger profits gives oligopolists an incentive to cooperate. However, collusive oligopoly is inherently unstable, because the most efficient firms will be tempted to break ranks by cutting prices in order to increase market share.

Several factors deter collusion. First, price-fixing is illegal in the United States, and antitrust laws exist to prevent collusion between firms. Second, coordination among firms is difficult, and becomes more so the greater the number of firms involved. Third, there is a threat of defection. A firm may agree to collude and then break the agreement, undercutting the profits of the firms still holding to the agreement. Finally, a firm may be discouraged from collusion if it does not perceive itself to be able to effectively punish firms that may break the agreement.

In contrast to price-fixing, price leadership is a type of informal collusion which is generally legal. Price leadership, which is also sometimes called parallel pricing, occurs when the dominant competitor publishes its price ahead of other firms in the market, and the other firms then match the announced price. The leader will typically set the price to maximize its profits, which may not be the price that maximized other firms' profits.

## **13.2.2: Game Theory Applications to Oligopoly**

Game theory provides a framework for understanding how firms behave in an oligopoly.

### **Learning Objective**

Explain how game theory applies to oligopolies

### **Key Points**

- In an oligopoly, firms are affected not only by their own production decisions, but by the production decisions of other firms in the market as well. Game theory models situations in which each actor, when

deciding on a course of action, must also consider how others might respond to that action.

- The prisoner's dilemma is a type of game that illustrates why cooperation is difficult to maintain for oligopolists even when it is mutually beneficial. In this game, the dominant strategy of each actor is to defect. However, acting in self-interest leads to a sub-optimal collective outcome.
- The Nash equilibrium is an important concept in game theory. It is the set of strategies such that no player can do better by unilaterally changing his or her strategy.
- Game theory is generally not needed to understand competitive or monopolized markets.

## **Key Terms**

### Prisoner's dilemma

A game that shows why two individuals might not cooperate, even if it appears that it is in their best interests to do so.

### game theory

A branch of applied mathematics that studies strategic situations in which individuals or organisations choose various actions in an attempt to maximize their returns.

### Nash equilibrium

The set of players' strategies for which no player can benefit by changing his or her strategy, assuming that the other players keep theirs unchanged.

In an oligopoly, firms are interdependent; they are affected not only by their own decisions regarding how much to produce, but by the decisions of other firms in the market as well. Game theory offers a useful framework for thinking about how firms may act in the context of this interdependence. More specifically, game theory can be used to model situations in which

each actor, when deciding on a course of action, must also consider how others might respond to that action.

For example, game theory can explain why oligopolies have trouble maintaining collusive arrangements to generate monopoly profits. While firms would be better off collectively if they cooperate, each individual firm has a strong incentive to cheat and undercut their competitors in order to increase market share. Because the incentive to defect is strong, firms may not even enter into a collusive agreement if they don't perceive there to be a way to effectively punish defectors.

The prisoner's dilemma is a specific type of game in game theory that illustrates why cooperation may be difficult to maintain for oligopolists even when it is mutually beneficial. In the game, two members of a criminal gang are arrested and imprisoned. The prisoners are separated and left to contemplate their options. If both prisoners confess, each will serve a two-year prison term. If one confesses, but the other denies the crime, the one that confessed will walk free, while the one that denied the crime would get a three-year sentence. If both deny the crime, they will both serve only a one year sentence. Betraying the partner by confessing is the dominant strategy; it is the better strategy for each player regardless of how the other plays. This is known as a Nash equilibrium. The result of the game is that both prisoners pursue individual logic and betray, when they would have collectively gotten a better outcome if they had both cooperated.

		Player A	
		Cooperate	Betray
Player B	Cooperate	1, 1	0, 3
	Betray	3, 0	2, 2

## Prisoner's Dilemma

In a prisoner's dilemma game, the dominant strategy for each player is to betray the other, even though cooperation would have led to a better collective outcome.

The Nash equilibrium is an important concept in game theory. It is the set of strategies such that no player can do better by unilaterally changing his or her strategy. If a player knew the strategies of the other players (and those strategies could not change), and could not benefit by changing his or her strategy, then that set of strategies represents a Nash equilibrium. If any player would benefit by changing his or her strategy, then that set of strategies is not a Nash equilibrium.

While game theory is important to understanding firm behavior in oligopolies, it is generally not needed to understand competitive or monopolized markets. In competitive markets, firms have such a small individual effect on the market, that taking other firms into account is simply not necessary. A monopolized market has only one firm, and thus strategic interactions do not occur.

### 13.2.3: The Prisoner's Dilemma and Oligopoly

The prisoner's dilemma shows why two individuals might not cooperate, even if it is collectively in their best interest to do so.

## **Learning Objective**

Analyze the prisoner's dilemma using the concepts of strategic dominance, Pareto optimality, and Nash equilibria

## **Key Points**

- In the game, two criminals are arrested and imprisoned. Each criminal must decide whether he will cooperate with or betray his partner. The criminals cannot communicate to coordinate their actions.
- Betrayal is the dominant strategy for both players in the game. Betrayal leads to best individual outcome regardless of what the other person does.
- Both players choosing betrayal is the Nash equilibrium of the game. However, this outcome is not Pareto-optimal. Both players would have clearly been better off if they had cooperated.
- Cooperation by firms in oligopolies is difficult to achieve because defection is in the best interest of each individual firm.

## **Key Terms**

Pareto optimal

Describing a situation in which the profit of one party cannot be increased without reducing the profit of another.

Nash equilibrium

The set of players' strategies for which no player can benefit by changing his or her strategy, assuming that the other players keep theirs unchanged.

Strategic dominance

Occurs when one strategy is better than another strategy for one player, no matter how that player's opponents may play.

Sometimes firms fail to cooperate with each other, even when cooperation would bring about a better collective outcome. The prisoner's dilemma is a canonical example of a game analyzed in game theory that shows why two individuals might not cooperate, even if it appears that it is in their best interest to do so.

In the game, two members of a criminal gang are arrested and imprisoned. Each prisoner is in solitary confinement with no means of speaking to or exchanging messages with the other. The police offer each prisoner a bargain :

		Player A	
		Cooperate	Betray
Player B	Cooperate	1, 1	0, 3
	Betray	3, 0	2, 2

## Prisoner's Dilemma

Betrayal is the dominant strategy for both players, as it provides for a better individual outcome regardless of what the other player does. However, the resulting outcome is not Pareto-optimal. Both players would clearly have been better off if they had cooperated.

- If Prisoner A and Prisoner B both confess to the crime, each of them will serve two years in prison.
- If A confesses but B denies the crime, A will be set free, while B will serve three years in prison (and vice versa).
- If both A and B deny the crime, both of them will only serve one year in prison.



For both players, the choice to betray the partner by confessing has strategic dominance in this situation; it is the better strategy for each player regardless of what the other player does. This set of strategies is thus a Nash equilibrium in the game--no player would be better off by changing his or her strategy. As a result, all purely self-interested prisoners would betray each other, resulting in a two year prison sentence for both. This outcome is not Pareto optimal; it is clearly possible to improve the outcomes for both players through cooperation. If both players had denied the crime, they would each be serving only one year in prison.

Similarly to the prisoner's dilemma scenario, cooperation is difficult to maintain in an oligopoly because cooperation is not in the best interest of the individual players. However, the collective outcome would be improved if firms cooperated, and were thus able to maintain low production, high prices, and monopoly profits.

One traditional example of game theory and the prisoner's dilemma in practice involves soft drinks. Coca-Cola and Pepsi compete in an oligopoly, and thus are highly competitive against one another (as they have limited other competitive threats). Considering the similarity of their products in the soft drink industry (i.e. varying types of soda), any price deviation on part of one competitor is seen as an act of non-conformity or betrayal of an established status quo.

In such a scenario, there are a number of plausible reactions and outcomes. If Coca-Cola reduces their prices, Pepsi may follow to ensure they do not lose market share. In this situation, defection results in a lose-lose. Which is to say that, due to the initial price reduction by Coca-Cola (betrayal of status quo), both companies likely see reduced profit margins. On the other hand, Pepsi could uphold the price point despite Coca-Cola's deviation, sacrificing market share to Coca-Cola but maintaining the established price point. Prisoner dilemma scenarios are difficult strategic choices, as any deviation from established competitive practice may result in less profits and/or market share.

### **13.2.4: Duopoly Example**

The Cournot model, in which firms compete on output, and the Bertrand model, in which firms compete on price, describe duopoly dynamics.

## **Learning Objective**

Discuss the characteristics of a duopoly

## **Key Points**

- The Cournot model focuses on the production output decision of a single firm. A firm determines its competitor's output level and the residual market demand. It then determines its profit-maximizing output for that residual demand as if it were the entire market, and produces accordingly.
- In the Bertrand model, firms set profit-maximizing prices in response to what they expect the competitor to charge. The model predicts that both firms will lower prices until they reach the marginal cost limit, arriving at an outcome equivalent to what prevails under perfect competition.
- The accuracy of the Cournot or Bertrand model will vary from industry to industry, depending on how easy it is to adjust output levels in the industry.

## **Key Terms**

Bertrand duopoly

A model that describes interactions among firms competing on price.

Cournot duopoly

An economic model describing an industry in which companies compete on the amount of output they will produce, which they decide on independently of each other and at the same time.

A true duopoly is a specific type of oligopoly where only two producers exist in a market. There are two principle duopoly models: Cournot duopoly and Bertrand duopoly.

## Cournot Duopoly

Cournot duopoly is an economic model that describes an industry structure in which firms compete on output levels. The model makes the following assumptions:

- There are two firms, which produce a homogeneous product;
- The number of firms is fixed;
- Firms do not cooperate (there is no collusion);
- Firms have market power, and each firm's output decision affects the good's price;
- Firms are economically rational and act strategically, seeking to maximize profit given their competitor's decisions; and
- Firms compete on quantity, and choose quantity simultaneously.

The Cournot model focuses on the production output decision of a single firm. The firm determines its rival's output level, evaluates the residual market demand, and then changes its own output level to maximize profits. It is assumed that the firm's output decision will not affect the output decision of its competitor.

For example, suppose that there are two firms in the market for toasters with a given demand function. Firm A will determine the output of Firm B, hold it constant, and then determine the remainder of the market demand for toasters. Firm A will then determine its profit-maximizing output for that residual demand as if it were the entire market, and produce accordingly. Firm B will be conducting similar calculations with respect to Firm A at the same time.

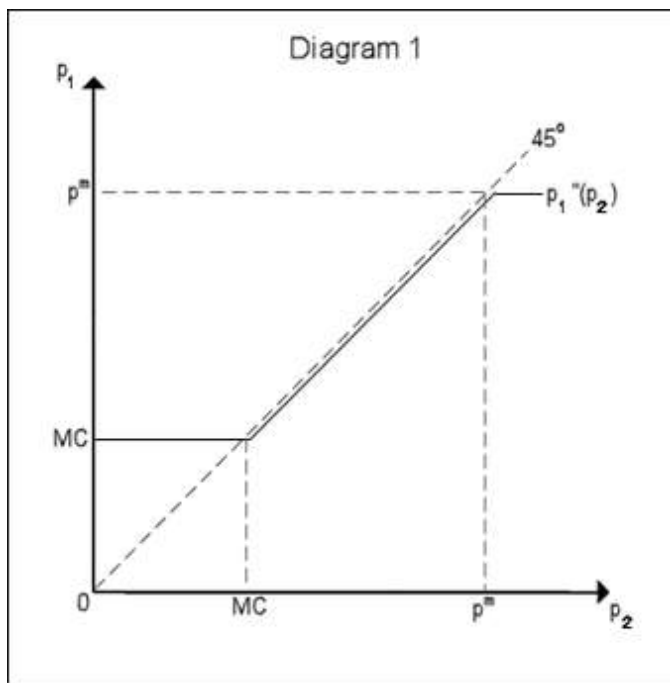
## Bertrand Duopoly

The Bertrand model describes interactions among firms that compete on price. Firms set profit-maximizing prices in response to what they expect a competitor to charge. The model rests on the following assumptions:

- There are two firms producing homogeneous products;
- Firms do not cooperate;

- Firms compete by setting prices simultaneously; and
- Consumers buy everything from a firm with a lower price. If all firms charge the same price, consumers randomly select among them.

In the Bertrand model, Firm A's optimum price depends on where it believes Firm B will set its price . Pricing just below the other firm will obtain full market demand, though this choice is not optimal if the other firm is pricing below marginal cost, as this would result in negative profits. If Firm B is setting the price below marginal cost, Firm A will set the price at marginal cost. If Firm B is setting the price above marginal cost but below monopoly price, then Firm A will set the price just below that of Firm B. If Firm B sets the price above monopoly price, Firm A will set the price at monopoly level.



## Bertrand Duopoly

The diagram shows the reaction function of a firm competing on price. When  $P_2$  (the price set by Firm 2) is less than marginal cost, Firm 1 prices at marginal cost ( $P_1 = MC$ ). When Firm 2 prices above  $MC$  but below monopoly prices, Firm 1 prices just below Firm 2. When Firm 2 prices above monopoly price ( $PM$ ), Firm 1 prices at monopoly level ( $P_1 = PM$ ).

Imagine if both firms set equal prices above marginal cost. Each firm would get half the market at a higher than marginal cost price. However, by lowering prices just slightly, a firm could gain the whole market. As a result, both firms are tempted to lower prices as much as they can. However, it would be irrational to price below marginal cost, because the firm would make a loss. Therefore, both firms will lower prices until they reach the marginal cost limit. According to this model, a duopoly will result in an outcome exactly equivalent to what prevails under perfect competition. The result of the firms' strategies is a Nash equilibrium--a pair of strategies where neither firm can increase profits by unilaterally changing the price.

Colluding to charge the monopoly price and supplying one half of the market each is the best that the firms could do in this scenario. However, not colluding and charging the marginal cost, which is the non-cooperative outcome, is the only Nash equilibrium of this model.

The accuracy of the Cournot or Bertrand model will vary from industry to industry. If capacity and output can be easily changed, Bertrand is generally a better model of duopoly competition. If output and capacity are difficult to adjust, then Cournot is generally a better model.

## **13.2.5: Cartel Example**

A cartel is a formal collusive arrangement among firms with the goal of increasing profits.

### **Learning Objective**

Assess the role of competition and collusion in the formation of cartels

### **Key Points**

- Cartel members cooperate to set industry price and output.
- Game theory indicates that cartels are inherently unstable. Each individual member has an incentive to cheat in order to make higher profits in the short run.

- Cheating may lead to the collapse of a cartel. With the collapse, firms would revert to competing, which would lead to decreased profits.
- OPEC, the Organization of Petroleum Exporting Countries, provides an example of a historically effective cartel.

## **Key Term**

### Cartel

A group of businesses or nations that collude to limit competition within an industry or market.

A cartel is an agreement among competing firms to collude in order to attain higher profits. Cartels usually occur in an oligopolistic industry, where the number of sellers is small and the products being traded are homogeneous. Cartel members may agree on such matters as price fixing, total industry output, market share, allocation of customers, allocation of territories, bid rigging, establishment of common sales agencies, and the division of profits.

Game theory suggests that cartels are inherently unstable, because the behavior of cartel members represents a prisoner's dilemma. Each member of a cartel would be able to make a higher profit, at least in the short-run, by breaking the agreement (producing a greater quantity or selling at a lower price) than it would make by abiding by it. However, if the cartel collapses because of defections, the firms would revert to competing, profits would drop, and all would be worse off.

Whether members of a cartel choose to cheat on the agreement depends on whether the short-term returns to cheating outweigh the long-term losses from the possible breakdown of the cartel. It also partly depends on how difficult it is for firms to monitor whether the agreement is being adhered to by other firms. If monitoring is difficult, a member is likely to get away with cheating for longer; members would then be more likely to cheat, and the cartel will be more unstable.

Perhaps the most globally recognizable and effective cartel is OPEC, the Organization of Petroleum Exporting Countries. In 1973 members of OPEC reduced their production of oil. Because crude oil from the Middle East was

known to have few substitutes, OPEC member's profits skyrocketed. From 1973 to 1979, the price of oil increased by \$70 per barrel, an unprecedented number at the time. In the mid 1980s, however, OPEC started to weaken. Discovery of new oil fields in Alaska and Canada introduced new alternatives to Middle Eastern oil, causing OPEC's prices and profits to fall. Around the same time OPEC members also started cheating to try to increase individual profits.



## OPEC

In the 1970s, OPEC members successfully colluded to reduce the global production of oil, leading to higher profits for member countries.

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# **14: Inputs to Production: Labor, Natural Resources, and Technology**

# 14.1: Demand for Labor

## 14.1.1: Marginal Product of Labor (Physical)

The marginal product of labor is the change in output that results from employing an added unit of labor.

### Learning Objective

Define the marginal product of labor

### Key Points

- The marginal product of labor is not always equivalent to the output directly produced by that added unit of labor.
- When production is discrete, we can define the marginal product of labor (MPL) as  $\Delta Y/\Delta L$ .
- When production is continuous, the MPL is the first derivative of the production function in terms of L.
- Graphically, the MPL is the slope of the production function.
- The law of diminishing marginal returns ensures that in most industries, the MPL will eventually be decreasing.

### Key Terms

returns to scale

A term referring to changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor).

marginal product

The extra output that can be produced by using one more unit of the input.

In economics, the marginal product of labor (MPL) is the change in output that results from employing an added unit of labor. This is not always equivalent to the output directly produced by that added unit of labor; for example, employing an additional cook at a restaurant may make the other cooks more efficient by allowing more specialization of tasks, creating a marginal product that is greater than that produced directly by the new employee. Conversely, hiring an additional worker onto an already crowded factory floor may make the other employees less productive, leading to a marginal product that is lower than the work done by the additional employee.

When production is discrete, we can define the marginal product of labor as  $\Delta Y/\Delta L$  where Y is output. If a factory that is initially producing 100 widgets hires another employee and is then able to produce 106 widgets, the MPL is simply six. When production is continuous, the MPL is the first derivative of the production function in terms of L. Graphically, the MPL is the slope of the production function.

gives another example of marginal product of labor. The second column shows total production with different quantities of labor, while the third column shows the increase (or decrease) as labor is added to the production process.

Marginal Product of Labor		
Labor (number of employees)	Output (number of toys per hour)	Marginal Product of labor
0	0	0
1	6	6
2	11	5
3	14	3
4	21	7
5	22	1
6	24	2
7	28	3
8	27	-1
9	28	1
10	26	-2

## Marginal Product of Labor

This table shows hypothetical returns and marginal product of labor. Note that in reality this firm would never hire more than seven employees, since a negative marginal product is bad for the firm regardless of the wage rate.

The law of diminishing marginal returns ensures that in most industries, the MPL will eventually be decreasing. The law states that "as units of one input are added (with all other inputs held constant) a point will be reached where the resulting additions to output will begin to decrease; that is marginal product will decline." The law of diminishing marginal returns applies regardless of whether the production function exhibits increasing, decreasing or constant returns to scale. The key factor is that the variable input is being changed while all other factors of production are being held constant. Under such circumstances diminishing marginal returns are inevitable at some level of production.

### 14.1.2: Marginal Product of Labor (Revenue)

The marginal revenue product of labor is the change in revenue that results from employing an additional unit of labor.

#### Learning Objective

Define the marginal product of labor under the marginal revenue productivity theory of wages

## Key Points

- The marginal revenue product of a worker is equal to the product of the marginal product of labor (MP:) and the marginal revenue (MR) of output.
- The marginal revenue productivity theory states that a profit maximizing firm will hire workers up to the point where the marginal revenue product is equal to the wage rate.
- The change in output from hiring one more employee is not limited to that directly attributable to the additional worker.

## Key Terms

diminishing marginal returns

The decrease in the per-unit output of a production process as the amount of a single factor of production is increased.

marginal product

The extra output that can be produced by using one more unit of the input.

The marginal revenue product of labor (MRPL) is the change in revenue that results from employing an additional unit of labor, holding all other inputs constant. The marginal revenue product of a worker is equal to the product of the marginal product of labor (MPL) and the marginal revenue (MR) of output, given by  $MR \times MP = MRPL$ . This can be used to determine the optimal number of workers to employ at an exogenously determined market wage rate. Theory states that a profit maximizing firm will hire workers up to the point where the marginal revenue product is equal to the wage rate, because it is not efficient for a firm to pay its workers more than it will earn in revenues from their labor.



For example, if a firm can sell t-shirts for \$10 each and the wage rate is \$20/hour, the firm will continue to hire workers until the marginal product of an additional hour of work is two t-shirts. If the MPL is three t-shirts the firm will hire more workers until the MPL reaches two; if the MPL is one t-shirt then the firm will remove workers until the MPL reaches two.

Let TR=Total Revenue; L=Labor; Q=Quantity. Mathematically:

- $MRPL = \Delta TR / \Delta L$
- $MR = \Delta TR / \Delta Q$
- $MPL = \Delta Q / \Delta L$
- $MR \times MPL = (\Delta TR / \Delta Q) \times (\Delta Q / \Delta L) = \Delta TR / \Delta L$

Note that the change in output is not limited to that directly attributable to the additional worker. Assuming that the firm is operating with diminishing marginal returns then the addition of an extra worker reduces the average productivity of every other worker (and every other worker affects the marginal productivity of the additional worker) - in other words, everybody is getting in each other's way.

Because the MRPL is equal to the marginal product of labor times the price of output, any variable that affects either MPL or price will affect the MRPL. For example, changes in technology or the quantity of other inputs will change the marginal product of labor, and changes in the product demand or changes in the price of complements or substitutes will affect the price of output. These will all cause shifts in the MRPL.

### **14.1.3: Deriving the Labor Demand Curve**

Firms will demand labor until the marginal revenue product of labor is equal to the wage rate.

#### **Learning Objective**

Explain how a company uses marginal revenue product in hiring decisions

#### **Key Points**

- The marginal revenue product of labor (MRPL) is the additional amount of revenue a firm can generate by hiring one additional employee. It is found by multiplying the marginal product of labor by the price of output.
- Firms will demand labor until the MRPL equals the wage rate.
- The demand curve for labor can be shifted by changes in the productivity of labor, the relative price of labor, or the price of the output.
- It will also change as a result of a change in technology, a change in the price of the good being produced, or a change in the number of firms hiring the labor.

## Key Terms

marginal revenue product

The change in total revenue earned by a firm that results from employing one more unit of labor.

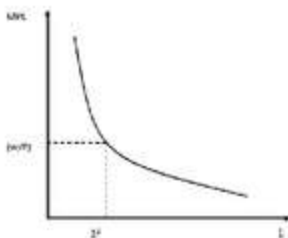
factor of production

A resource employed to produce goods and services, such as labor, land, and capital.

Firms demand labor and an input to production. The cost of labor to a firm is called the wage rate. This can be thought of as the firm's marginal cost. The additional revenue generated by hiring one more unit of labor is the marginal revenue product of labor (MRPL). This can be thought of as the marginal benefit.

The marginal revenue product of labor (MRPL) is the additional amount of revenue a firm can generate by hiring one additional employee. It is found by multiplying the marginal product of labor (MPL) - the amount of additional output one additional worker can generate - by the price of output. If an employee of a customer support call center can take eight calls an hour (the MPL) and each call earns the company \$3, then the MRPL is \$24.

We can use the MRPL curve to determine the quantity of labor a company will hire. Suppose workers are available at an hourly rate of \$10. The amount a factor adds to a firm's total cost per period is the marginal cost of that factor, so in this case the marginal cost of labor is \$10. Firms maximize profit when marginal costs equal marginal revenues, and in the labor market this means that firms will hire more employees until the wage rate (marginal cost of labor) equals the MRPL. At a price of \$10, the company will hire workers until the last worker hired gives a marginal revenue product of \$10 .



## Marginal Product of Labor

The MPL falls as the amount of labor employed increases. The optimum demand for labor falls where the real wage rate ( $w/P$ ) is equal to the MPL.

Thus, the downward-sloping portion of the marginal revenue product curve shows the number of employees a company will hire at each price (wage), so we can interpret this part of the curve as the firm's demand for labor. As with other demand curves, the market demand curve for labor is the sum of all firm's individual demand curves.

## Shifting the Demand for Labor

There are three main reasons why the demand curve for labor may shift:

1. Changes to the marginal productivity of labor: Technology, for instance, may increase the marginal productivity of labor, shifting the

- demand curve to the right. For example, computer technology has increased the productivity (marginal product) of many types of workers. This has led to an increase in the marginal revenue product of labor for these jobs, shifting firms' demand for labor to the right. This both increases the number of employed workers and increases the wage rate.
2. The prices of other factors of production: The change in the relative price of labor will increase or decrease demand for labor. For example, if capital becomes more expensive relative to labor, the demand for labor will increase as firms seek to substitute labor for capital.
  3. The price of the firm's output: Since the price of the output is a component of MRPL, changes will shift the demand curve for labor. If the price that a firm can charge for its output increases, for example, the MRPL will increase. This is reflected in an outward shift of the demand for labor.

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# 14.2: Labor Market Equilibrium and Wage Determinants

## 14.2.1: Conditions of Equilibrium

Equilibrium in the labor market requires that the marginal revenue product of labor is equal to the wage rate, and that  $MPL/PL=MPK/PK$ .

### Learning Objective

Employ the marginal decision rule to determine the equilibrium cost of labor

### Key Points

- Firms will hire more labor when the marginal revenue product of labor is greater than the wage rate, and stop hiring as soon as the two values are equal.
- The point at which the MRPL equals the prevailing wage rate is the labor market equilibrium.
- The marginal decision rule says that a firm will shift spending among factors of production as long as the marginal benefit of such a shift exceeds the marginal cost.
- If the marginal benefit of additional labor,  $MPL/PL$ , exceeds the marginal cost,  $MPK/PK$ , then the firm will be better off by spending more on labor and less on capital.
- According to the marginal decision rule, equilibrium in the labor market must occur where  $MPL/PL=MPK/PK$ .

### Key Terms

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings (structures).

marginal revenue product

The change in total revenue earned by a firm that results from employing one more unit of labor.

marginal product

The extra output that can be produced by using one more unit of the input.

The labor market differs somewhat from the market for goods and services because labor demand is a derived demand; labor is not desired for its own sake but rather because it aids in producing output. Firms determine their demand for labor through a lens of profit maximization, ultimately seeking to produce the optimum level of output and the lowest possible cost.

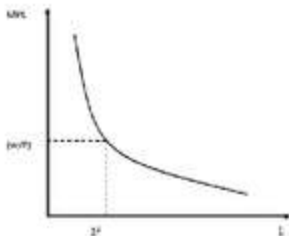
## **Labor Market Equilibrium**

In order to find the equilibrium quantity and price of labor, economists generally make several assumptions:

- The marginal product of labor (MPL) is decreasing;
- Firms are price-takers in the goods market (cannot affect the price of output) as well as in the labor market (cannot affect the wage rate);
- The supply of labor is elastic and increases with the wage rate (upward sloping supply); and
- Firms are profit-maximizers.

The marginal revenue product of labor (MRPL) is equal to the MPL multiplied by the price of output. The MRPL represents the additional revenue that a firm can expect to gain from employing one additional unit of labor - it is the marginal benefit to the firm from labor. Under the above assumptions, the MRPL is decreasing as the quantity of labor increases, and

firms can increase profit by hiring more labor if the MRPL is greater than the marginal cost of that additional unit of labor - the wage rate. Thus, firms will hire more labor when the MRPL is greater than the wage rate, and stop hiring as soon as the two values are equal. The point at which the MRPL equals the prevailing wage rate is the labor market equilibrium.



## Optimal Demand for Labor

The optimal demand for labor is located where the marginal product equals the real wage rate. The curved line represents the falling marginal product of labor, the y-axis is the marginal product/wage rate, and the x-axis is the quantity of labor.

## Optimizing Capital and Labor

In the long run, firms maximize profit by choosing the optimal combination of labor and capital to produce a given amount of output. It's possible that an automobile company could manufacture 1,000 cars using only expensive, technologically advanced robots and machinery (capital) that do not require any human participation. It's also possible that the company could produce the same number of vehicles using only employee work (labor), without any assistance from machines or technology. For most industries, however, relying solely on capital or solely on labor is more expensive than using some combination of the two .





## Factory Worker

Most firms need a combination of both labor and capital in order to produce their product.

Firms use the marginal decision rule in order to decide what combination of labor, capital, and other factors of production to use in the creation of output. The marginal decision rule says that a firm will shift spending among factors of production as long as the marginal benefit of such a shift exceeds the marginal cost. Imagine that a firm must decide whether to spend an additional dollar on labor. To determine the marginal benefit of that dollar, we divide the marginal product of labor ( $MP_L$ ) by its price (the wage rate,  $P_L$ ):  $MP_L/P_L$ . If capital and labor are the only factors of production, then spending an additional \$1 on labor while holding the total cost constant means taking \$1 out of capital. The cost of that action will be the output lost from cutting back on capital, which is the ratio of the marginal product of capital ( $MP_K$ ) to the price of capital (the rental rate,  $P_K$ ). Thus, the cost of cutting back on capital is  $MP_K/P_K$ .

If the marginal benefit of additional labor,  $MP_L/P_L$ , exceeds the marginal cost,  $MP_K/P_K$ , then the firm will be better off by spending more on labor and less on capital. On the other hand, if  $MP_K/P_K$  is greater than  $MP_L/P_L$ , the firm will be better off spending more on capital and less on labor. The equilibrium - the point at which the firm is producing the maximum amount of output at a given cost - occurs where  $MP_L/P_L = MP_K/P_K$ .

## 14.2.2: The Wage Rate

The wage rate is determined by the intersection of supply of and demand for labor.

### Learning Objective

Describe the factors that determine the wage rate

### Key Points

- An increase in demand or a reduction in supply will raise wages; an increase in supply or a reduction in demand will lower them.
- The demand curve depends on the marginal product of labor and the price of the good labor produces. If the demand curve shifts to the right, either because productivity or the price of output has increased, wages will be pushed up.
- In the long run the supply of labor is simply a function of the population size, but in the short run it depends on variables such as worker preferences, the skills and training a job requires, and wages available in alternative occupations.

### Key Terms

Union

an organization of workers who have banded together to achieve common goals

marginal product

The extra output that can be produced by using one more unit of the input.

When labor is an input to production, firms hire workers. Firms are demand labor and workers provide it at a price called the wage rate. Colloquially,

"wages" refer to just the dollar amount paid to a worker, but in economics, it refers to total compensation (i.e. it includes benefits).

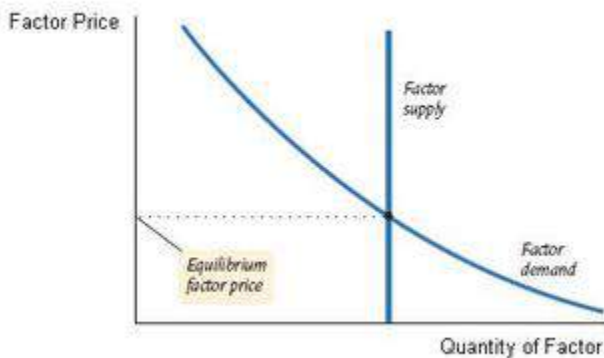
The marginal benefit of hiring an additional unit of labor is called the marginal product of labor: it is the additional revenue generated from the last unit of labor. In theory, as with other inputs to production, firms will hire workers until the wage rate (marginal cost) equals the marginal revenue product of labor (marginal benefit).

## **Changes in Supply and Demand**

In competitive markets, the demand curve for labor is the same as the marginal revenue curve. Thus, shifts in the demand for labor are a function of changes in the marginal product of labor. This can occur for a number of reasons. First of all, you can imagine that a new product or company is created that represents new demand for labor of a certain type. There are also three main factors that would shift the labor demand curve:

1. Technology which affects the output of a unit of labor.
2. Changes in the price of the output which affect the value of the unit of labor.
3. Changes in the price of labor relative to other factors of production.

In the long run, the supply of labor is a function of the population. A decrease in the supply of labor will typically cause an increase in the wage rate. The fact that a reduction in supply tends to strengthen wages explains why unions and other professional associations have often sought to limit the number of workers in their particular industry. Physicians, for example, have a financial incentive to enforce rigorous training, licensing, and certification requirements in order to limit the number of practitioners and keep the labor supply low .



## Wage Rate in the Long Run

In the long run the supply of labor is fixed and demand is downward-sloping. The wage rate is determined by their intersection.

### 14.2.3: Compensation Differentials

Some differences in wage rates across places, occupations, and demographic groups can be explained by compensation differentials.

#### Learning Objective

Describe nonmonetary factors that affect wage rates

#### Key Points

- Although basic economic theory suggests that there ought to be one prevailing wage rate for all labor, this is not the case.
- Wage differences are called compensation differentials and can be explained by many factors, such as differences in the skills of the workers, the country or geographical area in which jobs are performed, or the characteristics of the jobs themselves.
- One common source of differences in wage rates is human capital. More skilled and educated workers tend to have higher wages because their marginal product of labor tends to be higher.

- If a certain area is a desirable place to live, the supply of labor will be higher than in other areas and wages will be lower. This is a type of geographical differential.
- Discrimination against gender or racial groups can cause compensation differentials.
- A compensating differential is the additional amount of income that a given worker must be offered in order to motivate them to accept a given undesirable job, relative to other jobs that worker could perform.

## Key Terms

discrimination

Distinct treatment of an individual or group to their disadvantage; treatment or consideration based on class or category rather than individual merit; partiality; prejudice; bigotry.

differential

a qualitative or quantitative difference between similar or comparable things

According to the basic theory of the labor market, there ought to be one equilibrium wage rate that applies to all workers across industries and countries. Of course this is not the case; doctors typically make more per hour than retail clerks, and workers in the United States typically earn a higher wage than workers in India. These wage differences are called compensation differentials and can be explained by many factors, such as differences in the skills of the workers, the country or geographical area in which jobs are performed, or the characteristics of the jobs themselves.

## Education Differentials

One common source of differences in wage rates is human capital. More skilled and educated workers tend to have higher wages because their marginal product of labor tends to be higher. Additionally, the differential pay for more education tends to compensate workers for the time, effort,

and foregone wages from obtaining the necessary training. If all jobs paid the same rate, for example, fewer people would go through the expense and effort of law school. The compensation differential ensures that individuals are willing to invest in their own human capital.



## **Education Differentials**

Workers seek increased compensation by attaining higher levels of education

## **Geographic Compensation Differentials**

If a certain part of a country is a particularly attractive area to live in and if labor mobility is perfect, then more and more workers will move to that area, which in turn will increase the supply of labor and depress wages. If the attractiveness of that area compared to other areas does not change, the wage rate will be set at such a rate that workers will be indifferent between living in areas that are more attractive but with a lower wage and living in areas which are more attractive with a higher wage. In this way, a sustained equilibrium with different wage rates across different areas can occur.

## **Discrimination and Compensation Differentials**

In the United States, minorities and women make lower wages on average than Caucasian men. Some of this is due to historical trends affecting these

groups that result in less human capital or a concentration in certain lower-paying occupations. Another source of differing wage rates, however, is discrimination. Several studies have shown that, in the United States, several minority groups (including black men and women, Hispanic men and women, and white women) suffer from decreased wage earning for the same job with the same performance levels and responsibilities as white males.

## **Compensating Differential**

Not to be confused with a compensation differential, a compensating differential is a term used in labor economics to analyze the relation between the wage rate and the unpleasantness, risk, or other undesirable attributes of a particular job. It is defined as the additional amount of income that a given worker must be offered in order to motivate them to accept a given undesirable job, relative to other jobs that worker could perform. One can also speak of the compensating differential for an especially desirable job, or one that provides special benefits, but in this case the differential would be negative: that is, a given worker would be willing to accept a lower wage for an especially desirable job, relative to other jobs. .



## **Hazard Differential**

Hazard pay is a type of compensating differential. Occupations that are dangerous, such as police work, will typically have higher pay to compensate for the risk associated with that job.

### **14.2.4: Performance and Pay**

Theoretically there is a direct connection between job performance and pay, but in reality other factors often distort this relationship.

#### **Learning Objective**



Identify the relationship between performance and wages

## Key Points

- According to economic theory, workers' wages are equal to the marginal revenue product of their labor. If one employee is very productive he or she will have a high marginal revenue product.
- In reality, wages are determined not only by one's productivity, but also by seniority, networking, ambition, and luck.
- Some of the disconnect between performance and pay can be addressed with alternate pay schemes.

## Key Terms

commission

A fee charged by an agent or broker for carrying out a transaction

piece work

Work that a worker is paid for according to the number of units produced, rather than the number of hours worked.

According to economic theory, workers' wages are equal to the marginal revenue product of their labor. If one employee is very productive he or she will have a high marginal revenue product: one additional hour of their work will produce a significant increase in output. It follows that more productive employees should have higher wages than less productive employees. Imagine if this were not true: a firm decides to pay a highly productive worker less than the marginal revenue product of his labor. Any other firm could make a profit by offering a higher salary to attract the productive employee to their company, and the worker's wage would rise. Theoretically, therefore, there is a direct relationship between job performance and pay.

We know that this is not always the case in reality. Wages are determined not only by one's productivity, but also by seniority, networking, ambition,

and luck. It is very rare for an entry-level worker to make the same wage as an experienced member of the same profession regardless of their relative levels of productivity because the older worker has had time to receive pay raises and promotions for which the younger employee is simply not eligible. Discrimination is sometimes responsible for members of minority racial or gender groups receiving wages that are less than wages for the majority group even when productivity levels are the same. Finally, outside forces, such as unions or government regulations, can distort pay rates .



## Wages and Productivity in the U.S.

On a macroeconomic level, this graph shows the disconnect, beginning around 1975, between the productivity of labor and the wage rate in the U.S. If the economic theory were correct in the real world, wages and productivity would increase together.

## Linking Performance and Pay

Some of the disconnect between performance and pay can be addressed with alternate pay schemes. While a salary or hourly pay does not directly take into account the quality of work, performance-related pay compensates workers with higher levels of productivity directly. One example is commission-based pay. In this type of pay scheme, workers receive some percentage of the profit that they generate for their company. This may be paid on top of a baseline salary or may be the only form of compensation.

This type of system is very common among car salespeople and insurance brokers.

Another alternative is piece-work, in which employees are paid a fixed rate for every unit produced or action performed, regardless of the time it takes. This is common in settings where it is easy to measure the output of piece work, such as when a garment worker is paid per each piece of cloth sewn or a telemarketer is paid for every call placed.

## 14.2.5: Marginal Revenue Productivity and Wages

In a perfectly competitive market, the wage rate is equal to the marginal revenue product of labor.

### Learning Objective

Explain how wages are determined by marginal revenue productivity

### Key Points

- In the long run the supply of labor is a simple function of the size of the population, so in order to understand changes in wage rates we focus on the demand for labor.
- The marginal product of labor (MPL) is the increase in output that a firm experiences from adding one additional unit of labor.
- The marginal benefit to the firm of hiring an additional unit of labor is called the marginal revenue product of labor (MRPL). It is calculated by multiplying MPL by the price of the output.
- The MRPL represents the firm's demand curve for labor, which means that the firm will continue to hire more labor until the MRPL is equal to the wage rate.

### Key Terms

marginal benefit

The extra benefit received from a small increase in the consumption of a good or service. It is calculated as the increase in total benefit divided by the increase in consumption.

marginal revenue product

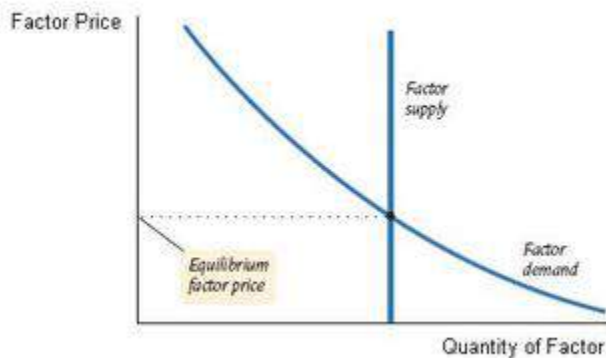
The change in total revenue earned by a firm that results from employing one more unit of labor.

Just as in any market, the price of labor, the wage rate, is determined by the intersection of supply and demand. When the supply of labor increases the equilibrium price falls, and when the demand for labor increases the equilibrium price rises. In the long run the supply of labor is a simple function of the size of the population, so in order to understand changes in wage rates we focus on the demand for labor.

To determine demand in the labor market we must find the marginal revenue product of labor (MRPL), which is based on the marginal productivity of labor (MPL) and the price of output. Conceptually, the MRPL represents the additional revenue that the firm can generate by adding one additional unit of labor (recall that MPL is the additional output from the additional unit of labor). Thus, MRPL is simply the product of MPL and the price of the output.

The MPL is generally decreasing: adding a 100th unit of labor will not increase output as much as adding a 99th. Since competitive industries are price takers and cannot change the price of output by changing their level of production, the MRPL curve will have the same downward slope as the MPL curve.

From the perspective of the firm, the MRPL is the marginal benefit to the firm of hiring an additional unit of labor. We know that a profit-maximizing firm will increase its factors of production until their marginal benefit is equal to the marginal cost. Therefore, firms will continue to add labor (hire workers) until the MRPL equals the wage rate. Thus, workers earn a wage equal to the marginal revenue product of their labor. For example, in a perfectly competitive market, an employee who earns \$20/hour has a marginal productivity that is worth exactly \$20 .



## Marginal Product and Wages

The graph shows that a factor of production - in our case, labor - has a fixed supply in the long run, so the wage rate is determined by the factor demand curve - in our case, the marginal revenue product of labor. The intersection of vertical supply and the downward sloping demand gives the wage rate.

### 14.2.6: Changes in Equilibrium for Shifts in Market Supply and Market Demand

A shift in the supply or demand of labor will cause a change in the market equilibrium.

#### Learning Objective

Discuss the factors that influence the shape and position of the labor supply curve

#### Key Points

- The opportunity cost of leisure is the wages lost while not working; as wages rise, the cost of leisure increases.
- The substitution effect means that when wages rise, people are likely to substitute more labor for less leisure.

- However, the income effect means that as people become wealthier, their demand for normal goods such as leisure increases.
- Typically the substitution effect dominates the supply of labor at normal wage rates, but the income effect may come to dominate at higher wage rates. This creates a backward bending labor supply curve.
- The supply curve for labor will shift in response to changes in preferences, changes in income, changes in population, and changes in expectations.
- The demand curve for labor will shift in response to changes in human capital, changes in technology, changes in the price of complements or substitutes for output, and changes in consumer preferences.

## Key Terms

### Opportunity cost

The cost of any activity measured in terms of the value of the next best alternative forgone (that is not chosen).

### normal good

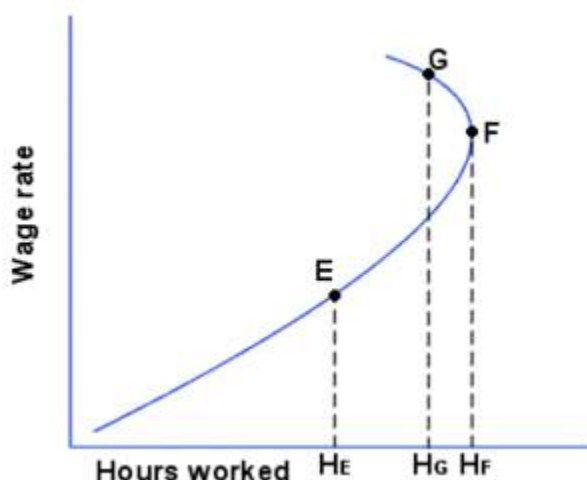
A good for which demand increases when income increases and falls when income decreases but price remains constant.

As in all competitive markets, the equilibrium price and quantity of labor is determined by supply and demand.

## Labor Supply

Labour supply curves are derived from the 'labor-leisure' trade-off. More hours worked earn higher incomes but necessitate a cut in the amount of other things workers enjoy such as going to movies, hanging out with friends, or sleeping. The opportunity cost of working is leisure time and vis versa. Considering this tradeoff, workers collectively offer a set of labor to the market which economists call the supply of labor.

To see how changes in wages affect the supply of labor, suppose wages rise. This increases the cost of leisure and causes the supply of labor to rise - this is the *substitution effect*, which states that as the relative price of one good increases, consumption of that good will decrease. However, there is also an *income effect* - an increased wage means higher income, and since leisure is a normal good, the quantity of leisure demanded will go up. In general, at low wage levels the substitution effect dominates the income effect and higher wages cause an increase in the supply of labor. At high incomes, however, the negative income effect could offset the positive substitution effect and higher wage levels could actually cause labor to decrease. A worker making \$800/hour who receives a raise to \$1200/hour may not have much use for the extra money and may choose to work less while maintaining the same standard of living, for example. This creates a supply curve that bends backwards, initially increasing with the wage rate but later decreasing.



## Backward Bending Supply

While normally hours of labor supplied will increase with the wage rate, the income effect may produce the opposite effect at high wage levels.

People supply labor in order to increase their utility—just as they demand goods and services in order to increase their utility. The supply curve for labor will shift in response to changes in the same factors that shift demand for goods and services. These include changes in preferences, changes in

income, changes in population, and changes in expectations. A change in preferences that causes people to prefer more leisure, for example, will shift the supply curve to the left, creating a lower level of employment and a higher wage rate.

## **Labor Demand**

An increase in the demand for labor will increase both the level of employment and the wage rate. We have already seen that the demand for labor is based on the marginal product of labor and the price of output. Thus, any factor that affects productivity or output prices will also shift labor demand. Some of these factors include:

- Available technology (marginal productivity of labor)
- The skills or education of the workforce (marginal productivity of labor)
- Level of physical capital (marginal productivity of labor)
- Price of physical capital (price of output)
- Price of substitute or complement goods (price of output)
- Consumer preferences (price of output)

All of the above may cause the demand for labor to shift and change the equilibrium quantity and price of labor.

### **14.2.7: Labor Union Impacts on Equilibrium**

Unions are organizations of workers that seek to improve working conditions and raise the equilibrium wage rate.

#### **Learning Objective**

Examine the role of unions and collective bargaining in labor-firm relations

#### **Key Points**



- Unions' primary work involves negotiating wages, work rules, complaint procedures, promotions, benefits, workplace safety and policies with company management.
- If the labor market is a competitive one in which wages are determined by demand and supply, increasing the wage requires either increasing the demand for labor or reducing the supply.
- Increasing demand for labor requires increasing the marginal product of labor or raising the price of the good produced by labor.
- Increasing demand for labor requires increasing the marginal product of labor or raising the price of the good produced by labor.
- Unions can restrict the supply of labor in two ways: slowing the growth of the labor force and promoting policies that make it difficult for workers to enter a particular craft.

## **Key Terms**

collective bargaining

A method of negotiation in which employees negotiate as a group with their employers.

strike

A work stoppage (or otherwise concerted stoppage of an activity) as a form of protest.

minimum wage

The lowest rate at which an employer can legally pay an employee; usually expressed as pay per hour.

A labor union is an organization of workers who have banded together to achieve common goals. The primary activity of the union is to bargain with the employer on behalf of union members and negotiate labor contracts. The most common purpose of associations or unions is maintaining or improving the conditions of employment, which may include the negotiation of wages, work rules, complaint procedures, promotions, benefits, workplace safety, and policies.

In order to achieve these goals unions engage in collective bargaining: the process of negotiation between a company's management and a labor union. When collective bargaining fails, union members may go on strike, refusing to work until a firm addresses the workers' grievances.

## **Union Impacts on Equilibrium**

Fundamentally, unions seek higher wages for its member workers (though, here "wages" encompasses all types of compensation, not just cash paid to the workers by the employer).

The effect of unions on the labor market equilibrium can be analyzed like any other price increase. If employers (those who demand labor) have an inelastic demand for labor, the increase in wages (the price of labor) will not translate into a drop in employment (quantity of labor supplied). If, however, their demand is elastic, employers will simply respond to union demands for higher wages by hiring fewer workers.

However, the reality of unions is more complex. As an organized body, unions are also active in the political realm. They can lobby for legislation that will affect the market not only for labor, but also for the goods they produce. For example, unions may advocate for trade restrictions to protect the markets in which they work from foreign competition. By preventing domestic firms from having to compete with unrestricted foreign firms, they can ensure that consumers do not have lower cost alternatives which would drive employers who pay a higher union wage out of business.



## Union Members Strike

One tool that unions may use to raise wages is to go on strike.

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# 14.3: Income Distribution

## 14.3.1: How Income is Allocated

Recent growth in overall income inequality has been driven mostly by increasing inequality in wages and salaries.

### Learning Objective

Discuss factors that contribute to income inequality

### Key Points

- There is a potential role for government to correct the market failures that have propelled the rise in income inequality.
- Common factors thought to impact domestic economic inequality include labor market outcomes, globalization, technological changes, policy reforms, more regressive taxation, and discrimination.
- Some government tools for affecting income distribution are policies, hiring regulations, and progressive taxation.

### Key Terms

regressive

Whose rate decreases as the amount increases.

progressive

Gradually advancing in extent; increasing.

globalization

The process of international integration arising from the interchange of world views, products, ideas, and other aspects of culture.

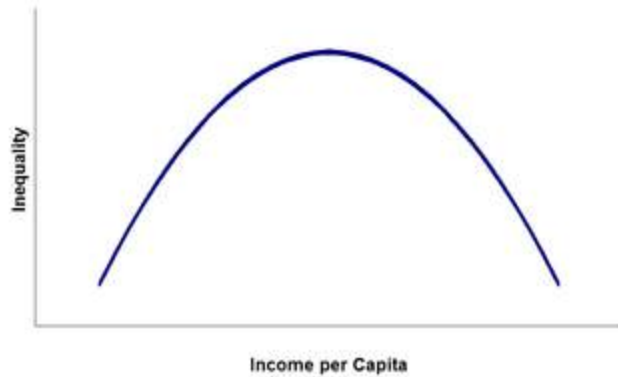
Recent growth in overall income inequality has been driven mostly by increasing inequality in wages and salaries. Globalization has contributed to some portion of rising inequality as jobs have moved to lower wage geographies, placing downward pressure on wages of higher cost of living countries. However, economists view the impact of technological progress to outweigh the effect of globalization, as technology has effectively been substituted for more expensive wage labor. Policy reforms and regressive taxation have promoted disparity but are relatively minor contributors to existing inequality. Discrimination and favoritism in the workplace has continued to limit advancement of minority groups and women, but evidence reveals that wage related impacts to marginalized groups diminish with the increase in educational attainment.

Common factors thought to impact domestic economic inequality include:

- Labor market outcomes
- Globalization
- Technological changes
- Policy reforms
- More regressive taxation
- Discrimination

Globally, income inequality has increased over the last few decades. In the U.S., recent studies have stated that the wealthiest 400 Americans control nearly 50% of domestic wealth. Given that economic theory points to a decline in income inequality over time, the recent increase has led many researchers to conclude that we may be starting a new inequality cycle .





## **Kuznets curve**

The Kuznets curve depicts the relationship between inequality and income; after hitting a market peak, inequality will decrease as income increases. Recent economic trends have caused researchers to believe that the economy may have started on a new Kuznet's curve given the heightening economic inequality.

## **Role of Government**

The market for labor is not completely transparent, competition is imperfect, information unevenly distributed, opportunities to acquire education and skills unequal, and since many such imperfect conditions exist in virtually every market, there is in fact little presumption that markets are in general efficient. This means that there is an enormous potential role for government to correct these market failures.

Governments have a number of tools with which they can affect income distribution. One way in which governments attempt to decrease income inequality is through progressive taxation. Wealthier people pay proportionally more of their income in taxes, which are then used to pay for services for the poor. Government can also place regulations of hiring and firing practices to address issues such as discrimination.

## **14.3.2: Current Topics in Income Distribution**

Income inequality in the United States has grown significantly since the early 1970s.

## **Learning Objective**

Describe trends in income inequality in the U.S.

## **Key Points**

- While inequality has risen among most developed countries, and especially English-speaking ones, it is highest in the United States.
- The fruits of overall growth have accrued disproportionately to the top 1%.
- According to PolitiFact and others, 400 Americans now own more than 50% of the net wealth of the United States.

## **Key Term**

inequality

An unfair, not equal, state.

While income inequality has risen among most developed countries, and especially English-speaking ones, it is highest in the United States. Income inequality in the United States has grown significantly since the early 1970s and has been the subject of study of many scholars and institutions.

Most of the income growth has been between the middle class and top earners, with the disparity becoming more extreme the further one goes up in the income distribution. A 2011 study by the Congressional Budget Office (CBO) found that the top earning 1% of households increased their income by about 275% after federal taxes and income transfers over a period between 1979 and 2007, compared to a gain of just under 40% for the 60% in the middle of America's income distribution. Scholars and others differ as to the causes, solutions, and the significance of the trend, which in 2011 helped ignite the "Occupy" protest movement. As a result, inequality has been described both as irrelevant in the face of economic

opportunity (or social mobility) in America, and as a cause of the decline in that opportunity.

Yale professor and economist Robert J. Shiller, who was among three Americans who won the Nobel prize for economics in 2013, believes that rising economic inequality in the United States and other countries is "the most important problem that we are facing now today. "

## **Brief History of Income Disparity in America**

The first era of inequality lasted roughly from the post-civil war era ("the Gilded Age") to sometime around 1937. But from about 1937 to 1947, a period that has been dubbed the "Great Compression," income inequality in America fell dramatically. Highly progressive New Deal taxation, the strengthening of unions, and regulation of the National War Labor Board during World War II raised the income of the poor and working class and lowered that of top earners. This "middle class society" characterized by a relatively low level of inequality remained fairly steady for about three decades ending in early 1970s. The return to high inequality or what has been referred as the "Great Divergence," began in the 1970s. It was caused mainly due to the widening gap between middle and top earners.

## **Recent History: Inequality on the Rise**

The income growth of the average American family closely matched that of economic productivity until some time in the 1970s. However, while income began to stagnate, productivity continued to climb .



Source: Bureau of Economic Analysis, Bureau of Economic Analysis, Supplemental Historical Income Tables, Table I-3 and Bureau of Labor Statistics, Productivity—Major Sector Productivity and Costs Database (2012)

## U.S. Income over time

Though productivity gains were primarily the basis for the increase in U.S. income, in more recent times, productivity increases have not been captured in income increases for the majority of U.S. families as noted in the graph.

In 2013, the Economic Policy Institute noted that even though corporate profits are at historic highs, the wage and benefit growth of the vast majority has stagnated. The fruits of overall growth have accrued disproportionately to the top 1%. According to PolitiFact and others, 400 Americans now own more than 50% of the net wealth of the United States.

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# 14.4: Capital and Natural Resource Markets

## 14.4.1: Other Factors of Production

There are three factors of production that are required to produce economic output: land, labor, and capital.

### Learning Objective

Discuss the role of capital and resources in production

### Key Points

- Land includes the site where goods are produced as well as all the minerals below and above the site.
- Labor includes all human effort used in production as well as the necessary technical and marketing expertise.
- Capital are the human-made goods used in the production of other goods, such as machinery and buildings. It does not include cash.

### Key Term

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings (structures).

Factors of production are the inputs to the production process. Finished goods are the output. Input determines the quantity of output; in other words, output depends upon input. Input is the starting point and output is the end point of a production process and such input-output relationship is

called a production function. There are three basic, otherwise known as classical, factors of production:

- Land: which includes the site where goods are produced as well as all the minerals below and above the site;
- Labor: which includes all human effort used in production as well as the necessary technical and marketing expertise; and
- Capital: which are the human-made goods used in the production of other goods, such as machinery and buildings .

Land is sometime included with capital in certain situations, such as in service industries where land has little importance. All three of these are required in combination at a time to produce a commodity. In economics, production means creation or an addition of utility. Factors of production (or productive 'inputs' or 'resources') are any commodities or services used to produce goods or services.

## **Further Defining Capital**

In accounting and other disciplines, the phrase "capital" can also refer to cash that have been invested in a business. The classical economists also employed the word "capital" in reference to money. Money, however, was not considered to be a factor of production in the sense of capital stock since it is not used to directly produce any good. The return to loaned money or to loaned stock was styled as interest while the return to the actual proprietor of capital stock (tools, etc.) is classified as profit.

It is important to note that the final output is the result of the combination of all of the inputs. Things like technological advancement and worker productivity are intricately tied to the productivity of the inputs; it is not enough to simply have the factors of production in one place without the knowledge and ability to convert them into the correct outputs.

### **14.4.2: The Importance of Factor Prices**

The prices of different factors of production can help determine which products a country will produce.

## **Learning Objective**

Explain how changes in resource prices affect production

## **Key Points**

- The exports of a capital-abundant country will be from capital-intensive industries, and relatively labor-abundant countries will import such goods, exporting labor intensive goods in return.
- In the long-run, entities will specialize in what costs them comparatively less to produce.
- If one factor of production becomes more plentiful, and therefore cheaper, it will cause production of the good that relies on that factor to increase.

## **Key Term**

comparative advantage

The ability of a party to produce a particular good or service at a lower margin and opportunity cost over another.

Comparative advantage is the ability of one country or region to produce a particular good or service at a lower opportunity cost than another. This idea suggests that in the long-run, entities will specialize in what costs them less to produce. These entities will then trade the goods they produce for the items that it would be expensive for them to produce. As a result, the prices of different factors of production can help dictate which products a country will choose to produce.





## Trade

Trade and comparative advantage are why factor prices are so important in determining what a country produces. Trade allows a country to produce only what is comparatively cheaper for them to manufacture because they can get everything else they need through trade.

This idea was expanded upon in the Heckscher-Ohlin Model (H-O model), which was designed to be used to predict patterns of international commerce. This model is premised on several assumptions. These assumptions are:

- All countries have identical production technology;
- Production output is assumed to exhibit constant returns to scale;
- The technologies used to produce the two commodities differ;
- Factor mobility within countries;
- Factor immobility between countries;
- Commodity prices are the same everywhere; and
- Perfect internal competition.

If these assumptions are held to be true, the HO-model suggests that the exports of a capital-abundant country will be from capital-intensive industries, and labor-abundant countries will import such goods, exporting labor intensive goods in return.

For example, a country where capital and land are abundant but labor is scarce will have comparative advantage in goods that require lots of capital and land, but little labor. If capital and land are abundant, their prices will be low. As capital and land the main factors used in the production of grain, the price of grain will also be low, and thus attractive for both local consumption and export. Labor intensive goods on the other hand will be very expensive to produce since labor is scarce and its price is high. Therefore, the country is better off importing those goods.

## Shifts in Factor Prices

Assuming the cost of relative goods remain constant, if one factor of production becomes more or less expensive, it can cause a significant shift of what is produced in that country.

If one factor of production becomes more plentiful, and therefore cheaper, it will cause production of the good that relies on that factor to increase. In response to that increase, the country will produce fewer goods that rely on other factors.

For example, imagine a country has a population boom from immigration. Its supply of labor will increase. As a result, the price of labor decreases. This country produces one good that is labor intensive, clothes, and one that is capital intensive, cars. When the cost of labor decreases, the country will produce more clothes and less cars. This is not necessarily a one-to-one relationship where the production of one more shirt means one less car is produced; the only thing that can be predicted is an overall shift in production levels.

It is important to note that the shifts in factor prices described above are based entirely on the assumptions found in the H-O Model. It is rare that a real market would meet all of those standards, so the results in the real world might vary from what this section describes.

### 14.4.3: Marginal Productivity and Resource Demand

Firms will demand more of a resource if the marginal product of the resource is greater than the marginal cost.

## **Learning Objective**

Explain the relationship between marginal productivity and resource demand

## **Key Points**

- When firms have positive net marginal products of resources, the demand for the resource will increase.
- Some resources are subject to the typical market constraints of supply and demand.
- Some resources are public goods, which means that they could be depleted if firms that have positive net marginal products from the resource are not regulated.

## **Key Term**

marginal productivity

The extra output that can be produced by using one more unit of the input

The marginal product of a given resource is the additional revenue generated by employing one more unit of the resource. In the case of labor, for example, the marginal product of labor is the additional value generated for the company by hiring one additional worker. A firm will continue to employ more of the resource until the marginal revenue equals the marginal cost to the firm. The same concept applies to all resources that can be used in production, whether its labor or wood or land.

Since firms will seek to use additional resources if the net marginal product is positive, they can affect the demand for the resources. For many resources, the increased demand has the same effects as if it were any other input: an increase in demand will lead to an increase in price .



## Oil Rig

Oil is a natural resource that is traded in markets. When firms have positive net marginal productivity from using more oil, demand for oil will rise.

Some resources, though, are public goods and therefore are not regulated by normal market forces. Take, for example, a body of water that multiple firms all use. If each firm has a positive marginal productivity of using more water in their manufacturing process, they will use more water since it's free (there is no, or limited, marginal cost). If each firm individually chooses to use more water, the lake will eventually be damaged. This is known as the tragedy of the commons.

Governments have an incentive to attempt to correct such market failures. There are often regulations on the use of public goods to prevent the tragedy of the common, and there may be regulations on private goods as well (e.g. companies are required to get permits to mine on land they own).

### **14.4.4: Marginal Productivity and Income Distribution**

Demand for the type of workers that can provide positive marginal productivity over marginal cost will see an increase in their wages.

#### **Learning Objective**

Explain how the marginal productivity of different factors can affect income distribution

## Key Points

- Firms hire workers when they have higher marginal productivity than marginal cost.
- Workers are often categorized as either skilled or unskilled workers. Firms only hire the type of workers they need.
- If, on aggregate, there is a higher demand for skilled workers than unskilled workers, skilled workers will gain proportionally more income as their wages rise.

## Key Term

marginal productivity

The extra output that can be produced by using one more unit of the input

Firms will hire workers if the marginal productivity of the worker is greater than the marginal cost. That is, firms will hire someone if the employee can produce more value for the firm than s/he costs in wages or salary.

Not all labor, however, is equal in the firm's eyes. The two broad categorizations of laborers is skilled (e.g. doctor) and unskilled (e.g. an assembly line worker). Firms will hire the type of workers that they need .



## **Scientists are Skilled Workers**

Scientists are skilled workers. Firms, such as pharmaceutical companies, will hire more scientists if the marginal productivity is greater than the marginal cost. This will drive up demand for scientists, and therefore their wages.

Suppose there are many firms with positive net marginal productivity of skilled labor. They will each seek to hire more skilled workers, driving up demand for skilled workers. This will increase the wages of skilled workers, but not of unskilled workers. Skilled workers will gain proportionally more wealth than unskilled workers. Taken in aggregate, the marginal productivity of one type of worker influences the income that they earn in comparison to other types of workers.

On a national scale, this can have massive implications. If a country has a number of workers with high marginal productivity proportional to marginal cost, firms will want to hire those workers. Those workers will see gains to their income, affecting overall income distribution.

It is important to remember, however, that countries will specialize in goods in which they have a comparative advantage. If a country has an absolute advantage in both skilled and unskilled workers, but a comparative advantage in unskilled workers, the country will specialize in the good that is intensive in the use of unskilled labor. The increased returns will go to unskilled workers (they will see their wages increase), even though the country also has an absolute advantage in skilled labor.

## 14.4.5: Capital Market

A capital market is a financial exchange for the buying and selling of long-term debt and equity-backed securities.

### Learning Objective

Define the capital market

### Key Points

- In primary markets, new stock or bond issues are sold to investors, often via a mechanism known as underwriting. In the secondary markets, existing securities are sold and bought among investors or traders.
- The money markets are used for the raising of short term finance, sometimes for loans that are expected to be paid back as early as overnight. Capital markets are used for the raising of long term finance.
- Regular bank lending is not usually classed as a capital market transaction, even when loans are extended for a period longer than a year.

### Key Term

capital market

The market for long-term securities, including the stock market and the bond market.

A capital market is a financial exchange for the buying and selling of long-term debt and equity-backed securities ( ). The purpose of these markets is to channel the funds of savers to entities that would put that capital to long-term productive use (i.e. borrowers).



## **NYSE**

This is the floor of the New York Stock Exchange. The NYSE is one of the largest capital markets in the world.

## **Primary vs. Secondary Markets**

A key division within the capital markets is between the primary markets and secondary markets. In primary markets, new stock or bond issues are sold to investors. The main entities seeking to raise long-term funds on the primary capital markets are governments (which may be municipal, local or national) and business enterprises (companies). Governments tend to issue only bonds, whereas companies often issue either equity or bonds. The main entities purchasing the bonds or stocks include pension funds, hedge funds, sovereign wealth funds, and, less commonly, individuals and investment banks trading on their own behalf.

In the secondary markets, existing securities are sold and bought among investors or traders, usually on an exchange, over-the-counter, or elsewhere. The existence of secondary markets increases the willingness of investors in primary markets, as they know they are likely to be able to swiftly cash out their investments if the need arises.

## **Money Market vs. Capital Market**



Money markets and capital markets are closely related, but are different types of financial markets. The money markets are used for the raising of short term finance, sometimes for loans that are expected to be paid back as early as overnight. Funds borrowed from the money markets are typically used for general operating expenses, to cover brief periods of illiquidity.

Capital markets are used for the raising of long term finance, such as the purchase of shares, or for loans that are not expected to be fully paid back for at least a year. When a company borrows from the primary capital markets, often the purpose is to invest in additional physical capital goods, which will be used to help increase its income. It can take many months or years before the investment generates sufficient return to pay back its cost, and hence the finance is long term.

## **Regular Bank Lending is Not a Capital Market Transaction**

Regular bank lending is not usually classed as a capital market transaction, even when loans are extended for a period longer than a year. A key difference is that with a regular bank loan, the lending doesn't take the form of resalable security like a share or bond that can be traded on the markets. A second difference is that lending from banks and similar institutions is more heavily regulated than capital market lending. A third difference is that bank depositors and shareholders tend to be more risk averse than capital market investors.

### **14.4.6: Natural Resource Market**

Commodity markets are exchanges that trade in primary rather than manufactured products.

#### **Learning Objective**

Define the natural resource market

#### **Key Points**

- There are two types of commodities. Hard commodities are mined and soft commodities are agricultural products.
- There are approximately 50 commodity markets worldwide. In general, these markets deal in purely financial transactions instead of outright purchases of goods. These financial transactions are known as financial derivatives.
- In the United States, the principal regulator of commodity and futures markets is the Commodity Futures Trading Commission (CFTC). The National Futures Association (NFA) formed in 1976 and is the futures industry's self-regulatory organization.

## **Key Term**

commodity

Raw materials, agricultural and other primary products as objects of large-scale trading in specialized exchanges.

Natural resources are a fundamental part of the production process, as these goods make up the basis of any manufactured product. Most natural resources that are used can be acquired through the open market or through private deals. Below are some methods of acquiring different natural resources for production.

## **Public Goods**

Some natural resources that are components of the production process are not sold, but are public goods. Public goods, like air and riverways, are non-excludable and non-rivalrous. This means that anyone can use these goods without paying a fee, and if one person uses the good it does not limit the ability of another to use the good.

As time has progressed, people have learned that some means of use of public goods in production processes can degrade certain natural resources. For example, pollution is a result of production processes that can foul the public goods of air and waterways. To combat this, governments have begun to impose ecotaxes on producers that use processes that pollute or

otherwise dilute public goods. While not a market, these taxes are essentially a fee charged to producers for using public natural resources and can make the production process more expensive.

## **Commodity Markets**

Commodity markets are exchanges that trade in primary rather than manufactured products . Not all commodities are natural resources, and not all natural resources are commodities, but commodity markets remain an important source for many resources. There are two types of commodities:



### **Chicago Mercantile Exchange**

The Chicago Mercantile Exchange, shown above, is one of the world's largest commodity markets.

- *Soft commodities* are agricultural products such as wheat, coffee, cocoa and sugar;
- *Hard commodities* are mined, such as gold, rubber and oil.

Commodity markets are heavily regulated. In the United States, the principal regulator of commodity and futures markets is the Commodity Futures Trading Commission (CFTC). The National Futures Association (NFA) formed in 1976 and is the futures industry's self-regulatory organization. The NFA's first regulatory operations began in 1982 and fall under the Commodity Exchange Act of the Commodity Futures Trading Commission Act.

In Europe, commodity markets are regulated by the European Securities and Markets Authority (Esma), based in Paris and formed in 2011. Esma sets position limits on commodity derivatives.

## **Closed Purchases**

Not all natural resources can be acquired on commodity markets. Some must be acquired through direct purchases without the use of an intermediary clearing house. One example is for land. Land is one of the three factors of production, can be used to mine other natural resources and is absolutely necessary if a person wants to have a "brick and mortar" location where they can sell their goods. Land cannot be acquired through a commodity market, but must be obtained through an agreement with someone who owns the land. A person can either purchase the land outright or become a tenant of the person who owns the property.

The challenge of this process is that for these closed deals, the producer has to find the resource that they need, determine who owns it, and then negotiate with that person to obtain the resource. These costs can make these natural resources more expensive.

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# 14.5: Capital, Productivity, and Technology

## 14.5.1: Capital and Technology

Firms add capital to the point where the value of marginal product of capital is equal to the rental rate of capital.

### Learning Objective

Analyze how firms determine the amount of capital to use in production.

### Key Points

- Capital is the infrastructure and equipment used to produce goods and services.
- The production function describes the relationship between the quantity of inputs used in production and the quantity of output. It can be used to derive the marginal product for capital.
- The value of marginal product (VMP) of capital is the marginal product of capital multiplied by its price. The firm's demand curve for capital is derived from the VMP of capital.

### Key Terms

Production function

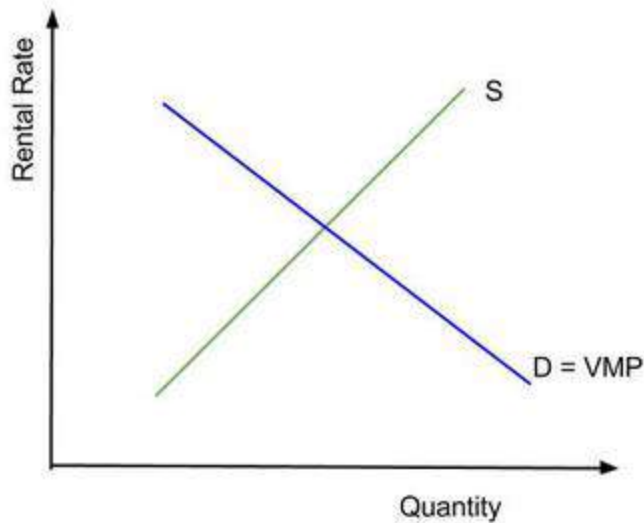
Relates physical output of a production process to physical inputs or factors of production.

Value of marginal product of capital

The marginal product of capital multiplied by its price.

Capital is a factor of production, along with labor and land. It consists of the infrastructure and equipment used to produce goods and services. Capital can include factory buildings, vehicles, plant machinery, and tools used in the production process. Firms may buy, rent, or lease infrastructure and tools in the capital market, but even if the firm owns these factors of production, the opportunity cost of using this capital is the foregone rent that the firm could receive if it rented the capital to somebody else rather than using it for production. Because of this, we say that the price of capital is the rental rate.

A firm decides how much of each factor input to use and how much output to produce based on the market prices for outputs and inputs, as well as exogenous technological determinants represented by the production function. The production function describes the relationship between the quantity of inputs used in production and the quantity of output. It can be used to derive the marginal product for capital, which is the increase in the amount of output from an additional unit of capital. The value of marginal product (VMP) of capital is the marginal product of capital multiplied by price. The downward-sloping demand curve for capital, which is equal to the VMP of capital, reflects the fact that the production process exhibits diminishing marginal product. A firm will continue to add capital up to the point where the rental rate is equal to the value of marginal product of capital, which is the point of equilibrium.



## Firm Demand for Capital

Firms will increase the quantity of capital hired to the point where the value of marginal product of capital is equal to the rental rate of capital.

### 14.5.2: Total Factor Productivity

Total factor productivity, which captures how efficiently inputs are utilized, is a key indicator of competitiveness.

#### Learning Objective

Discuss the importance of Total Factor Productivity in comparing firms, industries, and countries.

#### Key Points

- Total factor productivity measures the residual growth in total output of a firm, industry, or national economy that cannot be explained by the accumulation of traditional inputs such as labor and capital.
- Total factor productivity cannot be measured directly. Instead, it is a residual which accounts for effects on total output not caused by

inputs.

- Total factor productivity is considered one of the key indicators of competitiveness. It is also accepted by economics as the main contributing factor to economic growth.

## **Key Term**

### Total factor productivity

A variable which accounts for effects in total output not caused by traditionally measured inputs of labor and capital.

Total factor productivity measures the residual growth in total output of a firm, industry, or national economy that cannot be explained by the accumulation of traditional inputs such as labor and capital . Increases in total factor productivity reflect a more efficient use of inputs, and total factor productivity is often taken as a measure of long-term technological change or dynamism brought about by such factors as technical innovation.



## **Total Factor Productivity**

Total output is not only a function of labor and capital, but also of total factor productivity, a measure of efficiency.

Total factor productivity cannot be measured directly. Instead, it is a residual which accounts for effects on total output not caused by inputs. In

the Cobb-Douglas production function, total factor productivity is captured by the variable A:

In the equation above, Y represents total output, K represents capital input, L represents labor input, and alpha and beta are the two inputs' respective shares of output. An increase in K or L will lead to an increase in output. However, due to the law of diminishing returns, the increased use of inputs will fail to yield increased output in the long run. The quantity of inputs used thus does not completely determine the amount of output produced. How effectively the factors of production are used is also important. Total factor productivity is less tangible than capital and labor inputs, and it can account for a range of factors, from technology, to human capital, to organizational innovation.

Total factor productivity can be used to measure competitiveness. The higher a country's total factor productivity, the more competitive it is likely to be (subject to constraints such as resources). It is also generally viewed as one of the main vehicles for driving economic growth.

When a country is able to increase its total factor productivity, it can yield higher output with the same resources, and therefore drive economic growth.

### **14.5.3: Changes in Technology Over Time**

Technological improvement improves the efficiency of production, which increases supply and lowers prices.

#### **Learning Objective**

Summarize how changes in technology affect a firm's decision to produce.

#### **Key Points**

- The technology available in a particular industry or economy allows firms to use labor and capital more or less efficiently.
- A change in technology alters the combination of inputs required in the production process. An improvement in technology usually means that fewer and/or less costly inputs are needed.
- If the cost of production is lower, the profits available at a given price will increase, and producers will produce more.
- While we usually think of technology as enhancing production, declines in production due to problems in technology are also possible.

## Key Terms

### input

Something fed into a process with the intention of it shaping or affecting the outputs of that process.

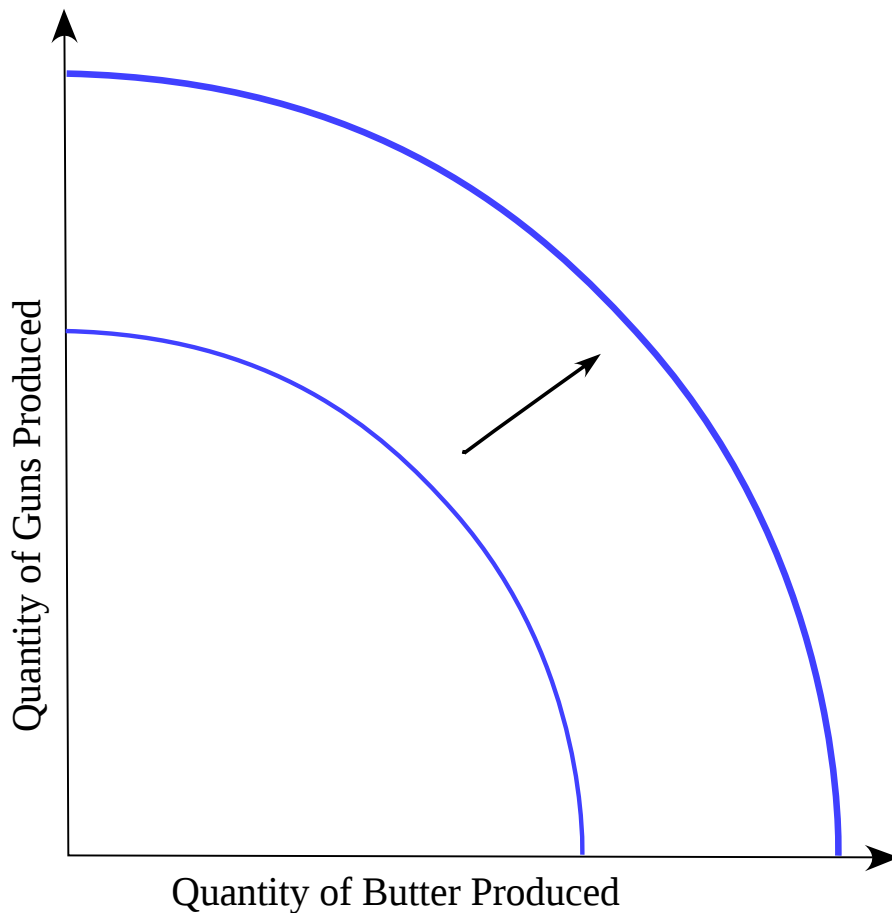
### assembly line

A system of workers and machinery in which a product is assembled in a series of consecutive operations; typically the product is attached to a continuously moving belt

Factors of production typically include land, labor, capital, and natural resources. These inputs are used directly to produce a good or service. Technology, on the other hand, is used to put these factors of production to work. A firm doesn't purchase additional units of technology to feed into the production process in the same way that a firm might hire more labor in order to increase output. Instead, the technology available in a particular industry or economy allows firms to use labor and capital more or less efficiently. It is important to note that advances in technology are a result of innovation, innovative practices such as process changes are also worth mentioning in this context. Innovation is the driving economic force behind these leaps in efficiency.

Technological change is a term used to describe any change in the set of feasible production possibilities. A change in technology alters the combinations of inputs or the types of inputs required in the production

process. An improvement in technology usually means that fewer and/or less costly inputs are needed. If the cost of production is lower, the profits available at a given price will increase, and producers will produce more. With more produced at every price, the supply curve will shift to the right, meaning an increase in supply and a decrease in prices. For the economy as a whole, an improvement in technology shifts the production possibilities frontier outward .



## **Production Possibility Frontier (PPF)**

An increase in technology that allows for greater output based upon the same inputs can be described as an outward shift of the PPF, as demonstrated in this figure.

The invention and popularization of the assembly line is an example of process change, which is worth mentioning in context with technological change. Innovative practices to how we do this is an example of the way in which output can be increased with the same input, and is often discussed in conjunction with technological innovation. During the industrial revolution, many products that had previously been created by hand by a single person or a team of craftsmen began to be manufactured instead in factories in which each worker performed one simple operation. This meant that companies could produce much more output using the same amount of raw materials, capital, and labor. Supply of these goods increased, and the production possibilities curve for the entire economy shifted outwards.

Technological change in the computer industry has resulting in a shift of the computer supply curve. Due to advances in technology, computers can now be manufactured more cheaply, even though they continue to grow smaller, faster, and more powerful. Producers respond to the cheaper production process by increasing output, shifting the supply curve outwards. Thus, the number of computers produced increases and the price of computers falls.

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# **15: Challenges to Efficient Outcomes**

# 15.1: Sources of Inefficiency

## 15.1.1: Asymmetric Information: Adverse Selection and Moral Hazard

Asymmetric information, different information between two parties, leads to the following - adverse selection, moral hazards, and market failure.

### Learning Objective

Examine the concept of adverse selection in the context of imperfect information

### Key Points

- Adverse selection is a term used in economics that refers to a process in which undesired results occur when buyers and sellers have access to different/imperfect information, also known as asymmetric information.
- Asymmetric information causes an imbalance of power.
- A moral hazard is a situation where a party will take risks because the cost that could incur will not be felt by the party taking the risk.
- A lack of equal information causes economic imbalances that result in adverse selection and moral hazards. All of these economic weaknesses have the potential to lead to market failure.

### Key Terms

adverse selection

The process by which the price and quantity of goods or services in a given market is altered due to one party having information that the other party cannot have at reasonable cost.

moral hazard

A situation where there is a tendency to take undue risks because the costs are not borne by the party taking the risk.

## **Asymmetric Information**

Asymmetric information means that one party has more or better information than the other when making decisions and transactions. The imperfect information causes an imbalance of power. For example, when you are trying to negotiate your salary, you will not know the maximum your employer is willing to pay and your employer will not know the minimum you will be willing to accept.

Accurate information is essential for sound economic decisions. When a market experiences an imbalance it can lead to market failure.

## **Adverse Selection**

Adverse selection is a term used in economics that refers to a process in which undesired results occur when buyers and sellers have access to different/imperfect information. The uneven knowledge causes the price and quantity of goods or services in a market to shift. This results in "bad" products or services being selected. For example, if a bank set one price for all of its checking account customers it runs the risk of being adversely affected by its low-balance and high activity customers. The individual price would generate a low profit for the bank.

## **Moral Hazards and Market Failure**

In addition to adverse selection, moral hazards are also a result of asymmetric information. A moral hazard is a situation where a party will take risks because the cost that could incur will not be felt by the party taking the risk. A moral hazard can occur when the actions of one party may change to the detriment of another after a financial transaction. In relation to asymmetric information, moral hazard may occur if one party is insulated from risk and has more information about its actions and intentions than the party paying for the negative consequences of the risk. For example, moral

hazards occur in employment relationships involving employees and management. When a firm cannot observe all of the actions of employees and managers there is the chance that careless and selfish decision making will occur.



## **Moral Hazard**

An insured driver getting into a car accident is an example of a moral hazard. The driver will take risks because the cost is not directly felt due to a transaction. The insurance company pays for the accident and not the driver.

Asymmetric information starts the downward economic spiral for a firm. A lack of equal information causes economic imbalances that result in adverse selection and moral hazards. All of these economic weaknesses have the potential to lead to market failure. A market failure is any scenario where an individual or firm's pursuit of pure self interest leads to inefficient results.

### **15.1.2: Principle-Agent Problem**

The principle-agent problem (agency dilemma) exists when conflicts of interest arise between a principal and an agent in a business setting.

#### **Learning Objective**

Explain the Principal-Agent Problem

#### **Key Points**

- A business contract creates a straightforward connection between agent performance and profitability.
- In business relationships, the principal will use performance evaluations to ensure that the agent is fulfilling the necessary duties.
- Incentive structures are used in business relationship in order to bridge the gap between best interests of the principal and the agent.

## **Key Terms**

subjective

Formed, as in opinions, based upon a person's feelings or intuition, not upon observation or reasoning; coming more from within the observer than from observations of the external environment.

Objective

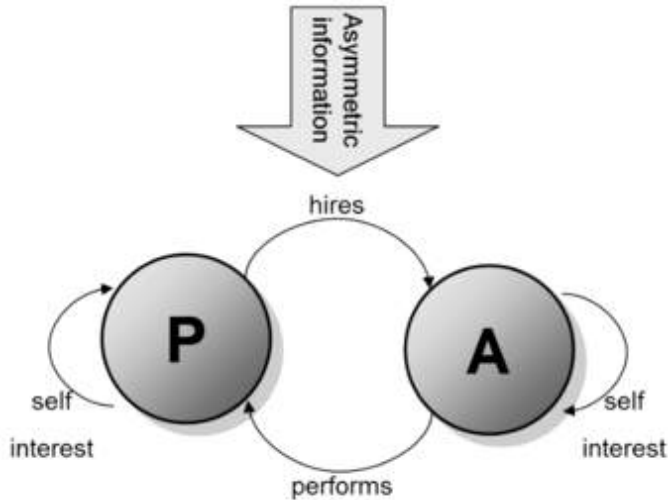
Agreed upon by all parties present (or nearly all); based on consensually observed facts.

incentive

Something that motivates, rouses, or encourages.

## **Principal-Agent Problem**

In economics, the principal-agent problem (also known as an agency dilemma) exists when conflicts of interest arise between a principal and an agent in a business setting . Conflicts usually exist when contracts are written due to uncertainty and risk taken on by both parties. The principal hires the agent to perform specific to duties that represent its best interest. The work that is performed can be costly to the agent and not in the principal's best interest. In short, the work done by the agent doesn't actually reflect the best interests of the principal. Examples of relationships that can experience the principal-agent problem include:



## Principle agent problem

The diagram shows the basic idea of the principle agent problem. P is the principle and A is the agent. It clearly illustrates the working relationship between the principle and the agent while highlighting the presence of business partnership as well as self-interest.

- Management (agent) and shareholders (principal)
- Politicians (agent) and voters (principal)

The conflict of interest potentially arises in almost any context where one party is being paid by another to do something, whether it is in formal employment or a negotiated deal. The two parties have different interests and asymmetric information. The deviation of the agent from the principals interest is referred to as "agency costs. "

## Contract Design

In order to minimize and control economic conflict, principals and agents design and agree on a contract. It serves as a guide and agreement to safeguard the best interests of both parties. The linear model is used to determine incentive compensation in a contract:  $w = a + b(e + x + gy)$ .

In the linear model  $w$  is the wage,  $a$  is a constant,  $e$  is the unobserved effort,  $x$  is the unobserved exogenous effects on outcomes, and  $y$  is the observed



exogenous effects; while  $g$  and  $a$  represent the weight given to  $y$ , and the base salary.

A business contract creates a straightforward connection between agent performance and profitability. This connection sets the standard for judging the performance of the agent.

## **Performance Evaluation**

In business relationships, the principal will use performance evaluations to ensure that the agent is fulfilling the necessary duties. There are two forms of performance evaluation:

- objective performance evaluation - takes into account how fast a task can be completed. The evaluation compares the performance of an agent by comparing the work completed by peers within the industry.
- subjective performance evaluation - involves the principal directly evaluating the performance of the agent. In this case, the evaluation is based on opinions instead of observations or reasoning. .

## **Incentive Structures**

Incentive structures are used in business relationship in order to bridge the gap between best interests of the principal and the agent.

Principals offer various incentive structures, which are rewards or motivating factors that drive the agent to work in the best interest of the principal and complete tasks efficiently. Incentive structures include price rates/commissions, profit sharing, and efficiency wages.

It is usually in best interest of both parties to work together. For the principal, agent inefficiency results in sub-optimal results and low welfare. For the agent, efficiency is important in order to receive payment for work completed.

## 15.1.3: Public Choice: Median Voters and Inefficient Voting Outcomes

Public choice may not lead to an economically efficient outcomes due to who votes, why they vote, and in what system they vote.

### Learning Objective

Use the Condorcet paradox to evaluate voting systems

### Key Points

- A voting system is a method by which voters choose between multiple options, usually in an election or policy referendum.
- The Condorcet paradox is a voting paradox where collective preferences can be cyclical. It is a paradox because the wishes of the majority can conflict with one another.
- The Condorcet method of voting consists of any election method that elects candidate that would win by majority rule in all pairings against the other candidates.
- Most Condorcet voting methods consist of a single round of voting where individuals rank their top choices. In the event of a tie or unclear winner (Condorcet paradox) alternate methods of determining a winner are used including tie breakers, additional rounds of voting, ect.

### Key Terms

paradox

A counter-intuitive conclusion or outcome.

public choice theory

The use of modern economic tools to study problems that traditionally are in the province of political science.

voting system

A system used to determine the result of an election based on voters' preferences.

A voting system is a method by which voters choose between multiple options, usually in an election or policy referendum. The system enforces rules to ensure valid voting, accurate tabulation, and a final result. Common voting systems include majority rule, proportional representation, or plurality voting. The study of voting systems is called voting theory. Voting theory is a subfield of economics.

## **Public Choice Theory**

No matter what voting system is used, the act of voting gives the public the ability to choose a candidate or influence a decision. Obviously, when voting takes place not everyone will agree with the outcome, but everyone has the ability to participate in the process. Public choice is described as "the use of economic tools to deal with traditional problems of political science. " In microeconomics, public choice analyses collective decision making and studies economic models of political processes including rent-seeking, elections, legislatures, and voting behavior.

Since not every voter participates in an election, not every voter will have full information, and not every voter will vote based on what s/he perceives as the best long-term outcome, voting outcomes may be inefficient. Elections do not necessarily reflect the best long-term outcome, what the active voters thought was best given their criteria at the time.

## **Condorcet Paradox**

The Condorcet paradox is a voting paradox where collective preferences can be cyclical. It is a paradox because the wishes of the majority can conflict with one another. Conflicting majorities are made up of different groups of individuals. For example, the Condorcet paradox can be compared to the game rock/paper/scissors. For each candidate, there can be another that is preferred by some majority. The Condorcet method of voting consists of any election method that elects candidate that would win by majority rule in all pairings against the other candidates. Most Condorcet voting methods

consist of a single round of voting where individuals rank their top choices. In the event of a tie or unclear winner (Condorcet paradox) alternate methods of determining a winner are used including tie breakers, additional rounds of voting, etc.

An example of a voting paradox can be seen in a simple voting scenario. There are three candidates including 1, 2, and 3. There are three voters with preferences. Each voter ranks the candidates from most to least favored. If the results are determined and 3 is the winner, it can be argued that another candidate should have won due to the number of preferred votes versus the first choice of each voter. In this case, the requirement of majority rule does not provide a clear winner. According to the Condorcet paradox additional methods would be needed to determine the winner since the voting process is complex and each voter provides preferences instead of only selecting one candidate.

**Rank any number of options in your order of preference.**

Joe Smith

John Citizen

Jane Doe

Fred Rubble

Mary Hill

**Preferential voting ballot**

The Condorcet paradox is used to evaluate voting systems. Voters rank candidates according to their own preferences. The Condorcet method states that a candidate wins by majority rule.

The Condorcet paradox means that there is not a clear winner and ambiguities must be resolved to determine the election results.

## **15.1.4: Behavioral Economics: Irrational Actions**

Behavioral economics is the study of the effects of social, cognitive, and emotional facts on the financial decisions of individuals and institutions.

### **Learning Objective**

Paraphrase the history and characteristics of behavioral economics

### **Key Points**

- Behavioral economics studies the consequences for market prices, returns, and resource allocation. It focuses on the bounds of rationality of economic agents.
- Behavioral economics analyzes behavioral finance, financial models, and the behavioral game theory in order to gain insight into why certain economic decisions are made.
- Three prevalent themes in behavioral economics are heuristics, framing, and market inefficiencies, though there are many more.
- Throughout its history, behavioral economics has analyzed psychology and economic findings to determine how and why economic decisions are made. Areas of focus included fairness, justice, and utility.

### **Key Terms**

behavioral economics

Study of the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices, returns, and resource allocation.

heuristic

Relating to general strategies or methods for solving problems.

Behavioral economics is the study of the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions. It also studies the consequences for market prices, returns, and resource allocation. Behavioral economics focuses on the bounds of rationality of economic agents.

## Characteristics

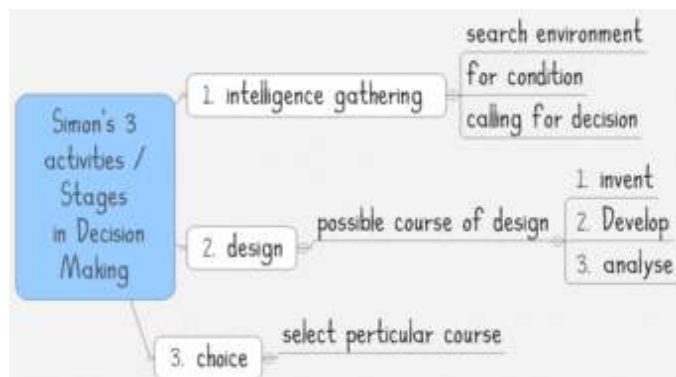
Behavioral economics has specific characteristics based on what is studied. Areas of focus include:

- Behavioral finance: the intent is to explain why market participants make systematic errors. Errors impact prices and returns which they create market inefficiencies. It also looks at how other participants take advantage of market inefficiencies.
- Financial models: some financial models used in money management incorporate behavioral financial parameters. Examples of areas studied include overreaction and irrational purchasing habits.
- Behavioral game theory: analyzes interactive strategic decisions and behavior using the methods of game theory, experimental economics, and experimental psychology. Studies interactive learning, social preferences, altruism, framing, and fairness.

There are many aspects in behavioral economics, and three of the most prevalent are:

- Heuristics: people make decisions based on approximate rules and not strict logic.
- Framing: using a collection of anecdotes and stereotypes that make up the mental and emotional filters that individuals rely on to understand and respond to events.
- Market inefficiencies: include the study of non-rational decision making and incorrect pricing.

Behavioral economics focuses on the study of how and why individuals and institutions make economic decisions .



## Decision making

This graph shows the three stages of rational decision making that was devised by Herbert Simon, a notable economist and scientist.

## History

Behavioral economics was born out of the combination of economics and psychology. By 1979, economists used cognitive psychology to explain economic decision making, which included an editing stage and an evaluation stage. The editing stage simplified risky situations using heuristics of choice. The evaluation stage evaluated risky alternatives through the study of dependence, loss aversion, non-linear probability weighting, and sensitivity to gains and losses. Throughout its history, behavioral economics has studied the economic choices of individuals and institutions by analyzing psychology against economic research. The study of behavioral economics shows both the strengths and weaknesses in decision making tendencies and how the decisions impact economic choices.

### 15.1.5: Government Failure

Government failure occurs when possible interventions are not analyzed before action is taken regarding market inadequacies.



## Learning Objective

Analyze situations in which the government has failed to act in an economically optimal way

## Key Points

- Government failure, also known as non-market failure, is the public sector version of market failure.
- Government failures can occur in relation to both supply and demand within a market.
- Economic crowding out occurs when the government expands its borrowing to pay for increased expenditure or tax cuts. The expanded borrowing is in excess of its revenue.
- Inefficient government regulation contributes to market and government failure.

## Key Terms

expenditure

Act of expending or paying out.

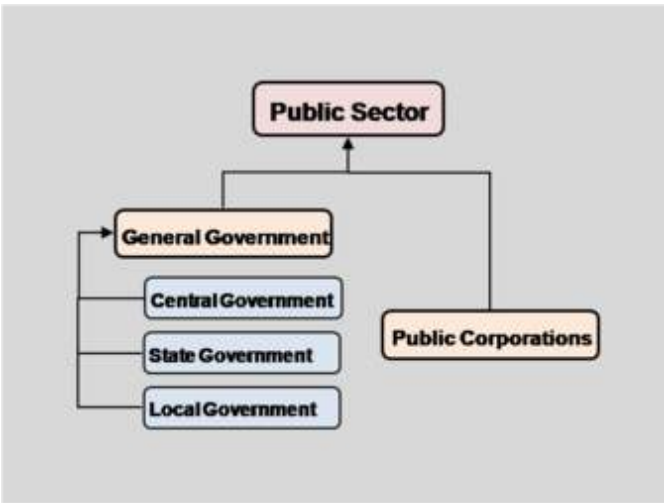
arbitrage

Taking advantage of a price difference between two or more markets: striking a combination of matching deals that capitalize upon the imbalance; the profit made between price differences.

## Government Failure

Government failure, also known as non-market failure, is the public sector version of market failure . The market fails and government intervention causes a more inefficient allocation of goods and resources than would occur without the intervention. It occurs when the market inadequacies are not compared and analyzed against possible interventions before action is taken.

Government failure can be described as providing "only limited help in prescribing therapies for government success. "



## The Public Sector

This graph shows the layers of the government. The government is tied directly to the public sector. Government failure is an analogy made by the public sector when market failure occurs.

A government failure is not the failure of the government to enact a solution to a failure, but rather it is a systematic problem that prevents an efficient government solution to the problem. Government failures can occur in relation to both supply and demand within a market. Demand failures are the result of preference/revelation problems and the imbalance of voting and collective behavior. Supply failures are usually the result of principal-agent problems. In this case, the failure occurs in trying to get one party (agent) to work in the best interest of another party (principal).

## Economic Crowding Out

There are specific scenarios that are directly associated with government failure. Economic crowding out occurs when the government expands its borrowing to pay for increased expenditure or tax cuts. The expanded borrowing is in excess of its revenue which crowds out private sector

investment due to higher interest rates. Government spending also crowds out private spending.

## Government Regulation

When analyzing government failure, inefficient regulation contributes to market failure. There are three specific regulatory inefficiencies:

- Regulatory arbitrage occurs when a regulated institution takes advantage of the difference between its real risk and the regulatory position.
- Regulatory capture occurs when regulatory agencies co-opt either its members or the entire regulated industry. Mechanisms that allow regulatory capture include rent seeking and rational ignorance.
- Regulatory risk is a risk faced by private sector firms when there is a chance that regulatory changes will negatively affect their business.

Recent evidence has suggested that even when democracies are economically stable, transparency, media freedom, and a larger government all contribute to increased government corruption. Government corruption leads to both market and government failure.

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# **16: Taxes and Public Finance**

# 16.1: Introduction to Taxes

## 16.1.1: What Taxes Do

On a general level, tax collections provide a revenue source to support the outlays or primary activities of a government.

### Learning Objective

Explain the role of taxation with respect to consumer and firm behavior

### Key Points

- Taxes allow the government to perform and provide services that would not evolve naturally through a free market mechanism, for example, public parks.
- Taxes are the primary source of revenue for most governments.
- Governments also use taxes to establish income equity and modify consumption decisions.

### Key Terms

sales tax

A local or state tax imposed as a percentage of the selling price of goods or services payable by the customer. The tax is not recognized as the seller's earnings; the seller only collects the tax and transmits the same to local or state authorities.

income tax

A tax levied on earned and unearned income, net of allowed deductions.



progressive tax

A tax by which the rate increases as the taxable base amount increases.

regressive tax

A tax imposed in such a manner that the rate decreases as the amount subject to taxation increases.

Taxes are the primary source of revenue for most governments. They are simply defined as a charge or fee on income or commerce. Taxes are most readily understood from the perspective of income taxes or sales tax, although there are many other types of taxes levied on both individuals and firms.

Necessarily, taxes raise the price of purchasing the good or resource for firms and consumers. As a result, the quantity demanded and supplied reacts according to the supply and demand curves.

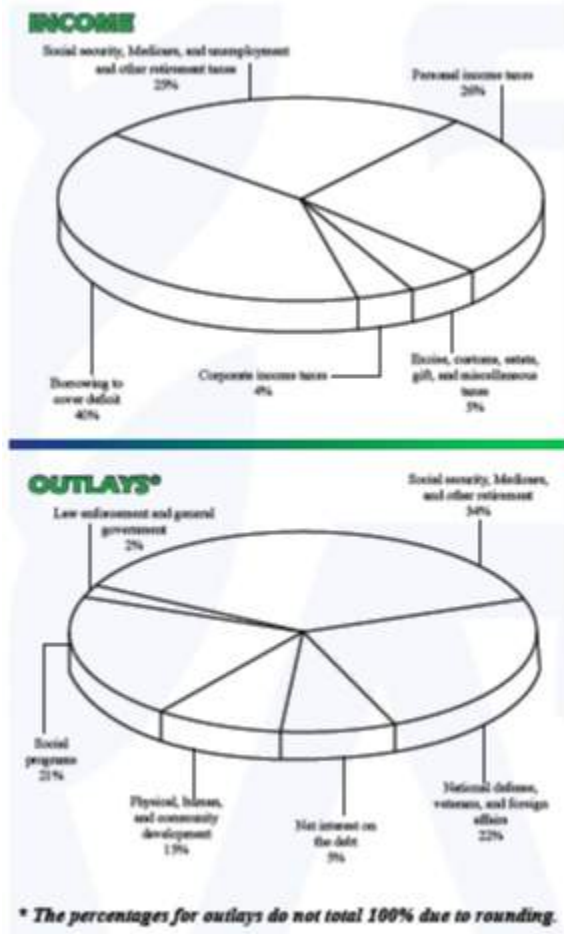
## **Tax Authority**

In the United States, Congress has the power to tax as stated in The United States Constitution, Article 1, Section 8, Clause 1: "The Congress shall have the Power to lay and collect Taxes, Duties, Imposts, and Excises to pay the Debts and provide for the common Defense and general Welfare of the United States. " This power was reinforced in the Sixteenth Amendment to the Constitution: "The Congress shall have the power to lay and collect taxes on income, from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration."

It is important to note that Congress has delegated to the Internal Revenue Service (IRS) the responsibility of administering the tax laws, known as the Internal Revenue Code (the Code). Congress enacts these tax laws, and the IRS enforces them. Individual states also have the power to tax as do smaller government entities such as towns, cities, counties, and municipalities.

# **Purpose of Taxation**

On a general level, tax collections provide a revenue source to support the outlays or primary activities of a government including but not limited to public buildings, military, national parks, and public welfare in the form of transfer payments. Taxes allow the government to perform and provide services that would not evolve naturally through a free market mechanism, for example, public parks. However, governments also use taxes to establish income equity and modify consumption decisions .



## Income and Outlays (IRS Publication 2105; Rev 3-2011)

Tax revenue is used by the government to support services and activities available to all residents.

### Sources of Tax Revenue: Income Taxation

Governments use different kinds of taxes and vary the tax rates. This is done to distribute the tax burden among individuals or classes of the population involved in taxable activities, such as business, or to redistribute resources between individuals or classes in the population. This type of taxation is referred to as progressive taxation because the tax liability increases in proportion to income.

## Sources of Tax Revenue: Sales Taxes

Sales taxes are borne by the consumer when s/he purchases certain goods. It is an *ad valorem* tax: the charged value is based on the value of what is being sold. This is in contrast to an *excise* tax, where the charged value is based on the number of items being sold.

Sales tax is a form of regressive taxation; the liability is based on the percentage of income consumed, which is higher for low income earners. As a result, individuals earning a relatively lower income will pay a higher proportion of income in the form of sales tax, defining the regressive nature of the tax. Though a general revenue source, sales taxes are also used to modify behavior. For example taxes on cigarettes are meant to dissuade purchase due to the inherent health implications of smoking.

### 16.1.2: How Taxes Impact Efficiency: Deadweight Losses

In economics, deadweight loss is a loss of economic efficiency that can occur when equilibrium for a good or service is not Pareto optimal.

#### Learning Objective

Discuss how taxes create deadweight loss

#### Key Points

- Causes of deadweight loss can include actions that prevent the market from achieving an equilibrium clearing condition and include taxes.
- Deadweight loss can generally be referenced as a loss of surplus to either the consumer, producer, or both.
- Harberger's triangle refers to the deadweight loss associated with government intervention in a perfect market.

#### Key Terms

Pareto optimal

Describing a situation in which the profit of one party cannot be increased without reducing the profit of another.

deadweight loss

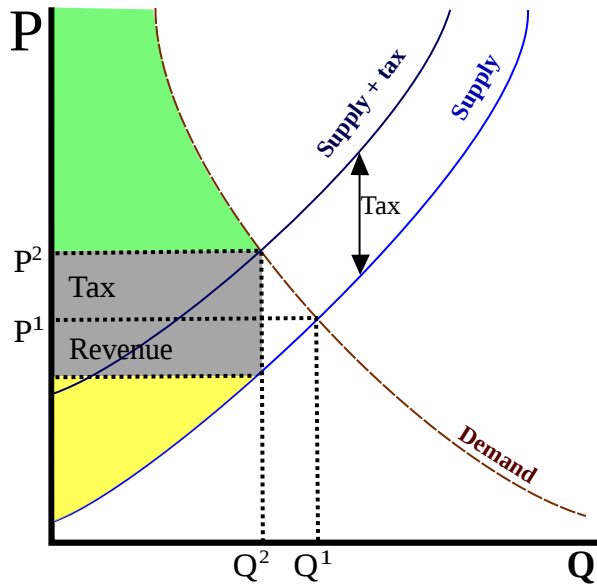
A loss of economic efficiency that can occur when an equilibrium is not Pareto optimal.

## **Deadweight Loss**

In economics, a deadweight loss (also known as excess burden or allocative inefficiency) is a loss of economic efficiency that can occur when equilibrium for a good or service is not Pareto optimal (resource allocation where it is impossible to make any one individual better off without making at least one individual worse off). Causes of deadweight loss can include actions that prevent the market from achieving an equilibrium clearing condition (where supply and demand are equal) and include taxes or subsidies and binding price ceilings or floors (including minimum wages). Deadweight loss can generally be referenced as a loss of surplus to either the consumer, producer, or both.

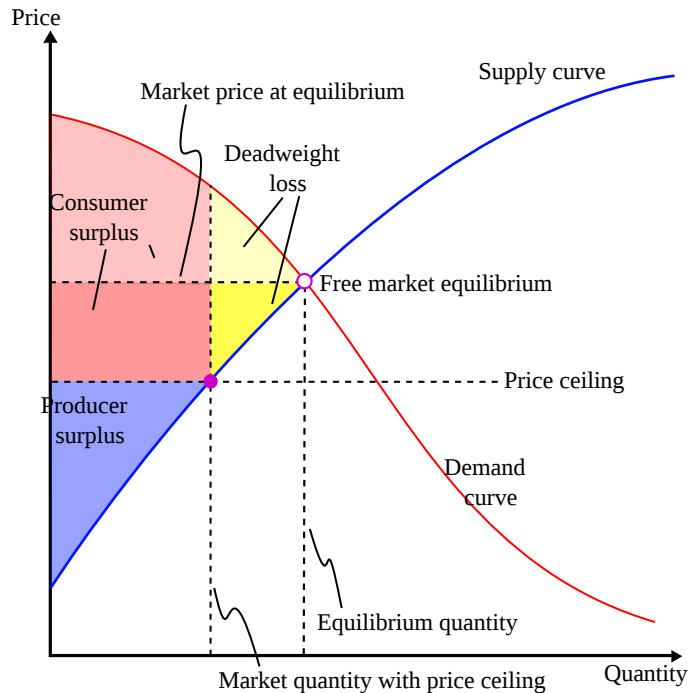
## **Harberger's Triangle, Taxes, and Deadweight Loss**

Harberger's triangle, generally attributed to Arnold Harberger, refers to the deadweight loss (as measured on a supply and demand graph) associated with government intervention in a perfect market . This can happen through price floors, caps, taxes, tariffs, or quotas. In the case of a tax on the supplier of a good, the supply curve will shift inward in proportion to the tax and resulting in a non-market clearing level of supply. As a result, the price of the good increases and the quantity available decreases .



## Taxation and Deadweight Loss

Taxation can be evaluated as a non-market cost. In this case imposition of taxes reduces supply, resulting in the creation of deadweight loss (triangle bounded by the demand curve and the vertical line representing the after-tax quantity supplied), similar to a binding constraint.



## Harberger's Triangle

Deadweight loss, represented by Harberger's triangle, is the yellow triangle. It represents lost efficiency.

The area represented by the Harberger's triangle results from the intersection of the supply and demand curves above market equilibrium resulting in a reduction in consumer surplus and producer surplus relative to their value before the imposition of the tax. The loss of the surplus, not recouped by tax revenues, is deadweight loss.

Some economists have argued that these triangles do not have a huge impact on the economy, whereas others maintain that they can seriously affect long term economic trends by pivoting the trend downwards, causing a magnification of losses in the long run.

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# 16.2: Deploying and Measuring Taxes

## 16.2.1: How Taxes Work in the United States

Tax laws are passed by Congress and enforced by the Internal Revenue Service (IRS) at the federal level.

### Learning Objective

Discuss the United States taxation process and the legislature involved

### Key Points

- There are federal, state, and local taxes in the US.
- Congress passes federal tax laws that are then interpreted and enforced by the IRS.
- The US judicial system is employed to handle tax disputes by companies or individuals.

### Key Terms

#### Internal Revenue Service

The United States government agency that collects taxes and enforces tax laws.

#### Congress

The two legislative bodies of the United States: the House of Representatives, and the Senate.

There are three levels of government in the United States: the federal government, state governments, and local governments. Each has its own authority to tax. For example, states can set their own sales and payroll taxes that apply only within the state. Similarly, local governments can impose a variety of taxes, such as property taxes. Since the taxation process varies on the state and local level, we will focus on the federal level.

Federal taxes are created by the US Congress, which passes laws mandating what is taxed and the amount of the tax. One of the most well-known taxes, the federal income tax, wasn't created until the passage of the 16th amendment in 1913 explicitly gave the US Congress the authority to tax income. Congress then takes the tax revenue and apportions it through its power to create and manage the federal budget.

Congress is not the body, however, that actually collects taxes. That duty is charged to the Internal Revenue Service (IRS), a part of the Department of the Treasury. The IRS is responsible for ensuring that companies and individuals pay the taxes they are legally obligated to .



## **IRS**

The IRS is responsible for interpreting and enforcing tax legislation passed by Congress. The IRS taxes only realized returns, though financial reports must also include unrealized returns on the balance sheet.

The IRS also has some power in determining exactly how the tax laws passed by Congress are interpreted and enforced. For example, Congress may say that depreciation will be an allowable expense "in accordance with regulations to be established by the IRS. " This allows the IRS to articulate the conditions under which depreciation is considered an allowable expense. At the same time, the IRS must also interpret the laws passed by Congress to determine what the law was intended to mean for a given organization or individual.

As would be expected with any law or interpretation of a law by a government body, there are disputes. Disputes over tax rules are generally heard in the United States Tax Court before the tax is paid, or in a United States District Court or United States Court of Federal Claims after the tax is paid. Tax laws are treated like any other piece of legislation in that there is a judicial process for resolving disputes.

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# 16.3: Progressive, Proportional, and Regressive Taxes

## 16.3.1: Comparing Marginal and Average Tax Rates

Taxes can be evaluated based on an average impact or a marginal impact and can be categorized as progressive, regressive, or proportional.

### Learning Objective

Calculate the average tax rate and marginal tax rate

### Key Points

- An average tax rate is the ratio of the total amount of taxes paid,  $T$ , to the total tax base,  $P$ , whereas the marginal tax rate equals the change in taxes, divided by the change in tax base.
- A proportional tax is a tax imposed so that the tax rate is fixed, with no change as the taxable base amount increases or decreases. The average tax rate equals the marginal tax rate.
- A regressive tax is a tax imposed in such a manner that the tax rate decreases as the amount subject to taxation increases. The average tax rate is higher than the marginal tax rate.
- A progressive tax is a tax in which the tax rate increases as the taxable base amount increases. The average tax rate is lower than the marginal tax rate.

### Key Terms

average tax rate

The ratio of the amount of taxes paid to the tax base (taxable income or spending).

marginal tax rate

The tax rate that applies to the last unit of currency of the tax base (taxable income or spending), and is often applied to the change in one's tax obligation as income rises.

## **Computing taxes**

### **Average and marginal tax rate**

An average tax rate is the ratio of the total amount of taxes paid, T, to the total tax base, P, (taxable income or spending), expressed as a percentage. If a company pays different rates on the first \$100,000 in earning than the next \$100,000, it will sum up the total tax paid and divide it by \$200,000 to calculate the average tax rate.

$T/P = \text{average tax rate}$

The marginal tax rate is sometimes defined as the tax rate that applies to the last (or next) unit of the tax base (taxable income or spending), it is in effect, the tax percentage on the highest dollar earned. For example, if a company pays 5% tax on its first \$100,000 earned, and 10% on the next \$100,000, the marginal tax rate of earning the \$101,000th dollar is 10%.

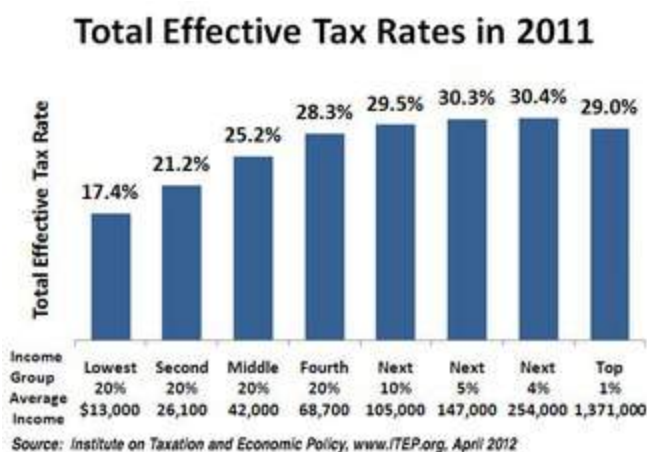
Broadly, the marginal tax rate equals the change in taxes, divided by the change in tax base, expressed as a percentage.

$\text{change in } T / \text{change in } P = \text{marginal tax rate}$

## **Types of taxes**

### **Progressive tax**

A progressive tax is a tax in which the tax rate increases as the taxable base amount increases. The term "progressive" describes a distribution effect on income or expenditure, referring to the way the rate progresses from low to high, where the average tax rate is less than the marginal tax rate. The term can be applied to individual taxes or to a tax system as a whole; a year, multi-year, or lifetime. Progressive taxes are imposed in an attempt to reduce the tax incidence of people with a lower ability-to-pay, as such taxes shift the incidence increasingly to those with a higher ability-to-pay. The opposite of a progressive tax is a regressive tax, where the relative tax rate or burden increases as an individual's ability to pay it decreases.



## Progressive taxation

Graph demonstrates a progressive tax distribution on income that becomes regressive for top earners.

## Regressive tax

A regressive tax is a tax imposed in such a manner that the average tax rate decreases as the amount subject to taxation increases. "Regressive" describes a distribution effect on income or expenditure, referring to the way the rate progresses from high to low, where the average tax rate exceeds the marginal tax rate. In terms of individual income and wealth, a regressive tax imposes a greater burden (relative to resources) on the poor

than on the rich — there is an inverse relationship between the tax rate and the taxpayer's ability to pay as measured by assets, consumption, or income.

## **Proportional tax**

A proportional tax is a tax imposed so that the tax rate is fixed, with no change as the taxable base amount increases or decreases. The amount of the tax is in proportion to the amount subject to taxation. "Proportional" describes a distribution effect on income or expenditure, referring to the way the rate remains consistent (does not progress from "low to high" or "high to low" as income or consumption changes), where the marginal tax rate is equal to the average tax rate.

### **16.3.2: Tax Incidence, Efficiency, and Fairness**

Tax incidence is the analysis of the effect of a particular tax on the distribution of economic welfare.

#### **Learning Objective**

Identify who bears the tax burden in various scenarios

#### **Key Points**

- Tax incidence or tax burden does not depend on where the revenue is collected, but on the price elasticity of demand and price elasticity of supply.
- Tax incidence falls mostly upon the group that responds least to price (the group that has the most inelastic price-quantity curve).
- If the demand curve is inelastic relative to the supply curve the tax will be disproportionately borne by the buyer rather than the seller. If the demand curve is elastic relative to the supply curve, the tax will be born disproportionately by the seller.

#### **Key Terms**



elastic

Sensitive to changes in price.

inelastic

Not sensitive to changes in price.

tax

Money paid to the government other than for transaction-specific goods and services.

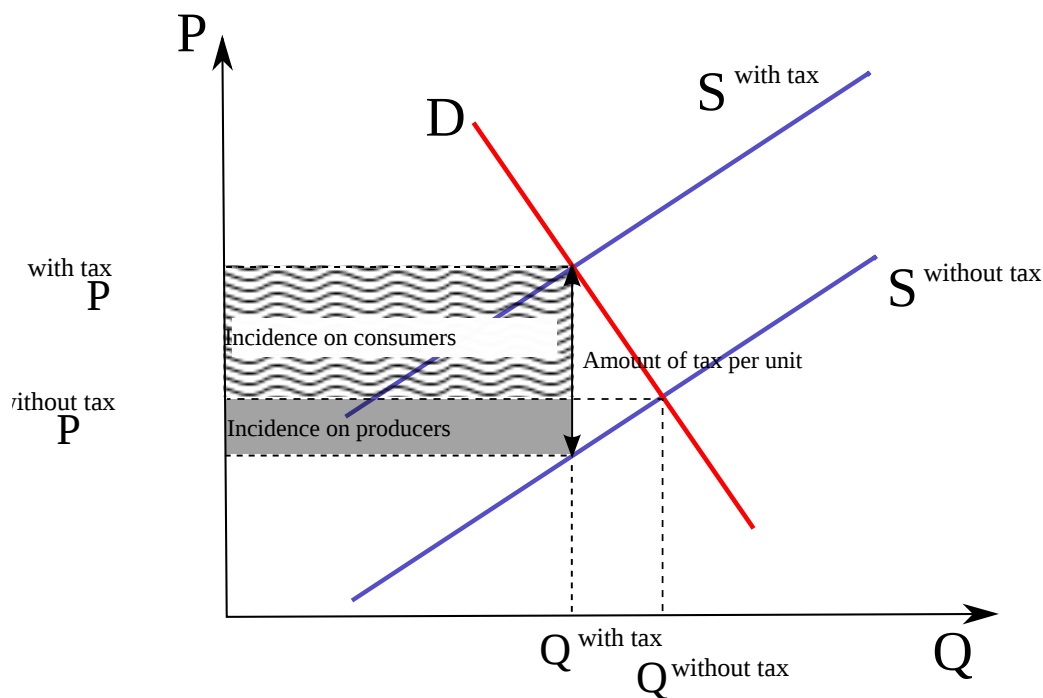
In economics, tax incidence is the analysis of the effect of a particular tax on the distribution of economic welfare. Tax incidence is said to "fall" upon the group that ultimately bears the burden of, or ultimately has to pay, the tax. The key concept is that the tax incidence or tax burden does not depend on where the revenue is collected, but on the price elasticity of demand and price elasticity of supply.

Tax incidence does not consider the concept of tax efficiency or the excess burden of taxation, also known as the distortionary cost or deadweight loss of taxation, is one of the economic losses that society suffers as the result of a tax. For example, United States Social Security payroll taxes are paid half by the employee and half by the employer. However, some economists think that the worker is bearing almost the entire burden of the tax because the employer passes the tax on in the form of lower wages. The tax incidence is thus said to fall on the employee and due to the need for workers for a particular job, the tax burden also falls, in this case, on the worker.

## **Example of Tax Incidence**

Imagine a \$1 tax on every barrel of apples an apple farmer produces. If the product (apples) is price inelastic to the consumer (whereby if price rose, a small demand loss would be accounted for by the extra revenue), the farmer is able to pass the entire tax on to consumers of apples by raising the price

by \$1. In this example, consumers bear the entire burden of the tax; the tax incidence falls on consumers. On the other hand, if the apple farmer is unable to raise prices because the product is price elastic (if prices rose, more demand would be lost than extra revenue gained), the farmer has to bear the burden of the tax or face decreased revenues: the tax incidence falls on the farmer. If the apple farmer can raise prices by an amount less than \$1, then consumers and the farmer are sharing the tax burden. When the tax incidence falls on the farmer, this burden will typically flow back to owners of the relevant factors of production, including agricultural land and employee wages .



## Shared tax incidence

The imposition of a tax can result in a reduction to both consumer and producer surplus relative to the pre-tax scenario.

Where the tax incidence falls depends (in the short run) on the price elasticity of demand and price elasticity of supply. Tax incidence falls mostly upon the group that responds least to price (the group that has the

most inelastic price-quantity curve). If the demand curve is inelastic relative to the supply curve the tax will be disproportionately borne by the buyer rather than the seller. If the demand curve is elastic relative to the supply curve, the tax will be borne disproportionately by the seller.

## **Tax efficiency**

In the example provided, the tax burden falls disproportionately on the party exhibiting relatively more inelasticity in the situation. This characteristic results in a reduction of the ability of the party to participate in the market to the level of willingness that would have been present in the absence of the tax. The loss is conceptually defined as a loss of surplus and the loss of surplus is characterized as deadweight loss. Policy makers evaluate the surplus and deadweight loss in relation to the imposition of a tax in order to better evaluate the efficiency of a tax or the distortion that the imposed tax causes on the attainment of market equilibrium.

Policymakers must consider the predicted tax incidence when creating them. If taxes fall on an unintended party, it may not achieve its intended objective and may not be fair.

### **16.3.3: Tax Incidence and Elasticity**

Tax incidence or tax burden does not depend on where the revenue is collected, but on the price elasticity of demand and price elasticity of supply.

#### **Learning Objective**

Explain how elasticity influences the relative tax burden between suppliers and consumers (demand).

#### **Key Points**

- If a producer (consumer) is inelastic, it will produce (demand) the same quantity no matter what the price.

- If the producer (consumer) is elastic, the producer (consumer) is very sensitive to price.
- The sensitivity between quantity and price will determine the proportion of tax incidence between producers and consumers of a good.

## **Key Terms**

inelasticity

The insensitivity of changes in a quantity with respect to changes in another quantity.

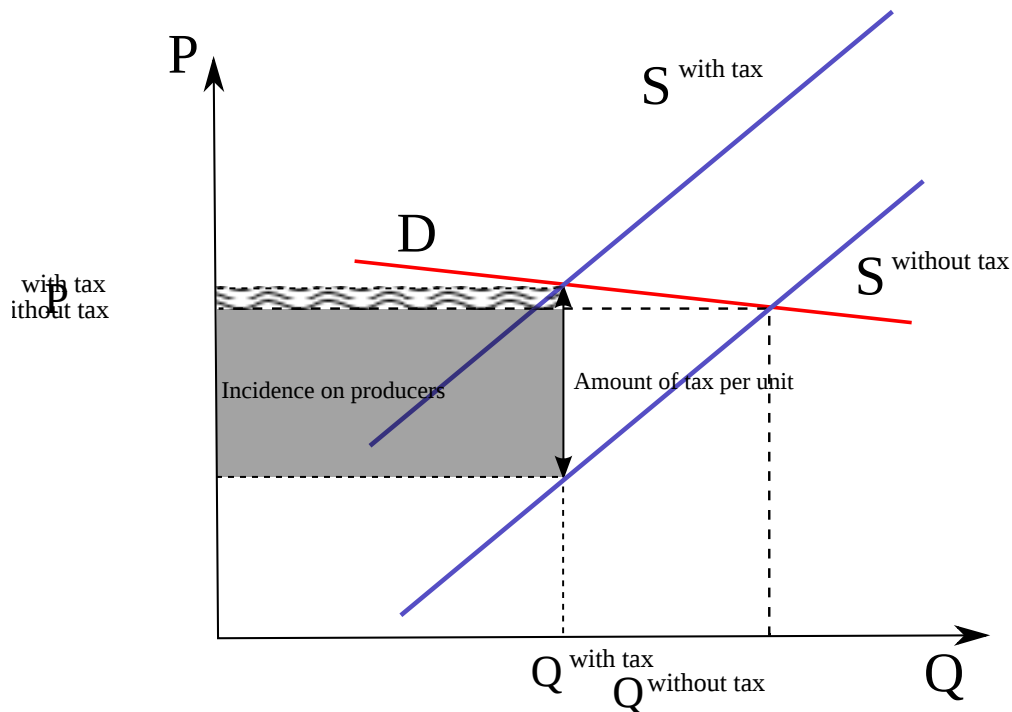
elasticity

The sensitivity of changes in a quantity with respect to changes in another quantity.

Tax incidence refers to who ultimately pays the tax, the producer or consumer, and the resulting societal effect.. Tax incidence is said to "fall" upon the group that ultimately bears the burden of, or ultimately has to pay, the tax. The key concept is that the tax incidence or tax burden does not depend on where the revenue is collected, but on the price elasticity of demand and price elasticity of supply.

## **Inelastic Supply, Elastic Demand**

If a producer is inelastic, he will produce the same quantity no matter what the price. If the consumer is elastic, the consumer is very sensitive to price. A small increase in price leads to a large drop in the quantity demanded .



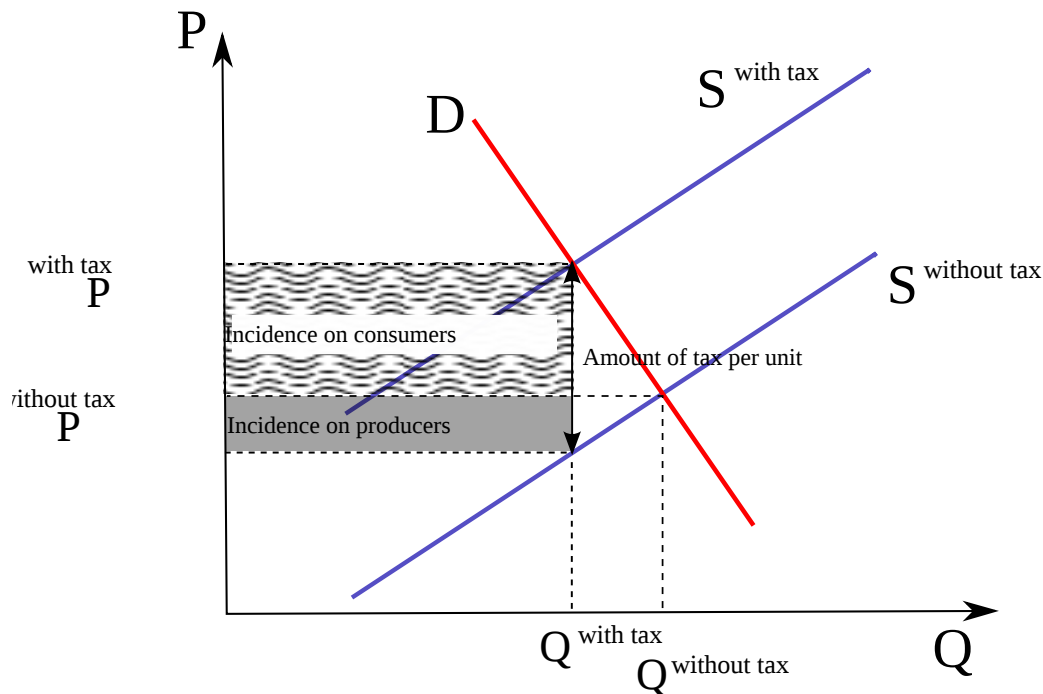
## Tax: Inelastic supply and elastic demand

In a scenario with inelastic supply and elastic demand, the tax burden falls disproportionately on suppliers.

The imposition of the tax causes the market price to increase from  $P$  without tax to  $P$  with tax and the quantity demanded to fall from  $Q$  without tax to  $Q$  with tax. Because the consumer is elastic, the quantity change is significant. Because the producer is inelastic, the price does not change much. The producer is unable to pass the tax onto the consumer and the tax incidence falls on the producer. In this example, the tax is collected from the producer and the producer bears the tax burden.

## Comparable Elasticities

In most markets, elasticities of supply and demand are fairly similar in the short-run, as a result the burden of an imposed tax is shared between the two groups albeit in varying proportions .



## Tax: Similar elasticity for supply and demand

When a tax is imposed in a scenario where demand and supply exhibit similar elasticities, the tax burden is shared.

In general, the tax burden will be greater for the group exhibiting the greater relative inelasticity.

### 16.3.4: Trading off Equity and Efficiency

Taxes may be considered equitable if they are administered in accordance with the definition of either horizontal or vertical equity.

#### Learning Objective

Explain tax equity in relation to the progressive, proportional, and regressive nature of taxes.

## Key Points

- Horizontal equity conforms to the concept that people with a similar ability to pay taxes should pay the same or similar amounts.
- Vertical equity usually refers to the idea that people with a greater ability to pay taxes should pay more.
- Income taxes are incorporate both horizontal and vertical equity via a progressive tax mechanism. Sales taxes are regressive and are considered inequitable.

## Key Terms

income tax

A tax levied on earned and unearned income, net of allowed deductions.

progressive tax

A tax by which the rate increases as the taxable base amount increases.

equity

Justice, impartiality or fairness.

In public finance, horizontal equity conforms to the concept that people with a similar ability to pay taxes should pay the same or similar amounts. It is related to *tax neutrality* or the idea that the tax system should not discriminate between similar things or people, or unduly distort behavior. Vertical equity usually refers to the idea that people with a greater ability to pay taxes should pay more.

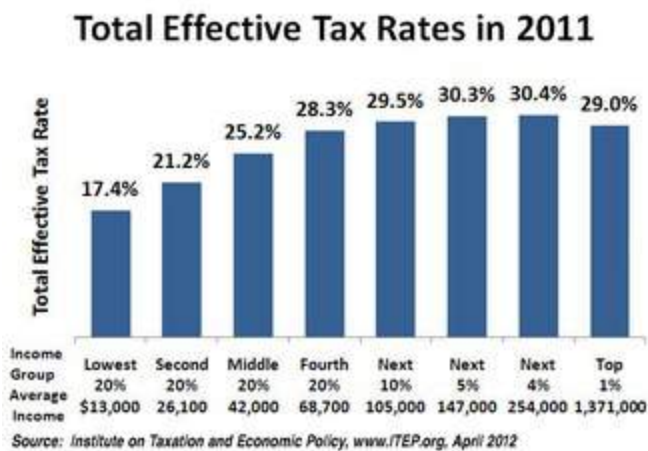
## Horizontal Equity, Vertical Equity, and Taxes

Income taxes are a laddered progressive tax where income tax rates are set in income bands or ranges. Each tax rate corresponds to a particular income range; income above a tax range is subject to a higher tax rate that

corresponds to a higher income range and income below a specific range is subject to a lower tax rate, similarly identified with a lower income range. Within any given income range, the tax rate is the same.

The income range conforms with the idea that the individuals included within it are similar with respect to their ability to pay. The range can be identified as conforming to the concept of horizontal equity. Vertical equity follows from the laddering of income tax to progressively higher rates. The laddering of income taxes conforms to the underlying definition of vertical equity, as those who have a greater ability to pay tax, pay a higher proportion of their income.

Proportional taxes, conform to horizontal equity. By definition proportional taxes are levied in proportion to income. However, income taxes are only proportional within specific income ranges. At the highest income tax rate, income taxes can become regressive, since high earners are only subject to a constant albeit highest rate on their income. For example, income from \$500,000 and above will be subject to the same rate, making the overall tax burden as a proportion of income higher for the individuals on the starting point of the range .



## Income tax

Income tax is a progressive tax that assumes a regressive nature at the highest tax rate.



# Tax efficiency and tax equity

The purpose of a progressive tax system is to increase the tax burden to those most able to pay. However, some policy makers believe that progressive taxation is an overall inefficiency within the tax structure. These individuals and groups support a flat tax or proportional tax instead. Their argument for a tax modification is related to the view that increasing the tax rate in conjunction with income creates a disincentive to individuals to earn more and is, as a result, punitive to those that achieve income related success. The net result from this reasoning is that progressive taxation results in lower GDP than would have resulted in a proportional tax regime, also referred to as a loss of economic efficiency.

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# 16.4: Taxation in the United States

## 16.4.1: Financing the US Government

Taxes are the primary source of government revenue.

### Learning Objective

Identify the basis for taxation.

### Key Points

- Taxes can be used to stabilize the economy.
- The implementation of taxes can promote social equity; for example the use of progressive income taxes.
- There are many types of taxes that can be legislated to derive revenue for government operations.

### Key Terms

balanced budget

A (usually government) budget in which income and expenditure are equal over a set period of time.

fiscal policy

Government policy that attempts to influence the direction of the economy through changes in government spending or taxes.

## Financing of Government Expenditures

Taxation is the central part of modern public finance. The importance of taxation arises from the fact that it is by far the most significant source of

government revenue and is therefore the primary means of financing government expenditures .



## **Taxation authority**

In the United States the Internal Revenue Service is the regulatory authority empowered by Congress to collect taxes.

Due to the pervasive nature of taxation, taxes can be used as an instrument of attaining certain social objectives. For example, income taxes due to their progressive nature are used to equitably derive revenue by differentiating tax rates by income strata. The income derived in this manner is then used to transfer income to lower income groups, thereby, reducing inequalities related to income and wealth.

Taxation is also used as part of fiscal policy to stabilize the economy. Increasing taxes can reduce consumption and lead to economic slowing when the economy may be growing too quickly. Alternatively, decreasing taxes can be a mechanism to promote economic growth by increasing the funds available for consumption and investment spending. It is important to note that when the government spends more than the tax revenue it collects, the government is operating at a deficit and will have to borrow funds to finance operations until taxes can be increased to return the government spending to a balanced budget.

## **Types of Taxes**

The US government imposes a number of different types of taxes in order to finance its operations. The following is a list of taxes in common use by governmental authorities:

- Excise tax: tax levied on production for sale, or sale, of a certain good.
- Sales tax: tax on business transactions, especially the sale of goods and services.
- Corporate income tax: tax on a company's profits.
- Income tax: tax on an individual's wages or salary.
- Capital gains tax: tax on increases in the value of owned assets.

## **16.4.2: Financing State and Local Government**

Taxes are the primary source of revenue for state and local governments; income, property, and sales taxes are common examples of state and local taxes.

### **Learning Objective**

Give an example of federal, state, and local taxes

### **Key Points**

- State and local governments collect taxes from residents to support corresponding state and local government activities. Examples of these services include maintenance of public parks and provision of a police force.
- Property tax is an example of a local tax. It is imposed on the value of real estate.
- Sales tax may be imposed by both a state and local government. It is charged at the point of sale of the good or service.
- Income tax may be imposed by the federal, state, or local government. Tax rates vary by location, and often by income level.

## Key Terms

### sales tax

A local or state tax imposed as a percentage of the selling price of goods or services payable by the customer. The tax is not recognized as the seller's earnings; the seller only collects the tax and transmits the same to local or state authorities.

### property tax

An (usually) ad valorem tax charged on the basis of the fair market value of property.

### income tax

A tax levied on earned and unearned income, net of allowed deductions.

Taxes are important to federal, state, and local governments. They are the primary source of revenue for the corresponding level of government and fund the activities of the governmental entity. For example, on a local level, taxes fund the provision of common services, such as police or fire department, and the maintenance of common areas, such as public parks . On a state level, taxes fund the school systems, including state universities. On a federal level, taxes are used to fund government activities such as the provision of welfare and transfer payments to redistribute income.



## **Pearl Hill State Park**

State parks like Pearl Hill, located in Townsend, Massachusetts, rely on tax revenue for support and maintenance.

## **Example of a Federal, State, and Local Tax**

Income taxes are taxes imposed on the net income of individuals and corporations by the federal, most state, and some local governments. State and local income tax rates vary widely by jurisdiction and many are graduated, or increase progressively as income levels increase. State taxes are generally treated as a deductible expense for federal tax computation.

## **Example of a State Tax**

Sales taxes are imposed by most states on the retail sale price of many goods and some services. Sales tax rates also vary widely among jurisdictions, from 0% to 16%, and may vary within a jurisdiction based on the particular goods or services taxed. Sales tax is collected by the seller at the time of sale, or remitted as use tax by buyers of taxable items who did not pay sales tax.

## **Example of a Local Tax**



Property taxes are imposed by most local governments and many special purpose authorities based on the fair market value of property. Property tax is generally imposed only on real estate, though some jurisdictions tax some forms of business property. Property tax rules and rates vary widely.

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[1 Hill State Park, Townsend MA.jpg/800px-  
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# 16.5: Personal, Property, and Sales Taxes

## 16.5.1: Corporate and Payroll Taxes

Many countries impose taxes on a company's earnings along with aspects of doing business. Two examples of these are corporate and payroll taxes.

### Learning Objective

Give examples of corporate and payroll taxes

### Key Points

- Two common taxes faced by companies are corporate tax and payroll tax.
- Corporate taxes are taxes a corporation must pay, and are analogous to personal taxes. Company income subject to taxation is often determined much like taxable income for individuals.
- Payroll taxes generally fall into two categories: deductions from an employee's wages and taxes paid by the employer based on the employee's wages.

### Key Terms

corporate tax

A tax levied on a corporation, especially on its profits; corporation tax

payroll tax

A tax levied when an employer pays its employees.

## Social Security

A system whereby the state either through general or specific taxation provides various benefits to help ensure the wellbeing of its citizens.

## **Corporate taxes**

Many countries impose a corporate tax, also called corporation tax or company tax, on the income or capital of some types of legal entities. A similar tax may be imposed at state or lower levels. The taxes may also be referred to as income tax or capital tax. Most countries tax all corporations doing business in the country on income from that country. Many countries tax all income of corporations organized in the country. Company income subject to taxation is often determined much like taxable income for individuals. Generally, the tax is imposed on net profits. In some jurisdictions, rules for taxing companies may differ significantly from rules for taxing individuals.

Net taxable income for corporate tax is generally financial statement income. The rate of tax varies by jurisdiction; however, most companies provide or make public the effective tax rate on the income earned. The effective tax rate is the average corporate tax rate on the company's income and this takes into consideration tax benefits included in a current tax year.

Corporations are also subject to a variety of other taxes including: property tax, payroll tax, excise tax, customs tax and value-added tax along with other common taxes, generally in the same manner as other taxpayers. These, however, are rarely referred to as "corporate taxes" .



## **Corporations are subject to multiple taxes**

Corporations, such as CBS, whose headquarters are pictured above, are subject to multiple forms of tax, from corporate income tax to payroll taxes.

### **Other taxes: Payroll taxes**

Payroll taxes are taxes that employers are required to pay when they pay salaries to their staff. Payroll taxes generally fall into two categories: deductions from an employee's wages, and taxes paid by the employer based on the employee's wages.

- Deductions from an employee's wages are taxes that employers are required to withhold from employees' wages, also known as withholding tax, pay-as-you-earn tax (PAYE), or pay-as-you-go tax (PAYG). These often cover advance payment of income tax, social

security contributions, and various insurances, such as, unemployment and disability.

- Taxes paid by an employer based on the employee's wages are taxes that are paid from the employer's own funds. They are directly related to employing a worker. These can consist of fixed charges, or be proportionally linked to an employee's pay. The charges paid by the employer usually cover the employer's funding of the social security system, and other insurance programs.

In the United States, payroll taxes are assessed by the federal government, all fifty states, the District of Columbia, and numerous cities. These taxes are imposed on employers and employees and on various compensation bases and are collected and paid to the taxing jurisdiction by the employers. Most jurisdictions imposing payroll taxes require reporting quarterly and annually in most cases, and electronic reporting is generally required for all but small employers.

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# **17: Income Inequality and Poverty**

# 17.1: Defining and Measuring Inequality, Mobility, and Poverty

## 17.1.1: Defining and Measuring Poverty

Poverty is framed from a material possessions perspective, and is defined as lacking a certain amount to fulfill basic standards of living.

### Learning Objective

Describe poverty and the poverty line

### Key Points

- The United Nations defines poverty as the inability to obtain choices and opportunities.
- A poverty line pertains to the idea of generating an amount of income that is appropriate to ensure a minimum standard of living for an individual. Someone below a nationally set poverty line lacks the purchasing power to fulfill their needs and capture opportunities.
- In observing poverty over time, the rates of poverty alongside the advances in economic production, demonstrate the value in technological and economic progress.
- Poverty is generally divided into absolute or relative poverty, with absolute concepts referring to a standard consistent over time and geographic location and relative pertaining to social benchmarks.

### Key Terms

purchasing power

The amount of goods and services that can be bought with a unit of currency or by consumers.



## Poverty line

The threshold of poverty, below which one's income does not cover necessities.

Poverty is framed from a material or capital possessions perspective, and is loosely defined as lacking a certain amount to fulfill basic standards of living. Absolute poverty is poverty to the extent of which an individual is deprived of the ability to fulfill basic human needs (i.e. water, shelter, food, education, etc.). The United Nations defines poverty as the inability to obtain choices and opportunities. The existence of poverty is one of the greatest challenges faced by the modern world, both in developing and developed nations (see ). Addressing poverty is best approached through the science of understanding monetary exchanges and the creation of wealth, and thus it is useful to employ an economic perspective when discussing and providing solutions to global poverty.



## Percentage of People Living on Less than \$1/Day

This map underlines the overall percentage of people in specific countries living on less than one dollar (USD) per day. The important takeaway is the wide range of countries suffering from varying levels of poverty.

## The Poverty Line

When conceptually approaching the idea of a poverty line, it is useful to frame it within the context of generating an amount of income that is appropriate to ensure a reasonable standard of living for an individual. Someone below a nationally set poverty line lacks the purchasing power to

fulfill their needs and capture opportunities. The United States, for example, has most recently (2012) set the poverty line at \$23,050 (annually) with a total of 16% of the population falling under this level (according to the U.S. Census Bureau). Internationally, the World Bank defines extreme poverty as living on less than \$1 per day (adjusted for purchasing power).

In observing poverty over time, the rates of poverty alongside the advances in economic production, demonstrates the value in technological and economic progress. The industrial revolution, the modernization (and thus increased efficiency) of agriculture, mass production in factories, technological innovation and a wide range of factors that have driven production and economies upwards have contributed to an increased standard of living. Economically, while the distribution of wealth heavily has tended to benefit the wealthy, there has been great value derived in technological progress in regards to minimizing poverty.

## **Measuring Poverty**

Varying approaches have been developed to measure poverty levels, with a particular focus on creating standardized tools to capture a global context. Poverty is generally divided into absolute or relative poverty, with absolute concepts referring to a standard that is consistent over time and geographic location. An example of absolute poverty is the number of people without access to clean drinking water, or the number of people eating less food than the body requires for survival. Absolute poverty levels, as discussed above, essentially underline the ability for an individual to survive with autonomy. Relative poverty is an approach based more upon a benchmark, that is to say the upper echelon of society versus the poor. Income distribution measures lend insight into relative poverty levels.

One interesting perspective is the *Multidimensional Poverty Index (MPI)*. This index was created in 2010 by the Oxford Poverty & Human Development Initiative alongside the United Nations Development Programme. It leverages a variety of dimensions and applies it to the number of people and the overall intensity across the poor to create a model to capture the extent of the poverty in the region. This dimensions include

health, child mortality, nutrition, standard of living, electricity, sanitation, water, shelter (via the floor), cooking fuel and assets owned.

## 17.1.2: Defining and Measuring Income Inequality

Income inequality uses the dispersion of capital to identify how economic inequality is defined among individuals in a given economy.

### Learning Objective

Apply indices of income inequality to measure global economic inequality

### Key Points

- In pursuing an objective and comparable lens in which to measure income inequality, a variety of methods have been created.
- One of the most commonly used income inequality metric is the Gini Index, which uses a straightforward 0-1 scale to illustrate deviance from perfect income equality.
- The 20:20 Ratio and the Palma Ratio (40:10) use percentile ratios of the richest groups and poorest groups to create scales of income inequality severity.
- The Theil Index takes a slightly different approach than the rest, identifying entropy within the system. Entropy, in this case, means the amount of noise or deviance from par, which is expressed as a scale (0 - 1); 0 indicates perfect equality, and 1 indicates perfect inequality.
- Often touted as the simplest measurement to calculate, the Hoover Index derives the overall amount of income in a system and divides it by the population to create the perfect proportion of distribution in the system.

### Key Term

entropy

A measure of the amount of information and noise present in a signal.

Income inequality utilizes the dispersion of capital to identify the way in which economic inequality is defined among a group of individuals in a given economy. Simply put, economics measures income levels and purchasing power across a society to identify averages and distributions to identify the extent of inequalities. Historically this problem was limited to the scope of differences of income and assets between people, creating separate social classes. However, as economists expand their understanding of markets, it has become increasingly clear that there is a relationship between income inequality and the potential for long-term sustainable economic growth. As a result, a wide array of income inequality scales and metrics have been generated in order to identify challenges.

## Inequality Metrics

In pursuing an objective and comparable lens in which to measure income inequality, a variety of methods have been created. Models, ratios and indices include:

- **Gini Index:** One of the most commonly used income inequality metric is the Gini Index, which uses a straightforward 0-1 scale to illustrate deviance from perfect equality of income. A 1 on this scale is essentially socialism, or the perfect distribution of capital/goods. The derivation of the Gini ratio is found via Lorenz curves, or more specifically, the ratio of two areas in a Lorenz curve diagram. The downside to this method is that it does not specifically capture where the inequality occurs, simply the degree of severity in the income gap. This demonstrates the Gini ratio across the globe, with some interesting implications for advanced economies like the U.S.
- **20:20 Ratio:** This name indicates the method; the top 20% and the bottom 20% of earners are used to derive a ratio. While this is a simple method of identifying how rich the rich are (and how poor the poor are), it unfortunately only captures these outliers (obscuring the middle 60%).
- **Palma Ratio:** Quite similar to the 20:20 ratio, the Palma ratio underlines the ratio between the richest 10% and the poorest 40% (dividing the former by the latter). The share of the overall economy occupied by these two groups demonstrates substantial variance from

economy to economy, and serves as a strong method to identify how drastic the inequity is.

- **Theil Index:** The Theil Index takes a slightly different approach than the rest, identifying entropy within the system. Entropy in this context is different than that which is found in thermodynamics, primarily meaning the amount of noise or deviance from par. In this case, 0 indicates perfect equality, and 1 indicates perfect inequality. When there is perfect equality, maximum entropy occurs because earners cannot be distinguished by their incomes. The gaps between two entropies is called redundancy, which acts as a negative entropy measure in the system. Redundancy in some individuals implies scarcity of resources for others. Comparing these gaps and inequality levels (high entropy or high redundancy) is the basic premise behind the Theil Index.
- **Hoover Index:** Often touted as the simplest measurement to calculate, the Hoover Index derives the overall amount of income in a system and divides it by the population to create the perfect proportion of distribution in the system. In a perfectly equal economy this would equate to income levels, and the deviance from this (on a percentile scale) is representative of the inequality in the system.

To simplify the information above, the basic concept behind measuring inequality is identifying an ideal and tracking any deviance from that ideal (which would be deemed the inequality of a given system). Minimizing this inequality is the sign of a mature and advanced society with high standards of living across the board, while substantial income gaps are indicative of a developing or struggling economy. Some powerful economies, like the United States and China, demonstrate high inequality despite high economic power while others, like Switzerland or Norway, demonstrate high equality despite lower economic output. This is a critical consideration in economic policy (from a political perspective). Minimizing inequality is a central step towards an advanced society.

### **17.1.3: Defining and Measuring Economic Mobility**

Economic mobility is a measurement of how capable a participant in a system can improve (or reduce) their economic status.

## **Learning Objective**

Distinguish between types of economic mobility

## **Key Points**

- This concept of economic mobility is often considered in conjunction with "social mobility," which is the capacity for an individual to change station within a society.
- Economic mobility can be perceived via a number of approaches, but is best summarized as inter-generational, intra-generational, absolute, or relative.
- Closely related to the concept of economic mobility is that of socio-economic mobility, referring to the ability to move vertically from one social or economic class to another. This is called "vertical" mobility.
- Economists studying economic mobility have identified a number of factors that play an integral role in enabling (or blocking) participants in an economic system from achieving mobility, such as gender, race and education.

## **Key Terms**

glass ceiling

An unwritten, uncoded barrier to further promotion or progression for a member of a specific demographic group.

Economic mobility

The ability of an individual or family to improve their income, and social status, in an individual lifetime or between generations.

Economic mobility is a measurement of how capable a participant in a system can improve (or reduce) their economic status (generally measured

in monetary income). This concept of economic mobility is often considered in conjunction with 'social mobility', which is the capacity for an individual to change station within a society.

## Types of Economic Mobility

Economic mobility can be perceived via a number of approaches, but is best summarized in the following four:

- **Intergenerational:** Intergenerational mobility pertains to a person's capacity to alter their station relative to the economic status of their parents or grandparents, essentially the flexibility within a society to allow individuals to grow regardless of their initial station. Contrary to concepts of mobility in America, 42% of individuals born into the bottom income bracket remain there. An interesting chart, measuring intergenerational income elasticity, can be found in .
- **Intragenerational:** Intragenerational mobility is defined by an individual's upwards and downwards movement throughout their lifetime (both relative to their working career and their peers). This type of mobility is shorter term than intergenerational in regards to the way in which it is confined to the lifetime of that individual specifically.
- **Absolute:** Similar to intergenerational mobility, absolute mobility looks at how widespread economic growth improves (or reduces) an individual or a family's income over a generational time frame. Put simply, it answers the following question: How likely is a person to exceed their parents income at a given age?
- **Relative:** Relative mobility, as the name implies, measures the mobility and economic growth of a particular person within the context of the system in which they work.

Closely related to the concept of economic mobility is that of socioeconomic mobility, which refers to the ability to move vertically from one social or economic class to another. This is called "vertical" mobility, which overlaps substantially with the categories discussed above.

Economists studying economic mobility have identified a number of factors that play an integral role in enabling (or blocking) participants in an economic system from achieving mobility. Some of the more well-known issues include:

- **Gender:** Gender is quite often a limiting factor in economic mobility, with concepts like the "glass ceiling" underlining the difficulty encountered by women in achieving high-earning status. While women have made great strides in some countries, many global economies still struggle to incorporate women into the workplace with equity.
- **Race/Ethnicity:** In the United States in particular there is huge inequity between Caucasian workers and that of other backgrounds (African American, Hispanic, etc.). Approaching this social tie with income inequity has taken a great deal of political reform over the years, and has much left to accomplish in terms of enabling movement across economic levels. This could in many ways be coupled with immigration, or the concept of being different socially or ethnically from a group that has historically achieved high income levels.
- **Education:** Access to equitable and affordable education in all places worldwide is a substantial domestic and global challenge in enabling the next generation for success. Access to the best education is highly correlated with access to the best professional opportunities, and thus the expansion and funding of effective public education lies at the center of enabling economic mobility.

## **17.1.4: Measurement Problems**

Due to the high complexity of measuring equality, the accuracy of many poverty and inequality measurements can be less than ideal.

### **Learning Objective**

Describe issues with measuring poverty and income inequality globally

### **Key Points**



- The most popular measurement of income inequality is the Gini ratio, which leverages a simple scale of 0-1 to derive deviance from a given perfect equality point. The primary drawback to this approach is that it measures relative poverty (as opposed to absolute poverty).
- The poverty line is a useful absolute measurement, but suffers from having no global standard set (for comparative value), having limited nuance to measure deviations from the poverty line, and failing to incorporate intangible societal assets such as health care.
- One interesting risk in measuring poverty is the concept of voluntary poverty, or the active pursuit of living at the absolute bare minimum.
- Overall, while measuring inequality is a necessary and useful economic perspective, there are inherent statistical drawbacks in mathematically approaching complex societal issues.

## **Key Terms**

### Poverty line

The threshold of poverty, below which one's income does not cover necessities.

### Gini Index

A measure of income distribution.

As with any statistical modeling and measuring approach, there is a great deal of complexity to capture within a finite algorithmic structure, making the accuracy and efficacy of many poverty and inequality measurements less than ideal. Inequality, poverty and economic mobility in particular have a number of measurement challenges.

## **Gini Index**

The most popular measurement of income inequality is the Gini index, which leverages a simple scale of 0-1 to derive deviance from a given perfect equality point. If a system demonstrates a Gini index of 0, the implication is that income differences among any individuals in the

population will be essentially zero, while a measurement of 1 is complete income disparity. The primary drawback to this approach is that it measures relative poverty (as opposed to absolute poverty). This criticism spans across most poverty measurement systems (Thiel entropy, the 20:20 ratio, and the Palma ratio to name a few), and ultimately implies that much of what is measured as inequality does not take into account absolute gains.

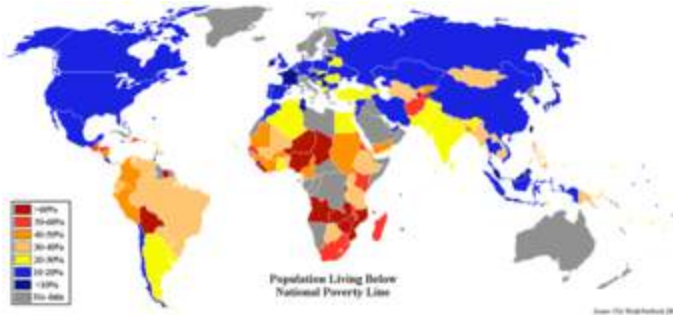
For example, if an economy were to grow by 20% over 10 years, it is perfectly possible (and indeed quite likely) that the upper 20% will capture 50% gains while the bottom 20% will only capture 10% gains. That bottom 10% (assuming inflation has been accounted for) will be gaining wealth and purchasing power in absolute terms despite the fact that the Gini index will be much worse. The Gini index still has important implications about relative inequality in this circumstance, but it neglects to point out positive gains.

## **Criticisms of the Poverty Line**

Taking into account the problems with the Gini ratio, a concept like the poverty line does an effective job in offsetting this variability. A poverty line is the determination of a specific income level in which it is considered the absolute minimum amount of capital required for an individual or family to live (and have all necessities) over the course of one year.

While there is great absolute value in utilizing a poverty line to determining the percentage of people still surviving on less than is considered the bare minimum, there are also drawbacks to this method as well. Looking at the , one can see that measuring the percentages of individuals under the poverty line from country to country demonstrates what appears to be a graphic for comparison. However, due to the fact that poverty lines are different in different countries (because there is no standard way in which to enforce setting and measuring the poverty line) it is not relative. As a result, there is high absolute value for each country but minimal comparative value between countries. Another prospective drawback of this method is that the poverty threshold only measures when an individual is above or below it, and not the extent to which each individual deviates. Finally, it is also important to consider less quantitative components that affect the standard

of living (for example, education quality, roads, access to public transportation, access to healthcare, etc.), and thus country to country comparisons are somewhat reduced in value.



## Individuals Below National Poverty Line

This graph illustrates the different percentiles of individuals under the poverty line across the world. One criticism of this method is that national poverty lines are not derived objectively in a standardized fashion, and thus there is limited value to this graphic in relative terms.

## Voluntary Poverty

One interesting risk in measuring poverty is the concept of voluntary poverty, or the active pursuit of living at the absolute bare minimum. This is done as a result of lifestyle choice or religion, and is counted into poverty and inequality levels despite the fact that the individual being counted has actively pursued this place in society. While this is a somewhat unusual circumstance, it shifts the measurement of poverty in some regions (particularly those with a high population of certain beliefs or religions) higher than would be expected.

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# 17.2: Policies for Reducing Poverty

## 17.2.1: Social Insurance

Social insurance are government-sponsored programs, such as Medicare, that provide benefits to people based on individual contributions to that program.

### Learning Objective

Describe the characteristics of social insurance programs

### Key Points

- Social insurance programs share four characteristics: they have well-defined eligibility requirements and benefits, have provisions for program income and expenses, are funded by taxes or premiums paid by participants, and have mandatory or heavily subsidized participation.
- Social insurance programs differs from welfare programs in that they take participant contributions into account. Welfare benefits are based on need, not contributions.
- Social Security, Medicare, and unemployment insurance are three well-known social insurance programs in the United States.

### Key Term

social insurance

Any government-sponsored program where risks are transferred to and pooled by an organization that is legally required to provide certain benefits.

Social insurance has been defined as a program where risks are transferred to and pooled by an organization (often governmental) that is legally required to provide certain benefits. It is any government-sponsored program with the following four characteristics:

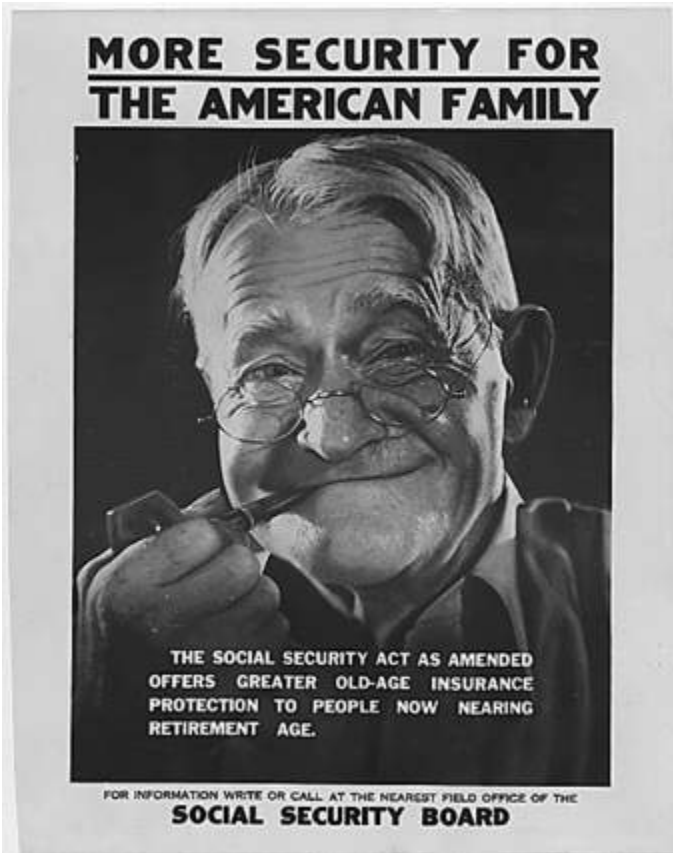
1. The benefits, eligibility requirements, and other aspects of the program are defined by statute;
2. Explicit provision is made to account for income and expenses (often through a trust fund);
3. It is funded by taxes or premiums paid by (or on behalf of) participants (although additional sources of funding may be provided as well); and
4. The program serves a defined population, and participation is either compulsory, or the program is subsidized heavily enough that most eligible individuals choose to participate.

Social insurance differs from welfare in that the beneficiary's contributions to the program are taken into account. A welfare program pays recipients based on need, not contributions. Medicare is an example of a social insurance program, while Medicaid is an example of a welfare one.

In the United States, Social Security, Medicare, and unemployment insurance are among the most well-known forms of social insurance.

## **Social Security**

Social Security in the U.S. is primarily the Old-Age, Survivors, and Disability Insurance (OASDI) federal insurance program. Social Security is funded through payroll taxes called Federal Insurance Contributions Act tax (FICA) and/or Self Employed Contributions Act Tax (SECA). Tax deposits are collected by the Internal Revenue Service (IRS) and are formally entrusted to the Social Security Trust Funds. Social Security provides monetary benefits to retirees, their spouses and surviving dependent children, and disabled workers .



## **Social Security Poster**

Social Security is one of the best-known social insurance programs in the United States. It provides benefits to retirees, surviving family members, and disabled workers who have contributed to the Social Security Trust Fund through payroll taxes.

## **Medicare**

Medicare is a national program that guarantees access to health insurance for Americans aged 65 and older, younger people with disabilities, and people with certain chronic diseases. Medicare is funded through revenue from FICA and SECA payroll taxes, as well as through premiums paid by Medicare enrollees and general fund revenue from the federal government.

## **Unemployment Insurance**



Unemployment insurance provides a monetary benefit to workers who have become unemployed through no fault of their own. Benefits are generally paid by state governments, and are funded in large part by state and federal payroll taxes levied against employers. These payroll taxes were established by the Federal Unemployment Tax Act (FUTA), and allow the IRS to collect federal employer taxes used to fund state workforce agencies. FUTA covers the costs of administering the Unemployment Insurance and Job Service programs in all states. In addition, FUTA pays one-half of the cost of extended unemployment benefits (during periods of high unemployment) and provides for a fund from which states may borrow, if necessary, to pay benefits.

## **17.2.2: Public Assistance**

Public assistance is the provision of a minimal level of social support for all citizens.

### **Learning Objective**

Define and describe different types of public assistance

### **Key Points**

- Public assistance is provided by the government, charities, social groups, and religious groups. It is funded by government agencies and private organizations.
- Public assistance systems vary by country, but welfare is usually provided to individuals who are unemployed, those with an illness or disability, the elderly, those with dependent children, and veterans.
- Forms of public assistance include monetary payments, subsidies, vouchers, housing assistance, and universal healthcare.

### **Key Terms**

public assistance

Payment made to disadvantaged persons by government in order to alleviate the burdens of poverty, unemployment, disability, old age, etc.

subsidy

Financial support or assistance, such as a grant.

voucher

A piece of paper that entitles the holder to a discount, or that can be exchanged for goods and services.

## **Public Assistance**

Public assistance, also referred to colloquially as welfare, is the provision of a minimal level of social support for all citizens. In most developed countries, public assistance is provided by the government, charities, social groups, and religious groups. It is funded by government agencies and private organizations.

Public assistance systems vary by country, but welfare is usually provided to individuals who are unemployed, those with an illness or disability, the elderly, those with dependent children, and veterans. Individuals must meet specific criteria to be eligible to receive public assistance.

In the United States, the funds for public assistance are given at a flat rate to each state based on population. Each state has to meet certain criteria to ensure that individuals receiving public assistance are being encouraged to work themselves out of welfare. The goal of public assistance is to support individuals who are in need of help while encouraging them to seek employment and better their lives.

## **Forms of Public Assistance**

Public assistance is offered in a variety of forms including:

- Monetary payments: individuals are paid bi-weekly or monthly based on their income level. Individuals must apply for monetary public assistance and meet specific criteria. Monetary payments will be lessened or stopped once the individual's income reaches a certain level. An example of monetary payments is Temporary Assistance for Needy Families (TANF), which provides a cash benefit to families in need.
- Subsidy: government funded programs that provide assistance to citizens on federal, state, local, and private levels. Subsidies help to provide food, housing, education, healthcare, and financial support to individuals in need. Examples include Medicaid .
- Vouchers: are bonds given out by the government or other welfare organizations. A voucher is worth a certain monetary value and can only be spent on specific goods .
- Housing assistance: provided by the government to ensure that individuals have shelter. In some cases individuals will receive free housing while other will receive housing at a discounted rate. Housing assistance is based on an individual's level of income.
- Universal healthcare: health care coverage that provides health care and financial protection to all citizens. It provides a specific package of benefits to all members of society with the goal of providing financial risk protection, improved access to health services, and improved health outcomes.

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# **18: Introduction to Macroeconomics**

# 18.1: Key Topics in Macroeconomics

## 18.1.1: Defining Macroeconomics

Macroeconomics is a branch of economics that focuses on the behavior and decision-making of an economy as a whole.

### Learning Objective

Define Macroeconomics.

### Key Points

- Macroeconomists study aggregated indicators such as GDP, unemployment rates, and price indices to understand how the whole economy functions.
- Macroeconomists develop models that explain the relationship between such factors as national income, output, consumption, unemployment, inflation, savings, investment, government spending and international trade.
- Though macroeconomics encompasses a variety of concepts and variables, but there are three central topics for macroeconomic research on the national level: output, unemployment, and inflation.

### Key Terms

microeconomics

That field that deals with the small-scale activities such as that of the individual or company.

Macroeconomics

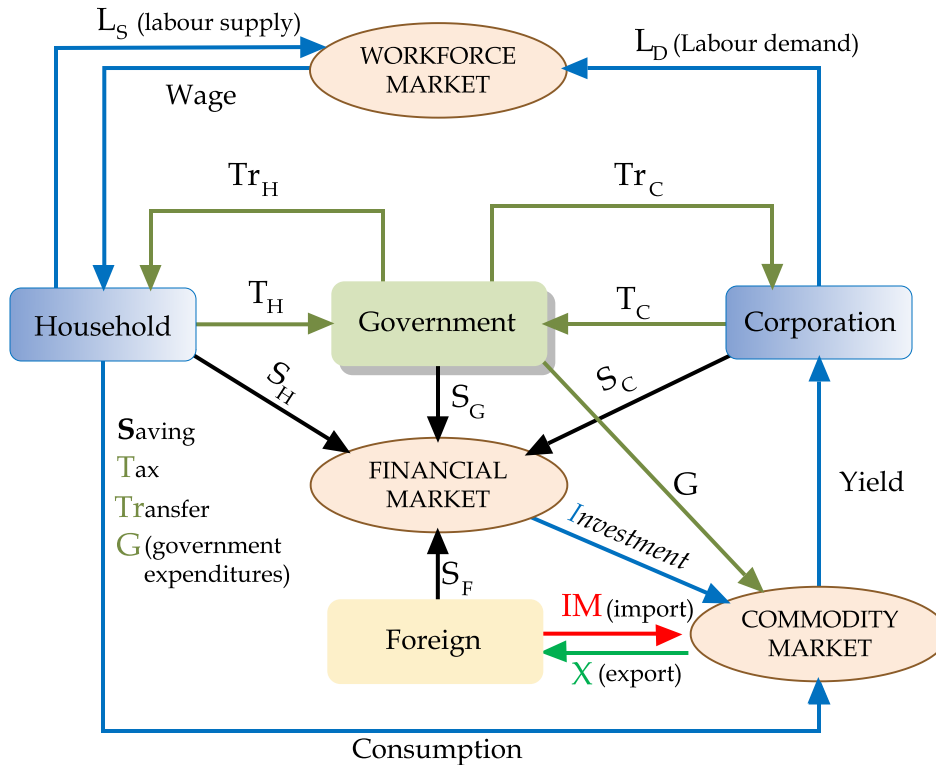
The study of the entire economy in terms of the total amount of goods and services produced, total income earned, the level of employment of productive resources, and the general behavior of prices.

Economics is comprised of many specializations; however, the two broad sub-groupings for economics are microeconomics and macroeconomics.

## **Macroeconomics**

Macroeconomics is a branch of economics that focuses on the behavior and decision-making of an economy as a whole . In this manner it differs from the field of microeconomics, which evaluates the motivations of and relationships between individual economic agents.

### Circulation in Macroeconomics



## Macroeconomics: Circular Flow of the Economy

Macroeconomics simplifies the complexities of the trading activities in an economy by distilling actions to primary participants and tracing the circular flow of activity between them.

## Indicators

Macroeconomists study aggregated indicators such as GDP, unemployment rates, and price indices to understand how the whole economy functions and develop models that explain the relationship between such factors as national income, output, consumption, unemployment, inflation, savings, investment, government spending, and international trade. These variables taken as a whole comprise a grouping of variables that are referred to as *economic indicators*. These indicators, which are classified as leading, lagging and coincident relative to their predictive capability, in combination



with one another provide economists with a directional attribution for the economy.

## **Macroeconomic Study**

While macroeconomics is a broad field of study, there are two areas of research that are especially well publicized in the media: the evaluation of the business cycle and the growth rate of the economy. As a result, macroeconomics tends to be widely cited in discussions related to government intervention in economic expansion and contraction, as well as, with respect to the evaluation of economic policy.

Though macroeconomics encompasses a variety of concepts and variables, but there are three central topics for macroeconomic research on a national level: output, unemployment, and inflation. Outside of macroeconomic theory, these topics are also extremely important to all economic agents including workers, consumers, and producers.

### **18.1.2: The Importance of Aggregate Decisions about Consumption versus Saving and Investment**

Money can either be consumed, invested, or saved (deferred consumption or investment).

#### **Learning Objective**

Explain the relationship between consumption, savings, and investment.

#### **Key Points**

- Aggregate demand is downward sloping as a result of three consumption sensitivities: wealth effect, interest rate effect and foreign exchange effect.
- Spending is related to income:  $\text{Income} - \text{Spending} = \text{Net Savings}$ .
- For the economy as a whole, aggregate savings is equal to investment, which is usually in the form of borrowed funds available as a result of

savings.

## **Key Term**

aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

There are three choices that market actors can make with their money. They can consume it by spending it on goods and services. For example, buying a movie ticket is spending money on consumption. They can also invest money by lending it to a company or project with the hope of getting back more money in the future. Finally, they can save it by putting it in a bank account (or keeping cash under the bed). Savings is essentially deferred consumption or investment; it is intended for use in the future.

In order to understand the effects of aggregate decisions of consumption, savings, and investment, we must look at aggregate demand (AD). AD is the total demand for final goods and services in the economy at a given time and price level. It specifies the amounts of goods and services that will be purchased at all possible price levels and is the demand for the gross domestic product of a country.

## **Components of Aggregate Demand**

It is often cited that the aggregate demand curve is downward sloping because at lower price levels a greater quantity is demanded. While this is correct at the microeconomic, single good level, at the aggregate level this is incorrect. The aggregate demand curve is downward sloping but in variation with microeconomics, this is as a result of three distinct effects: the wealth effect, the interest rate effect and the exchange-rate effect.

Basically individuals will consume or purchase more when they feel wealthier or have access to inexpensive funding.

The wealth effect is specifically related to the value of assets; market participants will adjust consumption in-line with their perception of the appreciation or depreciation of held assets (a home; equity investments, etc.). The interest rate effect has to do with access to inexpensive funding, which provides an incentive to increase current period expenditures; while the exchange-rate effect has to do with expenditure decisions related to imports or foreign related expenditures, as the exchange rate is perceived to be favorable to the domestic currency, expenditures on foreign items or imports will increase.

## **Consumption, Savings, and Investment**

Aggregate demand met by the market is spending, be it on consumption, investment, or other categories.

Spending is related to income:

$$\text{Income} - \text{Spending} = \text{Net Savings}$$

Rearranging:

$$\text{Spending} = \text{Income} - \text{Net Savings} = \text{Income} + \text{Net Increase in Debt}$$

In words: what you spend is what you earn, plus what you borrow: if you spend \$110 and earned \$100, then you must have net borrowed \$10; conversely if you spend \$90 and earn \$100, then you have net savings of \$10, or have reduced debt by \$10, for net change in debt of  $-\$10$ .

For the economy as a whole, aggregate savings is greater than or equal to investment, which is usually in the form of borrowed funds available as a result of savings. Through investment spending, savings influences aggregate demand.

Furthermore, since consumption and investment are components of GDP but saving is not, increased savings indirectly reduces GDP .



## US Savings Rate

Savings have declined in the US on aggregate since the 1980s, which means that the proportion of income spent on consumption and investment increased.

### 18.1.3: The Role of the Financial System

A financial market or system is a market in which people and entities can trade financial securities, commodities, and other fungible items.

#### Learning Objective

Explain the importance of the financial system

#### Key Points

- An economy which relies primarily on interactions between buyers and sellers to allocate resources is known as a market economy.
- Markets work by placing many interested buyers and sellers, including households, firms, and government agencies, in one "place," thus making it easier for them to find each other.
- Healthy financial systems are associated with the accelerated development of an economy.

#### Key Terms

entrepreneurship

The art or science of innovation and risk-taking for profit in business.

investment

A placement of capital in expectation of deriving income or profit from its use.

saving

the act of storing for future use

## Financial System

A financial market or system is a market in which people and entities can trade financial securities, commodities, and other fungible items . Securities include stocks and bonds, and commodities include precious metals or agricultural goods.



## Equity Markets

Equity markets are the most closely followed of the financial markets. They provide transparent and active trading platforms that promote liquidity and access to funds to on a global scale.

There are both general markets (where many commodities are traded) and specialized markets (where only one commodity is traded). Markets work by placing many interested buyers and sellers, including households, firms, and government agencies, in one place, thus making it easier for them to find each other.

An economy that relies primarily on interactions between buyers and sellers to allocate resources is known as a market economy, in contrast either to a command economy or to a non-market economy such as a gift economy.

## **Role of the Financial System**

Financial markets are associated with the accelerated growth of an economy. A financial market helps to achieve the following non-comprehensive list of goals:

- **Saving mobilization:** Obtaining funds from the savers or surplus units such as household individuals, business firms, public sector units, central government, state governments, etc. is an important role played by financial markets. Borrowers (e.g. bond issuers) are connected with lenders (e.g. bond buyers) in financial markets.
- **Investment:** Financial markets play a crucial role in arranging to invest funds. Both firms and individuals can invest in companies through financial markets (e.g. by buying stock).
- **National Growth:** An important role played by financial market is that, they contribute to a nation's growth by ensuring unfettered flow of surplus funds to deficit units. In other words, financial markets help shift money from industry to industry or firm to firm based on the supply and demand for their products.
- **Entrepreneurship growth:** Financial markets allow entrepreneurs (and established firms) to access the funds needed to invest in projects or companies.

### **18.1.4: The Business Cycle: Definition and Phases**

The term business cycle refers to economy-wide fluctuations in production, trade, and general economic activity.

## **Learning Objective**

Identify features of the economic business cycle

## **Key Points**

- Business cycles are identified as having four distinct phases: expansion, peak, contraction, and trough.
- Business cycle fluctuations occur around a long-term growth trend and are usually measured by considering the growth rate of real gross domestic product.
- In the United States, it is generally accepted that the National Bureau of Economic Research (NBER) is the final arbiter of the dates of the peaks and troughs of the business cycle.

## **Key Terms**

contraction

A period of economic decline or negative growth.

peak

The highest value reached by some quantity in a time period.

trough

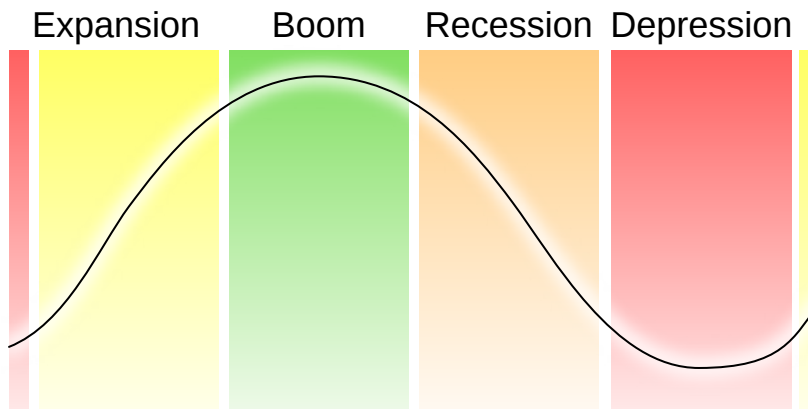
The lowest turning point of a business cycle

expansion

The act or process of expanding.

## **The Business Cycle**

The term "business cycle" (or economic cycle or boom-bust cycle) refers to economy-wide fluctuations in production, trade, and general economic activity. From a conceptual perspective, the business cycle is the upward and downward movements of levels of GDP (gross domestic product) and refers to the period of expansions and contractions in the level of economic activities (business fluctuations) around a long-term growth trend .



## Business Cycles

The phases of a business cycle follow a wave-like pattern over time with regard to GDP, with expansion leading to a peak and then followed by contraction leading to a trough.

## Business Cycle Phases

Business cycles are identified as having four distinct phases: expansion, peak, contraction, and trough.

An expansion is characterized by increasing employment, economic growth, and upward pressure on prices. A peak is realized when the economy is producing at its maximum allowable output, employment is at or above full employment, and inflationary pressures on prices are evident. Following a peak an economy, typically enters into a correction which is characterized by a contraction, growth slows, employment declines (unemployment increases), and pricing pressures subside. The slowing ceases at the trough and at this point the economy has hit a bottom from which the next phase of expansion and contraction will emerge.



# Business Cycle Fluctuations

Business cycle fluctuations occur around a long-term growth trend and are usually measured by considering the growth rate of real gross domestic product.

In the United States, it is generally accepted that the National Bureau of Economic Research (NBER) is the final arbiter of the dates of the peaks and troughs of the business cycle. An expansion is the period from a trough to a peak, and a recession as the period from a peak to a trough. The NBER identifies a recession as "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production. " This is significantly different from the commonly cited definition of a recession being signaled by two consecutive quarters of decline in real GDP.

## 18.1.5: Recessions

A recession is a business cycle contraction; a general slowdown in economic activity.

### Learning Objective

Explain the connection between a recession and other macroeconomic variables

### Key Points

- Macroeconomic indicators such as GDP (Gross Domestic Product), employment, investment spending, capacity utilization, household income, business profits, and inflation fall, while bankruptcies and the unemployment rate rise.
- Most mainstream economists believe that recessions are caused by inadequate aggregate demand in the economy, and favor the use of expansionary macroeconomic policy during recessions.

- Strategies favored for moving an economy out of a recession vary depending on which economic school the policymakers follow.

## **Key Term**

recession

A period of reduced economic activity

In economics, a recession is a business cycle contraction; a general slowdown in economic activity. Macroeconomic indicators such as GDP (Gross Domestic Product), employment, investment spending, capacity utilization, household income, business profits, and inflation fall, while bankruptcies and the unemployment rate rise. Recessions generally occur when there is a widespread drop in spending (an adverse demand shock). This may be triggered by various events, such as a financial crisis, an external trade shock, an adverse supply shock, or the bursting of an economic bubble .



## **Recessions and panic**

Recessions are characterized as periods of fear and uncertainty; historically they also were a time of widespread panic. However, as confidence in the central bank and federal government increased, though fear and uncertainty remain, panic-conditioned "runs" as depicted in the photo above have become an element of the past.

## **Attributes of Recession**

A recession has many attributes that can occur simultaneously, these include declines in component measures (economic indicators) of economic activity (GDP) such as consumption, investment, government spending, and net export activity. These indicators in turn, reflect underlying drivers such as employment levels and skills, household savings rates, corporate investment decisions, interest rates, demographics, and government policies.

## **Causes of Recession**

Under ideal conditions, a country's economy should have the household sector as net savers and the corporate sector as net borrowers, with the government budget nearly balanced and net exports near zero. When these relationships become imbalanced, recession can develop within a country or create pressure for recession in another country. Policy responses are often designed to drive the economy back towards this ideal state of balance.

Most mainstream economists believe that recessions are caused by inadequate aggregate demand in the economy, and favor the use of expansionary macroeconomic policy during recessions.

## **Policy Responses to Recession**

Strategies favored for moving an economy out of a recession vary depending on which economic school the policymakers follow. Monetarists would favor the use of expansionary monetary policy, while Keynesian economists may advocate increased government spending to spark economic growth. Supply-side economists may suggest tax cuts to promote business capital investment. When interest rates reach the boundary of an interest rate of zero percent (zero interest-rate policy) conventional monetary policy can no longer be used and government must use other measures to stimulate recovery.

A severe (GDP down by 10%) or prolonged (three or four years) recession is referred to as an economic depression, although some argue that their causes and cures can be different. As an informal shorthand, economists sometimes refer to different recession shapes, such as V-shaped, U-shaped, L-shaped, and W-shaped recessions.

## **18.1.6: Managing the Business Cycle**

When the economy is not at a steady state, the government and monetary authorities have policy mechanisms to move the economy back to consistent growth.

### **Learning Objective**

Identify how changes in monetary and fiscal policy can manage the business cycle, and why that is desirable

### **Key Points**

- If the economy needs to be slowed, enacted policies are referred to as being contractionary and if the economy needs to be stimulated the policy prescription is expansionary.
- Central banks use monetary policy measures to facilitate consistent economic growth, while the government uses fiscal policy.
- The government policy measures are referred to as fiscal policy.

### **Key Terms**

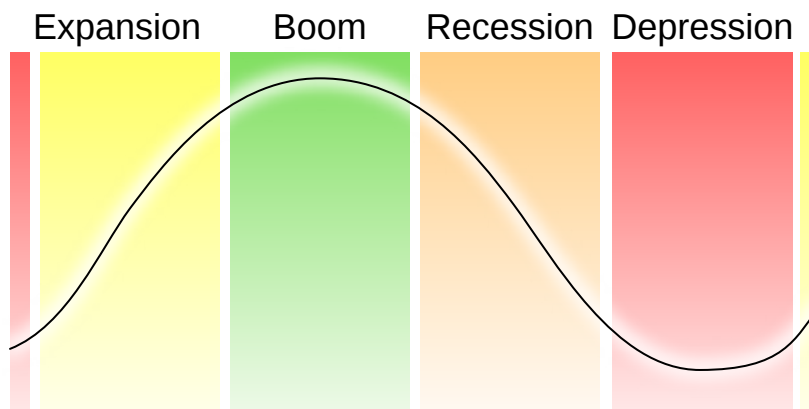
fiscal policy

Government policy that attempts to influence the direction of the economy through changes in government spending or taxes.

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

The business cycle is comprised of the upward and downward movement in the level of Gross Domestic Product (GDP) over time . These fluctuations occur around a long-term growth trend, and typically involve shifts over time between periods of relatively rapid economic growth (an expansion or boom), and periods of relative stagnation or decline (a contraction or recession).



## Cycles in the economy

The economy moves through expansion and contraction on a routine basis; policy mechanisms allow for smoother transitions and soften landings.

## Policy Responses

When the economy is not at a steady state and instead is at a point of either overheating (growing too fast) or slowing, the government and monetary authorities have policy mechanisms, fiscal and monetary, respectively, at their disposal to help move the economy back to a steady state growth trajectory. If the economy needs to be slowed, these policies are referred to as contractionary and if the economy needs to be stimulated the policy prescription is expansionary.

## Expansionary Policy

Expansionary fiscal policy involves government spending exceeding tax revenue, and is usually undertaken during recessions. Fiscal authorities will

increase government spending in order to revive the economy.

Expansionary monetary policy relies on the central bank increasing availability of loanable funds through three mechanisms: open market operations, discount rate, and the reserve ratio. As the supply of loanable funds increases, the interest rate is expected to decrease and thereby increase the desire to borrow funds for consumption and investment purposes.

## **Contractionary Policy**

Contractionary fiscal policy is opposite of the action taken in an expansionary purpose, and occurs when government spending is lower than tax revenue.

Similarly, contractionary monetary policy is the opposite of expansionary monetary policy and occurs when the supply of loanable funds is limited, to reduce the access and availability to relatively inexpensive credit.

## **18.1.7: Long Run Growth**

Long run growth is the increase in the market value of the goods and services produced by an economy over time.

### **Learning Objective**

Explain the impact of consistent long-run growth on an economy.

### **Key Points**

- Growth is usually calculated in real terms, meaning that it is inflation-adjusted to eliminate the distorting effect of inflation on the price of goods produced.
- Policymakers strive for continued and consistent growth.
- The large impact of a relatively small growth rate over a long period of time is due to the power of compounding.

- A small difference in economic growth rates between countries can result in very different standards of living for their populations if this small difference continues for many years.

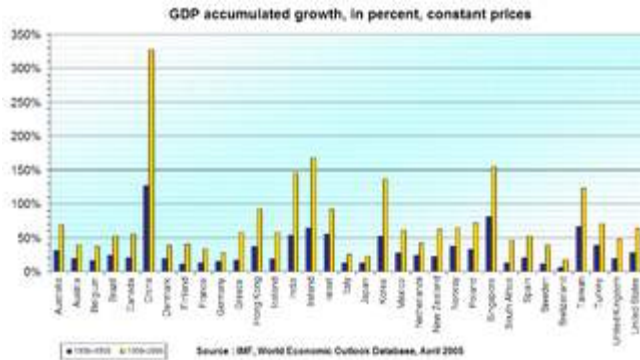
## Key Term

economic growth

The increase of the economic output of a country.

Long run growth is the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as the percentage of increase in real gross domestic product, or real GDP. Growth is usually calculated in real terms: it is inflation-adjusted to eliminate the distorting effect of inflation on the price of goods produced. In economics, *economic growth* or *economic growth theory* typically refers to growth of potential output, which is production at full employment.

Policymakers strive for steady, continued, and consistent growth because it is predictable and manageable for both policymakers and market participants. Over long periods of time even small rates of growth, like a 2% annual increase, have large effects. For example, the United Kingdom experienced a 1.97% average annual increase in its inflation-adjusted GDP between 1830 and 2008. In 1830, the GDP was £41,373 million. It grew to £1,330,088 million by 2008 (in 2005 pounds). A growth rate that averaged 1.97% over 178 years resulted in a 32-fold increase in GDP by 2008 .



## Long-run growth rates

Growth in GDP can be significant, especially when annual growth rates are fairly consistent.

## The Power of Compounding

The large impact of a relatively small growth rate over a long period of time is due to the power of compounding. A growth rate of 2.5% per annum leads to a doubling of the GDP within 29 years, while a growth rate of 8% per annum (an average exceeded by China between 2000 and 2010) leads to a doubling of GDP within 10 years. Therefore, a small difference in economic growth rates between countries can result in very different standards of living for their populations if this small difference continues for many years.

*Note: an easy way to approximate the doubling time of a number with a constant growth rate is to use the Rule of 72. Divide 72 by the percentage annual growth rate to get a rough estimate of the number of years until the number doubles. For example, at a 10%, divide 72 by 10 to get a doubling time of 7.2 years. The actual doubling time is 7.27 years, so the rule of 72 is a good rough approximation.*

## Attributions

- Defining Macroeconomics



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# **19: Measuring Output and Income**

# 19.1: Measuring Output Using GDP

## 19.1.1: Defining GDP

Gross domestic product is the market value of all final goods and services produced within the national borders of a country for a given period of time.

### Learning Objective

Distinguish between the income and expenditure approaches of assessing GDP

### Key Points

- GDP can be measured using the expenditure approach:  $Y = C + I + G + (X - M)$ .
- GDP can be determined by summing up national income and adjusting for depreciation, taxes, and subsidies.
- GDP can be determined in two ways, both of which, in principle, give the same result.

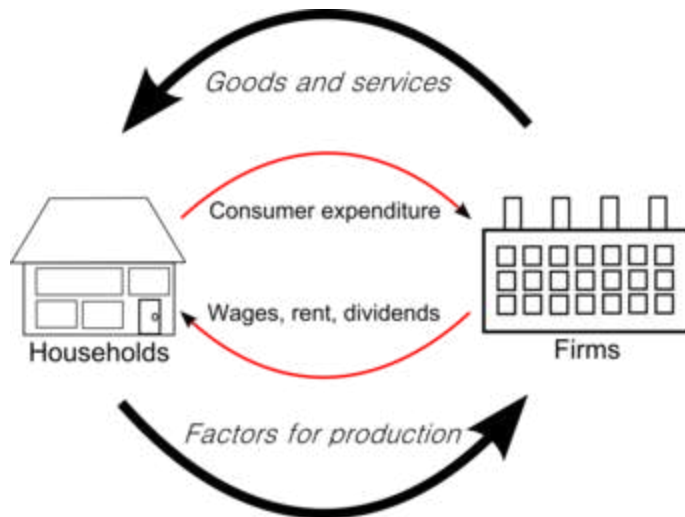
### Key Term

GDP

Gross domestic product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period of time.

Gross domestic product (GDP) is the market value of all final goods and services produced within the national borders of a country for a given

period of time. GDP can be determined in multiple ways. The income approach and the expenditure approach highlighted below should yield the same final GDP number .



## Simple view of expenditures

In an economy, households receive wages that they then use to purchase final goods and services. Since wages eventually are used in consumption (C), the expenditure approach to calculating GDP focuses on the end consumption expenditure to avoid double counting. The income approach, alternatively, would focus on the income made by households as one of its components to derive GDP.

## Expenditure Approach

The expenditure approach attempts to calculate GDP by evaluating the sum of all final good and services purchased in an economy. The components of U.S. GDP identified as "Y" in equation form, include Consumption (C), Investment (I), Government Spending (G) and Net Exports (X – M).

$Y = C + I + G + (X - M)$  is the standard equational (expenditure) representation of GDP.

- "C" (consumption) is normally the largest GDP component in the economy, consisting of private expenditures (household final consumption expenditure) in the economy. Personal expenditures fall under one of the following categories: durable goods, non-durable goods, and services.
- "I" (investment) includes, for instance, business investment in equipment, but does not include exchanges of existing assets. Spending by households (not government) on new houses is also included in Investment. "Investment" in GDP does not mean purchases of financial products. It is important to note that buying financial products is classed as 'saving,' as opposed to investment.
- "G" (government spending) is the sum of government expenditures on final goods and services. It includes salaries of public servants, purchase of weapons for the military, and any investment expenditure by a government. However, since GDP is a measure of productivity, transfer payments made by the government are not counted because these payments do not reflect a purchase by the government, rather a movement of income. They are captured in "C" when the payments are spent.
- "X" (exports) represents gross exports. GDP captures the amount a country produces, including goods and services produced for other nations' consumption, therefore exports are added.
- "M" (imports) represents gross imports. Imports are subtracted since imported goods will be included in the terms "G", "I", or "C", and must be deducted to avoid counting foreign supply as domestic.

## **Income Approach**

The income approach looks at the final income in the country, these include the following categories taken from the U.S. "National Income and Expenditure Accounts": wages, salaries, and supplementary labor income; corporate profits interest and miscellaneous investment income; farmers' income; and income from non-farm unincorporated businesses. Two non-income adjustments are made to the sum of these categories to arrive at GDP:

- Indirect taxes minus subsidies are added to get from factor cost to market prices.
- Depreciation (or Capital Consumption Allowance) is added to get from net domestic product to gross domestic product.

## **19.1.2: Learning from GDP**

GDP is a measure of national income and output that can be used as a comparison tool.

### **Learning Objective**

Explain how GDP is calculated.

### **Key Points**

- The output approach focuses on finding the total output of a nation by directly finding the total value of all goods and services a nation produces.
- The income approach equates the total output of a nation to the total factor income received by residents or citizens of the nation.
- The expenditure approach is basically an output accounting method. It focuses on finding the total output of a nation by finding the total amount of money spent.

### **Key Terms**

gross national product

The total market value of all the goods and services produced by a nation (citizens of a country, whether living at home or abroad) during a specified period.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.



There are two commonly used measures of national income and output in economics, these include gross domestic product (GDP) and gross national product (GNP). These measures are focused on counting the total amount of goods and services produced within some "boundary" where the boundary is defined by either geography or citizenship.

Since GDP measures income and output, it can be used to compare two countries. The country with higher GDP is often regarded as wealthier, but, when using GDP to compare countries, it is important to remember to adjust for population.

## **GDP**

GDP limits its focus to the value of goods or services in an actual geographic boundary of a country, where GNP is focused on the value of goods or services specifically attributable to citizens or nationality, regardless of where the production takes place. Over time GDP has become the standard metric used in national income reporting and most national income reporting and country comparisons are conducted using GDP.

GDP can be evaluated by using an output approach, income approach, or expenditure approach.

## **Output Approach**

The output approach focuses on finding the total output of a nation by directly finding the total value of all goods and services a nation produces. Because of the complication of the multiple stages in the production of a good or service, only the final value of a good or service is included in the total output. This avoids an issue referred to as *double counting*, where the total value of a good is included several times in national output, by counting it repeatedly in several stages of production.

For example, in meat production, the value of the good from the farm may be \$10, then \$30 from the butchers, and then \$60 from the supermarket.

The value that should be included in final national output should be \$60, not the sum of all those numbers, \$90.

Formula: GDP (gross domestic product) at market price = value of output in an economy in the particular year - intermediate consumption at factor cost = GDP at market price - depreciation + NFIA (net factor income from abroad) - net indirect taxes.

## **Income Approach**

The income approach equates the total output of a nation to the total factor income received by residents or citizens of the nation. The main types of factor income are:

- Employee compensation (cost of fringe benefits, including unemployment, health, and retirement benefits);
- Interest received net of interest paid;
- Rental income (mainly for the use of real estate) net of expenses of landlords;
- Royalties paid for the use of intellectual property and extractable natural resources.

All remaining value added generated by firms is called the residual or profit or business cash flow.

Formula: GDI (gross domestic income, which should equate to gross domestic product) = Compensation of employees + Net interest + Rental & royalty income + Business cash flow

## **Expenditure Approach**

The expenditure approach is basically an output accounting method. It focuses on finding the total output of a nation by finding the total amount of money spent. This is acceptable, because like income, the total value of all goods is equal to the total amount of money spent on goods. The basic formula for domestic output takes all the different areas in which money is spent within the region, and then combines them to find the total output .

GDP Components – United States (\$ Billions)

Line	2009	2009	2009	2009	2010	
	\$	\$	\$	\$	\$	
<b>1</b>	<b>14,178.8</b>	<b>14,151.2</b>	<b>14,242.1</b>	<b>14,453.8</b>	<b>14,601.4</b>	
<b>C</b>	<b>9,987.7</b>	<b>9,999.3</b>	<b>10,132.9</b>	<b>10,236.4</b>	<b>10,362.3</b>	
2	Personal consumption expenditures	3,197.7	3,193.8	3,292.3	3,337.1	3,406.4
3	Goods	1,625.2	1,631.5	1,651.3	1,652.0	1,672.8
4	Durable goods	2,172.4	2,182.2	2,241.0	2,285.1	2,333.8
5	Nondurable goods	6,790.0	6,805.6	6,840.6	6,899.3	6,955.8
6	Services	1,689.9	1,561.5	1,556.1	1,797.0	1,763.8
<b>I</b>	<b>1,689.9</b>	<b>1,561.5</b>	<b>1,556.1</b>	<b>1,797.0</b>	<b>1,763.8</b>	
7	Gross private domestic investment	1,817.2	1,737.7	1,712.4	1,731.4	1,726.9
8	Fixed investment	1,442.4	1,391.8	1,383.9	1,344.9	1,371.3
9	Nonresidential	533.1	494.8	457.9	434.1	417.5
10	Structures	803.5	897.0	895.9	932.8	953.9
11	Equipment and software	374.4	345.9	358.8	364.5	355.5
12	Residential	-127.4	-176.2	-156.5	-23.6	36.9
13	Change in private inventories	-378.3	-339.1	-402.2	-449.5	-499.4
<b>X-M</b>	<b>-378.3</b>	<b>-339.1</b>	<b>-402.2</b>	<b>-449.5</b>	<b>-499.4</b>	
14	Net exports of goods and services	1,509.2	1,492.7	1,573.8	1,680.1	1,729.3
15	Exports	909.8	979.1	1,045.2	1,140.6	1,180.0
16	Imports	1,387.8	1,392.8	1,374.8	1,329.7	1,228.7
17	Goods	1,506.2	1,461.1	1,592.8	1,739.4	1,827.6
18	Services	379.8	371.7	383.1	390.3	400.9
<b>G</b>	<b>2,879.0</b>	<b>2,929.4</b>	<b>2,955.4</b>	<b>2,959.2</b>	<b>2,974.7</b>	
19	Government consumption expenditures and gross investment	1,106.7	1,139.2	1,164.3	1,170.1	1,186.4
20	Federal	750.7	776.2	795.8	793.5	805.4
21	Nondefense	354.8	362.1	368.8	376.7	380.7
22	State and local	1,772.3	1,791.2	1,791.3	1,789.0	1,788.3

Source: U.S. Bureau of Economic Analysis

## U.S. GDP Components

The components of GDP include consumption, investment, government spending, and net exports (exports minus imports).

Formula:  $Y = C + I + G + (X - M)$  ; where: C = household consumption expenditures / personal consumption expenditures, I = gross private domestic investment, G = government consumption and gross investment expenditures, X = gross exports of goods and services, and M = gross imports of goods and services.

### 19.1.3: The Circular Flow and GDP

In economics, the "circular flow" diagram is a simple explanatory tool of how the major elements in an economy interact with one another.

#### Learning Objective

Evaluate the effect of the circular flow on GDP

#### Key Points

- In the circular flow model, the household sector, provides various factors of production such as labor and capital, to producers who in

- turn produce goods and services.
- Firms provide consumers with goods and services in exchange for consumer expenditure and "factors of production" from households.
  - Investment is equal to savings and is the income not spent but available to both consumers and firms for the purchase of capital investments, such as buildings, factories and homes.
  - A portion of income is also allocated to taxes (income is taxed and the remaining is either consumed and or saved); government spending,  $G$ , is based on the tax revenue,  $T$ .
  - The continuous flow of production, income and expenditure is known as circular flow of income; it is circular because it has neither any beginning nor an end.

## Key Terms

### Factors of production

In economics, factors of production are inputs. They may also refer specifically to the primary factors, which are stocks including land, labor, and capital goods applied to production.

### circular flow

A model of market economy that shows the flow of dollars between households and firms.

In economics, the "circular flow" diagram is a simple explanatory tool of how the major elements as defined by the equation  $Y = \text{Consumption} + \text{Investment} + \text{Government Spending} + (\text{Exports} - \text{Imports})$ . interact with one another. Circular flow is basically a continuous loop that for any point and time yields the value "Y" otherwise defined as the sum of final good and services in an economy, or gross domestic product (GDP) .



Figure 1: 2 sector circular flow model

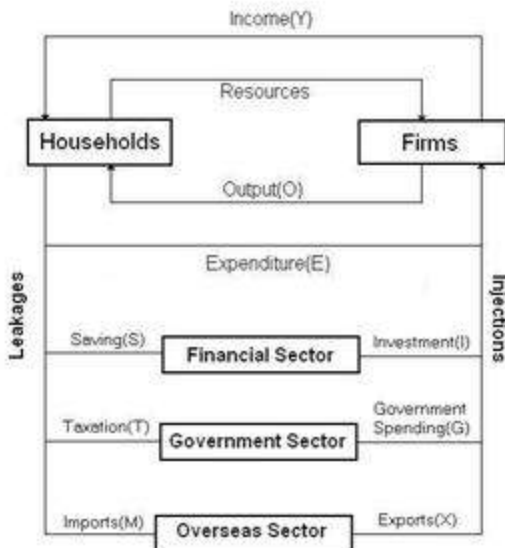


Figure 2: Five Sector Circular Flow of Income Model

Period	Output	Income	Consumption	Saving
1	2000	2000	2000	0
2	2000	2000	1800	200
3	1800	1800	1800	180

Figure 4: Effects of saving on the Circular Flow of Income

## Circular flow

The circular flow is a simplified view of the economy that provides an ability to assess GDP at a specific point in time.

In the circular flow model, the household sector, provides various factors of production such as labor and capital, to producers who in turn produce goods and services. Firms compensate households for resource utilized and households pay for goods and services purchased from firms. This portion

of the circular flow contributes to expenditures on consumption,  $C$  and generates income, which is the basis for savings (equal to investment) and government spending (tax revenue generated from income).

Investment,  $I$ , is equal to savings and is the income not spent but available to both consumers and firms for the purchase of capital investments, such as buildings, factories and homes.  $I$  represents an expenditure on investment capital.

Income generated in the relationship between firms and households is taxed and the remaining is either consumed and or saved. Government spending,  $G$ , is based on the tax revenue,  $T$ .  $G$  can be equal to taxes, less than or more than the tax revenue and represents government expenditure in the economy.

Finally, exports minus imports,  $X - M$ , references whether an economy is a net importer or exporter (or potentially trade neutral ( $X - M = 0$ )) and the impact of this component on overall GDP. Note that if the country is a net importer the value of  $X - M$  will be negative and will have a downward impact to overall GDP; if the country is a net exporter, the opposite will be true.

## **Circular flow**

The continuous flow of production, income and expenditure is known as circular flow of income. It is circular because it has neither any beginning nor an end. The circular flow involves two basic assumptions:

1. In any exchange process, the seller or producer receives what the buyer or consumer spends.
2. Goods and services flow in one direction and money payment flow in the opposite or return direction, causing a circular flow.

### **19.1.4: GDP Equation in Depth ( $C+I+G+X$ )**

GDP is the sum of Consumption (C), Investment (I), Government Spending (G) and Net Exports (X – M):  $Y = C + I + G + (X - M)$ .

## Learning Objective

Identify the variables that make up GDP

## Key Points

- C (consumption) is normally the largest GDP component in the economy, consisting of private (household final consumption expenditure) in the economy.
- I (investment) includes, for instance, business investment in equipment, but does not include exchanges of existing assets.
- G (government spending) is the sum of government expenditures on final goods and services. It includes salaries of public servants, purchase of weapons for the military, and any investment expenditure by a government.
- X (exports) represents gross exports. GDP captures the amount a country produces, including goods and services produced for other nations' consumption, therefore exports are added.
- M (imports) represents gross imports.

## Key Terms

government spending

Includes all government consumption, investment but excludes transfer payments made by a state.

consumption

In the expenditure approach, the amount of goods and services purchased for consumption by individuals.

export

Any good or commodity, transported from one country to another country in a legitimate fashion, typically for use in trade.

import

To bring (something) in from a foreign country, especially for sale or trade.

investment

A placement of capital in expectation of deriving income or profit from its use.

Gross domestic product (GDP) is defined as the sum of all goods and services that are produced within a nation's borders over a specific time interval, typically one calendar year.

## **Components of GDP**

GDP (Y) is a sum of Consumption (C), Investment (I), Government Spending (G) and Net Exports (X – M):

0



GDP Components – United States (\$ Billions)

Line	2009	2009	2009	2009	2010	
	I	II	III	IV	I	
<b>1</b>	<b>14,178.8</b>	<b>14,151.2</b>	<b>14,242.1</b>	<b>14,453.8</b>	<b>14,601.4</b>	
<b>C</b>	<b>9,987.7</b>	<b>9,999.3</b>	<b>10,132.9</b>	<b>10,236.4</b>	<b>10,362.3</b>	
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5	Nondurable goods	6,790.0	6,805.6	6,840.6	6,899.3	6,955.8
6	Services	1,689.9	1,561.5	1,556.1	1,797.0	1,763.8
<b>I</b>	<b>1,689.9</b>	<b>1,561.5</b>	<b>1,556.1</b>	<b>1,797.0</b>	<b>1,763.8</b>	
7	Gross private domestic investment	1,817.2	1,737.7	1,712.4	1,731.4	1,726.9
8	Fixed investment	1,442.4	1,391.8	1,383.9	1,344.9	1,371.3
9	Nonresidential	533.1	494.8	457.9	434.1	417.5
10	Structures	803.5	897.0	895.9	932.8	953.9
11	Equipment and software	374.4	345.9	358.8	364.5	355.5
12	Residential	-127.4	-176.2	-156.5	-23.6	36.9
13	Change in private inventories	-378.3	-339.1	-402.2	-449.5	-499.4
<b>X-M</b>	<b>-378.3</b>	<b>-339.1</b>	<b>-402.2</b>	<b>-449.5</b>	<b>-499.4</b>	
14	Net exports of goods and services	1,509.3	1,493.7	1,573.8	1,680.1	1,729.3
15	Exports	909.5	979.1	1,045.2	1,140.6	1,180.0
16	Goods	519.8	515.4	529.5	539.4	548.3
17	Services	1,389.8	1,463.8	1,515.8	1,601.2	1,631.7
18	Imports	1,508.2	1,441.1	1,572.0	1,730.4	1,827.6
19	Goods	379.8	371.7	383.1	380.3	400.9
20	Services	2,879.0	2,929.4	2,955.4	2,959.2	2,974.7
<b>G</b>	<b>2,879.0</b>	<b>2,929.4</b>	<b>2,955.4</b>	<b>2,959.2</b>	<b>2,974.7</b>	
21	Government consumption expenditures and gross investment	1,106.7	1,139.3	1,164.3	1,170.1	1,186.4
22	Federal	750.7	776.2	795.8	793.5	805.4
23	National defense	354.8	342.1	368.8	376.7	388.7
24	Nondefense	1,772.3	1,791.2	1,791.3	1,789.0	1,788.3
25	State and local					

Source: U.S. Bureau of Economic Analysis

## Expenditure accounts

Components of the expenditure approach to calculating GDP as presented in the National Income Accounts (U.S. Bureau of Economic Analysis).

## Defining the components

### Consumption

Consumption (C) is normally the largest GDP component in the economy, consisting of private (household final consumption expenditure) in the economy. These personal expenditures fall under one of the following categories: durable goods, non-durable goods, and services. Examples include food, rent, jewelry, gasoline, and medical expenses but does not include the purchase of new housing. Also, it is important to note that goods such as hand-knit sweaters are not counted as part of GDP if they are gifted and not sold. Only expenditure based consumption is counted.

### Investment

Investment (I) includes, for instance, business investment in equipment, but does not include exchanges of existing assets. Examples include construction of a new mine, purchase of software, or purchase of machinery

and equipment for a factory. Spending by households (not government) on new houses is also included in Investment. In contrast to common usage, 'Investment' in GDP does not mean purchases of financial products. Buying financial products is classified as 'saving', as opposed to investment. This avoids double-counting: if one buys shares in a company, and the company uses the money received to buy plant, equipment, etc., the amount will be counted toward GDP when the company spends the money on those things. To count it when one gives it to the company would be to count two times an amount that only corresponds to one group of products. Note that buying bonds or stocks is a swapping of deeds, a transfer of claims on future production, not directly an expenditure on products.

## **Government Spending**

Government spending (G) is the sum of government expenditures on final goods and services. It includes salaries of public servants, purchase of weapons for the military, and any investment expenditure by a government. It does not include any transfer payments, such as social security or unemployment benefits.

## **Net Exports**

Exports (X) represents gross exports. GDP captures the amount a country produces, including goods and services produced for other nations' consumption, therefore exports are added.

Imports (M) represents gross imports. Imports are subtracted since imported goods will be included in the terms G, I, or C, and must be deducted to avoid counting foreign supply as domestic.

Sometimes, net exports is simply written as NX, but is the same thing as X-M.

Note that C, G, and I are expenditures on final goods and services; expenditures on intermediate goods and services do not count.

## 19.1.5: Calculating GDP

GDP can be calculated through the expenditures, income, or output approach.

### Learning Objective

Identify the output approach to calculating GDP

### Key Points

- The expenditures approach says  $GDP = \text{consumption} + \text{investment} + \text{government expenditure} + \text{exports} - \text{imports}$ .
- The income approach sums the factor incomes to the factors of production.
- The output approach is also called the "net product" or "value added" approach.

### Key Terms

expenditure approach

The total spending on all final goods and services (Consumption goods and services (C) + Gross Investments (I) + Government Purchases (G) + (Exports (X) - Imports (M))  $GDP = C + I + G + (X - M)$ .

income approach

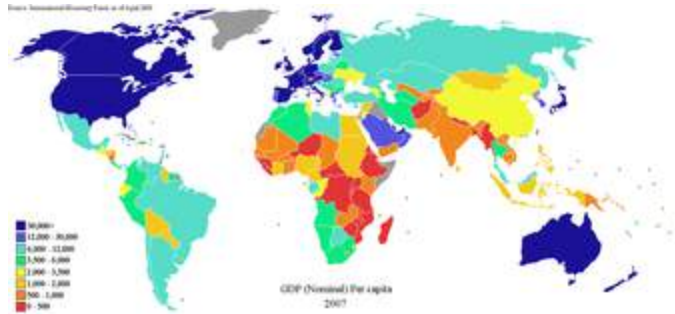
GDP based on the income approach is calculated by adding up the factor incomes to the factors of production in the society.

output approach

GDP is calculated using the output approach by summing the value of sales of goods and adjusting (subtracting) for the purchase of intermediate goods to produce the goods sold.

# Gross Domestic Product

Gross domestic product is one method of understanding a country's income and allows for comparison to other countries .



## Global GDP

GDP is a common measure for both inter-country comparisons and intra-country comparisons. The metric is one method of understanding economic growth within a country's borders.

By calculating the value of goods and services produced in a country, GDP provides a useful metric for understanding the economic momentum between the major factors of an economy: consumers, firms, and the government. There are a few methods used for calculating GDP, the most commonly presented are the expenditure and the income approach. Both of these methods calculate GDP by evaluating the final stage of sales (expenditure) or income (income). However, another approach referred to as the "output approach" calculates GDP by evaluating the value of all sales and adjusting for the purchase of intermediate goods (to remove double counting).

## Expenditures Approach

The most well known approach to calculating GDP, the expenditures approach is characterized by the following formula:

$$\text{GDP} = C + I + G + (X-M)$$

where C is the level of consumption of goods and services, I is gross investment, G is government purchases, X is exports, and M is imports.

## **Income Approach**

The income approach adds up the factor incomes to the factors of production in the society. It can be expressed as:

GDP = National Income (NY) + Indirect Business Taxes (IBT) + Capital Consumption Allowance and Depreciation (CCA) + Net Factor Payments to the rest of the world (NFP)

## **Output Approach**

The output approach is also called "net product" or "value added" method. This method consists of three stages:

- Estimating the gross value of domestic output;
- Determining the intermediate consumption, i.e., the cost of material, supplies, and services used to produce final goods or services;
- Deducting intermediate consumption from gross value to obtain the net value of domestic output.

*Net value added = Gross value of output – Value of intermediate consumption.*

*Gross value of output = Value of the total sales of goods and services + Value of changes in the inventories.*

The sum of net value added in various economic activities is known as GDP at factor cost. GDP at factor cost plus indirect taxes less subsidies on products is GDP at producer price. GDP at producer price theoretically should be equal to GDP calculated based on the expenditure approach. However, discrepancies do arise because there are instances where the price that a consumer may pay for a good or service is not completely reflected in the amount received by the producer and the tax and subsidy adjustments

mentioned above may not adequately adjust for the variation in payment and receipt.

## 19.1.6: Other Approaches to Calculating GDP

The income approach evaluates GDP from the perspective of the final income to economic participants.

### Learning Objective

Explain the income approach to calculating GDP.

### Key Points

- The sum of COE, GOS, and GMI is called total factor income; it is the income of all of the factors of production in society. It measures the value of GDP at factor (basic) prices.
- Adding taxes less subsidies on production and imports converts GDP at factor cost (as noted, a net domestic product) to GDP.
- By definition, the income approach to calculating GDP should be equatable to the expenditure approach; however, measurement errors will make the two figures slightly off when reported by national statistical agencies.

### Key Terms

expenditure approach

The total spending on all final goods and services (Consumption goods and services (C) + Gross Investments (I) + Government Purchases (G) + (Exports (X) - Imports (M))  $GDP = C + I + G + (X-M)$ .

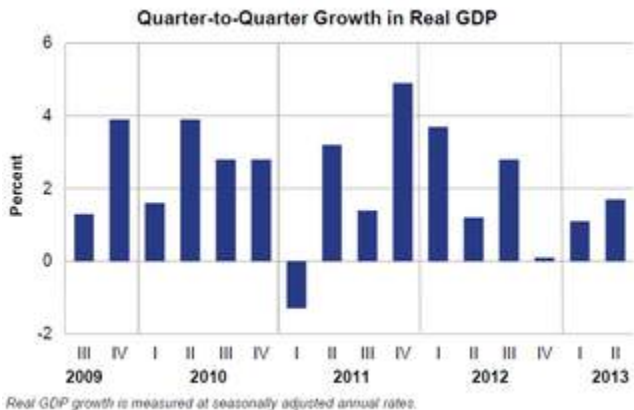
income approach

GDP based on the income approach is calculated by adding up the factor incomes to the factors of production in the society.

depreciation

The measurement of the decline in value of assets. Not to be confused with impairment, which is the measurement of the unplanned, extraordinary decline in value of assets.

Gross domestic product provides a measure of the productivity of an economy specific to the national borders of a country . It can be measured a few different ways and the most commonly used metric is the expenditure approach; however, the second most commonly used measure is the income approach. The income approach unlike the expenditure approach, which sums the spending on final goods and services across economic agents (consumers, businesses and the government), evaluates GDP from the perspective of the final income to economic participants. GDP calculated in this manner is sometimes referenced as "Gross Domestic Income" (GDI).



## GDP over time

GDP is measured over consecutive periods to enable policymakers and economic agents to evaluate the state of the economy to set expectations and make decisions.

This method measures GDP by adding incomes that firms pay households for factors of production they hire- wages for labor, interest for capital, rent for land, and profits for entrepreneurship. The U.S. "National Income and Expenditure Accounts" divide incomes into five categories:

- Wages, salaries, and supplementary labor income
- Corporate profits
- Interest and miscellaneous investment income
- Farmers' income
- Income from non-farm unincorporated businesses

Two adjustments must be made to get the GDP: Indirect taxes minus subsidies are added to get from factor cost to market prices. Depreciation (or Capital Consumption Allowance) is added to get from net domestic product to gross domestic product.

## Income Approach Formula

GDP = compensation of employees + gross operating surplus + gross mixed income + taxes less subsidies on production and imports. Alternatively, this can be expressed as:

$$\text{GDP} = \text{COE} + \text{GOS} + \text{GMI} + T_{P \& M} - S_{P \& M}$$

- Compensation of employees (COE) measures the total remuneration to employees for work done.
- Gross operating surplus (GOS) is the surplus due to owners of incorporated businesses.
- Gross mixed income (GMI) is the same measure as GOS, but for unincorporated businesses. This often includes most small businesses.
- $T_{P \& M}$  is taxes on production and imports.
- $S_{P \& M}$  is subsidies on production and imports.

The sum of COE, GOS, and GMI is called total factor income; it is the income of all of the factors of production in society. It measures the value of GDP at factor (basic) prices. The difference between basic prices and final prices (those used in the expenditure calculation) is the total taxes and subsidies that the government has levied or paid on that production. So, adding taxes less subsidies on production and imports converts GDP at factor cost (as noted, a net domestic product) to GDP.



By definition, the income approach to calculating GDP should be equatable to the expenditure approach ( $Y = C + I + G + (X - M)$ ). In practice, however, measurement errors will make the two figures slightly off when reported by national statistical agencies.

## **19.1.7: Evaluating GDP as a Measure of the Economy**

The value of GDP as a measure of the quality of life for a given country may be limited.

### **Learning Objective**

Assess the uses and limitations of GDP as a measure of the economy

### **Key Points**

- The sensitivities related to social welfare has continued the argument specific to the use of GDP as a economic growth or progress metric.
- A country with wide disparities in income could appear to be economically stronger, strictly using GDP, than a country where the income disparities were significantly lower (standard of living).
- Therefore, GDP has a tremendous big-picture value but policymakers would be better served using other metrics in combination with the aggregate measure if and when social welfare is being addressed.

### **Key Terms**

qualitative

Based on descriptions or distinctions rather than on some quantity.

welfare

Health, safety, happiness and prosperity; well-being in any respect.

quantitative

Of a measurement based on some number rather than on some quality.

Gross domestic product (GDP) due to its relative ease of calculation and definition, has become a standard metric in the discussion of economic welfare, growth and prosperity. However, the value of GDP as a measure of the quality of life for a given country may be quite poor given that the metric only provides the total value of production for a specific time interval and provides no insight with respect to the source of growth or the beneficiaries of growth. Therefore, growth could be misinterpreted by looking at GDP values in isolation.

## **Limitations of GDP**

Simon Kuznets, the economist who developed the first comprehensive set of measures of national income, stated in his first report to the US Congress in 1934, in a section titled "Uses and Abuses of National Income Measurements":

"Economic welfare cannot be adequately measured unless the personal distribution of income is known. And no income measurement undertakes to estimate the reverse side of income, that is, the intensity and unpleasantness of effort going into the earning of income. The welfare of a nation can, therefore, scarcely be inferred from a measurement of national income. "

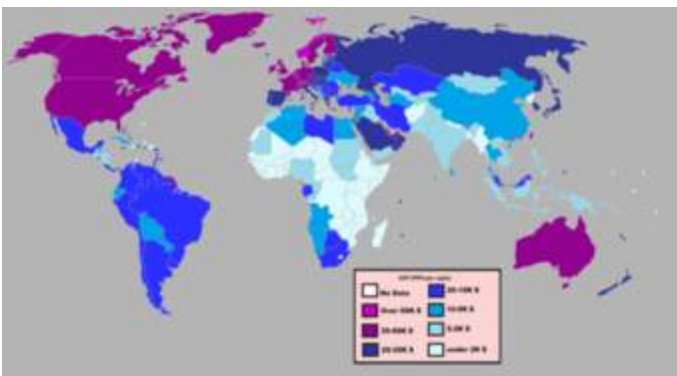
Following on his caution with respect to economic extrapolations from GDP, in 1962, Kuznets stated: "Distinctions must be kept in mind between quantity and quality of growth, between costs and returns, and between the short and long run. Goals for more growth should specify more growth of what and for what. "

The sensitivities related to social welfare has continued the argument specific to the use of GDP as a economic growth or progress metric.

Austrian School economist Frank Shostak has noted: "The GDP framework cannot tell us whether final goods and services that were produced during a particular period of time are a reflection of real wealth expansion, or a reflection of capital consumption. For instance, if a government embarks on the building of a pyramid, which adds absolutely nothing to the well-being of individuals, the GDP framework will regard this as economic growth. In reality, however, the building of the pyramid will divert real funding from wealth-generating activities, thereby stifling the production of wealth. "

## GDP as an Evaluation Metric

Although GDP provides a single quantitative metric by which comparisons can be made across countries, the aggregation of elements that create the single value of GDP provide limitations in evaluating a country and its economic agents. Given the calculation of the metric, a country with wide disparities in income could appear to be economically stronger than a country where the income disparities were significantly lower (standard of living). However, a qualitative assessment would likely value the latter country compared to the former on a welfare or quality of life basis .



## GDP across the globe

GDP can be adjusted to compare the purchasing power across countries but cannot be adjusted to provide a view of the economic disparities within a country.

Therefore, GDP has a tremendous big-picture value but policymakers would be better served using other metrics in combination with the aggregate measure if and when social welfare is being addressed.

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# 19.2: Other Measures of Output

## 19.2.1: National Income

A variety of measures of national income and output are used in economics to estimate total economic activity in a country or region.

### Learning Objective

Explain the importance of calculating national income.

### Key Points

- Arriving at a figure for the total production of goods and services in a large region like a country entails a large amount of data-collection and calculation.
- In order to count a good or service, it is necessary to assign value to it.
- Three strategies have been used to obtain the market values of all the goods and services produced: the product (or output) method, the expenditure method, and the income method.

### Key Term

national income

The total amount of goods and services produced within some "boundary." The boundary is usually defined by geography or citizenship, and may also restrict the goods and services that are counted.

A variety of measures of national income and output are used in economics to estimate total economic activity in a country or region, including gross domestic product (GDP), gross national product (GNP), net national income (NNI), and adjusted national income (NNI\* adjusted for natural resource



depletion). All of the measures are especially concerned with counting the total amount of goods and services produced within some boundary. The boundary is usually defined by geography or citizenship, and may also restrict the goods and services that are counted. For instance, some measures count only goods and services that are exchanged for money, excluding bartered goods, while other measures may attempt to include bartered goods by imputing monetary values to them.

Arriving at a figure for the total production of goods and services in a large region like a country entails a large amount of data-collection and calculation. Although some attempts were made to estimate national incomes as long ago as the 17th century, the systematic keeping of national accounts, of which these figures are a part, only began in the 1930s, in the United States and some European countries. The impetus for that major statistical effort was the Great Depression and the rise of Keynesian economics, which prescribed a greater role for the government in managing an economy, and made it necessary for governments to obtain accurate information so that their interventions into the economy could proceed as well-informed as possible .

$$GDP = C + I + G + (X - M)$$

## **Expenditure approach**

The expenditure approach is a common method for evaluating the value of an economy at a given point in time.

## **Measuring National Income**

In order to count a good or service, it is necessary to assign value to it. The value that the measures of national income and output assign to a good or service is its market value – the price when bought or sold. The actual usefulness of a product (its use-value) is not measured – assuming the use-value to be any different from its market value. Three strategies have been used to obtain the market values of all the goods and services produced: the product or output method, the expenditure method, and the income method.

## Product or Output Method

The output approach focuses on finding the total output of a nation by directly finding the total value of all goods and services a nation produces:

At factor cost = GDP at market price - depreciation + NFIA (*net factor income from abroad*) - net indirect taxes

## Income Method

The income approach equates the total output of a nation to the total factor income received by residents or citizens of the nation:

NDP at factor cost = compensation of employees + net interest + rental and royalty income + profit of incorporated and unincorporated NDP at factor cost

## Expenditure Method

The expenditure approach focuses on finding the total output of a nation by finding the total amount of money spent and is the most commonly used equational form:

$GDP = C + I + G + (X - M)$ ; where C = household consumption expenditures / personal consumption expenditures, I = gross private domestic investment, G = government consumption and gross investment expenditures, X = gross exports of goods and services, and M = gross imports of goods and services.

## 19.2.2: Personal Income

Personal income is an individual's total earnings from wages, investment interest, and other sources.

### Learning Objective

Explain personal income

## Key Points

- In the United States the most widely cited personal income statistics are the Bureau of Economic Analysis's (BEA) personal income and the Census Bureau's per capita money income.
- BEA's personal income measures the income received by persons from participation in production, from government and business transfers, and from holding interest-bearing securities and corporate stocks.
- The Census Bureau also produces alternative estimates of income and poverty based on broadened definitions of income that include many of these income components that are not included in money income.

## Key Term

personal income

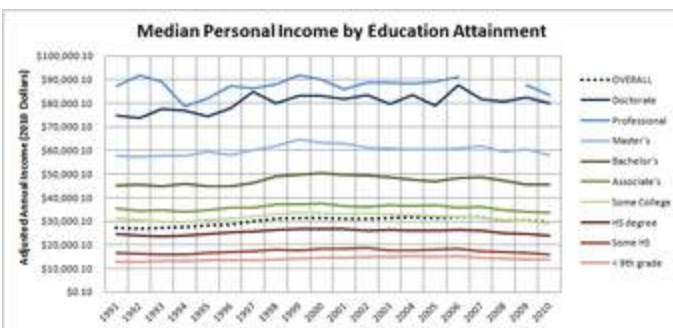
An individual's total earnings from wages, investment enterprises, and other ventures.

Personal income is an individual's total earnings from wages, investment interest, and other sources.

In the United States the most widely cited personal income statistics are the Bureau of Economic Analysis's (BEA) personal income and the Census Bureau's per capita money income. The two statistics spring from different traditions of measurement: personal income from national economic accounts and money income from household surveys.

BEA's personal income measures the income received by persons from participation in production, from government and business transfers, and from holding interest-bearing securities and corporate stocks. Personal income also includes income received by nonprofit institutions serving households, by private non-insured welfare funds, and by private trust funds. BEA publishes disposable personal income, which measures the income available to households after paying federal and state and local government income taxes. Income from production is generated both by the labor of individuals (for example, in the form of wages and salaries and of

proprietors' income) and by the capital that they own (in the form of rental income of persons). Income that is not earned from production in the current period—such as capital gains, which relate to changes in the price of assets over time—is excluded. BEA's monthly personal income estimates are one of several key macroeconomic indicators that the National Bureau of Economic Research considers when dating the business cycle. Personal income and disposable personal income are provided both as aggregate and as per capita statistics. BEA produces monthly estimates of personal income for the nation, quarterly estimates of state personal income, and annual estimates of local-area personal income .



## Historical personal income by educational attainment

Personal income data can provide governments with useful information in the formulation of public policy to combat income inequality.

The Census Bureau also produces alternative estimates of income and poverty based on broadened definitions of income that include many of these income components that are not included in money income. The Census Bureau releases estimates of household money income as medians, percent distributions by income categories, and on a per capita basis. Estimates are available by demographic characteristics of householders and by the composition of households.

### 19.2.3: Disposable Income

Disposable income is the income left after paying taxes.

## **Learning Objective**

Define disposable income

## **Key Points**

- Disposable income is total personal income minus personal current taxes.
- Discretionary income is disposable income minus all payments that are necessary to meet current bills.
- Disposable income is often incorrectly used to denote discretionary income.

## **Key Terms**

disposable income

Income left after taxes.

Discretionary Income

Disposable income (after-tax income) minus all payments that are necessary to meet current bills.

Income left after paying taxes is referred to as disposable income. Disposable income is thus total personal income minus personal current taxes . In national accounts definitions:



## Disposable income

Disposable income can be spent on essential or nonessential items. Alternatively, it can also be saved. It is whatever income is left after taxes.

Personal income - personal current taxes = disposable personal income

This can be restated as: consumption expenditure + savings = disposable income

For the purposes of calculating the amount of income subject to garnishment, United States federal law defines disposable income as an individual's compensation (including salary, overtime, bonuses, commission, and paid leave) after the deduction of health insurance premiums and any amounts required to be deducted by law. Amounts required to be deducted by law include federal, state, and local taxes, state unemployment and disability taxes, social security taxes, and other garnishments or levies, but does not include such deductions as voluntary retirement contributions and transportation deductions.

Discretionary income is disposable income minus all payments that are necessary to meet current bills. It is total personal income after subtracting taxes and typical expenses (such as rent or mortgage, utilities, insurance, medical fees, transportation, property maintenance, child support, food and sundries, etc.) needed to maintain a certain standard of living. In other words, it is the amount of an individual's income available for spending after the essentials (such as food, clothing, and shelter) have been taken care of.

Discretionary income = Gross income - taxes - all compelled payments (bills)

Disposable income is often incorrectly used to denote discretionary income. The meaning should therefore be interpreted from context. Commonly, disposable income is the amount of "play money" left to spend or save.

## **19.2.4: GDP per capita**

Gross domestic product (GDP) per capita is the mean income of people in an economic unit.

### **Learning Objective**

Define GDP per capita and assess its usefulness as a metric.

### **Key Points**

- GDP per capita is often used as average income, a measure of the wealth of the population of a nation, particularly when making comparisons among nations.
- Per capita income is often used to measure a country's standard of living.
- It is usually expressed in terms of a commonly used international currency such as the Euro or United States dollar, and can be easily calculated from readily-available GDP and population estimates.

### **Key Term**

per capita

per person

Gross domestic product (GDP) per capita is also known as income per person. It is the mean income of the people in an economic unit such as a country or city. GDP per capita is calculated by dividing GDP by the total population of the country.

# GDP per capita income as a measure of prosperity

GDP per capita is often used as average income, a measure of the wealth of the population of a nation, particularly when making comparisons to other nations . It is useful because GDP is expected to increase with population, so it may be misleading to simply compare the GDPs of two countries. GDP per capita accounts for population size.



## Comparisons of GDP per capita

GDP per capita varies across countries and is highest among developed countries. However, GDP per capita is not an indicator of income distribution in a given country. For this reason GDP per capita may not necessarily be a barometer for the quality of life in a given country.

Per capita income is often used to measure a country's standard of living. It is usually expressed in terms of a commonly used international currency such as the Euro or United States dollar. It is easily calculated from readily-available GDP and population estimates, and produces a useful statistic for comparison of wealth between sovereign territories. This helps countries know their development status.

However, critics contend that per capita income has several weaknesses as a measure of prosperity, including:

- Comparisons of GDP per capita over time need to take into account changes in prices. Without using measures of income adjusted for inflation, they will tend to overstate the effects of economic growth.



- International comparisons can be distorted by differences in the cost of living between countries that are not reflected in exchange rates. When looking at differences in living standards between countries, using a measure of GDP per capita adjusted for differences in purchasing power parity more accurately reflects the differences in what people are actually able to buy with their money.
- As it is a mean value, it does not reflect income distribution. If the distribution of income within a country is skewed, a small wealthy class can increase GDP per capita far above that of the majority of the population. Median income is a more useful measure of prosperity than GDP per capita because it is less influenced by outliers.

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# 19.3: Comparing Real and Nominal GDP

## 19.3.1: Calculating Real GDP

Real GDP growth is the value of all goods produced in a given year; nominal GDP is value of all the goods taking price changes into account.

### Learning Objective

Calculate real and nominal GDP growth

### Key Points

- The following equation is used to calculate the GDP:  $GDP = C + I + G + (X - M)$  or  $GDP = \text{private consumption} + \text{gross investment} + \text{government investment} + \text{government spending} + (\text{exports} - \text{imports})$ .
- Nominal value changes due to shifts in quantity and price.
- In economics, real value is not influenced by changes in price, it is only impacted by changes in quantity. Real values measure the purchasing power net of any price changes over time.
- Real GDP accounts for inflation and deflation. It transforms the money-value measure, nominal GDP, into an index for quantity of total output.

### Key Terms

nominal

Without adjustment to remove the effects of inflation (in contrast to real).

gross domestic product

Known also as GDP, this is a measure of the economic production of a particular territory in financial capital terms over a specific time period.

## Example

- Imagine a country with a GDP of \$100 in a given year. In the next year the GDP rises to \$105 and the inflation rate is %3. Roughly, we can say that real GDP rises to only \$102 as the inflation rate accounted for.

## Gross Domestic Product

The Gross domestic Product (GDP) is the market value of all final goods and services produced within a country in a given period of time. The GDP is the officially recognized totals. The following equation is used to calculate the GDP:

Written out, the equation for calculating GDP is:

$$GDP = \textit{private consumption} + \textit{gross investment} + \textit{government investment} + \textit{government spending} + (\textit{exports} - \textit{imports}).$$

For the gross domestic product, "gross" means that the GDP measures production regardless of the various uses to which the product can be put. Production can be used for immediate consumption, for investment into fixed assets or inventories, or for replacing fixed assets that have depreciated. "Domestic" means that the measurement of GDP contains only products from within its borders.

## Nominal GDP

The nominal GDP is the value of all the final goods and services that an economy produced during a given year. It is calculated by using the prices that are current in the year in which the output is produced . In economics, a

nominal value is expressed in monetary terms. For example, a nominal value can change due to shifts in quantity and price. The nominal GDP takes into account all of the changes that occurred for all goods and services produced during a given year. If prices change from one period to the next and the output does not change, the nominal GDP would change even though the output remained constant.

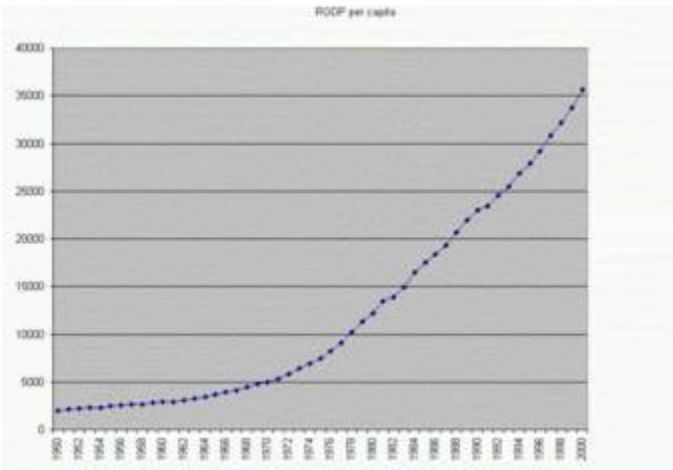


## Nominal GDP

This image shows the nominal GDP for a given year in the United States.

## Real GDP

The real GDP is the total value of all of the final goods and services that an economy produces during a given year, accounting for inflation. It is calculated using the prices of a selected base year. To calculate Real GDP, you must determine how much GDP has been changed by inflation since the base year, and divide out the inflation each year. Real GDP, therefore, accounts for the fact that if prices change but output doesn't, nominal GDP would change.



## Real GDP Growth

This graph shows the real GDP growth over a specific period of time.

In economics, real value is not influenced by changes in price, it is only impacted by changes in quantity. Real values measure the purchasing power net of any price changes over time. The real GDP determines the purchasing power net of price changes for a given year. Real GDP accounts for inflation and deflation. It transforms the money-value measure, nominal GDP, into an index for quantity of total output.

### 19.3.2: The GDP Deflator

The GDP deflator is a price index that measures inflation or deflation in an economy by calculating a ratio of nominal GDP to real GDP.

#### Learning Objective

Explain how the calculation of the GDP deflator can measure inflation

#### Key Points

- The GDP deflator is a measure of price inflation. It is calculated by dividing Nominal GDP by Real GDP and then multiplying by 100. (Based on the formula).

- Nominal GDP is the market value of goods and services produced in an economy, unadjusted for inflation. Real GDP is nominal GDP, adjusted for inflation to reflect changes in real output.
- Trends in the GDP deflator are similar to changes in the Consumer Price Index, which is a different way of measuring inflation.

## **Key Terms**

### GDP deflator

A measure of the level of prices of all new, domestically produced, final goods and services in an economy. It is calculated by computing the ratio of nominal GDP to the real measure of GDP.

### real GDP

A macroeconomic measure of the value of the economy's output adjusted for price changes (inflation or deflation).

### nominal gdp

A macroeconomic measure of the value of the economy's output that is not adjusted for inflation.

The GDP deflator (implicit price deflator for GDP) is a measure of the level of prices of all new, domestically produced, final goods and services in an economy. It is a price index that measures price inflation or deflation, and is calculated using nominal GDP and real GDP.

## **Nominal GDP versus Real GDP**

Nominal GDP, or unadjusted GDP, is the market value of all final goods produced in a geographical region, usually a country. That market value depends on the quantities of goods and services produced and their respective prices. Therefore, if prices change from one period to the next but actual output does not, nominal GDP would also change even though output remained constant.

In contrast, real gross domestic product accounts for price changes that may have occurred due to inflation. In other words, real GDP is nominal GDP adjusted for inflation. If prices change from one period to the next but actual output does not, real GDP would remain the same. Real GDP reflects changes in real production. If there is no inflation or deflation, nominal GDP will be the same as real GDP.

## Calculating the GDP Deflator

The GDP deflator is calculated by dividing nominal GDP by real GDP and multiplying by 100 .

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

## GDP Deflator Equation

The GDP deflator measures price inflation in an economy. It is calculated by dividing nominal GDP by real GDP and multiplying by 100.

Consider a numeric example: if nominal GDP is \$100,000, and real GDP is \$45,000, then the GDP deflator will be 222 (GDP deflator =  $\$100,000/\$45,000 * 100 = 222.22$ ).

In the U.S., GDP and GDP deflator are calculated by the U.S. Bureau of Economic Analysis.

## Relationship between GDP Deflator and CPI

Like the Consumer Price Index (CPI), the GDP deflator is a measure of price inflation/deflation with respect to a specific base year. Similar to the CPI, the GDP deflator of the base year itself is equal to 100. Unlike the CPI, the GDP deflator is not based on a fixed basket of goods and services; the "basket" for the GDP deflator is allowed to change from year to year with people's consumption and investment patterns. However, trends in the GDP deflator will be similar to trends in the CPI.



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# 19.4: Cost of Living

## 19.4.1: Introduction to Inflation

Inflation is a persistent increase in the general price level, and has three varieties: demand-pull, cost-push, and built-in.

### Learning Objective

Distinguish between demand-pull and cost-push inflation

### Key Points

- Inflation is an increase in price levels, which decreases the real value, or purchasing power, of money.
- Demand-pull inflation is an increase in price levels due to an increase in aggregate demand when the employment level is full or close to full.
- Cost-push inflation is an increase in price levels due to a decrease in aggregate supply. Generally, this occurs due to supply shocks, or an increase in the price of production inputs.

### Key Terms

inflation

An increase in the general level of prices or in the cost of living.

demand-pull inflation

A rise in the price level for goods and services in an economy due to greater demand than the economy's ability to produce those goods and services.

cost-push inflation

A rise in the price level for goods and services in an economy due to increases in the costs of production.

In economics, inflation is a persistent increase in the general price level of goods and services in an economy over a period of time. When the general price level rises,

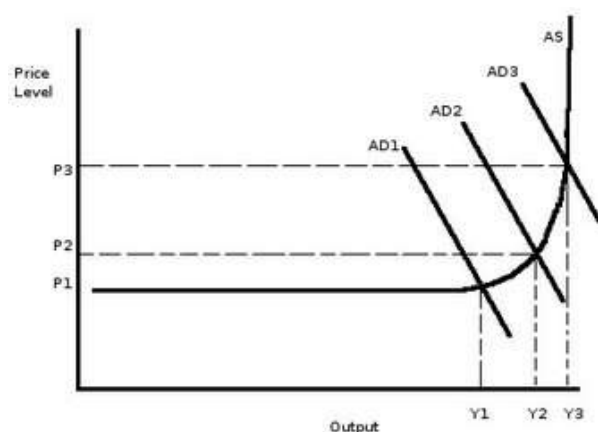
each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money; it is a loss of real value, as a single dollar is able to purchase fewer goods than it previously could.

## Types of Inflation

The reasons for inflation depend on supply and demand. Depending on the type of inflation, changes in either supply or demand can create an increase in the price level of goods and services. In Keynesian economics, there are three types of inflation.

### Demand-Pull Inflation

Demand-pull inflation is inflation that occurs when total demand for goods and services exceeds the economy's capacity to produce those goods. Put another way, there is "too much money chasing too few goods." Typically, demand-pull inflation occurs when unemployment is low or falling. The increases in employment raise aggregate demand, which leads to increased hiring to expand the level of production. Eventually, production cannot keep pace with aggregate demand because of capacity constraints, so prices rise.

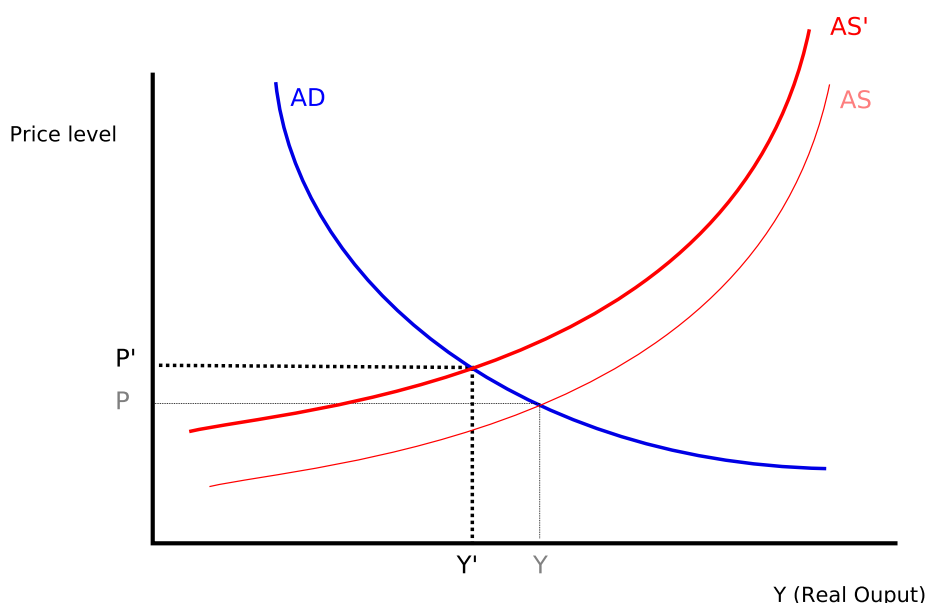


### Demand-Pull Inflation

Demand-pull inflation is caused by an increase in aggregate demand. As demand increases, so does the price level.

### Cost-Push Inflation

Cost-push inflation occurs when there is an increase in the costs of production. Unlike demand-pull inflation, cost-push inflation is not "too much money chasing too few goods," but rather, a decrease in the supply of goods, which raises prices .



## Cost-Push Inflation

As the costs of production inputs rises, aggregate supply can decrease, which increases price levels.

The reason for decreases in supply are usually related to increases in the prices of inputs. One major reason for cost-push inflation are supply shocks. A supply shock is an event that suddenly changes the price of a commodity or service. (sudden supply decrease) will raise prices and shift the aggregate supply curve to the left. One historical example of this is the oil crisis of the 1970's, when the price of oil in the U.S. surged. Because oil is integral to many industries, the price increase led to large increases in the costs of production, which translated to higher price levels.

## Built-In Inflation

Built-in inflation is the result of adaptive expectations. If workers expect there to be inflation, they will negotiate for wages increasing at or above the rate of inflation (so as to avoid losing purchasing power). Their employers then pass the higher labor costs on to customers through higher prices, which actually reflects inflation. Thus, there is a cycle of expectations and inflation driving one another.

## 19.4.2: Defining and Calculating CPI

The consumer price index (CPI) is a statistical estimate of the change in prices of goods and services bought for consumption.

### Learning Objective

Assess the uses and limitations of the Consumer Price Index

### Key Points

- The CPI is calculated by collecting the prices of a sample of representative items over a specific period of time.
- The CPI can be used to index the real value of wages, salaries, pensions, and price regulation. It is one of the most closely watched national economic statistics.
- The equation to calculate a price index using a single item is: \_\_\_\_\_ .
- The equation for calculating the CPI for multiple items is: \_\_\_\_\_ .

### Key Terms

market basket

A list of items used specifically to track the progress of inflation in an economy or specific market.

consumer price index

A statistical estimate of the level of prices of goods and services bought for consumption purposes by households.

# Consumer Price Index

The consumer price index (CPI) is a statistical estimate of the level of prices of goods and services bought for consumption by households. It measures changes in the price level of a market basket of goods and services used by households. The CPI is calculated by collecting the prices of a sample of representative items over a specific period of time. Goods and services are divided into categories, sub categories, and sub indexes. All of the information is combined to produce the overall index of consumer expenditures. The annual percentage change in a CPI is used to measure inflation. The CPI can be used to index the real value of wages, salaries, pensions, and price regulation. It is one of the most closely watched national economic statistics.



# Consumer Price Index

The graph shows the consumer price index in the United States from 1913 - 2004. The x-axis indicates year, the left y-axis indicates the Consumer Price Index, and the right y-axis indicates annual percentage change in Consumer Price Index, which can be used to measure inflation.

## Calculating CPI using a Single Item

In order to calculate the CPI using a single item the following equation is used:

\_\_\_\_\_

## Calculating the CPI for Multiple Items

When calculating the CPI for multiple items, it must be noted that many but not all price indices are weighted averages using weights that sum to 1 or 100. When calculating the average for a large number of products, the price is given a weighted average between 1 and 100 to simplify calculation. The weighting determines the importance of the quantity of the product on average. The equation for calculating the CPI for multiple items is:

---

For example, imagine you buy five sandwiches, two magazines, and two pairs of jeans. In the first period, sandwiches are \$6 each, magazines are \$4 each, and jeans are \$35 each. This will be our base period. In the second period, sandwiches are \$7, magazines are \$6, and jeans are \$45.

Market basket at base period prices =  $5(6.00) + 2(4.00) + 2(35.00) = 108.00$ .

Market basket at current period prices =  $5(7.00) + 2(6.00) + 2(45.00) = 137.00$ .

---

The CPI based on consumption is 127.

## **CPI Limitations**

The CPI is a convenient way to calculate the cost of living and price level for a certain period of time. However, the CPI does not provide a completely accurate estimate for the cost of living. Issues that impede the accuracy of the CPI include substitution bias (consumers substituting goods for others), introducing new products, and changes in quality. The CPI can also overstate inflation because it does not always account for quality improvements or new goods and services.

## **GDP Deflator vs. CPI**

The GDP deflator is a measure of the level of prices of all new, domestically produced, final goods and services in an economy. Unlike the CPI, the GDP deflator is a measure of price inflation or deflation for a specific base year. The GDP deflator differs from the CPI because it is not based on a fixed basket of goods and services. The GDP deflator "basket" changes from year to year depending on people's consumption and investment patterns. Unlike the CPI, the GDP deflator is not



impacted by substitution biases. Despite the GDP being more flexible, the CPI is a more accurate reflection of the changes in the cost of living.

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# **20: Economic Growth**

# 20.1: Comparing Economies

## 20.1.1: Economic Growth as a Measuring Stick

Economic growth is measured as the increase in real gross domestic product (GDP) in the long-run, through higher resources or productivity.

### Learning Objective

Examine the components that cause economic growth

### Key Points

- Economic growth could also be described as an outward shift in the production-possibility frontier, allowing for the generation of a higher quantity of goods.
- While measuring real GDP is useful in some ways, and considered a standard measure of economic growth, there is a great deal more complexity than is being captured (both quantitatively and qualitatively).
- Classic growth theory uses the production function to measure economic growth, which ultimately implies that economic growth constantly compounds.
- Growth accounting came into popularity after the classic model, identifying the crucial role of technology in economic growth.
- A more educated workforce will result in increases in real output, as will advances in technology and innovation.

### Key Terms

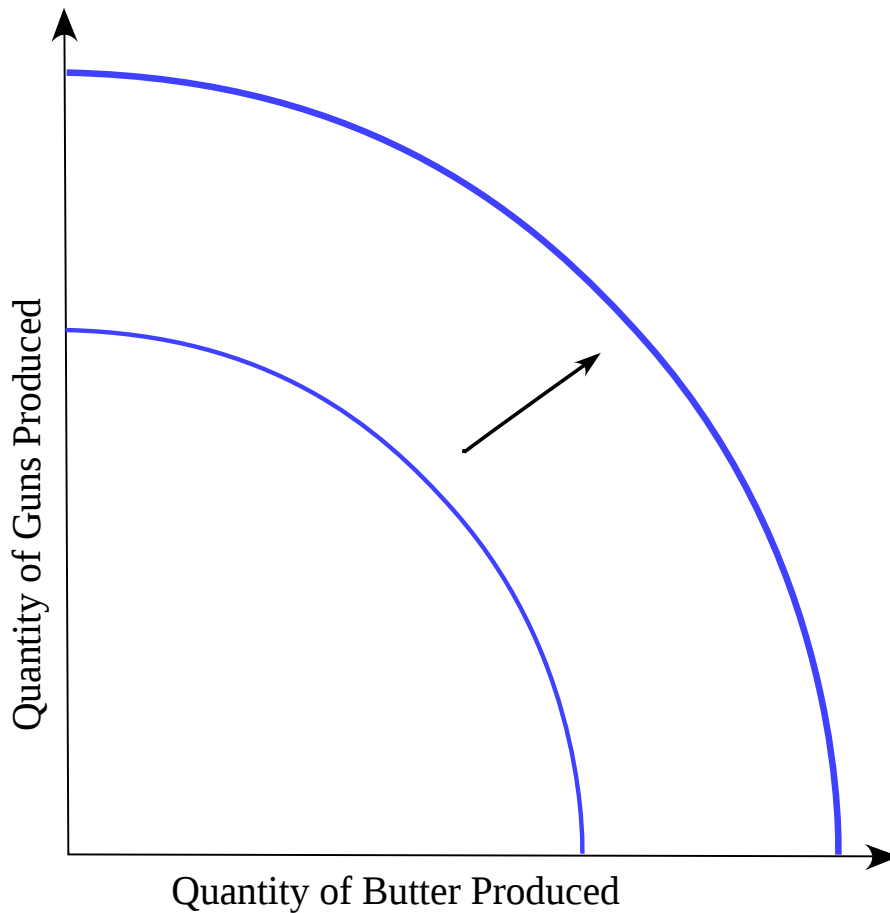
inflation

The rise in the general level of prices of goods and services in an economy over a period of time.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.

Economic growth can be defined as the increase in real gross domestic product (GDP) in the long-run, or as increased productivity or via an increase in the natural resources (inputs) that create output. It is important to note that real GDP adjusts for inflation, rather than looking at output in nominal dollars. Economic growth could also be described as an outward shift in the production-possibility frontier, allowing for the production of a higher quantity of goods (see ).



## **Production-Possibility Frontier**

This outward shift in the Production-Possibility frontier is indicative of economic growth within the economy it represents.

## **Standard Measures of Economic Growth**

Measuring economic growth is reasonably straight-forward, primarily focusing on either increases in productivity or increases in the available production inputs in a given system. This increase in productivity is converted into a relative percent based upon previous years, and expressed as a growth or decline. For example, if a given economy is producing \$1,000,000 in 1900 and 1,050,000 in 1901, the economic growth rate (or

GDP growth) will be expressed as 5%. If inflation is calculated to be 3% between 1900 and 1901, real economic growth will equate to 2%.

## Alternative Economic Growth Models

While measuring real GDP is useful in some ways, and considered a standard measure of economic growth, there is a great deal more complexity than is being captured (both quantitatively and qualitatively). An outline of the perspectives of economic growth over time include:

- **Classical Growth Theory:** Dating back to Adam Smith and the foundation of capitalism, classical growth theory uses the production function to measure economic growth.  $Y = AK^{\alpha}L^{\beta}N^{\gamma}$ , where Y, K, L and N represent output, capital, labor and land respectively. In this model, the overall growth of an economy will compound exponentially and capture economies of scale, implying that economic expansion via consistent growth is a reasonable proposition.
- **Growth Accounting:** Growth accounting came into popularity after the classical model, identifying the crucial role of technology in economic growth. Using the same classical growth equation, this method of measuring economic growth replaces the 'land' variable with 'technology' (technology including all of the contextual components that enable growth). In this scenario, technological leaps and bounds can be captured in the overall growth model.
- **Salter Cycle:** Economic growth is ultimately enabled by increases in productivity, and thus reductions in the required inputs to achieve each subsequent output per unit. As a result, an economy will continuously decrease price and thus increase demand, minimizing marginal utility over time and saturating markets.
- **Endogenous Growth Model:** This model takes into account technology, as in the growth accounting system discussed above, alongside increases in skills and intellectual capital. A more educated workforce will result in increases in real output, as will advances in technology and innovation.
- **Energy Growth Theory:** There has been a consistent correlation between economic growth and energy increase, alongside a paradox that increased energy and resource utilization efficiency actually

increases consumption of that resource (similar to the Salter Cycle concept). As a result, energy growth theory economists identify a critical role of energy and resources in measuring overall economic growth.

## **20.1.2: How to Compare Economies Throughout History**

Economies throughout history are defined by an evolution towards common currencies, global trade, and technologies driving productivity.

### **Learning Objective**

Describe historical trends in rates of economic growth

### **Key Points**

- Comparing historical economies and economic trends over the course of human history is a difficult endeavor, as the comparisons are not always equal.
- Babylonians are credited with generating the first metric to measure economic value (i.e. currency) and standardizing trade through leveraging this metric.
- The creation of the first official paper currency (or banknotes) by the Tang Dynasty in China around the 9th century.
- As the 20th century dawned, real world GDP is estimated to have quadrupled as a result of the advances in industry (see, technology, and intellectual innovations).
- Modern economies have been consistently measured for growth over the past couple centuries, underlining useful economic data on overall growth between nations. To simplify these comparisons, economic growth is generally assessed as general GDP.

### **Key Terms**

Bartering



Exchange goods or services without involving money.

evolution

Gradual directional change especially one leading to a more advanced or complex form; growth; development.

economic growth

The increase of the economic output of a country.

Comparing historical economies and economic trends over the course of human history is a difficult endeavor, as the comparisons are not always equal. The evolution of trade and the construction of measurement systems, currencies, standards, and the accuracy of historical record present a challenge to economists evaluating economies over time. That being said, timelines have been generated that capture useful insights, and modern economic comparisons (country to country) are growing increasingly accurate. Both of these perspectives shed light as to the overall patterns of economic growth over time.

## **Relevant Time Periods**

For the sake of this discussion, four general time frames are useful to highlight:

- **Stone Age:** Including the Paleolithic, Mesolithic, and Neolithic time frames (up to 3500 B.C.), economics was virtually basic trade between small, local groups. This age is particularly worthy of note due to the crucial development of bartering and specialization. Specialization refers to the fact that a small group of people performing (and specializing) in different tasks can create substantially more value than every individual learning all tasks (think of Henry Ford's assembly line).
- **Antiquity:** This includes the Bronze Age and the Iron Age, antiquity spans from 3500 B.C. around 500 A.D. As the names imply, the leveraging of natural resources (such as metals) were a critical step

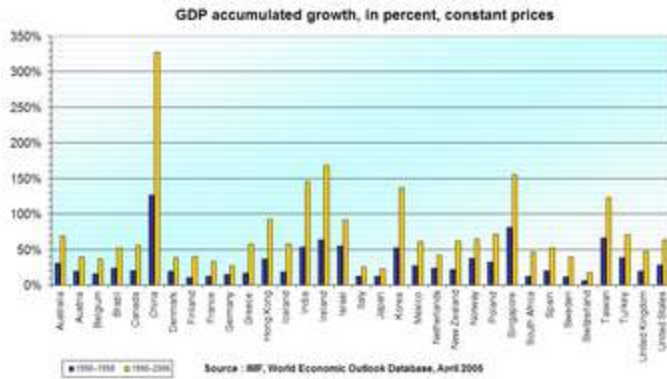
forward for trade. During this time frame the Babylonians are credited with generating the first metric to measure economic value (i.e. currency), and standardizing trade through leveraging this metric. This is an absolutely critical component to the ultimately measurement and comparison of economies from this time period forward.

- Middle Ages: The Silk Road is a famous economic historical element of this time frame, as is the creation of the first official paper currency (or banknotes) by the Tang Dynasty in China around the 9th century. The Middle Ages stretched from 500 A.D.-1500 A.D., and eventually saw the roots of accounting and financial trade roles in society.
- Modernity: From 1500 A.D. forward, trade grew increasingly global and increasingly standardized as a result. This era is marked by the Industrial Revolution, and the exponential productivity growth inherently found in technological advancement and standardized education systems. As the 20th century dawned, real world GDP is estimated to have quadrupled as a result of the advances in industry (see ), technology and intellectual innovations. Subsequently, population expanded as well.

With these four eras in mind, it is easy to empathize with economists attempting to unveil relative economic strength in the context of capitalist evolution. The modern age provides the most consistent data in which to analyze growth.

## **Comparing Modern Economies**

Modern economies have been consistently measured for growth over the past couple centuries, underlining useful economic data on overall growth between nations. To simplify these comparisons, economic growth is generally assessed as general GDP (or increased productivity within a nation). The figure demonstrates these comparisons between 1990 and 2006, with a few countries standing out (China in particular).

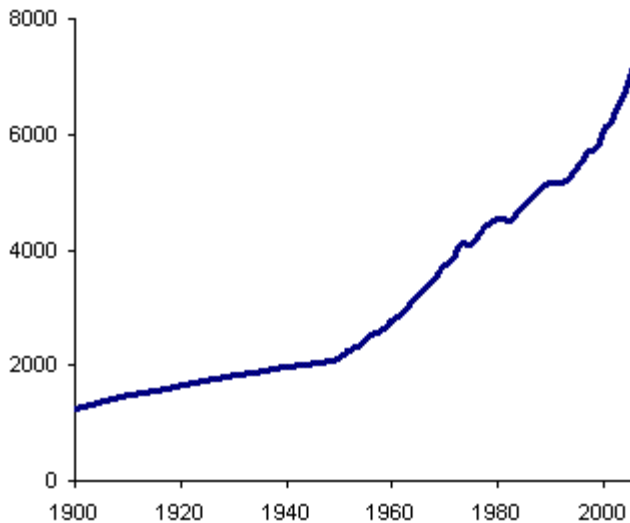


## GDP Growth Across Nations

This graph underlines the important fact that economic growth is not mutually or equally distributed, resulting from a wide variety of factors with external and global systems.

Over time, countries can change significantly, and these changes must be considered in order to make accurate comparisons. Inflation, for example, changes the value of one unit of currency across time, so comparisons across time should be made using Real GDP, a GDP index, or another measure that accounts for changes in price.

There are also a number of other factors that must be taken into account such as GDP per capita, energy consumption, pollution metrics, education levels, innovation, etc. As you can imagine, it is difficult to compare countries across large time horizons, but, after controlling for as many of these effects as you can, comparisons are possible.



## Economic Growth in the 20th Century

As a result of technological advances and increased intellectual capacity, real productivity increased by over 400% during this time frame.

### 20.1.3: Is Economic Growth a Good Goal?

Economic growth is typically viewed as positive, but there are mixed repercussions of increased productivity within an economic system.

#### Learning Objective

Identify the value of economic growth objectives.

#### Key Points

- The relationship between economic growth and the well-being of a society has largely been viewed as positive throughout the course of history.
- Economic growth increases consumer purchasing power and leisure time along with governmental purchasing power for societal benefits.
- The concept of uneconomic growth postulates that the costs of economic growth may outweigh the benefits, those costs being the

- environmental and societal repercussions.
- It is imperative that increased productivity can be created in a context in which the value can be captured in a positive and meaningful way.
  - It is imperative that increased productivity can be created in a context in which the value can be captured in a positive and meaningful way.

## **Key Term**

### Jevon's Paradox

The proposition that technological progress that increases the efficiency with which a resource is used tends to increase the rate of consumption of that resource.

Throughout history, economists have typically assumed a positive relationship between economic growth (increased productivity) and the well-being of a society. It seems logical to assume that a stronger economy would create a higher standard of living. However, there is some debate surrounding the validity of this assumption. Is economic growth the appropriate objective?

## **Why is Growth Good?**

Economic growth is the increase in the market value of the goods and services produced by an economy over time. Simply, more economic growth means that people are able to buy more of the things they like. Presumably, this translates into higher overall utility.

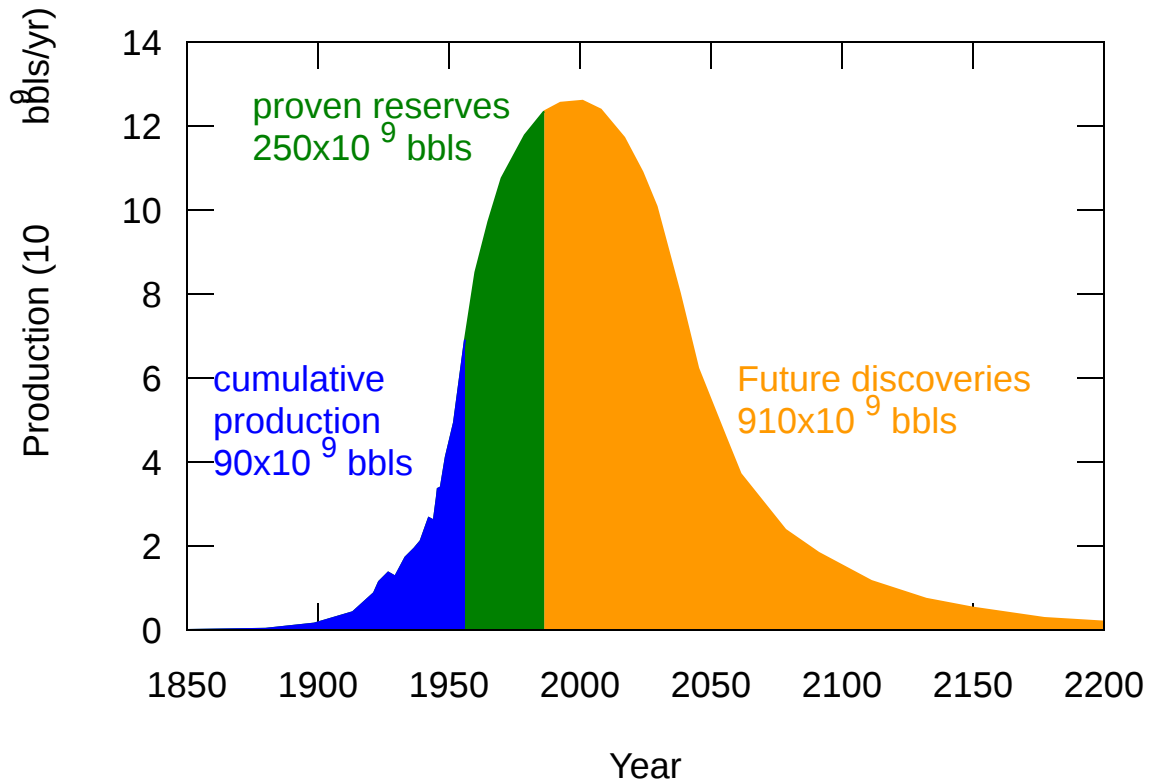
On a societal level, increases in GDP growth and overall productivity generates high prospective tax revenues, both on business profits and consumer purchases. Higher tax revenues will allow governments more financial flexibility to invest in social services such as education, welfare, transportation, etc.

## **Drawbacks to Economic Growth**

There are, however, some downsides to economic growth, which are summarized in the idea of uneconomic growth. The concept of uneconomic growth postulates that the costs of economic growth - primarily environmental and social costs - may outweigh the benefits. There are a few specific observations of this that are worth noting:

- **Jevon's Paradox:** Interestingly, increases in efficiency which drive increased economic growth often result in higher consumption. For example, when an economic system creates higher efficiency for generating electricity it will often increase the amount of electricity consumer in spite of that increased efficiency. This creates a culture of consumerism which is often wasteful.
- **Malthusian Trap:** Named after a political economist named Thomas Robert Malthus, the Malthusian trap simply states that increases in efficiency tend to result in population growth rather than wealth growth. Increased productivity within a system is only useful if it translates to an increase in per capita wealth.
- **Imbalanced Distribution:** Another issue is income distribution. This is what was meant by the adage that the rich get richer while the poor get poorer. It is quite common to see the rich absorb the vast majority of the value generated through increased productivity, creating a larger relative gap between the rich and the poor. In this circumstance there is limited utilitarian value to economic growth.
- **Environmental Degradation:** The final criticism is often the most discussed, particularly in light of the overwhelming evidence of global warming and the destructive nature of excessive consumption. It is also reasonable to consider the finite nature of natural resources (see ). Scientific modeling by environmental scientists often demonstrate significant long-term risks for the well-being of the ecosystem, posing a very real threat to the overall value in continued economic growth. Is it worth having more to consume if there is no ecosystem in which to enjoy it?

The important takeaway from this is to think carefully about the value created by economic growth. It is imperative that increased productivity can be created in a context in which the value can be captured in a positive and meaningful way.



## Petroleum Consumption Over Time

This figure demonstrates the risk of over-consuming our natural resources, ultimately resulting in scarcity of necessary goods. A continued drive for economic growth could lead to overconsumption of natural resources.

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# 20.2: Assessing Growth

## 20.2.1: Calculating Economic Growth

Economic growth is the increase in the market value of goods and services produced by an economy over time; the percentage rate of increase in the GDP.

### Learning Objective

Calculate various measures of economic growth

### Key Points

- In economics, economic growth refers to the growth of potential output. It shows how a country is developing its economy.
- The short-run variation in economic growth is called the business cycle. Economists use it to distinguish between short-run variations in economic growth and long-run economic growth.
- Long-run economic growth is measured as the percentage rate increase in the real gross domestic product.
- The GDP can be calculated using the product approach, income approach, or expenditure approach. The GDP is defined as the market value of all officially recognized final goods and services produced within a country in a given period of time.

### Key Terms

business cycle

A fluctuation in economic activity between growth and recession.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.

economic growth

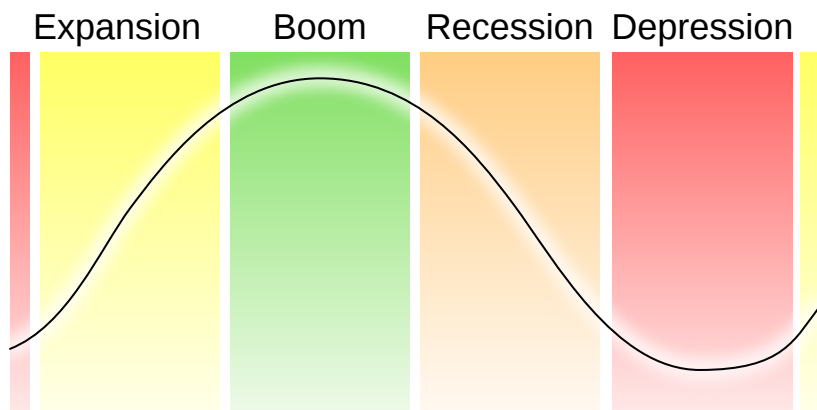
The increase of the economic output of a country.

## **Economic Growth**

Economic growth is defined as the increase in the market value of goods and services produced by an economy over time. It is usually measured as a percentage rate of increase in the real gross domestic product. In economics, economic growth refers to the growth of potential output. It shows how a country is developing its economy. Economic growth is directly impacted by human capital, which is the level of school or knowledge attainment in a country. The cognitive skills of a population directly impact economic growth. In general, economic growth is recorded and studied over the short-run and long-run.

## **Short-run Economic Growth**

The business cycle refers to economy-wide fluctuations in production, trade, and economic activity over several months or years. The short-run variation in economic growth is called the business cycle. Economists use it to distinguish between short-run variations in economic growth and long-run economic growth. The cycle is made up of increases and decreases in production that occur over months and years. The changes in the business cycle are a result of fluctuations in aggregate demand .



## The Business Cycle

The business cycle is used to determine the short-run variation in economic growth. Variations in the business cycle fluctuation over months and years and are attributed to fluctuations in aggregate demand.

## Long-run Economic Growth

Long-run economic growth is measured as the percentage rate increase in the real gross domestic product. The GDP is defined as the market value of all officially recognized final goods and services produced within a country in a given period of time. There are three approaches used to determine the GDP:

- Product (output) approach: adds together the outputs of every class of enterprise to provide the total.
- Income approach: calculates the sum of all the producers' incomes.
- Expenditure approach: the value of the total product must be equal to the people's total expenditures.

In principle, all of the approaches should yield the same result for the GDP of a country.

For example, the equation for the expenditure approach is:  $GDP = C + I + G + (X - M)$ .

Written out in full, the gross domestic product (GDP) equals private consumption (C) plus, gross investment (I), government spending (G), and the exports minus the imports (X - M).

For economic purposes, the economic growth is calculated and compared to the population, also known as per capita income (indicator of a country's standard of living). When the per capita income increases it is called intensive growth. When the GDP growth is only caused by increases in population or territory it is called extensive growth.

## **20.2.2: Growth in the United States**

The economy in the United States is the world's largest single national economy; 2013 GDP estimation was \$16.6 trillion.

### **Learning Objective**

Describe historical growth in the US

### **Key Points**

- Currently, the U.S. has a mixed economy, a stable GDP growth rate, moderate unemployment, and high levels of research and capital investment.
- Throughout its history, the U.S. has experienced economic growth in varying degrees. Time periods can be broken down by century and by decades.
- The U.S. economy experienced its most extensive growth from 1961 to 1969.

### **Key Terms**

financial crisis

A period of serious economic slowdown characterized by devaluing of financial institutions often due to reckless and unsustainable money

lending.

recession

A period of reduced economic activity

economic growth

The increase of the economic output of a country.

## Economic Growth

Economic growth is defined as the increase in the market value of the goods and services produced by an economy over time. It is measured as the percentage rate of increase in the real gross domestic product (GDP). To determine economic growth, the GDP is compared to the population, also known as the per capita income. When the per capita income increases it is called intensive growth. When the GDP growth is only caused by an increase in population or territory it is called extensive growth.



## U.S. GDP per capita (1929-2010)

This graph shows the GDP per capita in the United States from 1929 to 2010. The GDP per capita is the ratio of the GDP to the population. This graph shows the intensive growth of the United States during this time period.

# U.S. Economy

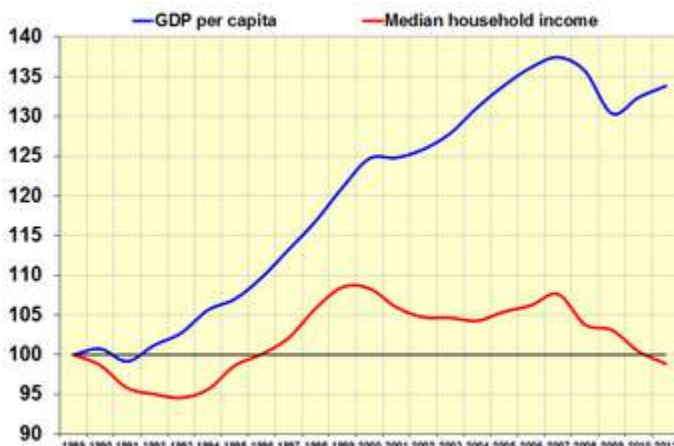
The economy in the United States is the world's largest single national economy. In 2013, the estimated GDP was \$16.6 trillion, which is a quarter of the nominal global GDP. Currently, the U.S. has a mixed economy, a stable GDP growth rate, moderate unemployment, and high levels of research and capital investment.

## U.S. Economic Growth

Throughout its history, the U.S. has experienced economic growth in varying degrees. Various historical time periods illustrate the rate of growth:

- **Prior to industrialization:** technological progress caused an increase in population, which was kept in check by food supply and other resources. The per capita income was limited.
- **Industrial Revolution:** a period of rapid economic growth. Despite the initial excess of population growth, the growth did eventually slow down; a condition called demographic transition. During the first Industrial Revolution mechanization was introduced. During the second Industrial Revolution, wind and water power replaced human and animal labor. This increased the level of production.
- **20th century growth:** most economic growth in the 20th century was due to reduced inputs of labor, materials, energy, and land per unit of economic output. The growth was more balanced because more inputs were used due to the growth of output. Also, this time period experienced the production of new goods and services through innovations.
- **1920s:** during this time period there was overproduction which was one cause of the Great Depression in the 1930s. Economic growth resumed following the depression and was aided by the demand for new goods and services (telephones, radios, televisions, etc. ).
- **1940 to 1970:** the U.S. economy grew by an average of 3.8% and the real median household income surged 74% (2.1% a year).
- **1960s:** the U.S. economy experienced its most extensive periods of economic growth from 1961 to 1969 with an expansion of 53% (5.1%

- a year).
- 1970s: the economy experienced slower growth after 1973. The average growth was 2.7%, there were stagnant living conditions, and household incomes increased by 10% (0.3% annually). The 1973 oil crisis caused the GDP to fall 3.7%. The GDP fell again in late 1973 to 1975 (3.1%).
  - 1980s: the U.S. share of the world GDP peaked in 1985 with 23.78% of global GDP. There was a recession from 1981 to 1982 when the GDP dropped by 2.9% .
  - 1990s: there was a mild recession in 1990 to 1991 when the output fell by 1.3%.
  - 2000s: one of the worst recessions in recent decades occurred in 2008 when the GDP fell by 5.% in one year. The 2008 financial crisis was caused by a derivatives market, the subprime mortgage crisis, and a declining dollar value.



## U.S. GDP vs. Household Income (1989-2011)

This graph shows the relationship of the GDP in the United States to the household income. This period from 1989 to 2011 was hit by a number of recessions.

### 20.2.3: Growth in the Rest of the World



On a global scale, economic growth is the sum of the growth of individual countries to give a worldwide total.

## **Learning Objective**

Describe historical growth in developing and developed countries

## **Key Points**

- Economic growth and global impact varies by country based on the individual economy, the development of the country, accumulation of human and physical capital, and level of productivity.
- Due to the vast number of countries globally, the world economy is usually determined in monetary terms, even in cases where no efficient market is available to evaluate goods and services.
- From 1990 to 2000 the U.S. dominated in expansion. From 2006 to 2008, China's expansion moved closer to that of the United States. China led in expansion in 2007.
- The global credit crisis started in 2008 and expanded in 2009. By 2010, the U.S. had experienced some economic recovery while the global economic growth had lost momentum.
- From 2010 to 2018, China is expected to lead in expansion. The global economic output is projected to expand.

## **Key Terms**

economic growth

The increase of the economic output of a country.

purchasing power

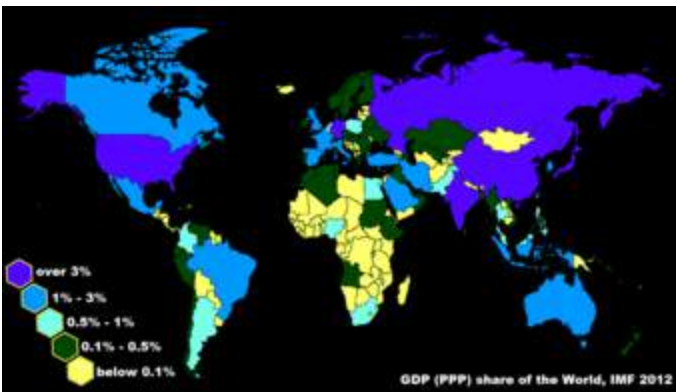
The amount of goods and services that can be bought with a unit of currency or by consumers.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.

## Economic Growth

Economic growth is the increase in the market value of goods and services produced by an economy over a period of time. It is measured as the percentage rate increase in the real gross domestic product (GDP). On a global scale, economic growth is the sum of the growth of individual countries to give a worldwide total. Economic growth and global impact varies by country based on the individual economy, the development of the country, accumulation of human and physical capital, and level of productivity .



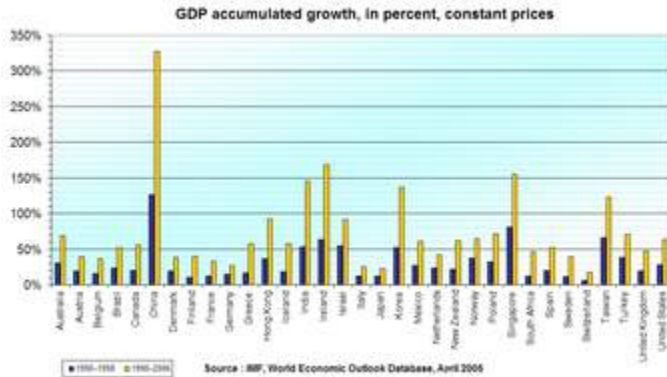
## Share of World GDP

This image shows the share of GDP worldwide. The economic growth and global impact that each country has is influenced by the individual economy, the development of the country, accumulation of human and physical capital, and level of productivity.

## Global Economic Growth

Due to the vast number of countries globally, the world economy is usually determined in monetary terms, even in cases where no efficient market is available to evaluate goods and services. The market valuations are

translated into a single monetary unit using the idea of purchasing power. Analyzing economic growth in prominent countries provides an overview of global economic growth .



## Change in GDP

This graph shows the change in GDP for countries around the world for 1900 to 1999 and 1999 to 2006. The GDP for each individual country is used to determine the global economic growth.

- 1980 to 1990: during this time period the economic output of 112 countries expanded while the output of 34 countries contracted. The purchasing power expanded for 145 markets and contracted for two. The five largest contributors to global output contraction were Argentina, Saudi Arabia, Nigeria, Venezuela, and Vietnam.
- 1990 to 2000: the United States dominated expansion during these years. The economic output expanded for 122 countries and contracted for 29. The purchasing power increased for 148 markets and contracted for three. The five largest contributors to global output contraction were Italy, Finland, Bulgaria, Algeria, and the Democratic Republic of Congo.
- 2000 to 2006: Expansion in China moved the country closer to the United States. The economic output for 176 countries expanded and four contracted. The five largest contributors to the expansion were the United States, China, Germany, the United Kingdom, and France. The purchasing power increased for 180 markets. The largest global output contributors were the United States, China, India, Japan, and Russia.

From 2000 to 2010 there was a rise in developing and emerging economies.

- 2007: The nominal GDP expanded in 183 countries. The largest contributors were China, the U.S., Germany, and the United Kingdom.
- 2008: the credit crisis started. Economic output expanded in 171 countries, but 11 countries experienced output contractions. The United Kingdom accounted for half the global contraction while South Korea accounted for two-fifths. The crisis impacted most countries, but it was not deep enough to reverse growth.
- 2009: the credit crisis spread. The economic output of 127 countries contracted. The United Kingdom was impacted the most, followed by Russia and Germany. 56 countries experienced expansion of economic output, including China, Japan, and Indonesia. The purchasing power contracted for 79 markets. The U.S. was the largest victim and accounted for 18%, followed by Japan and Russia. 104 markets expanded purchasing power including China, India, and Indonesia.
- 2010: the economic output expanded for 148 countries and contracted for 35. The purchasing power increased for 169 markets and contracted for 14. It was noted that banks faced a "wall" of maturing debt. The U.S. experienced economic recovery, but the global economic growth lost momentum.
- 2011 to 2012: in 2011 it was projected that global growth would drop 4% followed by another 3.5% drop in 2012.
- 2010 to 2018: it is projected that China will lead economic growth during this period. The global economic output is expected to expand by \$32.9 trillion.

## **Power of Annual Growth**

Over long periods of time, small rates of growth have large economic effects. For example, the United Kingdom experienced a 1.97% average annual increase in its GDP from 1830 to 2008. The growth rate averaged 1.97% over 178 years and resulted in a 32-fold increase in the GDP by 2008. The GDP in 1830 was £41,373. It grew to £1,330,088 by 2008.

A growth rate of 2.5% a year leads to a doubling of the GDP within 29 years. A growth rate of 8% a year leads to a doubling of the GDP in 10

years. As a result, small differences in economic growth rates between countries can produce very different standards of living for the populations if the small growth rate continues for many years.

## **20.2.4: Catch-Up: Possible, but not Certain**

Developing countries can catch up to developed countries by achieving growing faster, which is determined by a wide number of country-specific factors.

### **Learning Objective**

Describe different factors that affect the growth rate of developing economies

### **Key Points**

- Every country is unique based on population, technology, government, wealth, etc. Economic growth can be compared between countries, although no two countries are the same.
- Factors that influence economic growth include: growth of productivity, demographics, labor force participation, human capital, inequality, trade, quality of life, and employment rate.
- The economic growth of any country takes time to develop. Some countries have much larger, stronger, and more developed economies than other countries.
- It is possible, but not certain that smaller, underdeveloped economies can experience economic growth and catch-up to more prominent economies.

### **Key Terms**

economic growth

The increase of the economic output of a country.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.

demographics

The characteristics of human populations for purposes of social studies.

## **Economic Growth**

Economic growth is defined as the increase in the market value of the goods and services produced by an economy over time. In order to assess economic growth it must be measured. It is the percentage rate of increase in real gross domestic product (GDP). When looking at the long-term economic growth of a country, it is important to analyze the ratio of the GDP to the population (GDP per capita).

For a developing country to catch up to a developed country, it must not only grow, but grow faster than the developed country. It is possible for such accelerated growth to occur, but there are many country-specific factors that affect a country's ability to catch up to developed countries.

## **Factors that Impact Economic Growth**

There are specific factors that have a direct impact on the economic growth of a country. Every country is unique based on population, technology, government, wealth, etc. Economic growth can be compared between countries, although no two countries are the same. Some of the factors that impact economic growth include:

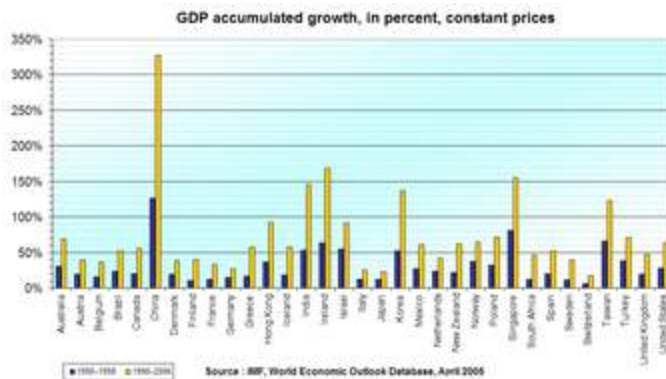
- Growth of productivity: the growth of productivity is the ratio of economic output to input (capital, labor, energy, materials, and services). When productivity increases the cost of goods decreases causing an increase in the per capita GDP. Lower prices create an

increase in higher aggregate demand. The growth of productivity is the driving force behind economic growth.

- **Demographics:** demographics change the employment to population ratio as well as the labor force participation rate. The age structure of the population affects the labor force participation rate. For example, when women entered the workforce in the U.S. it contributed to economic growth, as did the entrance of the baby boomers into the workforce.
- **Labor force participation:** the rate of labor force participation impacts economic growth. It is the number of people working in the labor force. When manufacturing increased, it created a higher productivity rate, but lowered the labor force participation, prices fell, and employment shrank.
- **Human capital:** human capital is referred to as the skills of the population. Education is a commonly used measurement for human capital. Human capital increases the society's skill which increases economic growth.
- **Inequality:** inequality in wealth and income has a negative impact on economic growth. Inequality results in high and persistent unemployment. This has a negative effect on long-run economic growth.
- **Trade:** international trade represents a significant part of GDP for most countries. It is the exchange of goods and services across national borders.
- **Quality of life:** happiness has been shown to increase with a higher GDP per capita. Quality of life is a direct result of economic growth. When poverty is alleviated and society has access to what it needs, the quality of life increases. Consistent quality of life leads to continued economic growth.
- **Employment rate:** in order for the employment rate to have a positive impact on economic growth there must also be increases in productivity. If employment increases, but productivity does not, then there is a higher number of working poor.

## **Economic Growth in Developing Countries**

The economic growth of any country takes time to develop. Some countries have much larger, stronger, and more developed economies than other countries. The study of the economic aspects of development in low-income countries is called development economics. It focuses on methods for promoting economic development. All of the factors listed previously impact economic growth - most of them positively. It is possible, but not certain that smaller, underdeveloped economies can experience economic growth and catch-up to more prominent economies.



## Change in GDP

This graph shows the change in GDP for various countries for the periods of 1990 to 1998 and 1990 to 2006. It is obvious that certain countries have larger and more developed economies than other countries. It is possible for countries with weaker economies to catch up with larger countries, but it is not certain.

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# 20.3: Productivity

## 20.3.1: The Importance of Productivity

Increasing productivity is a rare win-win, improving the standard of living from a governmental, commercial and consumer perspective.

### Learning Objective

Use the production function to determine how different variables affect output and productivity

### Key Points

- Productivity is essentially the efficiency in which a company or economy can transform resources into goods, potentially creating more from less.
- Productivity can effectively raise living standards through decreasing the required monetary investment in everyday necessities (and luxuries), making consumers wealthier and business more profitable and in turn enabling higher government tax revenues.
- Economists looking to measure this productivity within a given system generally leverage production functions to determine how different factors of production (i.e. inputs) affect the overall output.
- The final important consideration in assessing productivity potential is the production-possibility frontier (PPF), which outlines the maximum production quantity of two goods in the scope of our current technological capacity and supply.

### Key Terms

productivity

the rate at which goods or services are produced by a standard population of workers.

## Production function

Relates physical output of a production process to physical inputs or factors of production.

Productivity is essentially the efficiency in which a company or economy can transform resources into goods, potentially creating more from less. Increased productivity means greater output from the same amount of input. This is a value-added process that can effectively raise living standards through decreasing the required monetary investment in everyday necessities (and luxuries), making consumers wealthier (in a relative sense) and businesses more profitable.

From a broader perspective, increased productivity increases the power of an economy through driving economic growth and satisfying more human needs with the same resources. Increased gross domestic product (GDP) and overall economic outputs will drive economic growth, improving the economy and the participants within the economy. As a result, economies will benefit from a deeper pool of tax revenue to draw on in generating necessary social services such as health care, education, welfare, public transportation and funding for critical research. The benefits of increasing productivity are extremely far-reaching, benefiting participants within the system alongside the system itself.

## **Productivity Beneficiaries**

To expand upon this, there are three useful perspectives in which to frame the value in improving productivity within a system from an economic standpoint:

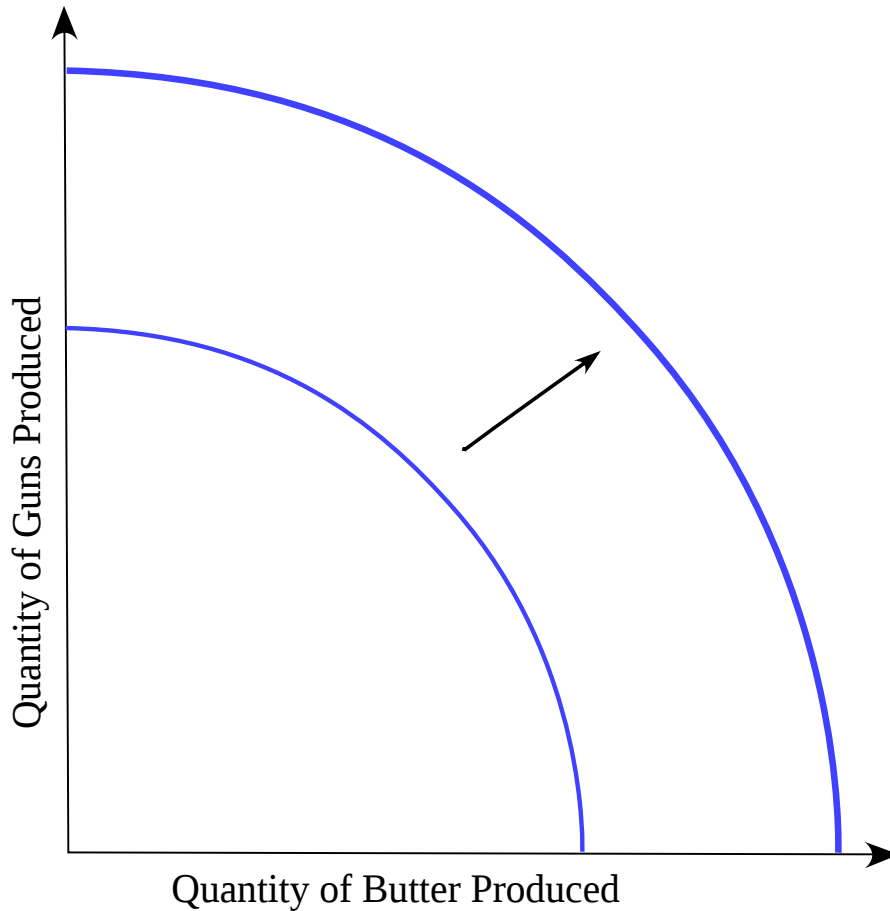
- **Consumers/Workers:** At the most micro level we have improvements in the standard of living for everyday consumers and workers as a result of increased productivity. The more efficiency captured within a system, the lower the required inputs (labor, land and capital) will be

required to generate goods. This can potentially reduce price points and minimize the necessary working hours for the participants within an economy while retaining high levels of consumption.

- **Businesses:** Businesses that can derive higher productivity from a system also benefit from creating more outputs with the same or fewer inputs. Simply put, higher efficiency equates to better margins through lower costs. This allows for better compensation for employees, more working capital and an improved competitive capacity.
- **Governments:** Higher economic growth will also generate larger tax payments for governments. This allows governments to invest more towards infrastructure and social services (as noted above).

## **Factors Affecting Productivity**

The final important consideration in assessing productivity potential is the production-possibility frontier (PPF), which essentially outlines the maximum production quantity of two goods (in the scope of our current technological capacity and supply). This demonstrates the confinement of productivity, and thus is well captured in the Leontief production function. The critical takeaway here is that the production function will generally be affected by two things: overall supply and technological capabilities. Note that demand does not come into account in altering the production function or overall productivity potential. The illustration in the following figure demonstrates an increase in PPF, thus affecting the production function.



## **Production-Possibility Frontier Expansion**

In this graph, the prospective production-possibility frontier shifts to the right, implying a higher supply or improved technological production ability of the two goods being discussed (in this case guns and butter).

### **20.3.2: Measuring Productivity**

Productivity is represented by production functions, and is the amount of output that can be generated from a set of inputs.

#### **Learning Objective**

Discuss different ways to measure productivity and productivity growth

## Key Points

- From an economic standpoint, the production function demonstrates the tangible output created as a result of a production process including all tangible inputs.
- The objective in employing this perspective is to pursue allocative efficiency within the process (as opposed to technical or logistical efficiency, as engineers or supply chain managers may be pursuing).
- Generally speaking, the factors of production include land, labor and capital.
- There are a variety of ways to approach the measuring of productivity in the context of production functions, including the functional form, the linear form, the Cobb-Douglas production Function and the Leontief Production Function.

## Key Terms

### Allocative efficiency

A type of economic efficiency in which economy/producers produce only those types of goods and services that are more desirable in the society and also in high demand.

### Liquid assets

An asset in the form of money or cash in hand, or an asset which can be quickly converted into cash without losing much value.

Productivity, in economic terms, measures inputs and outputs to derive overall production efficiency within a system. Simply put, it measures how much can you get out of what you put into a given system. Increased productivity means more output is produced from the same amount of inputs. In order to generate meaningful information about the productivity of a given system, production functions are used to measure it. Understanding the way in which productivity metrics function, one can more comprehensively grasp the concept and employ it in a meaningful way.

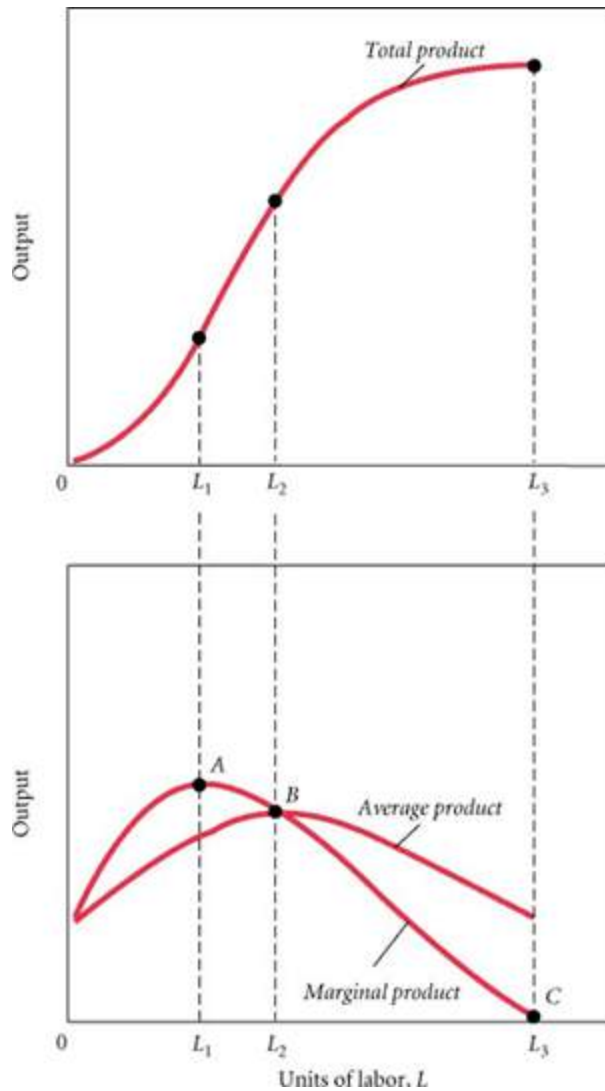


# Production Function

From an economic standpoint, the production function demonstrates the tangible output created as a result of a production process including all tangible inputs. The objective in employing this perspective is to pursue allocative efficiency within the process (as opposed to technical or logistical efficiency, as engineers or supply chain managers may be pursuing). This means that the production function identifies optimal inputs (and consequent outputs) to satisfy the needs of a given population via a particular production process. While different economic perspectives often identify different factors of production (i.e. inputs in the system), it is useful to identify the following:

- Land/Natural Resources: Products of nature that have economic value, including metals/agriculture/livestock/land/etc.
- Capital: This is a broad term, capturing more than just financing and investment. Capital can also be fixed capital (i.e. machinery, equipment, buildings, computers, etc.) or working capital (i.e. goods, inventory and liquid assets). Concepts of human, intellectual and social capital is also highlighted, separate from the concept of labor below, which can affect the efficiency of a process.
- Labor: The human skills, time and efforts necessary to add value to the production process. This can range from highly tangible inputs (working hours, products assembled) to highly intangible inputs (entrepreneurship, experience, technology skills, etc.).

Conceptually, the production function makes certain assumptions of the maximum potential production, availability of inputs and demand for outputs to create a boundary of potential production. This will include the derivation of a marginal product for each factor (see ), or essentially the extra output that can be created for each additional unit of input. Naturally, this is theoretically subjected to the concept of diminishing marginal returns, where the marginal product of a given input (in the figure we are illustrating labor) will fall as the starting points for quantity rise.



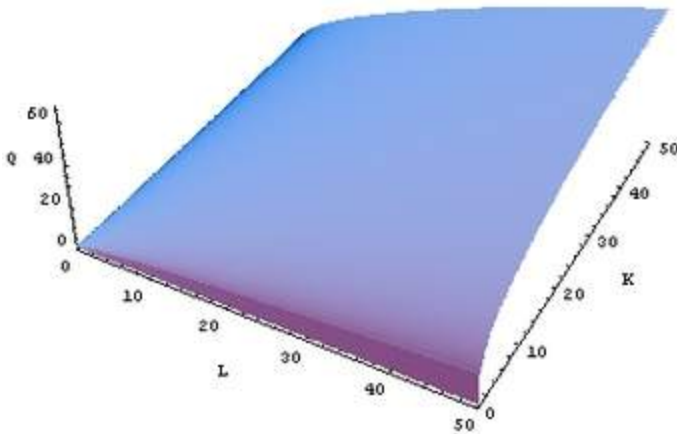
## Product Function

This graph illustrates the way in which a production function identifies the relationship between a quantity of inputs and the resulting output of a given product. This takes into account marginal and average product, which are indicative of the change in efficiency based upon inputs.

## Forms of the Production Function

There are a variety of ways to approach the measuring of productivity in the context of production functions:

- **Functional Form:** One way a production function can be illustrated is through the following equation  $Q = f(x_1, x_2, \dots, x_n)$ . In this circumstance 'Q' is the quantity of output while each 'x' is a factor input.
- **Linear Form:** While this is generally not practical in practice, it is also possible to represent this in a linear mathematical fashion if parameters (a, b, c, and d below) are identified:  $Q = a + bx_1 + cx_2 + dx_3$
- **Cobb-Douglas Production Function:** One of the most useful frameworks, that allow for a technological relationship to be illustrated between the amount of two (or more) inputs is the Cobb-Douglas model. This is most often used to illustrate how physical capital and labor effect one another (see ). In the equation, 'Y' is total production while 'L' is labor, 'K' is capital, 'A' is total factor productivity and the alpha and beta are the elasticity of the two inputs.
- **Leontief Production Function:** The Leontief Production Function assumes a technologically pre-determined set of proportions for the factors of production (i.e. no ability to substitute between factors. This is specifically designed to capture minimums or limiting cases of production. The 'z's in the equation are inputs of specific goods while the a and b represent the technological determined constants and 'q' being the overall output:  $Q = a \min\{bz_1, cz_2\}$



## Cobb-Douglas Production Function

This is an illustration of a two-input Cobb-Douglas Production Function, where the ability to benchmark an output in comparison to two separate quantities of inputs is feasible.

### 20.3.3: Impacts of Technological Change on Productivity

Technological advances play a crucial role in improving productivity, and thus the standard of living in a system.

#### Learning Objective

Analyze how changes in technology affect productivity and productivity growth

#### Key Points

- Productivity growth is bound by what is called the production-possibility frontier (PPF), which essentially stipulates a series of

maximum amounts of two commodities that can be generated using a fixed amount the relevant factors of production.

- The variance in technological advances that have driven productivity upwards is remarkable, underlining the ongoing importance of focusing on technology as a primary change agent.
- Advances in energy systems, transportation, communication, logistics, and a variety of other technological trajectories have greatly enabled an increased standard of living through advancing productivity.
- Measuring the affects of technology on productivity is a difficult pursuit. It is generally approached through metrics such as Gross Domestic Product (GDP), GDP per capita, and Total Factor Productivity (TFP).

## **Key Terms**

### Production-Possibility Frontier (PPF)

A graph that shows the various combinations of amounts of two commodities that could be produced using the same fixed total amount of each of the factors of production.

### productivity

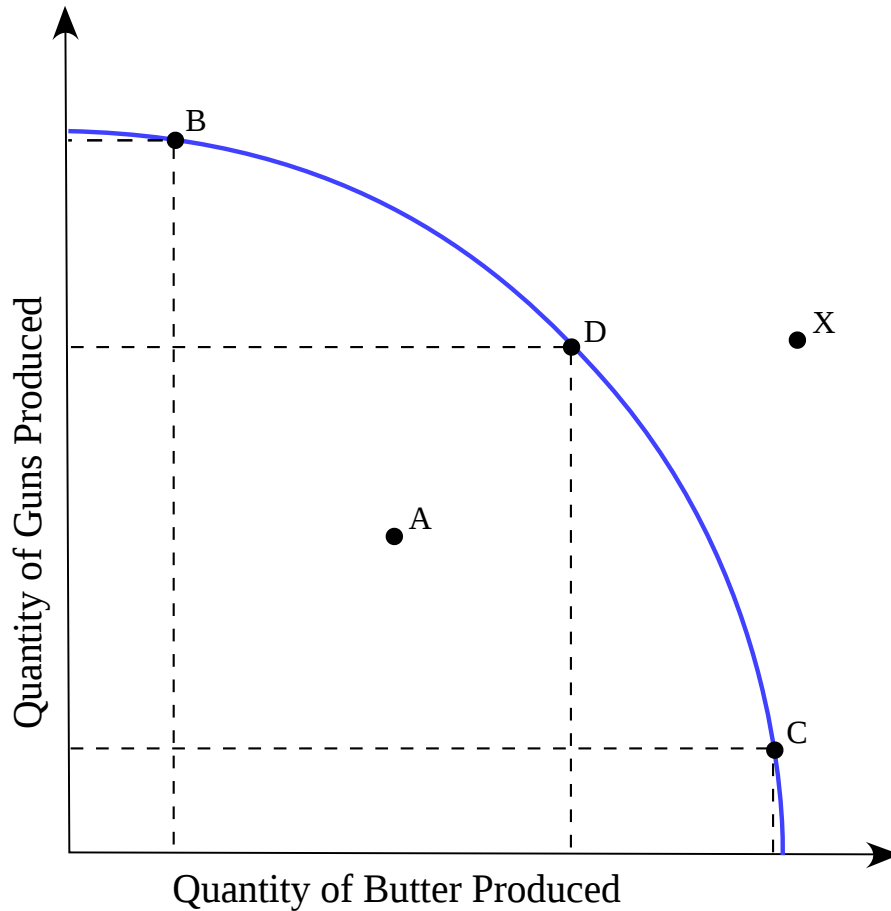
A ratio of production output to what is required to produce it (inputs).

Productivity measures the way in which an economic system or business can leverage available functional inputs to generate meaningful outputs. This concept drives economies towards higher degrees of efficiency in production and thus higher economic growth and standards of living. As a result, improving productivity is a critical objective for societies to increase their relative wealth. Technological advances play a crucial role in improving productivity, and thus the standard of living in a system.

## **Production-Possibility Frontier**

Productivity growth is bound by what is called the production-possibility frontier (PPF), which essentially stipulates a series of maximum amounts of

two commodities that can be generated using a fixed amount the relevant factors of production . In the context of a given PPF, only an increase in overall supply of inputs or a technological advancement will allow for the PPF to shift out and allow for an increase in potential outputs of both goods simultaneously (represented by point 'X' in the figure). The shift due to changes in technology represents increased productivity. This is a critical component in understanding the role of technology in productivity, as it is a primary influence on increasing the prospective production possibilities.



## Production-Possibility Frontier (PPF)

This graph illustrates the varying theoretical takeaways from a PPF chart. On this, points B, C, and D all lie on a maximum output level, while A is representative of a realistic but inefficient amount. X is beyond the scope of the PPF graph, and thus requires a technological improvement or increase in supply.

## Technological Advances: Past, Present, and Future

The variance in technological advances that have driven productivity upwards is remarkable, underlining the ongoing importance of focusing on technology as a primary change agent. Innovative advances in technologies

can be either leaps or increments, although the larger technological advances tend to take the limelight. In general, there are a particularly notable categories:

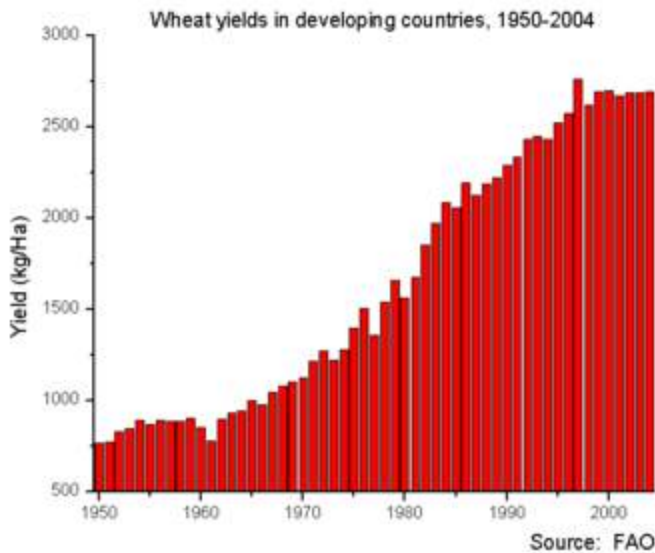
- **Energy:** Historically, animals and humans were the primary energy input for the generation of products. This was extremely expensive and time-consuming relative to more modern ways to power things, and has been improved upon dramatically over time. Electricity, heat, steam, water, solar, and a wide variety of other energy capturing methodologies have dramatically increased efficiency while freeing up man hours.
- **Transportation and Industrial Machinery:** Trade has been a part of human history for nearly as long as civilizations knew of one another, bartering being the a central component of human interaction. The improvement of trade venues, such as boats, cars, planes, trains, etc. have enabled rapid increases in trade quantity and efficiency. Similarly, industrial machinery utilizing similar vehicles have enabled mass increases in scale and efficiency, particularly agriculture .
- **Communication:**Needless to say, the internet and mobile communications have rapidly expedited the transmission of knowledge, data, information, and networking. This has resulted in a massive increase in synergy across the world, alongside the development of economic learning and development.
- **Logistics:** Increases in technological systems is generally considered to be a tangible innovation, but is not limited to such. Improvements in the ways in which we do things is often just as useful. Henry Ford is a classic example of this, innovating the assembly line to maximize the efficiency the production process through strategic implementation of labor roles.

## **Implications on Productivity**

Measuring the effects of technology on productivity is a difficult pursuit. It is generally approached through metrics such as Gross Domestic Product (GDP), GDP per capita, and Total Factor Productivity (TFP). The former two attempt to capture the overall output of a given economy from a macro-environmental perspective. The latter is slightly more interesting,



attempting to measure technologically driven advancement through noting increases in overall output without increases in inputs. This is done through utilizing production function equations and identifying when the output is greater than the supposed input, implying an advance in the external technological environment. This system is more specifically tailored for technological change than GDP.



## Wheat Yield

Over the past 60 years, wheat yield (PPF) has dramatically improved as a result of critical technological and logistic advancements.

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# 20.4: Long-Run Growth

## 20.4.1: Determinants of Long-Run Growth

Long-run growth is defined as the sustained rise in the quantity of goods and services that an economy produces.

### Learning Objective

Predict how population growth will affect the level of capital per worker

### Key Points

- Economic growth is the increase in the market value of the goods and services that an economy produces over time. It is measured as the percentage rate change in the real gross domestic product (GDP).
- Determinants of long-run growth include growth of productivity, demographic changes, and labor force participation.
- When the economic growth matches the growth of money supply, an economy will continue to grow and thrive.
- Inflation occurs in an economy when the prices of goods and services continue to rise while the purchasing power decreases.
- When the GDP growth is only caused by increases in population, the growth is excessive.

### Key Terms

inflation

An increase in the general level of prices or in the cost of living.

economic growth

The increase of the economic output of a country.

# Long-Run Growth

Economic growth is the increase in the market value of the goods and services that an economy produces over time. It is measured as the percentage rate change in the real gross domestic product (GDP).



## Measuring the GDP

Economic growth is the percentage rate increase in the GDP. Long-run growth is directly impacted by the GDP.

Long-run growth is defined as the sustained rise in the quantity of goods and services that an economy produces. The GDP of a country is closely tied to the growth of the population in addition to prices and supply and demand.

## Determinants of Long-Run Growth

There are specific determinants that impact the long-run growth of an economy:

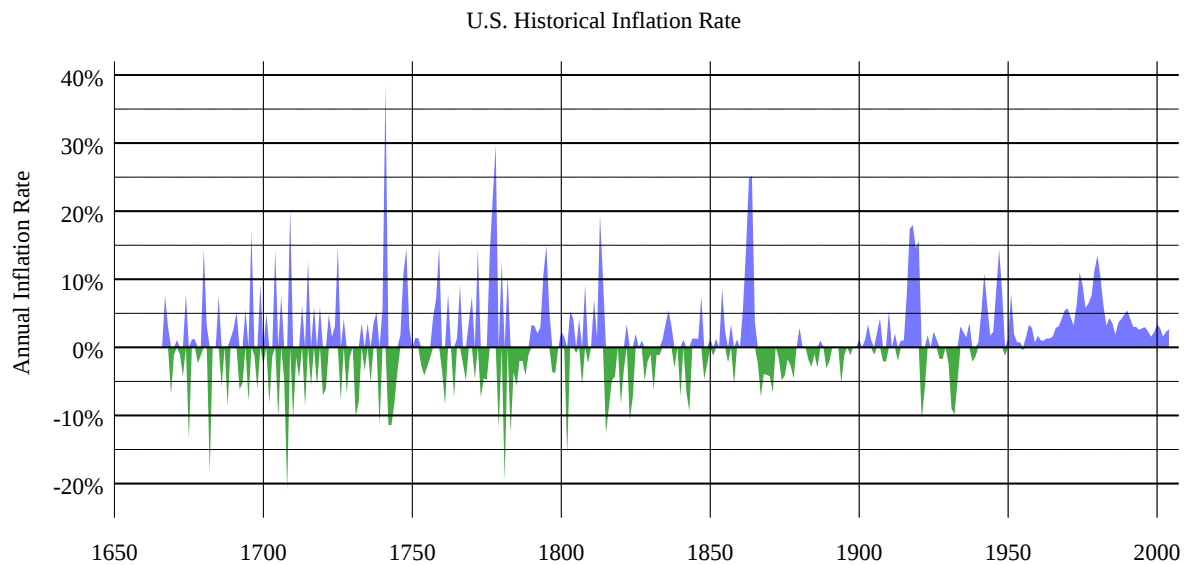
- Growth of productivity: is the ratio of economic outputs to inputs (capital, labor, energy, materials, and services). When the productivity increases the cost of goods is lowered. Lower prices increase the demand for the product or service. An increase in demand can lead to higher revenue.

- Demographic changes: demographic factors influence economic growth by changing the employment to population ratio. Factors include the quantity and quality of available natural resources. Age structure of the population also influences employment and long-run growth.
- Labor force participation: the amount of labor force participation and the size of economic sectors influence economic growth. The labor force participation is the amount of workers available. In countries with high development and industrialization, labor force participation is high because of low birth and death rates.

## **Inflation and Excessive Growth**

When the economic growth matches the growth of money supply, an economy will continue to grow and thrive. In this case, population growth would increase, but the need for goods and services would also increase. As a result, more jobs would be available and the employment rate would also increase.

However, when economic growth is not balanced, the result can include inflation and excessive growth. Inflation occurs when the price of goods and services are rising which causes purchasing power to fall if wages don't also rise . A decrease in the demand for goods and services will lead to a decrease in revenue and employment. A high rate of population growth will cause less capital per worker, lower productivity, and lower GDP growth.



## Inflation

Inflation occurs when the price of goods and services are rising which causes purchasing power to fall if wages don't also rise. Inflation is a negative effect of economic growth that is not balanced.

When the GDP growth is only caused by increases in population (not increases in supply, demand, revenue) the growth is excessive. In order for an economy to be successful, it must meet the needs of the population (supply, demand, revenue, and employment). When a population grows too fast the economic system cannot support the changes. Excessive growth leads to an imbalance in supply and demand and higher levels of unemployment. The quality of living decreases when the economy cannot support the population growth.

### 20.4.2: Aggregate Production

The aggregate production function examines how the productivity depends on the quantities of physical capital per worker and human capital per worker.

#### Learning Objective



Discuss how aggregate production impacts long-run growth

## Key Points

- Aggregate production functions create an estimated framework to determine how much of an economies' growth is related to changes in capital or changes in technology.
- The aggregate production function describes the boundary representing the limit of output attainable from each feasible combination of input.
- The aggregate production takes the physical outputs and inputs into account to determine the allocative efficiency of the economy as a whole.
- The long-run growth of a firm can change the scale of operations by adjusting the level of inputs that are fixed in the short-run, which shifts the production function upward as plotted against the variable input.

## Key Terms

physical capital

A physical factor of production (or input into the process of production), such as machinery, buildings, or computers.

human capital

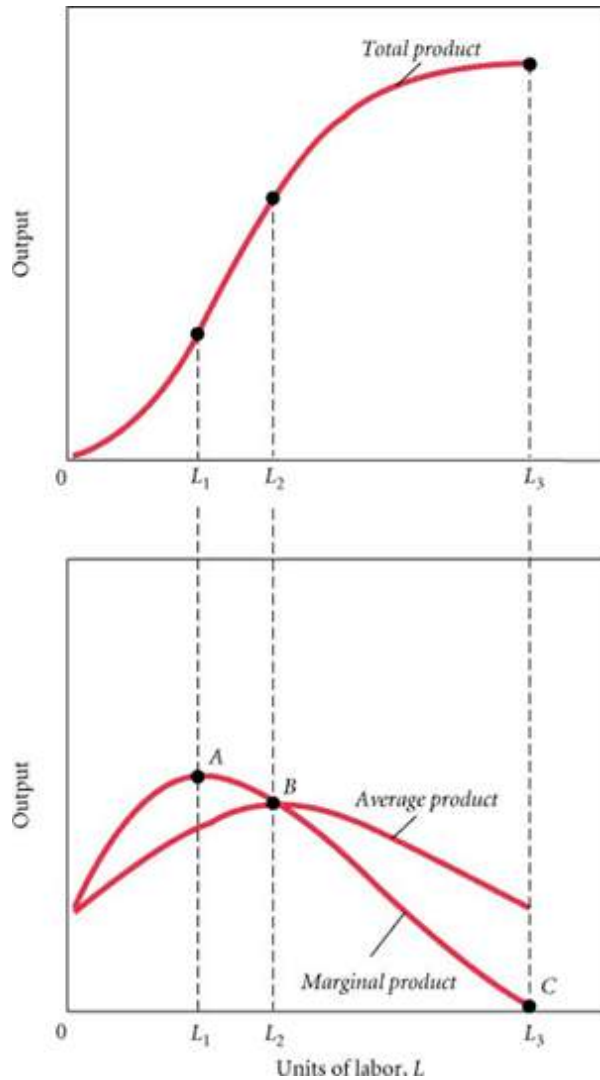
The stock of competencies, knowledge, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produce economic value.

## Aggregate Production

The aggregate production function examines how productivity, or real GDP per worker, depends on the quantities of physical capital per worker and human capital per worker. The production function relates the physical outputs of production to the physical inputs or factors of production. The aggregate production takes the physical outputs and inputs into account to determine the allocative efficiency of the economy as a whole.

Aggregate production functions create an estimated framework to determine how much of an economy's growth is related to changes in capital or changes in technology. Production functions assume that the maximum output is attainable from a given set of inputs. The aggregate production function describes the boundary representing the limit of output attainable from each feasible combination of input.

To understand how the aggregate production impacts long-run growth, it is important to understand the stages of production :



## Graphing Production

The production function of a firm or economy can be graphed using the total, average, and marginal products. The aggregate production is determined based on the stages of production and the results of the graph.

- Stage 1: the variable input is being used with increasing output per unit. The average physical product is at its maximum.
- Stage 2: output increases at a decreasing rate and the average and marginal physical product are declining. The average product of fixed inputs are still rising. The optimum input/output combination will be reached.

- Stage 3: variable input is too high relative to the available fixed inputs. The output of both fixed and variable input declines.

## **Aggregate Production and Long-Run Growth**

The long-run growth of a firm can change the scale of operations by adjusting the level of inputs that are fixed in the short-run, which shifts the production function upward as plotted against the variable input. Aggregate production functions study the short-run inputs and outputs of a firm or economy. The results allow adjustments to be made which improves the long-run growth by balancing the inputs and outputs.

### **20.4.3: Changing Worker Productivity**

In economics and long-run growth, worker productivity is influenced directly by fixed capital, human capital, physical capital, and technology.

#### **Learning Objective**

Examine the role of human capital in production and economic growth

#### **Key Points**

- Human capital is defined as the stock of competencies, skills, and knowledge that allows individuals to produce economic value.
- Human capital has been shown to increase economic development, productivity growth, and innovation.
- When individuals and societies invest in human capital it strengthens the future of the long-run economic growth. The qualitative and quantitative progress of a country is inevitable when human development is a priority.
- When a society invests in human capital, it increases worker productivity and economic growth. Human capital grows cumulatively over a long period of time.

#### **Key Terms**

human capital

The stock of competencies, knowledge, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produce economic value.

productivity

A ratio of production output to what is required to produce it (inputs).

## **Worker Productivity**

In economics and long-run growth, worker productivity is influenced directly by fixed capital. The four types of fixed capital include: useful machines, instruments of the trade; buildings as the means of procuring revenue; improvements of land; and the acquired and useful abilities of all the inhabitants or members of society.

One way to increase worker productivity is to invest in better machinery, for example. A worker with a more productive tool is more productive.

Another way to increase productivity is to find ways to increase the revenue of the product generated by the workers. Since productivity is measured in dollars per worker, being able to generate more revenue from the same output is reflected in an increase in worker productivity.

Perhaps most interesting, though, is how to change worker productivity through human capital.

## **Human Capital**

Human capital is defined as the stock of competencies, knowledge, social and personal attributes, including creativity, embodied in the ability to perform labor so as to produce economic value. Many economic theories tie education to economic growth explaining that it is an investment in human capital development. Human capital has been shown to increase economic development, productivity growth, and innovation.



## **Education**

Education increases human capital and worker productivity.

A human resource is transformed into human capital with the effective inputs of education, health, and moral values. When individuals and societies invest in human capital it strengthens the future of the long-run economic growth. The qualitative and quantitative progress of a country is inevitable when human development is a priority. Over time, when worker productivity increases the quality and quantity of the goods and services will also increase.

## **Importance of Worker Productivity**

When a society invests in human capital, it increases worker productivity and economic growth. Human capital and increased worker productivity are critical because they are different from the tangible monetary capital or revenue. It is important thought that an economy recognizes the importance of monetary capital. Worker productivity in the long-run is related to real income. If the real income falls over time it will negatively impact worker productivity. Economic revenue goes up and down due to shocks in the business cycle. Human capital grows cumulatively over a long period of time. When a society focuses on human capital and in turn worker productivity, the long-run economic growth will be steady. Economic inputs towards education, health, and worker productivity impacts future generations by ensuring that they will be more advanced and efficient than

the current generation. The increase in worker efficiency is the direct result of a superior quality of manpower created through increased human capital.

## **20.4.4: Technological Change**

In economics, technological change is a term used to describe the change in a set of feasible production possibilities.

### **Learning Objective**

Assess the value of technology to a nation's economic growth

### **Key Points**

- Growth is defined as the increase in output per capita of a country over a long period of time. One primary factor that influences the growth of an economy is technological change.
- When looking at long-run growth, technological change in the economic environment makes production more or less efficient.
- Technology is defined as the making, modification, usage, and knowledge of tools, machines, techniques, systems, and methods of organization in order to solve a problem, improve a preexisting solution to a problem, or achieve a goal.
- The expansion and sharing of technology leads to the further development of goods, processes, applications, materials, and services. All of these areas are critical to the advancement of an economy in the long-run.
- The expansion and sharing of technology leads to the further development of goods, processes, applications, materials, and services. All of these areas are critical to the advancement of an economy in the long-run.

### **Key Terms**

technology

The study of or a collection of techniques.

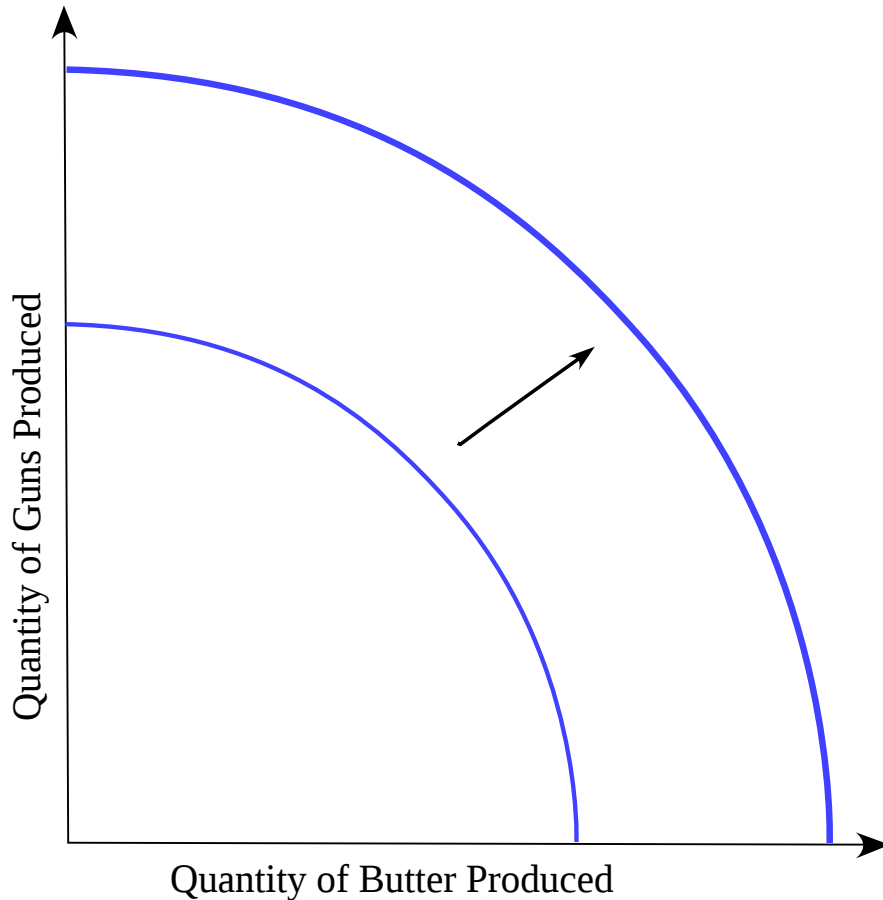
output

Production; quantity produced, created, or completed.

## **Technological Change**

In economics, growth is defined as the increase in output per capita of a country over a long period of time. One primary factor that influences the growth of an economy is technological change. Technological change is a term used to describe the change in a set of feasible production possibilities. Technological improvement has the ability to increase the amount of output an economy can produce, even if the level of inputs remains constant .





## **Technological Change**

Technological change causes the production possibility frontier to shift outward and initiate economic growth.

## **Technology and Long-Run Growth**

Technology is defined as the making, modification, usage, and knowledge of tools, machines, techniques, systems, and methods of organization in order to solve a problem, improve a preexisting solution to a problem, or achieve a goal. In economics, improvements in technology have helped develop more advanced economies (for example, today's global economy).



## **ENIAC**

ENIAC, the first general purpose computer, was a technological advancement that affected both productivity and the types of outputs that could be produced.

In a developing country, the government works to ensure that the technologies, skills, knowledge, and methods of manufacturing are tested and developed so that they can be passed on to a broader audience. The expansion and sharing of technology leads to the further development of goods, processes, applications, materials, and services. All of these areas are critical to the advancement of an economy in the long-run.

The field of economics is constantly evolving as is the production of goods and services. In order to advance and continue to grow all markets need to make use of new technology to stay competitive. In the case of long-run economic growth, using the most advanced technology provides a market with a competitive advantage. Advances in technology creates an increased level of output with the same inputs, which improves productivity.

### **20.4.5: Government Activity**

Government activity and policies have a direct impact on long-run growth. It can invest, and operate through monetary and fiscal policy.

## Learning Objective

Discuss the long-run implications on growth from government policies

## Key Points

- Long-run growth is the increase in the market value of goods and services produced by an economy over a period of time.
- The government may choose to invest in projects that are associated with long-term growth, such as infrastructure.
- Monetary and fiscal policy are used to regulate the economy, economic growth, and inflation so that long-run growth is possible.
- Government activities used to improve long-run growth include stimulating economic growth, enacting monetary policies, fixing the exchange rates, and using wage and price controls.

## Key Terms

economic growth

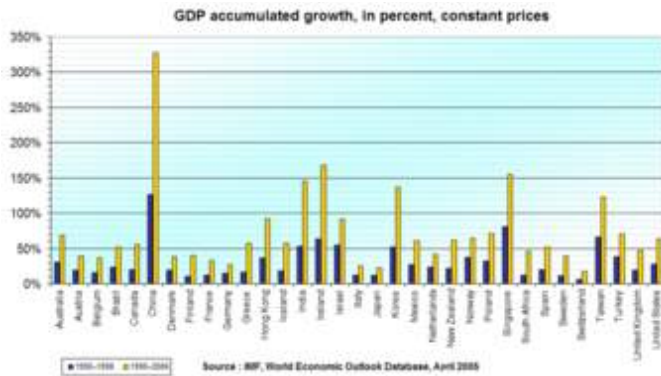
The increase of the economic output of a country.

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

## Economic Growth

In macroeconomics, long-run growth is the increase in the market value of goods and services produced by an economy over a period of time. The long-run growth is determined by percentage of change in the real gross domestic product (GDP) . In order for an economy to experience positive long-run growth its outputs and inputs must be in balance for an increase to occur in supply, demand, revenue, and employment. The long-run economic growth is determined by short-run economic decisions.



## Gross Domestic Product

The change in GDP is used to determine economic growth within a country.

## Government Activity

Government activity and policies have a direct impact on long-run growth. Long-run growth can be redirected and improved when changes are made to short-run actions. When an economy or industry experiences imbalanced economic growth, the government can respond in order to assist in securing the market. Examples of possible government activity include:

- **Investment:** the government can stimulate economic growth by investing in the economy. Examples of stimulants include investing in market production, infrastructure, education, and preventative health care. This is especially important when excessive growth occurs. The government must stimulate economic growth to meet the needs of an increasing population.
- **Monetary policy:** the government enacts monetary policies to keep the growth rate of money steady. This helps to control excess inflation and excess short-term growth, both of which can negatively affect long-run growth. It's important to note, however, that fiscal policy can also affect the level of inflation within an economy.
- **Fiscal Policy:** Choices in tax structure, government spending, and economic regulation can all impact long-run growth by affecting the choices that businesses and individuals make.

Government activity impacts long-run growth. It is critical that increasing populations have access to productive resources. It is also important that markets stay balanced in order to be successful and thrive.

## **20.4.6: Arguments in Favor and Opposed to Economic Growth**

Economic growth has the potential to make all people richer, but may have downsides such as increased inequality and environmental impacts.

### **Learning Objective**

Compare and contrast the consequences of economies in which growth is a goal

### **Key Points**

- Over the long-run economic growth looks at the growth of the ratio of GDP to the population. Economic growth is an expansion of the economic output of a country.
- Arguments in support of economic growth include increased productivity, the expansion of power, and an increase in the quality of life.
- Arguments opposed to economic growth include resource depletion, environmental impacts, and equitable growth.

### **Key Terms**

quality of life

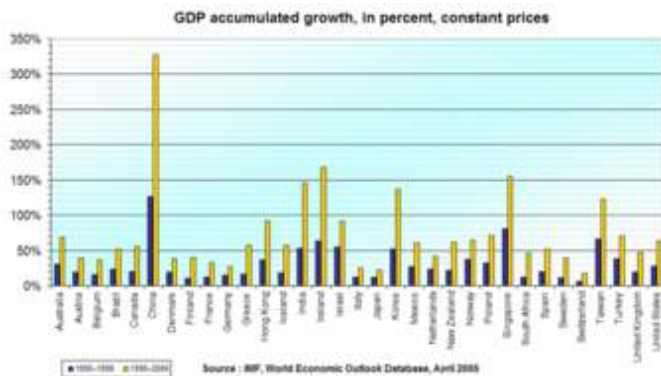
The general well-being of societies, including not only wealth and employment, but also the environment, physical and mental health, education, recreation and leisure time, and social belonging.

economic growth

The increase of the economic output of a country.

# Economic Growth

Economic growth is defined as the increase in the market value of goods and services produced by an economy over a period of time. It is measured as the percentage increase in the real gross domestic product (GDP). In other words, economic growth is an expansion of the economic output of a country. Over the long-run economists might look at the per-capita rate of GDP growth (the growth of the ratio of GDP to the population).



## GDP

The percentage increase in the GDP of a country is used to measure the country's economic growth.

## Arguments in Favor of Growth

There are numerous arguments in support of economic growth that describe its positive impact on society. Arguments in favor of economic growth include:

- **Increased productivity:** in countries that experience positive economic growth, the growth is often attributed to an increase in human and physical capital. Also, economic growth is usually accompanied by new and improved technological innovations.
- **Expansion of power:** economic growth is influential within a country even if the percentage of growth is small. With a small growth rate, a country will experience a substantial increase in power over the long-

run. For example, a growth rate of 2.5% per annum leads to a doubling of the GDP within 29 years. In contrast, a growth rate of 8% per annum leads to a doubling of the GDP within 10 years. The power expansion associated with economic growth has long-run influences on a country.

- Quality of life: the quality of life increases in countries that experience economic growth. Economic growth alleviates poverty by increasing employment opportunities and labor productivity. It has been found that happiness increases with a higher GDP per capita, up to a level of at least \$15,000 per person.

## **Arguments Opposed to Growth**

There are a series of arguments that are opposed to economic growth.

Arguments opposed to growth include:

- Resource depletion: economic growth has the potential to deplete resources if science and technology do not produce viable substitutes or new resources. Also, some arguments state that better technology and more efficient production will deplete resources quicker in the long-run even though advancements are perceived as positive right now.
- Environmental impact: some argue that a narrow view of economic growth combined with globalization could collapse the world's natural resources. Portions of society have advocated the ideas of uneconomic growth and de-growth (economic contraction) in an attempt to lessen these effects of economic growth.
- Equitable growth: it has been found that while economic growth has a positive impact on society as a whole, it is common that poor sections of society are not able to participate in economic growth. Economic growth has many positive effects, but a society must not favor economic growth over solving pressing social issues such as poverty. For example, in a country with low inequality, a country with a growth rate of 2% per head and 40% of the population living in poverty can halve the poverty in 10 years. In contrast, if the same country has high inequality it will take nearly 60 years to achieve the same level of poverty reduction.

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# 20.5: The Impact of Policy on Growth

## 20.5.1: Incentivizing Saving and Investment

The government can incentivize savings and investment by changing the relative cost of taking each action.

### Learning Objective

Explain how the governments incentivize saving and investment

### Key Points

- Monetary policy seeks to encourage investment by lowering interest rates and to encourage savings by borrowing them.
- Governments give tax breaks to industries in which it wants to encourage investment.
- Governments can also make certain types of savings tax exempt if it wishes to encourage savings.

### Key Term

monetary policy

The process of controlling the supply of money in an economy, often conducted by central banks.

Governments have a strong interest in affecting the savings and investments in an economy. Both savings and investment affect the overall economy. For example, if an economy is overheating, a government might want to disincentivize investment or consumption, and would therefore be interested in increasing the savings rate. If an economy is in a recession, a

government would want to encourage savers to start spending or investing their money .



## US Savings Rate

The US government may want to increase the savings rate if the economy is in a downturn, and increase it if the economy is overheating.

There are a number of ways in through which a government can incentivize savings and investment. Broadly, each incentive adjusts the cost of saving or investing. We will discuss two main ways to affect the savings and investment rates here.

## Monetary Policy

One of the main tools of central banks is the interest rate that it charges banks to hold their money overnight. This rate is ultimately passed on to the bank's depositors. Depositors, in turn, adjust their levels of savings and investment based on that rate.

Take, for example, a high interest rate. At a high interest rate, it is very expensive to borrow money: investors will not want to invest because they have to pay a lot of interest on their loans. Savers, on the other hand, love high interest rates: they earn a lot simply by keeping their cash in the bank. High interest rates encourage savings and discourage investment.

The precise opposite is true for low interest rates. When rates are low, investors know they can borrow money to finance investments cheaply. At the same time, savers aren't earning much by keeping their money in the bank. Low interest rates encourage investment and discourage savings.

Much of a central bank's actions are focused on adjusting how much people save and invest.

## **Taxes**

The government can also incentivize savings and investment in a number of ways. The most common way of doing so is by adjusting tax rates. Governments offer individuals and firms who take the action it desires. For example, a government can offer a tax break to companies that are investing in a desirable area (e.g. medicine). It can also encourage savings through tax breaks. Roth IRAs are an instrument for saving for retirement that the US has made tax exempt (under certain conditions). In the first example, the government uses tax reductions to encourage investment for companies. In the second, the government encourages saving by helping savers earn more of the interest they earn over time in the savings vehicle.

## **20.5.2: Improving Education and Health Outcomes**

A country can impact its long-term growth by affecting human capital through education and healthcare investments.

### **Learning Objective**

Analyze the long-run implications on growth from education and healthcare policies

### **Key Points**

- Both education and healthcare systems have short- and long-term costs, but can also be viewed as investments in human capital.

- Education economics studies the relationship between schooling and the labor market.
- Health economics is the branch of economics that focuses on issues relating to the efficiency, effectiveness, value, and behavior in the production and consumption of health and healthcare.
- According to the World Health Organization, a successful health policy defines a vision for the future, it outlines national priorities regarding health, and it builds a consensus and informs the public.

## **Key Terms**

economic growth

The increase of the economic output of a country.

human capital

The stock of competencies, knowledge, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produce economic value.

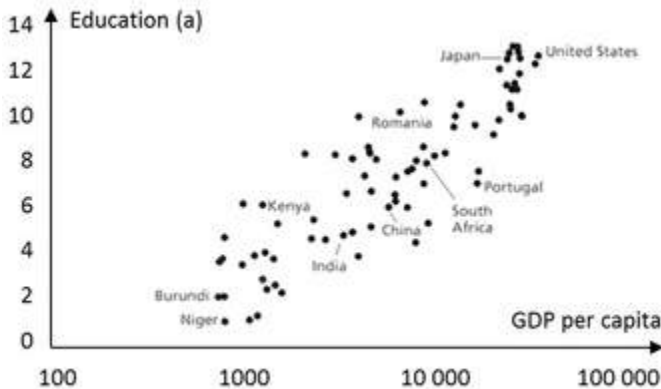
Both education and healthcare are important because they have short- and long-term costs, and significantly affect the level of human capital in an economy. If a country can set up its education and healthcare systems to maximize the growth of human capital, it can also significantly impact its long-term economic growth prospects.

## **Education Economics and Policies**

Education economics studies economic issues related to education, such as the demand for education and the financial cost of education. It studies the relationship between schooling and the labor market. By making educational policies and spending money now, a country ensures that it will have the necessary human capital to expand its economy.

Human capital requires investment, but also provides economic returns. As education increases human capital increases, countries will also expect to

see higher productivity, wages, and the GDP .



## Impact of Education on GDP

This graph shows the positive relationship between education and per capita GDP of a country. As the number of years of education within a country increase, so does the per capita GDP.

Economics is one field of study that researches the effectiveness of education policies. Education policies are designed to cover all education fields from early childhood education through college graduate programs. Policies focus on school size, class size, school choice, tracking, teacher education and certification, teacher pay, teaching methods, curricular content, and graduation requirements. To ensure economic growth, a country must have strong education policies.

## Health Economics and Policies

Health economics is the branch of economics that focuses on issues relating to the efficiency, effectiveness, value, and behavior in the production and consumption of health and healthcare. In this field, economists study the function of healthcare systems and public health-affecting behaviors. Health economics focuses on the following topics:

- What influences health
- What is health and what is its value
- What is the demand for healthcare



- What is the supply for healthcare
- Macro-economic evaluation at treatment level
- Market equilibrium
- Evaluation of the whole healthcare system
- Planning, budgeting, and monitoring the system

Although health is not directly related to human capital, it is obvious that without health and life human capital will be impacted negatively. Health policies are the decisions, plans, and actions that are undertaken in a country to achieve specific healthcare goals. According to the World Health Organization, a successful health policy defines a vision for the future, it outlines national priorities regarding health, and it builds a consensus and informs the public.

Health policies can have positive long-run effects on not only human capital, but also economic growth as a whole. Health policies are designed to educate society and improve the current and long-term health of a country. Examples of health policy topics include: vaccination policies, tobacco control, and pharmaceutical policies.

Furthermore, healthcare can constitute a large part of a country's expenditures. Determining the structure of the healthcare system (private, public, regulated, etc.) can have large economic consequences, and therefore is of great interest to the government.

### **20.5.3: Defining and Defending Property Rights**

Property rights are theoretical constructs that determine how a resource is used and owned.

#### **Learning Objective**

Explain the economic consequences of property rights

#### **Key Points**

- There are four broad components that property rights consist of: the right to use the good, the right to earn income from the good, the right to transfer the good to others, and the right to enforcement of property rights.
- Property usually refers to ownership and control over a good or resource. Ownership means that the entity or individual has the rights to the proceeds of the output that the property generates.
- There are four types of property rights: open access, state, common, and private.

## Key Terms

resource

Something that one uses to achieve an objective, e.g. raw materials or personnel.

property rights

The exclusive rights pertaining to the ownership of a given asset.

## Property Rights

Property rights are theoretical constructs that determine how a resource is used and owned. Resources can be owned and used by governments, collective bodies, or individuals. There are four broad components of property rights. They are the right to:

- use the good,
- earn income from the good,
- transfer the good to others, and
- enforce the property rights.

Property usually refers to ownership and control over a good or resource. Ownership means that the entity or individual has the rights to the proceeds of the output that the property generates.

# Types of Property Rights

Property rights are determined based on the level of transaction costs associated with the rights. The transaction costs are the costs of defining, monitoring, and enforcing the property rights. The four types of property rights are:

- Open access property: this type of property is not owned by anyone. For this reason, no one can exclude anyone else from using it. It is possible though that one's person use of the property will reduce the quantity available to others. Open access property is not managed by anyone and access to it is not controlled. Examples include the atmosphere or ocean fisheries.
- State property: also known as public property, this type of property is owned by all, but its access and use is controlled by the state. An example would be a national park .
- Common property: also called collective property, this type of property is owned by a group of individuals. The joint owners control the access, use, and exclusion of the property.
- Private property: use of this type of property is exclude. Private property use and access is managed and controlled by a private owner or a legal group of owners.

## Defending Property Rights

For any good, property rights must be monitored and the possession of the rights must be enforced. The rights are put in place to control, monitor, and exclude the use of the stated property. Property rights protect not only land, but also goods, services, and finances associated with the land itself. Corruption impacts the private and public sectors because it increases the cost of doing business and distorts markets.

The concept of property rights are closely related to the law in terms of defending the rights. There is a difference between an economist's view of property rights and the view of the law, but both work together to reach the final goal of securing and maintaining the rights. For example, suppose a

thief steals a good. The thief has *economic* property right to the good because it is in his possession - he has the ability to use the good. However, the thief does not have *legal* property right to use the good - by law he is not permitted to have access to or use of the good. Economics sets the property rights and the law is used to enforce the rights. Each of the four types of property rights differ in the amount of money and defense needed to ensure that the rights are upheld. The greater the restrictions that property rights place, the more likely that defense of the rights will be needed.



## **Yosemite National Park**

This picture is a view at Yosemite National Park. National parks in the United States are state property. Access and use of the park is controlled and enforced by the state.

### **20.5.4: Promoting Free Trade**

Government can promote free trade by reducing tariffs, quotas, and non-tariff barriers.

#### **Learning Objective**

Describe the effects of free trade and trade barriers on long run growth

#### **Key Points**

- Free trade allows countries to produce the good in which they have a comparative advantage, which increases overall welfare.
- Tariffs and quotas are explicit government economic protections that reduce the efficiency of global markets.
- Non-tariff barriers like quality standards and customs paperwork are other government-implemented barriers to trade.
- Governments can reduce barriers to free trade unilaterally, bilaterally, or multilaterally.

## Key Terms

tariff

A system of government-imposed duties levied on imported or exported goods; a list of such duties, or the duties themselves.

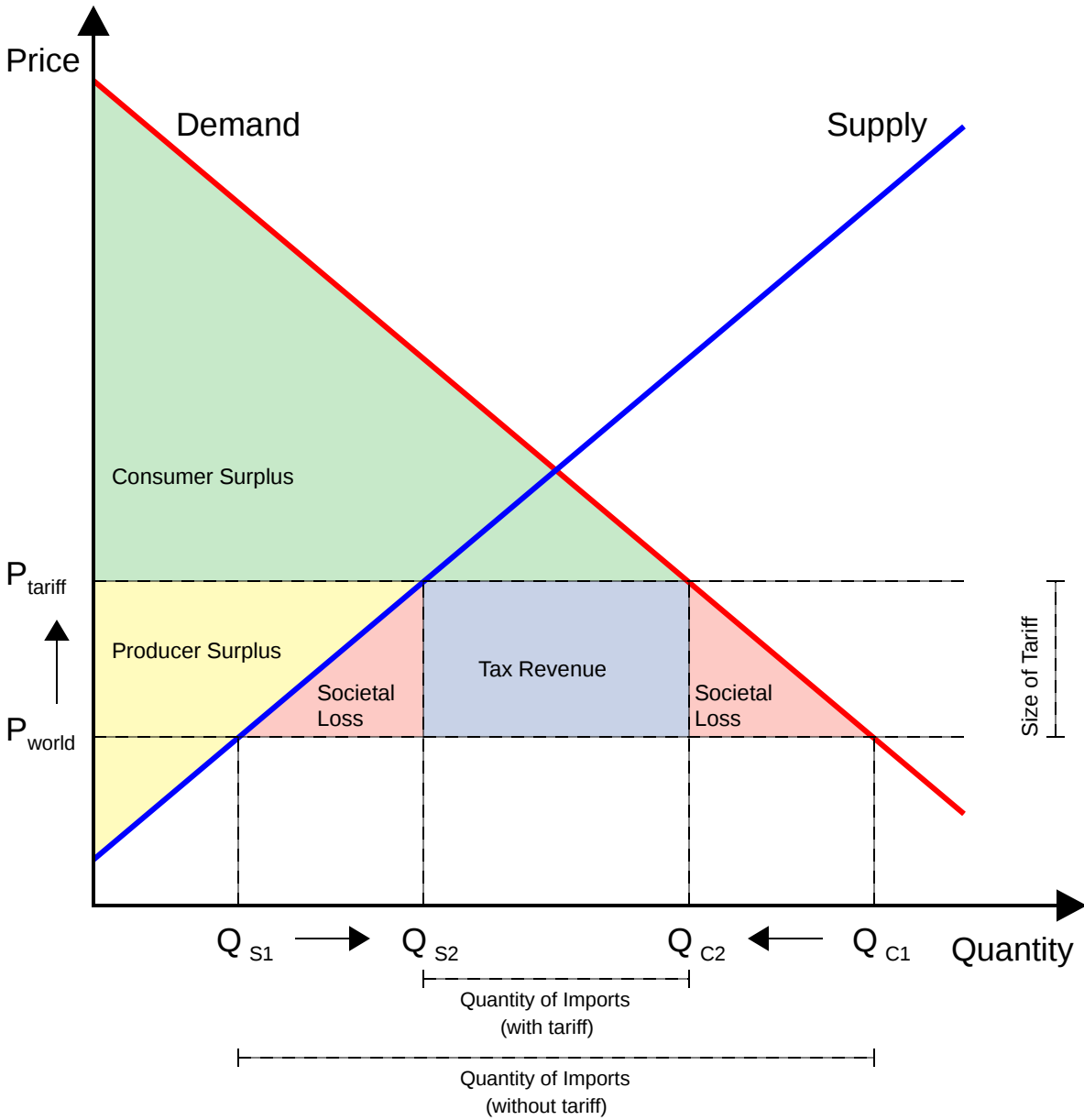
comparative advantage

The ability of a party to produce a particular good or service at a lower margin and opportunity cost over another.

Free trade is a policy by which a government does not discriminate against imports or interfere with exports by applying tariffs (to imports), subsidies (to exports), or quotas. According to the law of comparative advantage, the policy permits trading partners mutual gains from trade of goods and services.

## Government Barriers to Free Trade

There are a number of barriers to free trade that governments can mitigate, most importantly, tariffs (government imposed import taxes) and quotas (government imposed limits on the quantity of a good that can be imported). Tariffs and quotas are explicit government policies that are designed to protect domestic producers, even if they are not the most efficient producers .



## Loss Due to Tariffs

There are a number of reasons why governments place tariffs or other barriers to free trade, but they necessarily reduce overall societal welfare. Governments can promote free trade and impact economic growth.

In addition to tariffs and quotas, there are a number of other barriers to free trade that countries use. Broadly, they are categorized as non-tariff barriers (NTBs). NTBs come in a variety of forms. One example of an NTB are

product standard requirements. A country can set high quality standards for a product, knowing that not all foreign producers will be able to meet the standard. Another way that countries can implement NTBs is through customs procedures. Countries can force foreign exporters to fill out arduous paperwork over the course of months, and perhaps in a language the foreign producer does not speak. NTBs act just like tariffs and quotas in that they are barriers to free trade.

## **Government Promotion of Free Trade**

Countries that recognize the benefits for growth from promoting free trade can take unilateral, bilateral, or multilateral action to reduce some of these barriers to trade.

Unilateral promotion of free trade is when a country decides to reduce its own trade barriers without any promise of action from its trading partners. This would lead to a reduction in import prices, but could be unpopular with domestic industries who are not afforded lower barriers in the countries with which they wish to trade.

Bilateral promotion of free trade is when two countries come to an agreement to reduce barriers together. This solves the problem of one country giving the benefit of reduced barriers to foreign exporters without any promise of similar benefits in return.

Multilateral promotion of free trade is when a group of countries agree to reduce their barriers together. Examples of multilateral promotion of free trade are trade agreements such as the North American Free Trade Agreement (NAFTA) in which the US, Mexico, and Canada agreed to allow free trade among one another.

Reducing barriers to free trade may be politically difficult, but due to the law of comparative advantage, will allow for increased overall surplus for each trading partner in the long run.

### **20.5.5: Investing in Research and Development**

The government can establish intellectual property laws, directly conduct research, or finance research and development.

## **Learning Objective**

Describe the appropriate role of government in research and development

## **Key Points**

- Patents are a form of intellectual property rights protection that encourages researchers to invest in research.
- The government can conduct research itself. NASA is an example of a government agency that conducts research and development directly.
- The government offers funding to non-government researchers, often through grants.

## **Key Terms**

intellectual property

Any product of someone's knowledge that has commercial value: copyrights, patents, trademarks and trade secrets.

research and development

The process of discovering and creating new knowledge about scientific and technological topics in order to develop new products

The government has the ability to encourage or discourage research and development. The government can do so by creating a good structure of intellectual property protection, called, broadly, patent law. It can also directly intervene and encourage or discourage research and development in a specific area of interest to the government or society that is not currently being addressed by the market.

Investing in research and development is important because it can result in new products, technologies, or processes. Thus, research and development



can improve productivity or simply improve the welfare of society.

This atom will first discuss how the government can establish a patent system, and then ways in which it can directly affect the level of research and development in an economy.

## **Patents**

Patents are temporary monopolies granted to inventors by the government, in exchange for public disclosure of how the invention works. They are one of the basic forms of intellectual property. Essentially, a patent gives the holder the right to exclude others from, among other things, using, selling, and making the claimed invention.

Patents and, more broadly, intellectual property rights, are important because they encourage investment in research. Without intellectual property protection, researchers would be worried that, once they make a breakthrough, competitors would simply sell their product. The original researcher would have made the investment in the research, but would have to compete with others once the research becomes able to generate revenue.

## **Direct Government Research**

When the government directly conducts research, it hires its own scientists, engineers, etc. to study a particular issue. For example, NASA is a government agency that also does research.

## **Indirect Government Research**

The government also finances research and development that it does not directly conduct. Such financing often takes the form of grants given to researchers in companies or organizations by the government. The government incentivizes the researches by making the research financially affordable (or more affordable). Not all research is financed, however. The grants are given to projects that are valuable either to the government or to society as a whole. Such grants can be viewed through the lens of market

failure: the open market is not financing a socially or government-desirable project, so the government steps in to correct the failure.



## NASA's Research and Development

The moon landing was the result of research and development conducted directly by a government agency.

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# 21: Inflation

# 21.1: Defining, Measuring, and Assessing Inflation

## 21.1.1: Defining Inflation

Inflation is an increase in average price levels.

### Learning Objective

Use the quantity theory of money to explain inflation

### Key Points

- Inflation refers to the average changes in price economy-wide, not the change in price in a particular industry. Further, inflation refers to the rate of change in prices, not the level of prices at any one time.
- Most economists agree that in the long run, inflation depends on the money supply.
- The idea that increasing the supply of money increases the price levels is known as the quantity theory of money.
- In mathematical terms, the quantity theory of money is based upon the following relationship:  $M \times V = P \times Q$ ; where M is the money supply, V is the velocity of money, P is the price level, and Q is total output.
- While most agree with the basic principles behind the quantity theory of money in the long run, many argue that it does not apply in the short run.

### Key Terms

money supply

The total amount of money (bills, coins, loans, credit, and other liquid instruments) in a particular economy.

velocity of money

The average frequency with which a unit of money is spent on new goods and services produced domestically in a specific period of time.

inflation

An increase in the general level of prices or in the cost of living.

Inflation is a persistent increase in the general price level of goods and services in an economy over a period of time. Specifically, the rate of inflation is the percent increase of prices from the start to the end of the given time period (usually measured annually).

When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy.

The decrease in purchasing power means that inflation is good for debtors and bad for creditors. Since debtors usually pay back loans in a nominal amount, they want to give up the least purchasing power possible. For example, if you borrowed money and have to pay back \$100 next year, you'd like that \$100 to be worth as little as possible. Conversely, creditors don't like inflation because the money they are getting paid is can purchase less than if there were no inflation.

## **What Causes Inflation?**

When looking at individual goods, price changes may result from changes in consumer preferences, changes in the price of inputs, changes in the price of substitute or complement goods, or many other factors. When looking at the inflation rate for an entire economy, however, these microeconomic factors are relatively unimportant.

Instead, most economists agree that in the long run, inflation depends on the money supply. Specifically, the money supply has a direct, proportional



relationship with the price level, so if, for example, the currency in circulation increased, there would be a proportional increase in the price of goods. To understand this, imagine that tomorrow, every single person's bank account and salary doubled. Initially we might feel twice as rich as we were before, but prices would quickly rise to catch up to the new status quo. Before long, inflation would cause the real value of our money to return to its previous levels. Thus, increasing the supply of money increases the price levels. This idea is known as the quantity theory of money .



## Inflation and the Money Supply

While the two variables are not exactly equivalent in the short run, over time the money supply has had a direct relationship to the level of inflation. This is consistent with the quantity theory of money.

In mathematical terms, the quantity theory of money is based upon the following relationship:  $M \times V = P \times Q$ ; where  $M$  is the money supply,  $V$  is the velocity of money,  $P$  is the price level, and  $Q$  is total output. In the long run, the velocity of money (that is, how quickly money flows through the economy) and total output (that is, an economy's Gross Domestic Product) are exogenous. If all other factors are held constant, an increase in  $M$  will require an increase in  $P$ . Thus, an increase in the money supply requires an increase in the price level (inflation).

While most agree with the basic principles behind the quantity theory of money in the long run, many argue that it does not apply in the short run. John Maynard Keynes, for example, disagreed that  $V$  and  $Q$  are exogenous and stable in the near-term, and therefore a change in the money supply may not produce a proportional change in the price level. Instead, for example, an increase in the money supply could boost total output or cause the velocity of money to fall.

## 21.1.2: Measuring Inflation

Inflation is measured as a percentage rate of change in the level of prices.

### Learning Objective

Describe inflation and how to measure it

### Key Points

- Economists typically measure the price level with a price index.
- A price index is a number whose movement reflects movement in the average level of prices. If a price index rises 10%, it means the average level of prices has risen 10%.
- The price index is the proportion of the cost of a basket of goods in one period to the cost of the same basket of goods in a previous base period. If the price index is currently 103, for example, the inflation rate was 3% between the base period and today.

### Key Terms

market basket

A list of items used specifically to track the progress of inflation in an economy or specific market.

purchasing power

The amount of goods and services that can be bought with a unit of currency or by consumers.

The inflation rate is widely calculated by calculating the movement or change in a price index, usually the consumer price index (CPI) The consumer price index measures movements in prices of a fixed basket of goods and services purchased by a "typical consumer".

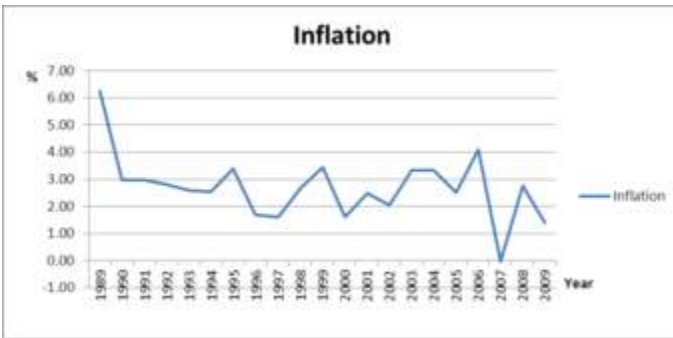
CPI is usually expressed as an index, which means that one year is the base year. The base year is given a value of 100. The index for another year (say, year 1) is calculated by

The percent change in the CPI over time is the inflation rate.

For example, assume you spend your money on bread, jeans, DVDs, and gasoline, and you'd like to measure the inflation that you experience with this basket of goods. In the base period you purchased three loaves of bread (\$4 each), two pairs of jeans (\$30 each), five DVDs (\$20 each), and 10 gallons of gasoline (\$3.50 each). The price of the basket of goods in the base period is the total money spent on this quantity of items at the base period prices; in this case, this equals \$207.

Now imagine that in the current period, bread still costs \$4, jeans are \$35, DVDs are \$18, and gasoline is \$4. Using the quantities from the base period, the total cost of the market basket in the current period is \$212. The price index is  $(212/207)*100$ , or 102.4. This means that the inflation rate between the base period and the current period was 2.4%.

In everyday life, we experience inflation as a loss in the purchasing power of money. When the inflation rate is 2.4%, it means that a dollar can buy 2.4% fewer goods and services than it could in the previous period. When inflation is steady, incomes will generally compensate for the effects of inflation by rising or falling at approximately the same rate as the general price level. Money saved as currency, however, will lose its value if inflation occurs .



## U.S. Inflation Rate

The U.S. inflation rate is measured by comparing the price of goods in one year to the price of goods in a previous base year.

### 21.1.3: Price Indices and the Rate of Change of Prices

Price indices are tools used to measure price changes for a specific subset of goods and services.

#### Learning Objective

Explain how inflation is measured through price indices

#### Key Points

- Price indices are often normalized and compared to a base year.
- The basket of goods determines which prices are being compared.
- The most commonly used formula is the Laspeyres price index, which determines a basket of goods during a base period, finds the price of this basket, and then compares that to the price of the same basket of goods in a later period of time.
- An alternate type of index, the Paasche index, finds a basket of goods in the current period, determines its total price, and compares that price to what the current basket of goods would have cost in the base period.

- The Consumer Price Index (CPI) and the Producer Price Index (PPI) are commonly used inflation indices. The CPI reflects changes in the prices of goods and services typically purchased by consumers.
- The PPI reflects changes in the revenue that producers receive for goods and services.

## Key Terms

cost of living

The average cost of a standard set of basic necessities of life, especially of food, shelter and clothing

price index

A statistical estimate of the level of prices of some class of goods or services.

## Price Indices

Price indices are tools used to measure price changes for a specific subset of goods and services. A price index is a statistic designed to help compare how a normalized average of prices differ between time periods. Broad price indices, such as the consumer price index (CPI) or the GDP deflator are often used to measure inflation throughout the entire economy, while narrower ones, such as the consumer price index for the elderly (CPI-E) measure the inflation experienced by specific groups of people or industries.

In order to calculate a price index, one must specify a base period and a basket of goods. The base period is the time period against which costs in other periods will be compared. Most often, the base period for an index is a single year and normalized. For example, a the CPI could select 1950 as the base year. In 1950, the CPI would have a value of 100 (this is *not* the cost of the basket, just a normalized value). Suppose that in 1960, the cost of the basket has increased 15%. The CPI in 1960 would then be listed as 115 (15% greater than the base year).

The basket of goods determines which prices are being compared. If a price index wanted to measure the inflation experienced by young people on the west coast of the United States, for example, it would first have to calculate which goods these particular consumers purchase and in what quantities. For example, this population may spend 40% of its income on housing, 10% on food, 10% on transportation, 20% on entertainment, and 20% on surfing supplies. The basket of goods should reflect these proportions.

## Calculating Price Indices

There are different ways to calculate price indices. Suppose we want to find the inflation rate for consumers who, in the base period, bought an average of five CDs (\$10 each), eight cans of soda (\$1.5 each), and two pairs of shoes (\$40 each). In the current period, the same type of consumer bought an average of four CDs (\$12 each), six cans of soda (\$2 each), and two pair of shoes (\$45 each). One very basic approach to finding this price index might multiply the items' cost and the quantity bought in the base period, and compare that to the cost and quantity in the current period. This calculation would give:

$$5*10+8*1.5+2*40 = 142 \text{ (base period)}$$

$$4*12+6*2+2*45 = 150 \text{ (current period)}$$

$$\text{Price index} = (150/142)*100 = 105.6$$

This would show that inflation was 5.6%.

However, this is not a very practical way to measure the change in prices since it compares two different baskets of goods. In this type of approach, a higher index number in the current period might mean that prices have gone up, but it might also mean that incomes have risen and people are simply buying more goods. The Laspeyres index and the Paasche index are two price indexes that attempt to compensate for this difficulty.

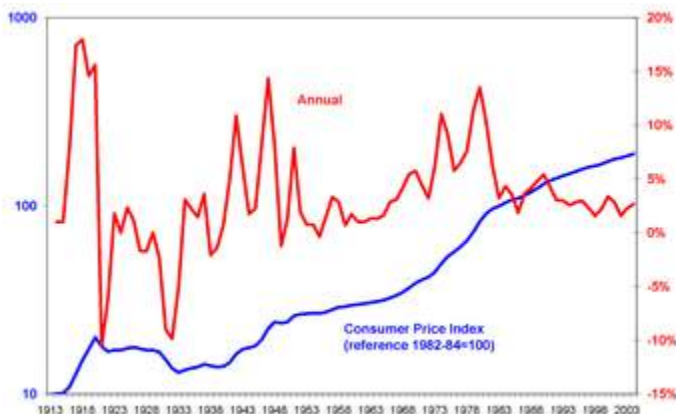
The most commonly used formula is a form of the Laspeyres price index, which determines a basket of goods during a base period, finds the price of

this basket, and then compares that to the price of the same basket of goods in a later period of time. Using the example above, the base period index would be  $5 \times 10 + 8 \times 1.5 + 2 \times 40 = 142$ , and the current period index would be  $5 \times 12 + 8 \times 2 + 2 \times 45 = 166$ . The Laspeyres price index is  $(166/142) \times 100 = 116.9$ , giving an inflation rate of 16.9%.

An alternate type of index, the Paasche index, finds a basket of goods in the current period, determines its total price, and compares that price to what the current basket of goods would have cost in the base period. Again, using the above example, the base period index would be  $4 \times 10 + 6 \times 1.5 + 2 \times 40 = 129$ , and the current period index would be  $4 \times 12 + 6 \times 2 + 2 \times 45 = 150$ . The Paasche index is  $(150/129) \times 100 = 116.3$ , giving an inflation rate of 16.3%.

## Common Price Indices

Two common price indices are the Consumer Price Index (CPI) and the Producer Price Index (PPI). The CPI reflects changes in the prices of goods and services typically purchased by consumers, and includes price changes in imported goods. The CPI is often used to measure changes in the cost of living.



## Consumer Price Index and Inflation

The above graph shows the annual inflation rate and the consumer price index from 1913 to 2003. As long as the inflation rate was above zero, the CPI was increasing.

The PPI, on the other hand, reflects changes in the revenue that producers receive in return for goods and services. The PPI, unlike the CPI, includes price changes for goods produced within the US but exported abroad. It also does not include sales and excise taxes, nor does it include distribution costs. While we often expect the CPI and PPI to show similar rates of inflation, they measure two different sets of price changes.

## **21.1.4: The Costs of Inflation**

The costs of inflation include menu costs, shoe leather costs, loss of purchasing power, and the redistribution of wealth.

### **Learning Objective**

Show inflation's impact on purchasing power

### **Key Points**

- In economics, a menu cost is the cost to a firm resulting from changing its prices. With high inflation, firms must change their prices often in order to keep up with economy-wide changes.
- Shoe leather cost refers to the cost of time and effort that people spend trying to counter-act the effects of inflation, such as holding less cash and having to make additional trips to the bank.
- Money loses value with inflation, leading to a drop in the purchasing power of an individual dollar. Unless wages increase with inflation, individuals' purchasing power will also drop.
- Unexpected inflation redistributes wealth from creditors to debtors.
- Other costs of high and/or unexpected inflation include the economic costs of hoarding and social unrest.

### **Key Terms**

purchasing power



The amount of goods and services that can be bought with a unit of currency or by consumers.

shoeleather costs

The cost of time and effort that people spend trying to counter-act the effects of inflation.

menu costs

The cost to a firm resulting from changing its prices.

Economists generally regard a relatively low, stable level of inflation as desirable. When inflation is stable and expected, the economy is generally able to adjust easily to slowly rising prices. Further, a low level of inflation encourages people to invest their money in productive projects rather than keeping savings in the form of unproductive currency, since inflation will slowly erode the value of money. However, inflation does have some economic costs, especially when it is high or unexpected.

## **Menu Costs**

In economics, a menu cost is the cost to a firm resulting from changing its prices. The name stems from the cost of restaurants literally printing new menus, but economists use it to refer to the costs of changing nominal prices in general. With high inflation, firms must change their prices often in order to keep up with economy-wide changes, and this can be a costly activity: explicitly, as with the need to print new menus, and implicitly, as with the extra time and effort needed to change prices constantly .



## Menu Costs

The cost to a restaurant to change the prices on menus is incurred even with low and expected inflation.

## Shoeleather Costs

Shoeleather cost refers to the cost of time and effort that people spend trying to counteract the effects of inflation, such as holding less cash, investing in different currencies with lower levels of inflation, and having to make additional trips to the bank. The term comes from the fact that more walking is required (historically, although the rise of the Internet has reduced it) to go to the bank and get cash and spend it, thus wearing out shoes more quickly. A significant cost of reducing money holdings is the additional time and convenience that must be sacrificed to keep less money on hand than would be required if there were less or no inflation.

## Loss of Purchasing Power

By definition, inflation causes the value of an individual dollar to decrease over time. Each dollar has less purchasing power with inflation. Thus, individuals who have the same wage next year as this year will be able to purchase less. Purchasing power can be maintained if wages increase

exactly at the rate of inflation, but this is not always the case. When wages increase less than the rate of inflation, people lose purchasing power.

## **Redistribution of Wealth**

The effect of inflation is not distributed evenly in the economy, and as a consequence there are hidden costs to some and benefits to others from this decrease in the purchasing power of money. For example, with inflation, those segments in society which own physical assets (e.g. property or stocks) benefit from the price of their holdings going up, while those who seek to acquire them will need to pay more for them.

Their ability to do so will depend on the degree to which their income is fixed. For example, increases in payments to workers and pensioners often lag behind inflation, and for some people income is fixed.

## **Other Costs**

Other costs of high and/or unexpected inflation include the economic costs of hoarding and social unrest. When prices are rising quickly, people will buy durable and nonperishable goods quickly as a store of wealth, to avoid the losses expected from the declining purchasing power of money. This can create shortages of hoarded goods and removes an economy from the efficient equilibrium. Further, inflation can lead to social unrest. For example, rises in the price of food is considered to be a contributing factor to the 2010-2011 Tunisian revolution and the 2011 Egyptian revolution (though it was certainly not the only one).



## Hyperinflation in Zimbabwe

The photo shows bills worth millions and billions of dollars that were printed by the Zimbabwe government as a response to massive inflation. At one point the 50 billion dollar note was worth less than three US dollars.

### 21.1.5: Distribution Effects of Inflation

Unexpectedly high inflation tends to transfer wealth from creditors to debtors and from the rich to the poor.

#### Learning Objective

Discuss how inflation affects distribution and creates winners and losers

#### Key Points

- Inflation is good for borrowers and bad for lenders because it reduces the value of the money paid back to the lenders.
- The inflation rate is built in to the nominal interest rate, which is the sum of the real interest rate and expected inflation. When the inflation rate rises or falls unexpectedly, wealth is redistributed between creditors and debtors.

- In general, this means that those with savings in the form of currency or bonds lose money from inflation. Those with negative savings (debt) or savings in the form of stocks, however, are better off with higher inflation.
- In demographic terms, unexpected inflation often manifests as a wealth transfer from older individuals to younger individuals.

## **Key Terms**

nominal interest rate

The rate of interest before adjustment for inflation.

Real interest rate

The rate of interest an investor expects to receive after allowing for inflation.

Whether one regards inflation as a "good" thing or a "bad" thing depends very much on one's economic situation. Assuming that loans must be paid back according to a nominal amount (i.e. the borrower must pay back \$100 in one year), inflation is good for borrowers and bad for lenders. When there is inflation, the value of the money borrowers pay back is less.

When inflation is expected, it has few distribution effects between borrowers and lenders. This is because the inflation rate is built in to the nominal interest rate, which is the sum of the real interest rate and expected inflation. For example, if the real cost of borrowing money is 3% and inflation is expected to be 4%, the nominal interest rate on a loan would be 7%. If the inflation rate unexpectedly jumps to 8% after the loan is made, however, then the creditor is essentially transferring purchasing power to the borrower. Since it benefits debtors and hurts creditors, in practice unexpected inflation is often a transfer of wealth from the rich to the poor .

Malawi Savings Bank Ltd.		Interest Rates	
Ordinary Savings		5	00 %
Premium Savings		5	25 %
Now Accounts		0	75 %
Short Term Deposits:	7 Day Call	4	00 %
	30 Day Call	5	00 %
Fixed Deposits:	2 Months	6	00 %
	3 Months	5	50 %
	6 Months	4	00 %
	12 Months		
Base Lending Rate		19	00 %

## Interest Rates and Inflation

Part of the reason that lenders charge interest is to recoup the cost of inflation over time.

In general, this means that those with savings in the form of currency or bonds lose money from inflation. The lower purchasing power of money erodes the value of currency, and inflation reduces the real interest rate earned on bonds. Those with negative savings (debt) or savings in the form of stocks, however, are better off with higher inflation. Debtors find themselves paying a lower real interest rate than expected, and stocks tend to rise in value to reflect the inflation level. In demographic terms, this often manifests as a transfer from older individuals, who are wealthier and tend to hold their savings in more conservative assets such as cash and bonds, to younger individuals, who have more debt and tend to hold their savings in more aggressive assets such as stocks.

### 21.1.6: Deflation

Deflation is a decrease in the general price levels of goods and services.

#### Learning Objective

Define deflation and analyze its effects

## Key Points

- When deflation occurs, the general price level is falling and the purchasing power of money is increasing.
- While there are problems associated with high inflation, economists generally believe that deflation is a more serious problem because it increases the real value of debt and may worsen recessions.
- Deflation discourages consumption because consumers know that if they wait to make a purchase, the price will likely drop.
- Deflation discourages borrowing and investment because the real value of the money to be repaid will be higher than the real value of the money borrowed.
- Some economists believe that deflation is caused by a fall in the general level of demand, while others attribute it to a fall in the money supply.

## Key Terms

deflationary spiral

A situation where decreases in price lead to lower production, which in turn leads to lower wages and demand, which leads to further decreases in price.

purchasing power

The amount of goods and services that can be bought with a unit of currency or by consumers.

## Deflation

Deflation is a decrease in the general price levels of goods and services. It occurs when the inflation rate falls below 0%. When this happens, the nominal prices of goods are falling on average and the purchasing power of money is increasing.

## Effects of Deflation

While there are some problems associated with high levels of inflation, economists generally believe that deflation is a more serious problem because it increases the real value of debt and may worsen recessions.

Suppose you are a borrower that has borrowed \$100 at a 5% interest rate to pay back in one year. Next year, you will give your lender \$105 regardless of inflation. If there is no inflation, \$105 next year buys the same amount as it does today. If there is inflation, \$105 next year buys less than \$105 does today. And if there is deflation, \$105 next year buys *more* than \$105 does today.

Deflation is good for lenders and bad for borrowers: when loans are paid back, the cash is worth more. Thus, deflation discourages borrowing, and by extension, consumption and investment today.

## What Causes Deflation?

There are several theories about the causes of deflation. In the IS/LM model, deflation is caused by a shift in the supply and demand curve for goods and services. If there is a fall in how much the whole economy is willing to buy, for example, then the general demand curve shifts to the left and overall prices fall. Because the price of goods is falling, consumers have an incentive to delay purchases and consumption until prices fall further, which in turn reduces overall economic activity. Unemployment rises and investment falls, which in turn leads to further reductions in aggregate demand. This cycle of continuing inflation is called a deflationary spiral.

Recall that in monetarist theory,  $\text{Money Supply} \times \text{Velocity of Money} = \text{Price Level} \times \text{Output}$ . According to monetarist economists, therefore, deflation is caused by a reduction in the money supply, a reduction in the velocity of money, or an increase in the number of transactions. However, any of these may occur separately without causing deflation as long as they are offset by another change - for example, the velocity of money could rise and the money supply could fall without causing a change in price levels.





## The Great Depression

Most economists agree that the high levels of deflation during the 1930s made the Great Depression much more severe and long-lasting. It discouraged consumption, borrowing, and investment that would increase economic activity.

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# **22: Unemployment**

# 22.1: Introduction to Unemployment

## 22.1.1: Defining Unemployment

Unemployment, also referred to as joblessness, occurs when people are without work and actively seeking employment.

### Learning Objective

Classify the different measures and types of unemployment

### Key Points

- Types of unemployment determine what the causes, consequences, and solutions. The types of unemployment include: classical, cyclical, structural, frictional, hidden, and long-term.
- Unemployment is calculated as a percentage by dividing the number of unemployed individuals by the number of all the individuals currently employed in the work force.
- When unemployment rates are high and steady, there are negative impacts on the long-run economic growth.
- Demand side and supply side solutions are used to reduce unemployment rates.

### Key Term

unemployment

The state of being jobless and looking for work.

Unemployment, also referred to as joblessness, occurs when people are without work and are actively seeking employment. During periods of

recession, an economy usually experiences high unemployment rates. There are many proposed causes, consequences, and solutions for unemployment.

## **Types of Unemployment**

- **Classical:** occurs when real wages for jobs are set above the market-clearing level. It causes the number of job seekers to be higher than the number of vacancies.
- **Cyclical:** occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work. Demand for goods and services decreases, less production is needed, and fewer workers are needed.
- **Structural:** occurs when the labor market is not able to provide jobs for everyone who wants to work. There is a mismatch between the skills of the unemployed workers and the skills needed for available jobs. It differs from frictional unemployment because it lasts longer.
- **Frictional:** the time period in between jobs when a worker is searching for work or transitioning from one job to another.
- **Hidden:** the unemployment of potential workers that is not taken into account in official unemployment statistics because of how the data is collected. For example, workers are only considered unemployed if they are looking for work so those without jobs who have stopped looking are no longer considered unemployed.
- **Long-term:** usually defined as unemployment lasting longer than one year.

## **Measuring Unemployment**

Unemployment is calculated as a percentage by dividing the number of unemployed individuals by the number of all individuals currently employed in the workforce. The final measurement is called the rate of unemployment .



## Unemployment Rate

Unemployment is calculated as a percentage by dividing the number of unemployed individuals by the number of individual employed in the labor force.

## Effects of Unemployment

When unemployment rates are high and steady, there are negative impacts on the long-run economic growth. Unemployment wastes resources, generates redistributive pressures and distortions, increases poverty, limits labor mobility, and promotes social unrest and conflict. The effects of unemployment can be broken down into three types:

- **Individual:** people who are unemployed cannot earn money to meet their financial obligations. Unemployment can lead to homelessness, illness, and mental stress. It can also cause underemployment where workers take on jobs that are below their skill level.
- **Social:** an economy that has high unemployment is not using all of its resources efficiently, specifically labor. When individuals accept employment below their skill level the economies efficiency is reduced further. Workers lose skills which causes a loss of human capital.
- **Socio-political:** high unemployment rates can cause civil unrest in a country.



# Reducing Unemployment

There are numerous solutions that can help reduce the amount of unemployment:

- Demand side solutions: many countries aid unemployed workers through social welfare programs. Individuals receive unemployment benefits including insurance, compensation, welfare, and subsidies to aid in retraining. An example of a demand side solution is government funded employment of the able-bodied poor.
- Supply side solutions: the labor market is not 100% efficient. Supply side solutions remove the minimum wage and reduce the power of unions. The policies are designed to make the market more flexible in an attempt to increase long-run economic growth. Examples of supply side solutions include cutting taxes on businesses, reducing regulation, and increasing education.

## 22.1.2: Defining Full Employment

Full employment is defined as an acceptable level of unemployment somewhere above 0%; there is no cyclical or deficient-demand unemployment.

### Learning Objective

Define full employment

### Key Points

- Full employment represents a range of possible unemployment rates based on the country, time period, and political biases.
- Full employment is often seen as an "ideal" unemployment rate. Ideal unemployment excludes types of unemployment where labor-market inefficiency is reflected.
- The full employment unemployment rate is also referred to as "natural" unemployment.

- The Non-Accelerating Inflation Rate of Unemployment (NAIRU) corresponds to the unemployment rate when real GDP equals potential output.

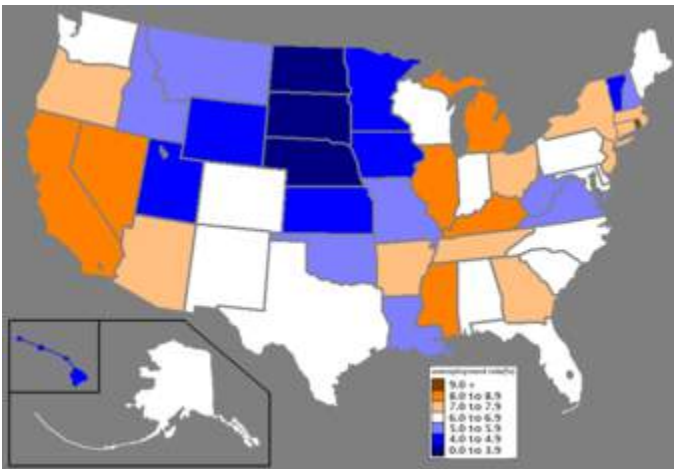
## Key Term

full employment

A state when an economy has no cyclical or deficient-demand unemployment.

## Full Employment

In macroeconomics, full employment is the level of employment rates where there is no cyclical or deficient-demand unemployment. Mainstream economists define full employment as an acceptable level of unemployment somewhere above 0%. Full employment represents a range of possible unemployment rates based on the country, time period, and political biases .



## U.S. Unemployment

The graph shows the unemployment rates in the United States. Full employment is defined as "ideal" unemployment. It is important because it keeps inflation under control.

## **Ideal Unemployment**

Full employment is often seen as an "ideal" unemployment rate. Ideal unemployment excludes types of unemployment where labor-market inefficiency is reflected. Only some frictional and voluntary unemployment exists, where workers are temporarily searching for new jobs. This classifies the unemployed individuals as being without a job voluntarily. Ideal unemployment promotes the efficiency of the economy.

Lord William Beveridge defined "full employment" as the situation where the number of unemployed workers equaled the number of job vacancies available. He preferred that the economy be kept above the full employment level to allow for maximum economic production.

## **Non-Accelerating Inflation Rate of Unemployment (NAIRU)**

The full employment unemployment rate is also referred to as "natural" unemployment. In an effort to avoid this normative connotation, James Tobin introduced the term "Non-Accelerating Inflation Rate of Unemployment" also known as the NAIRU. It corresponds to the level of unemployment when real GDP equals potential output. The NAIRU has been called the "inflation threshold. " The NAIRU states the inflation does not rise or fall when unemployment equals the natural rate.

As an example, the United States is committed to full employment. The "Full Employment Act" was passed in 1946 and revised in 1978. It states that full employment in the United States is no more than 3% unemployment for persons 20 and older, and 4% for persons aged 16 and over.

### **22.1.3: Types of Unemployment: Frictional, Structural, Cyclical**

In economics, unemployment is occurs when people are without work while actively searching for employment.

## **Learning Objective**

Discuss structural unemployment, frictional unemployment, and the natural unemployment rate

## **Key Points**

- Structural unemployment focuses on the structural problems within an economy and inefficiencies in labor markets.
- Frictional unemployment is the time period between jobs when a worker is searching for or transitioning from one job to another.
- Cyclical unemployment is a type of unemployment that occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work.
- Classical unemployment occurs when real wages for a jobs are set above the marketing clearing level.
- The natural unemployment rate represents the hypothetical unemployment rate that is consistent with aggregate production being at a long-run level.

## **Key Terms**

structural unemployment

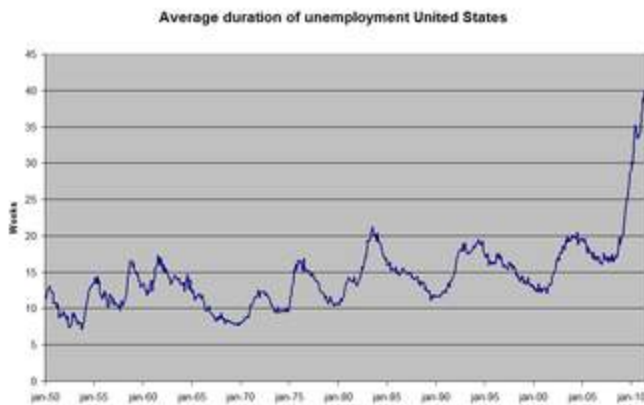
A mismatch between the requirements of the employers and the properties of the unemployed.

frictional unemployment

When people being temporarily between jobs, searching for new ones.

## **Unemployment**

In economics, unemployment occurs when people are without work while actively searching for employment . The unemployment rate is a percentage, and calculated by dividing the number of unemployed individuals by the number of all currently employed individuals in the labor force. The causes, consequences, and solutions vary based on the specific type of unemployment that is present within a country.



## U.S. Unemployment

This graph shows the average duration of unemployment in the United States from 1950-2010. Unemployment occurs when there are more individuals seeking jobs than there are vacancies.

## Structural Unemployment

Structural unemployment is one of the main types of unemployment within an economic system. It focuses on the structural problems within an economy and inefficiencies in labor markets. Structural unemployment occurs when a labor market is not able to provide jobs for everyone who is seeking employment. There is a mismatch between the skills of the unemployed workers and the skills needed for the jobs that are available. It is often impacted by persistent cyclical unemployment. For example, when an economy experiences long-term unemployment individuals become frustrated and their skills become obsolete. As a result, when the economy recovers they may not fit the requirements of new jobs due to their inactivity .



## **Retraining**

When there is structural unemployment, workers may seek to learn different skills so that they can apply to new types of jobs.

## **Frictional Unemployment**

Frictional unemployment is another type of unemployment within an economy. It is the time period between jobs when a worker is searching for or transitioning from one job to another. Frictional unemployment is always present to some degree in an economy. It occurs when there is a mismatch between the workers and jobs. The mismatch can be related to skills, payment, work time, location, seasonal industries, attitude, taste, and other factors. Frictional unemployment is influenced by voluntary decisions to work based on each individual's valuation of their own work and how that compares to current wage rates as well as the time and effort required to find a job.

## **Cyclical Unemployment**

Cyclical unemployment is a type of unemployment that occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work. In an economy, demand for most goods falls, less production is needed, and less workers are needed. With cyclical

unemployment the number of unemployed workers is greater than the number of job vacancies.

## The Natural Unemployment Rate

The natural unemployment rate, sometimes called the structural unemployment rate, was developed by Friedman and Phelps in the 1960s. It represents the hypothetical unemployment rate that is consistent with aggregate production being at a long-run level. The natural rate of unemployment is a combination of structural and frictional unemployment. It is present in an efficient and expanding economy when labor and resource markets are at equilibrium. The natural unemployment rate occurs within an economy when disturbances are not present.

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# 22.2: Measuring Unemployment

## 22.2.1: Measuring the Unemployment Rate

The labor force is the actual number of people available for work; economists use the labor force participation rate to determine the unemployment rate.

### Learning Objective

Classify the six measures of unemployment calculated by the Bureau of Labor Statistics (BLS)

### Key Points

- Unemployment occurs when people are without work and are actively seeking employment.
- There are three types of unemployment: cyclical, structural, and frictional.
- The CPS and CES are two surveys that the U.S. Bureau of Labor Statistics uses to determine the unemployment rate for households, businesses, and government agencies.
- The U.S. Bureau of Labor Statistics uses six measurements when calculating the unemployment rate. The measures range from U1 - U6 and were reported from 1950 through 2010. They calculate different aspects of unemployment.

### Key Term

unemployment

The state of being jobless and looking for work.

## Unemployment Rate

Unemployment occurs when people are without work *and* are actively seeking employment. In an economy, the labor force is the actual number of people available for work. Economists use the labor force participation rate to determine the unemployment rate.

Unemployment can be broken down into three types of unemployment:

- Cyclical unemployment: occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work.
- Structural unemployment: occurs when the labor market is unable to provide jobs for everyone who wants to work. There is a mismatch between the skills of the unemployed workers and the skills necessary for the jobs available.
- Frictional unemployment: the time period between jobs when a worker is looking for a job or transitioning from one job to another.

## Measuring Unemployment

The U.S. Bureau of Labor Statistics measures employment and unemployment for individuals over the age of 16. The unemployment rate is measured using two different labor force surveys.

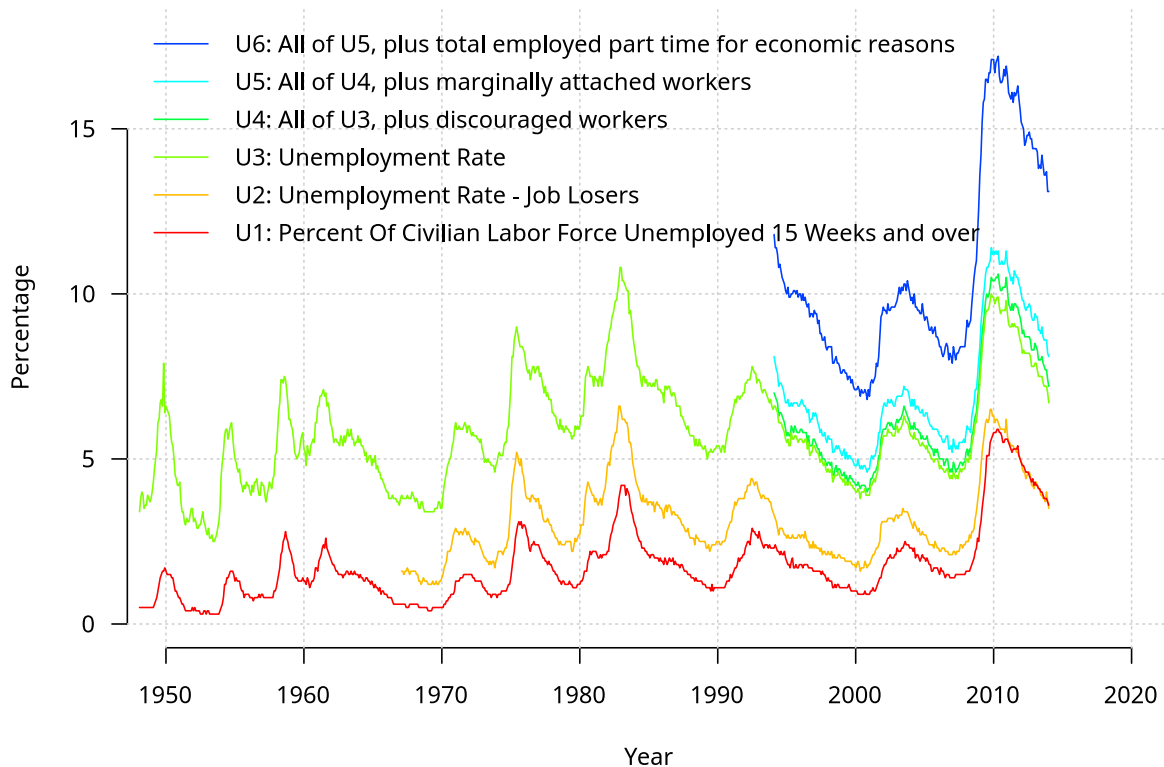
- The Current Population Survey (CPS): also known as the "household survey" the CPS is conducted based on a sample of 60,000 households. The survey measures the unemployment rate based on the ILO definition.
- The Current Employment Statistics Survey (CES): also known as the "payroll survey" the CES is conducted based on a sample of 160,000 businesses and government agencies that represent 400,000 individual employees.

The unemployment rate is also calculated using weekly claims reports for unemployed insurance. The government provides this data. The unemployment rate is updated on a monthly basis.

## Six Measures of Unemployment

The U.S. Bureau of Labor Statistics uses six measurements when calculating the unemployment rate. The measures range from U1 - U6 and were reported from 1950 through 2010 . They calculate different aspects of unemployment. The measures are:

*Measurement of unemployment*



## Unemployment Rate

The U.S. Bureau of Labor Statistics used the six employment measures to calculate the unemployment rate in the United States from 1950 to 2010.

- U1: the percentage of labor force unemployed for 15 weeks or longer.
- U2: the percentage of labor force who lost jobs or completed temporary work.
- U3: the official unemployment rate that occurs when people are without jobs and they have actively looked for work within the past four weeks.

- U4: the individuals described in U3 plus "discouraged workers," those who have stopped looking for work because current economic conditions make them think that no work is available for them.
- U5: the individuals described in U4 plus other "marginally attached workers," "loosely attached workers," or those who "would like" and are able to work, but have not looked for work recently.
- U6: the individuals described in U5 plus part-time workers who want to work full-time, but cannot due to economic reasons, primarily underemployment.

## 22.2.2: Shortcomings of the Measurement

Unemployment is not an absolute calculation and it is prone to errors and biases related to data assembly and inconsistencies in reporting.

### Learning Objective

Describe the rates in the U.S. of those who are employed, unemployed, and not in the labor force

### Key Points

- The rate of unemployment is a percentage that is calculated by dividing the number of unemployed individuals by the number of individuals currently employed in the work force.
- The rate of unemployment is calculated using four methods: the Labor Force Sample Surveys, Official Estimates, Social Insurance Statistics, and Employment Office Statistics.
- The measurement of unemployment does have some shortcomings based on who is and is not measured.
- By not including all under-employed or unemployed individuals in the measurement of the unemployment rate, the calculation does not provide an accurate assessment of how unemployment truly impacts society.

### Key Terms

labor force

The collective group of people who are available for employment, i.e. including both the employed and the unemployed.

unemployment

The state of being jobless and looking for work.

## Unemployment

Unemployment, also called joblessness, occurs when people are without work and are actively seeking employment. Unemployment is measured in order to determine the unemployment rate. The rate is a percentage that is calculated by dividing the number of unemployed individuals by the number of individuals currently employed in the labor force .

 U.S. Unemployment Rate

## U.S. Unemployment Rate

This image shows the unemployment rates by county throughout the United States in 2008. The unemployment rate is the percentage of unemployment calculated by dividing the number of unemployed individuals by the number of individuals currently employed in the labor force.

## Measurements

In order to find the rate of unemployment, four methods are used:

- Labor Force Sample Surveys: provide the most comprehensive results. Calculates unemployment by different categories such as race and gender. This method is the most internationally comparable.
- Official Estimates: combines information from the three other methods. The method is not the preferred method to use when calculating the rate of unemployment.

- Social Insurance Statistics: these statistics are calculated based on the number of individuals receiving unemployment benefits. The method is criticized because unemployment benefits can expire before an individual finds employment which makes the calculations inaccurate.
- Employment Office Statistics: only include a monthly total of unemployed individuals who enter unemployment offices. This method is the least effective for measuring unemployment.

## **Measurement Shortcomings**

The measurement of unemployment is not an absolute calculation and is prone to errors. For example, the unemployment rate does not take into account individuals who are not actively seeking employment, such as individuals attending college or even individuals who are in U.S. prisons. Individuals who are self-employed, those who were forced to take early retirement, those with disability pensions who would like to work, and those who work part-time and seek full-time employment are not factored in to the unemployment rate. Some individuals also choose not to enter the labor force and these statistics are also not considered. By not including all underemployed or unemployed individuals in the measurement of the unemployment rate, the calculation does not provide an accurate assessment of how unemployment truly impacts society. Errors and biases are also present due to data assembly and reporting inconsistencies.

### **22.2.3: Typical Lengths of Unemployment**

Short-term unemployment is any period of joblessness that lasts fewer than 27 weeks. Long-term unemployment lasts 27 or more weeks.

#### **Learning Objective**

Distinguish between short-term and long-term unemployment and the impact on people and economy

#### **Key Points**

- Unemployment occurs when people are without work and are actively seeking employment.
- Unemployment impacts the economy and society by increasing inequality, impeding long-term economic growth, wasting resources, and reducing economic efficiency.
- Unemployment impacts individuals because they are not able to meet their financial obligations which can lead to poverty, poor labor mobility, and low self-esteem. Unemployment is also known to cause civil unrest and conflict.
- Unemployment impacts individuals because they are not able to meet their financial obligations which can lead to poverty, poor labor mobility, and low self-esteem. Unemployment is also known to cause civil unrest and conflict.

## Key Terms

poverty

The quality or state of being poor or indigent; want or scarcity of means of subsistence; indigence; need.

unemployment

The state of being jobless and looking for work.

## Unemployment

Unemployment, also referred to as joblessness, occurs when people are without work and actively seeking employment. Generally, unemployment is high during recessions. Individuals struggle to find work when there are more job-seekers than vacant positions.

There are three types of unemployment:

- **Cyclical:** occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work. The demand for most goods and services declines, less production is needed, and

fewer workers are needed. Wages are sticky and do not fall to meet the equilibrium level which results in mass unemployment.

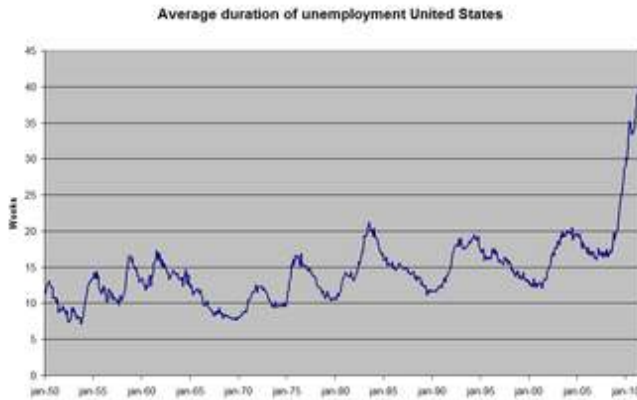
- Structural: occurs when the labor market is not able to provide jobs for everyone who wants to work. There is a mismatch between the skills of the workers and the skills needed for the jobs that are available. Structural unemployment is similar to frictional unemployment, but it lasts longer.
- Frictional: when a worker is searching for a job or transitioning from one job to another. Frictional unemployment is always present in an economy.

## **Lengths of Unemployment**

Short-term unemployment is considered any unemployment period that lasts less than 27 weeks. The unemployment period is temporary and often includes the time needed to switch from one job to another. Also, if an individual is searching for employment the search period is relatively short.

Long-term unemployment is classified as unemployment that lasts for 27 weeks or longer. Being unemployed for a long period of time can have substantial impacts on individuals. Jobs skills, certifications, and qualifications lessen over time. When the job market finally increases many individuals will no longer match the requirements for the new positions. Long-term unemployment can also result in older workers taking early retirement .





## Average Length of Unemployment

This graph shows the average length of unemployment in the United States from 1950-2010. Short-term unemployment is considered less than 27 weeks, while long-term unemployment is joblessness that lasts 27 weeks or longer.

## Social and Individual Impacts

Unemployment can have lasting impacts of individual people as well as the economy as a whole.

- **Social:** Within the economy, long-term unemployment increases the inequality present in the economy and impedes long-run economic growth. Unemployment wastes resources and generates redistributive pressures and distortions within the economy. When unemployment is high, the economy is not using all of the available resources, specifically labor. Unemployment can also reduce the efficiency of the economy because unemployed workers are willing to accept employment that is below their skill level.
- **Individual:** For individual people, unemployment increases poverty, creates poor labor mobility, and impacts self-esteem. When individuals are unemployed they are unable to meet their financial obligations. It is not uncommon for social unrest and conflict that get worse during times of mass unemployment.

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# 22.3: Understanding Unemployment

## 22.3.1: Reasons for Unemployment

There are three reasons for unemployment which are categorized as frictional, structural, and cyclical unemployment.

### Learning Objective

Explain why the unemployment rate may fluctuate

### Key Points

- The natural rate of unemployment is the unemployment rate when the economy is producing at its full potential output. This natural rate is positive, rather than zero, due to frictional and structural unemployment.
- Frictional unemployment is caused by an inability for workers and employers to find each other immediately.
- Structural unemployment is caused by mismatches between the skills offered by potential employees and those sought by employers.
- Cyclical unemployment occurs whenever the economy is not operating at its full, long-term potential. During low periods in the business cycle, firms demand fewer workers and the result is an unemployment level above the natural rate.

### Key Terms

structural unemployment

A mismatch between the requirements of the employers and the properties of the unemployed.

frictional unemployment

When people being temporarily between jobs, searching for new ones.

cyclical unemployment

A type of unemployment explained by the demand for labor going up and down with the business cycle.

There are four types of unemployment. The distinction between them is important to economists because the policy prescriptions for addressing each type vary.

## **Natural Level of Unemployment**

The natural level of unemployment is the unemployment rate when an economy is operating at full capacity. This is the unemployment rate that occurs when production is at its long-run level, removing any temporary fluctuations and frictions. It is mainly determined by an economy's production possibilities and economic institutions. At this level of unemployment, the quantity of labor supplied equals the quantity of labor demanded, though this does not imply that unemployment is zero. The reason why the natural rate of unemployment is still positive is due to frictional and structural unemployment.

## **Frictional Unemployment**

*Frictional unemployment* is the time period between jobs when a worker is searching for or transitioning from one job to another. It is sometimes called search unemployment and can be voluntary based on the circumstances of the unemployed individual. Frictional unemployment exists because both jobs and workers are heterogenous, and a mismatch can result between the characteristics of supply and demand. Such a mismatch can be related to skills, payment, work-time, location, seasonal industries, attitude, taste, and a multitude of other factors.

There is always at least some frictional unemployment in an economy, so the level of involuntary unemployment is properly the unemployment rate minus the rate of frictional unemployment.

Though economists accept that some frictional unemployment is okay because both potential workers and employers take some time to find the best employee-position match, too much frictional unemployment is undesirable. Governments will seek ways to reduce unnecessary frictional unemployment through multiple means including providing education, advice, training, and assistance such as daycare centers.

## **Structural Unemployment**

Structural unemployment is a form of unemployment where, at a given wage, the quantity of labor supplied exceeds the quantity of labor demanded, because there is a fundamental mismatch between the number of people who want to work and the number of jobs that are available. The unemployed workers may lack the skills needed for the jobs, or they may not live in the part of the country or world where the jobs are available. It is generally considered to be one of the "permanent" types of unemployment, where improvement if possible, will only occur in the long run.

A common cause of structural unemployment is technological change. With the advent of telephones, for example, some telegraph operators were put out of work. Their inability to find work was due to an oversupply of skilled telegraph operators relative to the demand for workers with that ability.

## **Cyclical Unemployment**

Of course, the economy may not be operating at its natural level of employment, so unemployment may be above or below its natural level. This is often attributed to the business cycle: the expansion and contraction of the economy around the long-term growth trend. During periods in the business cycle when the economy is producing below its long-run, optimum level, firms demand fewer workers and the result is *cyclical unemployment*.

In this case the long-run demand for labor is higher than the temporary demand, so the rate of unemployment is higher than its natural rate .



## U.S. Unemployment Rate

The short-term fluctuations in the graph are the result of cyclical unemployment that changes when economic activity is above or below its long-term potential. Over time, unemployment has returned to about 5%, which is the approximate natural rate of unemployment.

### 22.3.2: Impact of Public Policy on Unemployment

Public policy seeks to minimize unemployment by providing information, training, facilities, and other programs to assist the unemployed.

#### Learning Objective

Review the importance of unemployment benefits in the American social welfare program

#### Key Points

- Policies to combat unemployment differ depending on the type of unemployment.
- Policies to combat frictional unemployment include providing free and clear information to help match available job-seekers and jobs, providing facilities to increase availability and flexibility, and

combating prejudice against certain types of workers, jobs, or locations.

- Unemployment insurance alleviates the short-term hardship faced by the unemployed and allows workers more time to search for a job that fits their skills and preferences.
- Job training and education to equip workers with the skills firms demand are public policy responses to structural unemployment.

## **Key Terms**

frictional unemployment

When people being temporarily between jobs, searching for new ones.

structural unemployment

A mismatch between the requirements of the employers and the properties of the unemployed.

unemployment insurance

Insurance against loss of earnings during the time that an able-bodied worker is involuntarily unemployed.

Most governments strive to achieve low levels of unemployment. However, the types of policies differ depending on what type of unemployment they address.

## **Frictional Unemployment**

Frictional unemployment is the period between jobs in which an employee is searching for or transitioning from one job to another. It exists because the labor market is not perfect and there may be mismatches between job-seekers and jobs before workers are hired for the right position. If the search takes too long and mismatches are too frequent, the economy suffers, since some work will not get done.

Governments can enact policies to try to reduce frictional unemployment. These include offering advice and resources for job-seekers and providing clear and transparent information on available jobs and workers. This can take the form of free career counseling and job boards or job fairs. The government can provide facilities to increase availability and flexibility - for example, providing daycare may allow part-time or non-workers to transition into full-time jobs, and public transportation may widen the number of jobs available to somebody without a car. The government may also fund publicity campaigns or other programs to combat prejudice against certain types of workers, jobs, or locations.

On the other hand, some frictional unemployment is a good thing - if every worker was offered, and accepted, the first job they encountered, the distribution of workers and jobs would be quite inefficient. Many governments offer unemployment insurance to both alleviate the short-term hardship faced by the unemployed and to allow workers more time to search for a job. These benefits generally take the form of payments to the involuntarily unemployed for some specified period of time following the loss of the job. In order to achieve the goal of reducing frictional unemployment, governments typically require beneficiaries to actively search for a job while receiving payments and do not offer unemployment benefits to those who are fired or leave their job by choice.

## **Structural Unemployment**

Structural unemployment is due to more people wanting jobs than there are jobs available. The unemployed workers may lack the skills needed for the jobs, or they may not live in the part of the country or world where the jobs are available.

Public policy can respond to structural unemployment through programs like job training and education to equip workers with the skills firms demand. A worker who was trained in an obsolete field, such as a typesetter who lost his job when printing was digitized, may benefit from free retraining in another field with strong demand for labor .





## Job Training Programs

Many organizations seek to minimize structural unemployment by offering job training and education to provide workers with in-demand skills.

### 22.3.3: Impact of Unions on Unemployment

If the labor market is competitive, unions will typically raise wages but increase unemployment.

#### Learning Objective

Discuss the impact of unionization on unemployment

#### Key Points

- Unions function by negotiating with employers to create a collective agreement that applies to all union members and typically lasts for a set time period.
- Unions are able to raise wages because, when they are powerful, they may turn the labor market into a monopoly market.
- Many economists criticize unionization, arguing that it frequently produces higher wages at the expense of fewer jobs. Essentially, unionization benefits the already employed at the expense of the unemployed.
- In labor markets that are not competitive, the equilibrium without unionization may result in wages that are lower than the competitive

equilibrium. In this case, unions may be able to raise wages without increasing unemployment.

## **Key Terms**

marginal product of labor

the change in output that results from employing an added unit of labor.

oligopsony

An economic condition in which a small number of buyers exert control over the market price of a commodity.

bargaining power

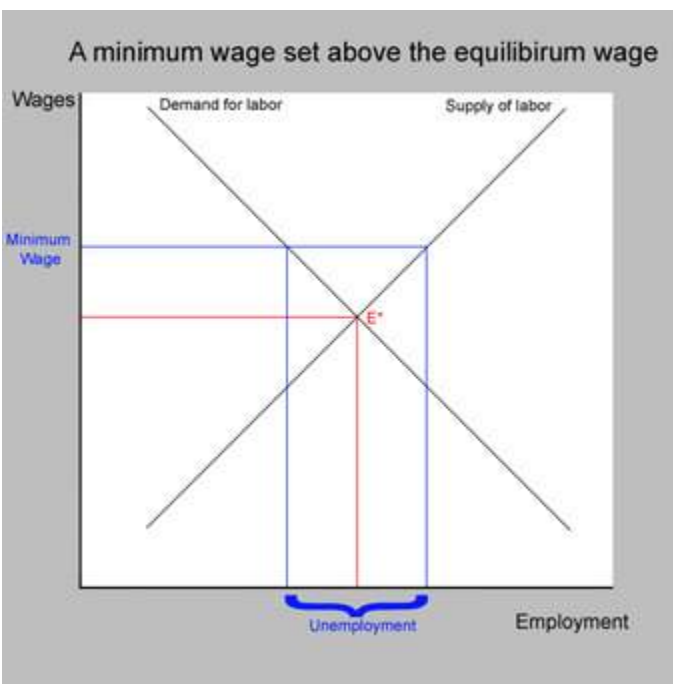
The ability to influence the setting of prices or wages, usually arising from some sort of monopoly or monopsony position -- or a non-equilibrium situation in the market.

A union is a formal organization of workers who have banded together to achieve common goals such as protecting the integrity of its trade, achieving higher pay, increasing the number of employees an employer hires, and better working conditions. They function by negotiating with employers to create a collective agreement that applies to all union members and typically lasts for a set time period. For example, in a unionized industry, rather than each employee negotiating his or her own vacation time with the employer, a union will negotiate with the firm in order to create a contract governing vacation time that applies to every union member. This gives workers as a whole a stronger bargaining position when negotiating working conditions and pay.

Trade unions in their current form became popular during the industrial revolution, when most jobs required little skill or training and therefore almost all of the bargaining power fell with employers rather than employees. While unions have many goals, their primary objective has

historically been to achieve higher wages for members of the union - that is, those who are already employed in an industry.

Unions are able to raise wages because, when they are powerful, they may turn the labor market into a monopoly market. Rather than a competitive market with many buyers (employers) and sellers (employees), there are many buyers but only one seller: the union. Like any monopoly market, the outcome will be an equilibrium with higher prices and lower supply than in the competitive equilibrium. In the case of the labor market, this means that wages will be higher, but so will unemployment. This is illustrated in the graphic, in which a union successfully raises the wage rate above the equilibrium wage. The gap between the point where the new wage rate intersects the demand curve and where it intersects the supply curve represents the resulting unemployment .



## Raising Wages Above Equilibrium

If a union is able to raise the minimum wage for their members above the equilibrium wage, then wages will be higher but fewer workers will be employed.

Many economists criticize unionization, arguing that it frequently produces higher wages at the expense of fewer jobs. Essentially, unionization benefits the already employed at the expense of the unemployed. Further, by charging higher prices than the equilibrium wage rate, unions promote deadweight loss. Critics also argue that if some industries are unionized and others are not, wages will decline in non-unionized industries.

## **Unions in Imperfect Labor Markets**

The above arguments assume that without unions, the labor market would be competitive - that is, there would be many buyers and many sellers of labor. In this competitive equilibrium, the wage rate would equal the marginal revenue product of labor and the outcome would be efficient. In reality this is often not the case. Rather, many industries are dominated by only a few firms, making the labor market an oligopsony - a market with many sellers of labor but only a few buyers. In an oligopsony firms have the advantage over workers, and wages may be lower than they would be at the competitive equilibrium.

If we assume that the labor market is imperfect and that wages are naturally lower than the marginal revenue product of labor, unions may increase efficiency by raising wage rates closer to the efficient level. In this case, wages will rise without a resulting rise in unemployment.

## **Unions, Productivity, and Unemployment**

The above arguments focus on how unions affect unemployment by negotiating for higher wages, but unions may also affect unemployment in other ways. Many argue that unions are capable of raising productivity by reducing turnover, increasing coordination between workers and management, and by increasing workers' motivation. More productive workers means a higher marginal product of labor. Since the demand for labor is determined by its marginal product, increased productivity will cause demand to shift to the right and lead to an efficient equilibrium with both higher wages and lower unemployment.

## 22.3.4: Efficiency Wage Theory

Efficiency wage theory is the idea that firms may permanently hold to a real wage greater than the equilibrium wage.

### Learning Objective

Define Efficiency Wage Theory

### Key Points

- Efficiency wages are wages that are higher than the market equilibrium. Firms that pay efficiency wages could lower their wages and hire more workers, but choose not to do so.
- Some reasons that managers might choose to pay efficiency wages are to avoid shirking, reduce turnover, and attract productive employees.
- The consequence of the efficiency wage theory is that the market for labor does not clear, even in the long run, and unemployment may be persistently higher than its natural rate.

### Key Terms

turnover

The number of times a worker is replaced after leaving.

shirking

To provide less quality work than is required.

## Efficiency-Wage Theory

The market-clearing wage is the wage at which supply equals demand; there is no excess supply of labor (unemployment) and no excess demand for labor (labor shortage). In the basic economic theory, in the long run the economy will achieve this market-clearing equilibrium and will experience

the natural level of unemployment. However, firms may choose to pay wages higher than the market-clearing equilibrium in order to incentivize increased worker productivity or to reduce turnover. This is called efficiency-wage theory.

## Why Pay Efficiency Wages?

There are several theories of why managers might pay efficiency wages:

- **Avoiding shirking:** If it is difficult to measure the quantity or quality of a worker's effort, there may be an incentive for him or her to "shirk" (do less work than agreed). The manager thus may pay an efficiency wage in order to increase the cost of job loss, which gives a sting to the threat of firing. This threat can be used to prevent shirking .
- **Minimizing turnover:** As mentioned above, by paying above-market wages, the worker's motivation to leave the job and look for a job elsewhere will be reduced. This strategy makes sense when it is expensive to train replacement workers.
- **Selection:** If job performance depends on workers' ability and workers differ from each other in those terms, firms with higher wages will attract more able job-seekers, and this may make it profitable to offer wages that exceed the market clearing level.

## Consequence of Efficiency Wage

The consequence of the efficiency wage theory is that the market for labor does not clear and unemployment may be persistently higher than its natural rate. Instead of market forces causing the wage rate to adjust to the point at which supply equals demand, the wage rate will be higher and supply will exceed demand. This produces higher wages for those who are employed but higher levels of unemployment.

### 22.3.5: Job Creation and Destruction

Jobs are created when workers become more productive, the price of output increases, or when total economic output increases.

## Learning Objective

Summarize how jobs are created and destroyed on a firm, industry, and economy wide level

## Key Points

- Firms will continue to demand labor until the marginal revenue product of labor equal the wage rate - that is, until the marginal benefit of one more employee equals the marginal cost of that employee.
- Any factor that increases the marginal revenue product of labor or that decreases the marginal cost of labor will create jobs.
- At a macroeconomic level, jobs are created when the general level of output rises and jobs are destroyed when the general level of output falls.
- In general, output rises when the demand for consumer goods increases. Thus, factors that stimulate consumer demand also encourage job creation.

## Key Terms

business cycle

A fluctuation in economic activity between growth and recession.

marginal productivity

The extra output that can be produced by using one more unit of the input

## Job Creation at the Microeconomic Level

Firms decide to create or lose jobs based on the price of output, the price of inputs, and the marginal productivity of inputs. Firms will continue to demand labor until the marginal revenue product of labor equals the wage rate - that is, until the marginal benefit of one more employee equals the marginal cost of that employee. For example, suppose a shoe factory can

sell shoes for \$50 a pair, and hiring an additional employee to work for an hour allows the factory to produce one extra pair of shoes. As long as the wage rate is less than \$50/hour, the firm can increase its profit by hiring more worker and producing more shoes. Eventually, however, the factory will become crowded, workers will need to wait in line for access to necessary tools and machinery, or the supply of materials will fail to keep up with the production pace. This will cause the marginal productivity of labor to fall, so that an additional hour of work produces less than one extra pair of shoes. If the prevailing wage rate is \$25/hour, the firm will hire until it takes two hours of work to produce one pair of shoes. At this point, the marginal benefit of hiring labor is \$25, equal to the marginal cost.

Factors that increase the productivity of labor will increase demand for labor and create jobs. Suppose a new type of sewing machine is invented that is smaller and allows shoemakers to work more quickly. This increases the productivity of labor, so that at its previous employment levels the firm can now earn \$35 for every hour of labor it employs. Just as before, the firm will create more jobs and continue to hire until the marginal revenue product of labor is again equal to the wage rate. Similarly, if the price of output rises firms will hire more employees. If the price of shoes increases to \$60, for example, workers that were previously making \$25 worth of shoes in an hour will be making \$30 worth of shoes each hour instead. Since the wage rate is still \$25, the firm will hire more workers until the marginal revenue product of labor is equal to the wage rate.

## **Job Creation at the Macroeconomic Level**

At a macroeconomic level, jobs are created when the general level of output rises and jobs are destroyed when the general level of output falls. The quantity of labor employed and the wage rate are determined by the intersection of labor supply (the number of people willing to enter the workforce at any given wage) and the labor demand (the amount of labor producers are willing to employ at any given wage rate). Labor supply is based primarily upon the size of the population and therefore remains fairly stable. The labor demand, however, shifts to the left when an economy's output falls, since firms will need fewer workers to produce fewer goods. Likewise, labor demand shifts to the right when an economy's output rises.



These shifts will destroy jobs and lower wages or create jobs and increase wages, respectively .

GDP %	Unemployment rate %	Number unemployed
-4	4.1	1.64
-3	3.7	1.528
-2	3.4	1.416
-1	3.1	1.304
0	2.8	1.192
1	2.5	1.08
1.5	2.35	1.024
2	2.2	0.968
2.5	2.05	0.912
3	1.9	0.856
3.5	1.4	0.75
4	1.2	0.62

## Output and Employment

As this hypothetical graph shows, when output (GDP) is rising, jobs are created and unemployment falls. When output is falling, jobs are destroyed and unemployment rises.

One reason that economic activity might rise or fall is the business cycle. The business cycle refers to the periods of expansions and contractions in the level of economic activities around the long-term growth trend. This is typically due to an increase or decrease in the economy-wide demand for consumer goods, but these cycles could also take place due to changes in production technology, changes in governmental policy, and many other factors.

At the macroeconomic level jobs may also shift between industries due to changes in demand or technology. For example, when health researchers uncovered facts about the health risks of smoking, the demand for cigarettes dropped and many jobs were lost in the tobacco industry. As for technology, the invention of the telephone created many jobs in telecommunications, but destroyed most of the jobs associated with telegraphs.

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# **23: Inflation and Unemployment**

# 23.1: The Relationship Between Inflation and Unemployment

## 23.1.1: The Phillips Curve

The Phillips curve shows the inverse relationship between inflation and unemployment: as unemployment decreases, inflation increases.

### Learning Objective

Review the historical evidence regarding the theory of the Phillips curve

### Key Points

- The relationship between inflation rates and unemployment rates is inverse. Graphically, this means the short-run Phillips curve is L-shaped.
- A.W. Phillips published his observations about the inverse correlation between wage changes and unemployment in Great Britain in 1958. This relationship was found to hold true for other industrial countries, as well.
- From 1861 until the late 1960's, the Phillips curve predicted rates of inflation and rates of unemployment. However, from the 1970's and 1980's onward, rates of inflation and unemployment differed from the Phillips curve's prediction. The relationship between the two variables became unstable.

### Key Terms

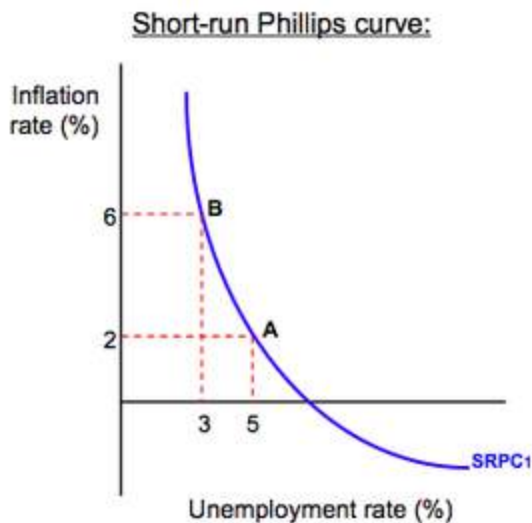
stagflation

Inflation accompanied by stagnant growth, unemployment, or recession.

## Phillips curve

A graph that shows the inverse relationship between the rate of unemployment and the rate of inflation in an economy.

The Phillips curve relates the rate of inflation with the rate of unemployment. The Phillips curve argues that unemployment and inflation are inversely related: as levels of unemployment decrease, inflation increases. The relationship, however, is not linear. Graphically, the short-run Phillips curve traces an L-shape when the unemployment rate is on the x-axis and the inflation rate is on the y-axis .



## Theoretical Phillips Curve

The Phillips curve shows the inverse trade-off between inflation and unemployment. As one increases, the other must decrease. In this image, an economy can either experience 3% unemployment at the cost of 6% of inflation, or increase unemployment to 5% to bring down the inflation levels to 2%.

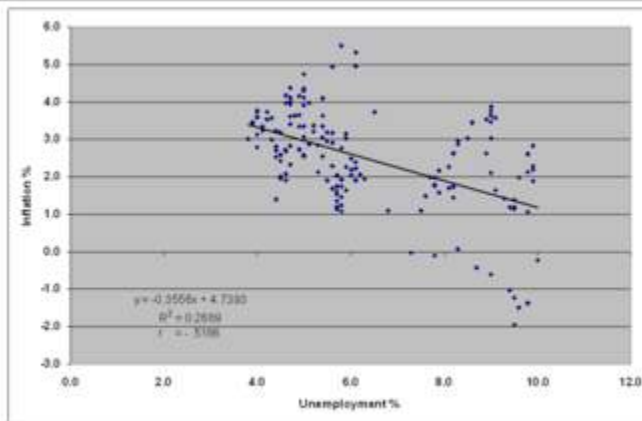
## History

The early idea for the Phillips curve was proposed in 1958 by economist A.W. Phillips. In his original paper, Phillips tracked wage changes and unemployment changes in Great Britain from 1861 to 1957, and found that there was a stable, inverse relationship between wages and unemployment. This correlation between wage changes and unemployment seemed to hold for Great Britain and for other industrial countries. In 1960, economists Paul Samuelson and Robert Solow expanded this work to reflect the relationship between inflation and unemployment. Because wages are the largest components of prices, inflation (rather than wage changes) could be inversely linked to unemployment.

The theory of the Phillips curve seemed stable and predictable. Data from the 1960's modeled the trade-off between unemployment and inflation fairly well. The Phillips curve offered potential economic policy outcomes: fiscal and monetary policy could be used to achieve full employment at the cost of higher price levels, or to lower inflation at the cost of lowered employment. However, when governments attempted to use the Phillips curve to control unemployment and inflation, the relationship fell apart. Data from the 1970's and onward did not follow the trend of the classic Phillips curve. For many years, both the rate of inflation and the rate of unemployment were higher than the Phillips curve would have predicted, a phenomenon known as "stagflation. " Ultimately, the Phillips curve was proved to be unstable, and therefore, not usable for policy purposes .



U.S. Phillips Curve: Inflation vs. Unemployment Rate (1/2000 – 4/2013)



Source: FRED Database  
"CPIAUCSL" = Consumer Price Index for All Urban Consumers (% Change from Year Ago)  
"Unempmed" = Unemployment Rate

## US Phillips Curve (2000 - 2013)

The data points in this graph span every month from January 2000 until April 2013. They do not form the classic L-shape the short-run Phillips curve would predict. Although it was shown to be stable from the 1860's until the 1960's, the Phillips curve relationship became unstable - and unusable for policy-making - in the 1970's.

### 23.1.2: The Relationship Between the Phillips Curve and AD-AD

Changes in aggregate demand cause movements along the Phillips curve, all other variables held constant.

#### Learning Objective

Relate aggregate demand to the Phillips curve

#### Key Points

- Aggregate demand and the Phillips curve share similar components. The rate of unemployment and rate of inflation found in the Phillips curve correspond to the real GDP and price level of aggregate demand.

- Changes in aggregate demand translate as movements along the Phillips curve.
- If there is an increase in aggregate demand, such as what is experienced during demand-pull inflation, there will be an upward movement along the Phillips curve. As aggregate demand increases, real GDP and price level increase, which lowers the unemployment rate and increases inflation.

## Key Terms

### Phillips curve

A graph that shows the inverse relationship between the rate of unemployment and the rate of inflation in an economy.

### aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

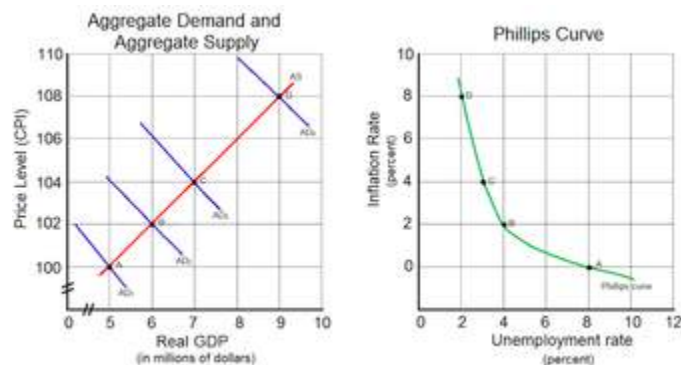
## The Phillips Curve Related to Aggregate Demand

The Phillips curve shows the inverse trade-off between rates of inflation and rates of unemployment. If unemployment is high, inflation will be low; if unemployment is low, inflation will be high.

The Phillips curve and aggregate demand share similar components. The Phillips curve is the relationship between inflation, which affects the price level aspect of aggregate demand, and unemployment, which is dependent on the real output portion of aggregate demand. Consequently, it is not far-fetched to say that the Phillips curve and aggregate demand are actually closely related.

To see the connection more clearly, consider the example illustrated by . Let's assume that aggregate supply, AS, is stationary, and that aggregate demand starts with the curve,  $AD_1$ . There is an initial equilibrium price level and real GDP output at point A. Now, imagine there are increases in

aggregate demand, causing the curve to shift right to curves  $AD_2$  through  $AD_4$ . As aggregate demand increases, unemployment decreases as more workers are hired, real GDP output increases, and the price level increases; this situation describes a demand-pull inflation scenario.



## Phillips Curve and Aggregate Demand

As aggregate demand increases from  $AD_1$  to  $AD_4$ , the price level and real GDP increases. This translates to corresponding movements along the Phillips curve as inflation increases and unemployment decreases.

As more workers are hired, unemployment decreases. Moreover, the price level increases, leading to increases in inflation. These two factors are captured as equivalent movements along the Phillips curve from points A to D. At the initial equilibrium point A in the aggregate demand and supply graph, there is a corresponding inflation rate and unemployment rate represented by point A in the Phillips curve graph. For every new equilibrium point (points B, C, and D) in the aggregate graph, there is a corresponding point in the Phillips curve. This illustrates an important point: changes in aggregate demand cause movements along the Phillips curve.

### 23.1.3: The Long-Run Phillips Curve

The long-run Phillips curve is a vertical line at the natural rate of unemployment, so inflation and unemployment are unrelated in the long run.

## Learning Objective

Examine the NAIRU and its relationship to the long term Phillips curve

## Key Points

- The natural rate of unemployment is the hypothetical level of unemployment the economy would experience if aggregate production were in the long-run state.
- The natural rate hypothesis, or the non-accelerating inflation rate of unemployment (NAIRU) theory, predicts that inflation is stable only when unemployment is equal to the natural rate of unemployment. If unemployment is below (above) its natural rate, inflation will accelerate (decelerate).
- Expansionary efforts to decrease unemployment below the natural rate of unemployment will result in inflation. This changes the inflation expectations of workers, who will adjust their nominal wages to meet these expectations in the future. This leads to shifts in the short-run Phillips curve.
- The natural rate hypothesis was used to give reasons for stagflation, a phenomenon that the classic Phillips curve could not explain.

## Key Terms

non-accelerating inflation rate of unemployment

(NAIRU); theory that describes how the short-run Phillips curve shifts in the long run as expectations change.

Natural Rate of Unemployment

The hypothetical unemployment rate consistent with aggregate production being at the long-run level.

The Phillips curve shows the trade-off between inflation and unemployment, but how accurate is this relationship in the long run? According to economists, there can be no trade-off between inflation and

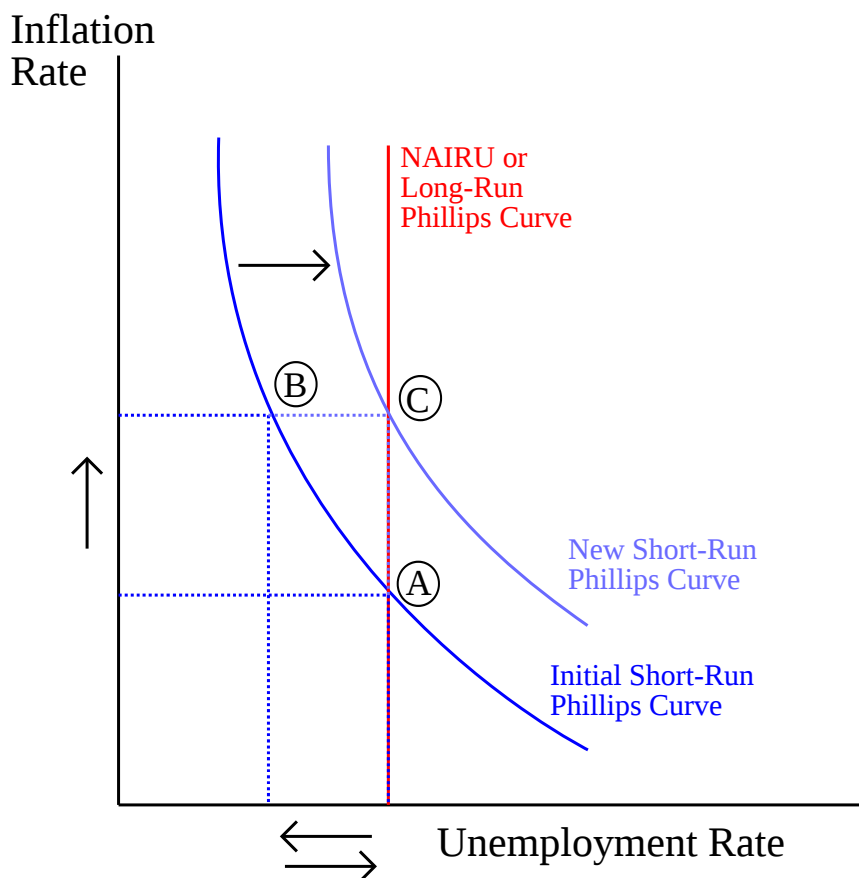
unemployment in the long run. Decreases in unemployment can lead to increases in inflation, but only in the short run. In the long run, inflation and unemployment are unrelated. Graphically, this means the Phillips curve is vertical at the natural rate of unemployment, or the hypothetical unemployment rate if aggregate production is in the long-run level. Attempts to change unemployment rates only serve to move the economy up and down this vertical line.

## Natural Rate Hypothesis

The natural rate of unemployment theory, also known as the non-accelerating inflation rate of unemployment (NAIRU) theory, was developed by economists Milton Friedman and Edmund Phelps. According to NAIRU theory, expansionary economic policies will create only temporary decreases in unemployment as the economy will adjust to the natural rate. Moreover, when unemployment is below the natural rate, inflation will accelerate. When unemployment is above the natural rate, inflation will decelerate. When the unemployment rate is equal to the natural rate, inflation is stable, or non-accelerating.

## An Example

To get a better sense of the long-run Phillips curve, consider the example shown in . Assume the economy starts at point A and has an initial rate of unemployment and inflation rate. If the government decides to pursue expansionary economic policies, inflation will increase as aggregate demand shifts to the right. This is shown as a movement along the short-run Phillips curve, to point B, which is an unstable equilibrium. As aggregate demand increases, more workers will be hired by firms in order to produce more output to meet rising demand, and unemployment will decrease. However, due to the higher inflation, workers' expectations of future inflation changes, which shifts the short-run Phillips curve to the right, from unstable equilibrium point B to the stable equilibrium point C. At point C, the rate of unemployment has increased back to its natural rate, but inflation remains higher than its initial level.



## NAIRU and Phillips Curve

Although the economy starts with an initially low level of inflation at point A, attempts to decrease the unemployment rate are futile and only increase inflation to point C. The unemployment rate cannot fall below the natural rate of unemployment, or NAIRU, without increasing inflation in the long run.

The reason the short-run Phillips curve shifts is due to the changes in inflation expectations. Workers, who are assumed to be completely rational and informed, will recognize their nominal wages have not kept pace with inflation increases (the movement from A to B), so their real wages have been decreased. As such, in the future, they will renegotiate their nominal wages to reflect the higher expected inflation rate, in order to keep their real

wages the same. As nominal wages increase, production costs for the supplier increase, which diminishes profits. As profits decline, suppliers will decrease output and employ fewer workers (the movement from B to C). Consequently, an attempt to decrease unemployment at the cost of higher inflation in the short run led to higher inflation and no change in unemployment in the long run.

The NAIRU theory was used to explain the stagflation phenomenon of the 1970's, when the classic Phillips curve could not. According to the theory, the simultaneously high rates of unemployment and inflation could be explained because workers changed their inflation expectations, shifting the short-run Phillips curve, and increasing the prevailing rate of inflation in the economy. At the same time, unemployment rates were not affected, leading to high inflation and high unemployment.

### **23.1.4: The Short-Run Phillips Curve**

The short-run Phillips curve depicts the inverse trade-off between inflation and unemployment.

#### **Learning Objective**

Interpret the short-run Phillips curve

#### **Key Points**

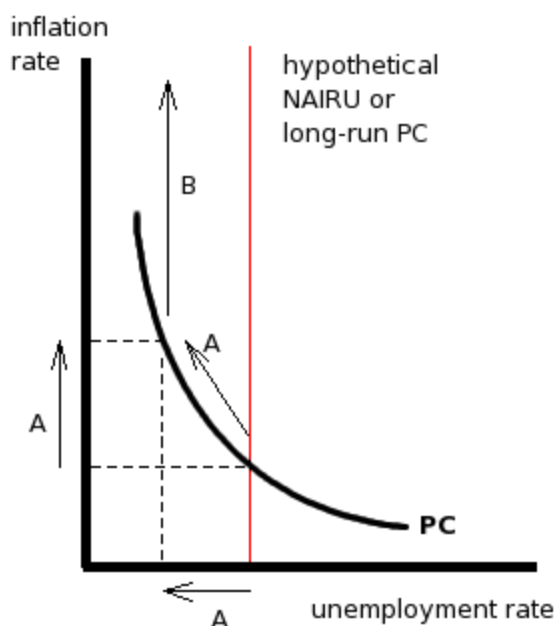
- The long-run Phillips curve is a vertical line at the natural rate of unemployment, but the short-run Phillips curve is roughly L-shaped.
- The inverse relationship shown by the short-run Phillips curve only exists in the short-run; there is no trade-off between inflation and unemployment in the long run.
- Economic events of the 1970's disproved the idea of a permanently stable trade-off between unemployment and inflation.

#### **Key Term**

## Phillips curve

A graph that shows the inverse relationship between the rate of unemployment and the rate of inflation in an economy.

The Phillips curve depicts the relationship between inflation and unemployment rates. The long-run Phillips curve is a vertical line that illustrates that there is no permanent trade-off between inflation and unemployment in the long run. However, the short-run Phillips curve is roughly L-shaped to reflect the initial inverse relationship between the two variables. As unemployment rates increase, inflation decreases; as unemployment rates decrease, inflation increases.



## Short-Run Phillips Curve

The short-run Phillips curve shows that in the short-term there is a tradeoff between inflation and unemployment. Contrast it with the long-run Phillips curve (in red), which shows that over the long term, unemployment rate stays more or less steady regardless of inflation rate.

Consider the example shown in . When the unemployment rate is 2%, the corresponding inflation rate is 10%. As unemployment decreases to 1%, the



inflation rate increases to 15%. On the other hand, when unemployment increases to 6%, the inflation rate drops to 2%.

## Historical application

During the 1960's, the Phillips curve rose to prominence because it seemed to accurately depict real-world macroeconomics. However, the stagflation of the 1970's shattered any illusions that the Phillips curve was a stable and predictable policy tool. Nowadays, modern economists reject the idea of a stable Phillips curve, but they agree that there is a trade-off between inflation and unemployment in the short-run. Given a stationary aggregate supply curve, increases in aggregate demand create increases in real output. As output increases, unemployment decreases. With more people employed in the workforce, spending within the economy increases, and demand-pull inflation occurs, raising price levels.

Therefore, the short-run Phillips curve illustrates a real, inverse correlation between inflation and unemployment, but this relationship can *only exist in the short run*. The idea of a stable trade-off between inflation and unemployment in the long run has been disproved by economic history.

## 23.1.5: Relationship Between Expectations and Inflation

There are two theories of expectations (adaptive or rational) that predict how people will react to inflation.

### Learning Objective

Distinguish adaptive expectations from rational expectations

### Key Points

- Nominal quantities are simply stated values. Real quantities are nominal ones that have been adjusted for inflation.

- Adaptive expectations theory says that people use past information as the best predictor of future events. If inflation was higher than normal in the past, people will expect it to be higher than anticipated in the future.
- Rational expectations theory says that people use all available information, past and current, to predict future events. If inflation was higher than normal in the past, people will take that into consideration, along with current economic indicators, to anticipate its future performance.
- According to adaptive expectations, attempts to reduce unemployment will result in temporary adjustments along the short-run Phillips curve, but will revert to the natural rate of unemployment. According to rational expectations, attempts to reduce unemployment will only result in higher inflation.

## **Key Terms**

adaptive expectations theory

A hypothesized process by which people form their expectations about what will happen in the future based on what has happened in the past.

rational expectations theory

A hypothesized process by which people form their expectations about what will happen in the future based on all relevant information.

The short-run Phillips curve is said to shift because of workers' future inflation expectations. Yet, how are those expectations formed? There are two theories that explain how individuals predict future events.

## **Real versus Nominal Quantities**

To fully appreciate theories of expectations, it is helpful to review the difference between real and nominal concepts. Anything that is nominal is a stated aspect. In contrast, anything that is real has been adjusted for inflation. To make the distinction clearer, consider this example. Suppose

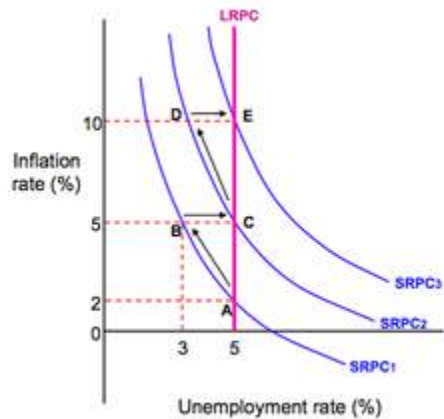
you are opening a savings account at a bank that promises a 5% interest rate. This is the nominal, or stated, interest rate. However, suppose inflation is at 3%. The real interest rate would only be 2% (the nominal 5% minus 3% to adjust for inflation).

The difference between real and nominal extends beyond interest rates. In an earlier atom, the difference between real GDP and nominal GDP was discussed. The distinction also applies to wages, income, and exchange rates, among other values.

## **Adaptive Expectations**

The theory of adaptive expectations states that individuals will form future expectations based on past events. For example, if inflation was lower than expected in the past, individuals will change their expectations and anticipate future inflation to be lower than expected.

To connect this to the Phillips curve, consider . Assume the economy starts at point A at the natural rate of unemployment with an initial inflation rate of 2%, which has been constant for the past few years. Accordingly, because of the adaptive expectations theory, workers will expect the 2% inflation rate to continue, so they will incorporate this expected increase into future labor bargaining agreements. This way, their nominal wages will keep up with inflation, and their real wages will stay the same.



## Expectations and the Phillips Curve

According to adaptive expectations theory, policies designed to lower unemployment will move the economy from point A through point B, a transition period when unemployment is temporarily lowered at the cost of higher inflation. However, eventually, the economy will move back to the natural rate of unemployment at point C, which produces a net effect of only increasing the inflation rate. According to rational expectations theory, policies designed to lower unemployment will move the economy directly from point A to point C. The transition at point B does not exist as workers are able to anticipate increased inflation and adjust their wage demands accordingly.

Now assume that the government wants to lower the unemployment rate. To do so, it engages in expansionary economic activities and increases aggregate demand. As aggregate demand increases, inflation increases. Because of the higher inflation, the real wages workers receive have decreased. For example, assume each worker receives \$100, plus the 2% inflation adjustment. Each worker will make \$102 in nominal wages, but \$100 in real wages. Now, if the inflation level has risen to 6%. Workers will make \$102 in nominal wages, but this is only \$96.23 in real wages.

Although the workers' real purchasing power declines, employers are now able to hire labor for a cheaper real cost. Consequently, employers hire more workers to produce more output, lowering the unemployment rate and increasing real GDP. On the graph, the economy moves from point A to point B.

However, workers eventually realize that inflation has grown faster than expected, their nominal wages have not kept pace, and their real wages have been diminished. They demand a 4% increase in wages to increase their real purchasing power to previous levels, which raises labor costs for employers. As labor costs increase, profits decrease, and some workers are let go, increasing the unemployment rate. Graphically, the economy moves from point B to point C.

This example highlights how the theory of adaptive expectations predicts that there are no long-run trade-offs between unemployment and inflation. In the short run, it is possible to lower unemployment at the cost of higher inflation, but, eventually, worker expectations will catch up, and the economy will correct itself to the natural rate of unemployment with higher inflation.

## **Rational Expectations**

The theory of rational expectations states that individuals will form future expectations based on all available information, with the result that future predictions will be very close to the market equilibrium. For example, assume that inflation was lower than expected in the past. Individuals will take this past information and current information, such as the current inflation rate and current economic policies, to predict future inflation rates.

As an example of how this applies to the Phillips curve, consider again. Assume the economy starts at point A, with an initial inflation rate of 2% and the natural rate of unemployment. However, under rational expectations theory, workers are intelligent and fully aware of past and present economic variables and change their expectations accordingly. They will be able to anticipate increases in aggregate demand and the accompanying increases in inflation. As such, they will raise their nominal wage demands to match the forecasted inflation, and they will not have an adjustment period when their real wages are lower than their nominal wages. Graphically, they will move seamlessly from point A to point C, without transitioning to point B.

In essence, rational expectations theory predicts that attempts to change the unemployment rate will be automatically undermined by rational workers.

They can act rationally to protect their interests, which cancels out the intended economic policy effects. Efforts to lower unemployment only raise inflation.

## **23.1.6: Shifting the Phillips Curve with a Supply Shock**

Aggregate supply shocks, such as increases in the costs of resources, can cause the Phillips curve to shift.

### **Learning Objective**

Give examples of aggregate supply shock that shift the Phillips curve

### **Key Points**

- In the 1970's soaring oil prices increased resource costs for suppliers, which decreased aggregate supply. The resulting cost-push inflation situation led to high unemployment and high inflation (stagflation), which shifted the Phillips curve upwards and to the right.
- Stagflation is a situation where economic growth is slow (reducing employment levels) but inflation is high.
- The Phillips curve was thought to represent a fixed and stable trade-off between unemployment and inflation, but the supply shocks of the 1970's caused the Phillips curve to shift. This ruined its reputation as a predictable relationship.

### **Key Terms**

stagflation

Inflation accompanied by stagnant growth, unemployment, or recession.

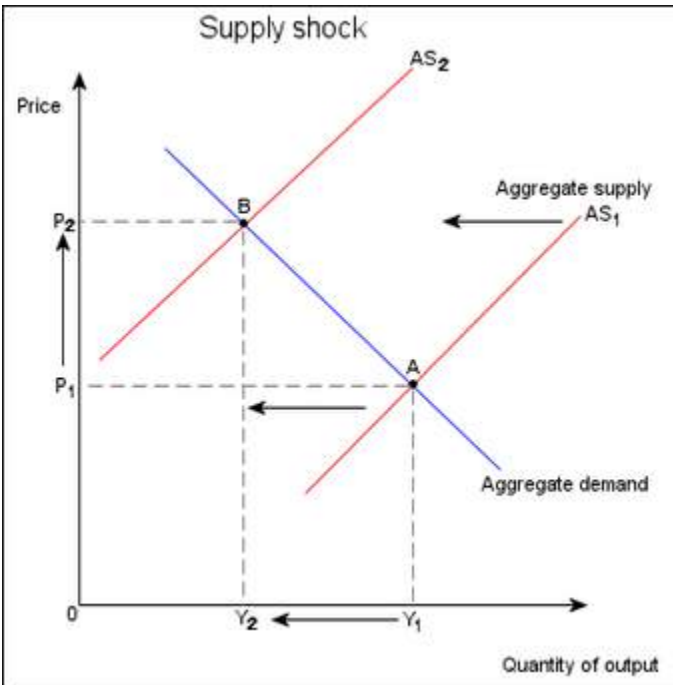
supply shock

An event that suddenly changes the price of a commodity or service. It may be caused by a sudden increase or decrease in the supply of a particular good.

The Phillips curve shows the relationship between inflation and unemployment. In the short-run, inflation and unemployment are inversely related; as one quantity increases, the other decreases. In the long-run, there is no trade-off. In the 1960's, economists believed that the short-run Phillips curve was stable. By the 1970's, economic events dashed the idea of a predictable Phillips curve. What could have happened in the 1970's to ruin an entire theory? Stagflation caused by a aggregate supply shock.

## **Stagflation and Aggregate Supply Shocks**

Stagflation is a combination of the words "stagnant" and "inflation," which are the characteristics of an economy experiencing stagflation: stagnating economic growth and high unemployment with simultaneously high inflation. The stagflation of the 1970's was caused by a series of aggregate supply shocks. In this case, huge increases in oil prices by the Organization of Petroleum Exporting Countries (OPEC) created a severe negative supply shock. The increased oil prices represented greatly increased resource prices for other goods, which decreased aggregate supply and shifted the curve to the left. As aggregate supply decreased, real GDP output decreased, which increased unemployment, and price level increased; in other words, the shift in aggregate supply created cost-push inflation.



## Aggregate Supply Shock

In this example of a negative supply shock, aggregate supply decreases and shifts to the left. The resulting decrease in output and increase in inflation can cause the situation known as stagflation.

## Shifting the Phillips Curve

The aggregate supply shocks caused by the rising price of oil created simultaneously high unemployment and high inflation. At the time, the dominant school of economic thought believed inflation and unemployment to be mutually exclusive; it was not possible to have high levels of both within an economy. Consequently, the Phillips curve could not model this situation. For high levels of unemployment, there were now corresponding levels of inflation that were higher than the Phillips curve predicted; the Phillips curve had shifted upwards and to the right. Thus, the Phillips curve no longer represented a predictable trade-off between unemployment and inflation.

### 23.1.7: Disinflation



Disinflation is a decline in the rate of inflation, and can be caused by declines in the money supply or recessions in the business cycle.

## **Learning Objective**

Identify situations with disinflation

## **Key Points**

- Disinflation is not the same as deflation, when inflation drops below zero.
- During periods of disinflation, the general price level is still increasing, but it is occurring slower than before.
- The short-run and long-run Phillips curve may be used to illustrate disinflation.

## **Key Terms**

disinflation

A decrease in the inflation rate.

inflation

An increase in the general level of prices or in the cost of living.

deflation

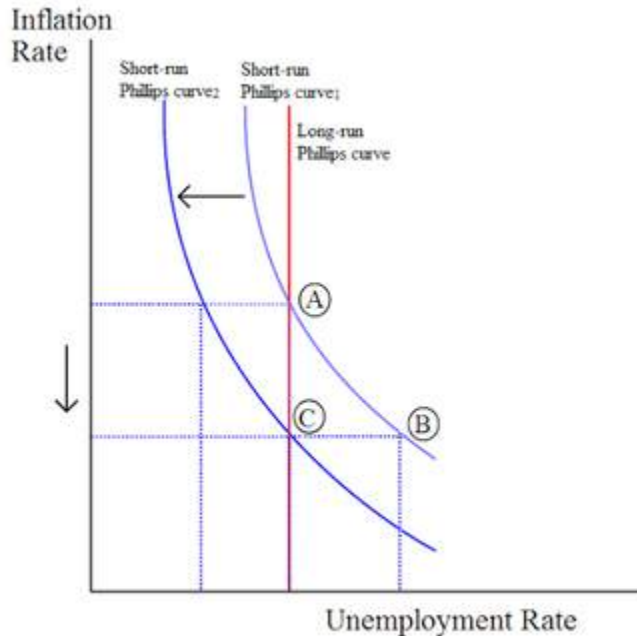
A decrease in the general price level, that is, in the nominal cost of goods and services.

Inflation is the persistent rise in the general price level of goods and services. Disinflation is a decline in the rate of inflation; it is a slowdown in the rise in price level. As an example, assume inflation in an economy grows from 2% to 6% in Year 1, for a growth rate of four percentage points. In Year 2, inflation grows from 6% to 8%, which is a growth rate of only two percentage points. The economy is experiencing disinflation because

inflation did not increase as quickly in Year 2 as it did in Year 1, but the general price level is still rising. Disinflation is not to be confused with deflation, which is a decrease in the general price level.

## Causes

Disinflation can be caused by decreases in the supply of money available in an economy. It can also be caused by contractions in the business cycle, otherwise known as recessions. The Phillips curve can illustrate this last point more closely. Consider an economy initially at point A on the long-run Phillips curve in . Suppose that during a recession, the rate that aggregate demand increases relative to increases in aggregate supply declines. This reduces price levels, which diminishes supplier profits. As profits decline, employers lay off employees, and unemployment rises, which moves the economy from point A to point B on the graph. Eventually, though, firms and workers adjust their inflation expectations, and firms experience profits once again. As profits increase, employment also increases, returning the unemployment rate to the natural rate as the economy moves from point B to point C. The expected rate of inflation has also decreased due to different inflation expectations, resulting in a shift of the short-run Phillips curve.



## Disinflation

Disinflation can be illustrated as movements along the short-run and long-run Phillips curves.

## Inflation vs. Deflation vs. Disinflation

To illustrate the differences between inflation, deflation, and disinflation, consider the following example. Assume the following annual price levels as compared to the prices in year 1:

- Year 1: 100% of Year 1 prices
- Year 2: 104% of Year 1 prices
- Year 3: 106% of Year 1 prices
- Year 4: 107% of Year 1 prices
- Year 5: 105% of Year 1 prices

As the economy moves through Year 1 to Year 4, there is a continued growth in the price level. This is an example of inflation; the price level is continually rising. However, between Year 2 and Year 4, the rise in price levels slows down. Between Year 2 and Year 3, the price level only

increases by two percentage points, which is lower than the four percentage point increase between Years 1 and 2. The trend continues between Years 3 and 4, where there is only a one percentage point increase. This is an example of disinflation; the overall price level is rising, but it is doing so at a slower rate.

Between Years 4 and 5, the price level does not increase, but decreases by two percentage points. This is an example of deflation; the price rise of previous years has reversed itself.

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# **24: Aggregate Demand and Supply**



# 24.1: Introducing Aggregate Expenditure

## 24.1.1: Defining Aggregate Expenditure: Components and Comparison to GDP

Aggregate expenditure is the current value of all the finished goods and services in the economy.

### Learning Objective

Define aggregate expenditure

### Key Points

- The aggregate expenditure is the sum of all the expenditures undertaken in the economy by the factors during a specific time period. The equation is:  $AE = C + I + G + NX$ .
- The aggregate expenditure determines the total amount that firms and households plan to spend on goods and services at each level of income.
- The aggregate expenditure is one of the methods that is used to calculate the total sum of all the economic activities in an economy, also known as the gross domestic product (GDP).
- When there is excess supply over the expenditure, there is a reduction in either the prices or the quantity of the output which reduces the total output (GDP) of the economy.
- When there is an excess of expenditure over supply, there is excess demand which leads to an increase in prices or output (higher GDP).

### Key Terms

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

expenditure

Act of expending or paying out.

gross domestic product

A measure of the economic production of a particular territory in financial capital terms over a specific time period.

## **Aggregate Expenditure**

In economics, aggregate expenditure is the current value of all the finished goods and services in the economy. It is the sum of all the expenditures undertaken in the economy by the factors during a specific time period. The equation for aggregate expenditure is:  $AE = C + I + G + NX$ .

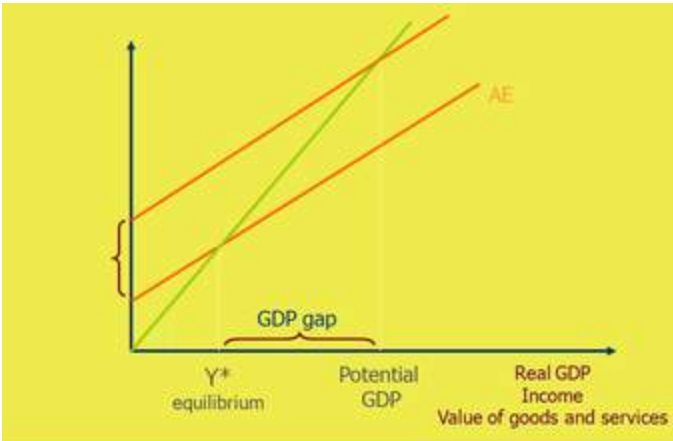
Written out the equation is: aggregate expenditure equals the sum of the household consumption (C), investments (I), government spending (G), and net exports (NX).

- Consumption (C): The household consumption over a period of time.
- Investment (I): The amount of expenditure towards the capital goods.
- Government expenditure (G): The amount of spending by federal, state, and local governments. Government expenditure can include infrastructure or transfers which increase the total expenditure in the economy.
- Net exports (NX): Total exports minus the total imports.

The aggregate expenditure determines the total amount that firms and households plan to spend on goods and services at each level of income.

## **Comparison to GDP**

The aggregate expenditure is one of the methods that is used to calculate the total sum of all the economic activities in an economy, also known as the gross domestic product (GDP). The gross domestic product is important because it measures the growth of the economy. The GDP is calculated using the Aggregate Expenditures Model .



## Aggregate Expenditure

This graph shows the aggregate expenditure model. It is used to determine and graph the real GDP, potential GDP, and point of equilibrium. A shift in supply or demand impacts the GDP.

An economy is at equilibrium when aggregate expenditure is equal to the aggregate supply (production) in the economy. The economy is not in a constant state of equilibrium. Instead, the aggregate expenditure and aggregate supply adjust each other toward equilibrium.

When there is excess supply over the expenditure, there is a reduction in either the prices or the quantity of the output which reduces the total output (GDP) of the economy.

In contrast, when there is an excess of expenditure over supply, there is excess demand which leads to an increase in prices or output (higher GDP). A rise in the aggregate expenditure pushes the economy towards a higher equilibrium and a higher potential of the GDP.

## 24.1.2: Aggregate Expenditure at Economic Equilibrium

An economy is said to be at equilibrium when aggregate expenditure is equal to the aggregate supply (production) in the economy.

### Learning Objective

Identify the assumptions fundamental to classical economics in regards to aggregate expenditure at economic equilibrium

### Key Points

- In economics, aggregate expenditure is the current value (price) of all the finished goods and services in the economy. The equation for aggregate expenditure is  $AE = C + I + G + NX$ .
- In the aggregate expenditure model, equilibrium is the point where the aggregate supply and aggregate expenditure curve intersect.
- The classical aggregate expenditure model is:  $AE = C + I$ .
- Classical economics states that the factor payments made during the production process create enough income in the economy to create a demand for the products that were produced.

### Key Terms

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

expenditure

Act of expending or paying out.

equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

## **Aggregate Expenditure**

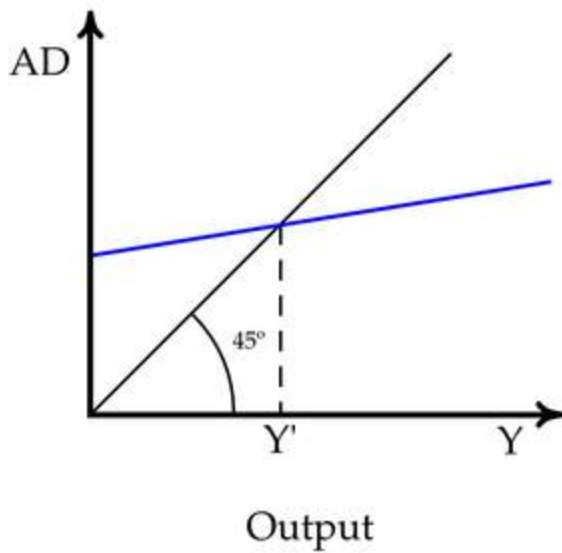
In economics, aggregate expenditure is the current value (price) of all the finished goods and services in the economy. The equation for aggregate expenditure is  $AE = C + I + G + NX$ .

Written out in full, the equation reads: aggregate expenditure = household consumption (C) + investments (I) + government spending (G) + net exports (NX).

Aggregate expenditure is a method that is used to calculate the total value of economic activities, also referred to as the gross domestic product (GDP). The GDP of an economy is calculated using the aggregate expenditure model.

## **Economic Equilibrium**

An economy is said to be at equilibrium when aggregate expenditure is equal to the aggregate supply (production) in the economy. The economy is constantly shifting between excess supply (inventory) and excess demand. As a result, the economy is always moving towards an equilibrium between the aggregate expenditure and aggregate supply. On the aggregate expenditure model, equilibrium is the point where the aggregate supply and aggregate expenditure curve intersect. An increase in the expenditure by consumption (C) or investment (I) causes the aggregate expenditure to rise which pushes the economy towards a higher equilibrium .



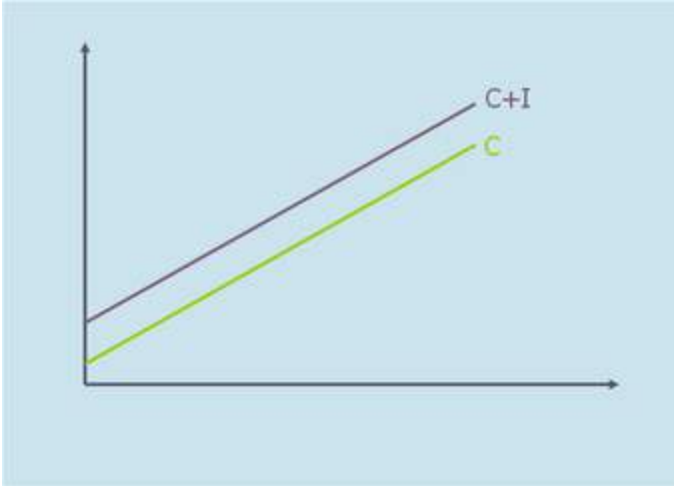
## Aggregate Expenditure - Equilibrium

In this graph, equilibrium is reached when the total demand (AD) equals the total amount of output (Y). The equilibrium point is where the blue line intersects with the black line.

## Classical Economics - Aggregate Expenditure

Classical economists believed in Say's law, which states that supply creates its own demand. This idea stems from the belief that wages, prices, and interest rate were all flexible. Classical economics states that the factor payments (wage and rental payments) made during the production process create enough income in the economy to create a demand for the products that were produced. This belief is parallel to Adam Smith's invisible hand - markets achieve equilibrium through the market forces that impact economic activity.

The classical aggregate expenditure model is:  $AE = C + I$ .



## Classical Aggregate Expenditure

This graph shows the classical aggregate expenditure where  $C$  is consumption expenditure and  $I$  is aggregate investment. The aggregate expenditure is the aggregate consumption plus the planned investment ( $AE = C + I$ ).

The aggregate expenditure equals the aggregate consumption plus planned investment. Classical economics assumes that the economy works on a full-employment equilibrium, which is not always true. In reality, many economists argue that the economy operates at an under-employment equilibrium.

### 24.1.3: Graphing Equilibrium

An economy is said to be at equilibrium when the aggregate expenditure is equal to the aggregate supply (production) in the economy.

#### Learning Objective

Demonstrate how aggregate demand and aggregate supply determine output and price level by using the AD-AS model

#### Key Points

- Aggregate supply (AS) is the total supply of goods and services that firms in an economy plan on selling during a specific time period.
- Aggregate demand (AD) is the total demand for final goods and services in the economy at a given time and price level.
- Aggregate expenditure is the current value of all the finished goods and services in the economy. The equation for aggregate expenditure is:  $AE = C + I + G + NX$ .
- The AD-AS model is used to graph the aggregate expenditure at the point of equilibrium.

## Key Terms

### equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

### aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

### aggregate supply

The total supply of goods and services that firms in a national economy plan on selling during a specific time period.

## Aggregate Supply and Aggregate Demand

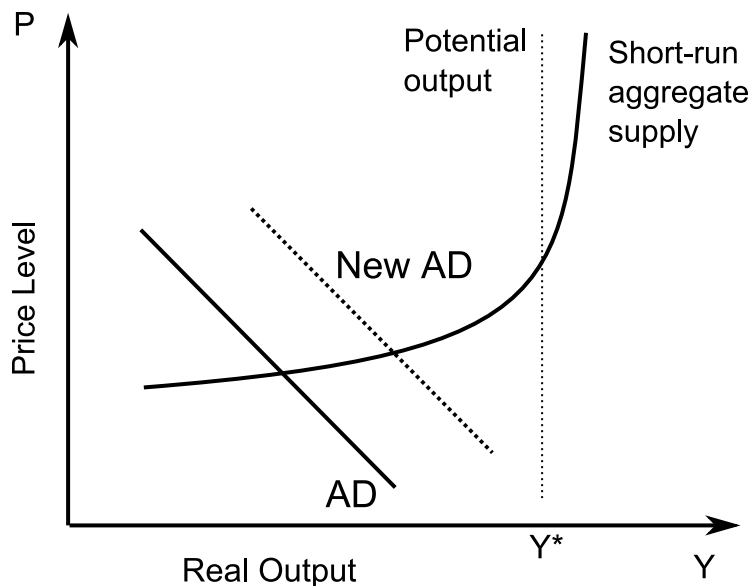
In economics, the aggregate supply (AS) is the total supply of goods and services that firms in an economy produce during a specific time period. It represents the total amount of goods and services that firms are willing to sell at a given price level. The aggregate supply curve is graphed as a backwards L-shape in the short-run and vertical in the long-run.

Aggregate demand (AD) is the total demand for final goods and services in the economy at a given time and price level. It shows the amounts of goods



and services that will be purchased at all the possible price levels. When aggregate demand increases its graph shifts to the right. It shifts to the left when it decreases which shows a fall in output and prices.

The aggregate supply and aggregate demand determine the output and price for goods and services. The AD-AS model is used to graph the aggregate expenditure and the point of equilibrium .



## AD-AS Model

This graph shows the AD-AS model where P is the average price level and  $Y^*$  is the aggregate quantity demanded. The model is used to show how increases in aggregate demand leads to increases in prices (inflation) and in output.

## Aggregate Expenditure

Aggregate expenditure is the current value of all the finished goods and services in the economy. The equation for aggregate expenditure is:  $AE = C + I + G + NX$ .

The aggregate expenditure equals the sum of the household consumption (C), investments (I), government spending (G), and net exports (NX).

# Graphing Equilibrium

The AD-AS model is used to graph the aggregate expenditure at the point of equilibrium. The AD-AS model includes price changes. An economy is said to be at equilibrium when the aggregate expenditure is equal to the aggregate supply (production) in the economy. It is important to note that the economy does not stay in a state of equilibrium. The aggregate expenditure and aggregate supply adjust each other towards equilibrium. When there is excess supply over expenditure, there is a reduction in the prices or the quantity or output. When there is an excess of expenditure over supply, then there is excess demand which leads to an increase in prices out output. In an effort to adjust and reach equilibrium, the economy constantly shifts between excess supply and excess demand. This shift is graphed using the AD-AS model which determines the output and price for the good or service.

## 24.1.4: The Multiplier Effect

When the fiscal multiplier exceeds one, the resulting impact on the national income is called the multiplier effect.

### Learning Objective

Explain the fiscal multiplier effect

### Key Points

- In economics, the fiscal multiplier is the ratio of change in the national income in relation to the change in government spending that causes it.
- The multiplier is influenced by an incremental amount of spending that leads to higher consumption spending, increased income, and then even more consumption. As a result, the overall national income is greater than the initial incremental amount of spending.
- The multiplier effect is a tool that is used by governments to attempt to stimulate aggregate demand in times of recession or economic uncertainty.

- The multiplier effect is criticized because it can create over crowding and an increase in the number of negative externalities.

## **Key Terms**

### fiscal multiplier

The ratio of a change in national income to the change in government spending that causes it.

### multiplier effect

A factor of proportionality that measures how much an endogenous variable changes in response to a change in some exogenous variable.

## **The Fiscal Multiplier and the Multiplier Effect**

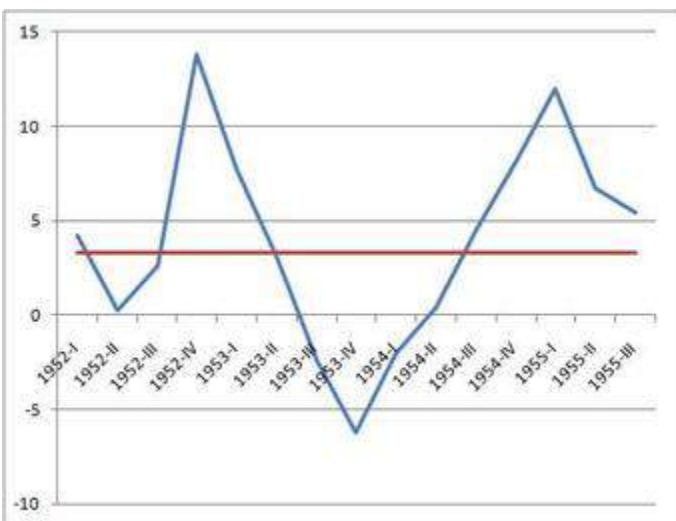
In economics, the fiscal multiplier is the ratio of change in the national income in relation to the change in government spending that causes it (not to be confused with the monetary multiplier). National income can change as a direct result in a change in spending whether it is private investment spending, consumer spending, government spending, or foreign export spending. When the fiscal multiplier exceeds one, the resulting impact on the national income is called the multiplier effect.

## **Cause of the Multiplier Effect**

The multiplier is influenced by an incremental amount of spending that leads to higher consumption spending, increased income, and then even more consumption. As a result, the overall national income is greater than the initial incremental amount of spending. Simply put, an initial shift in aggregate demand may cause a change in aggregate output (as well as the aggregate income it creates) that is a multiplier of the initial change.

## **Use of the Multiplier Effect**

The multiplier effect is a tool that is used by governments to attempt to stimulate aggregate demand in times of recession or economic uncertainty . The government invests money in order to create more jobs, which in turn will generate more spending to stimulate the economy. The goal is that the net increase in disposable income will be greater than the original investment.



## 1953 U.S. Recession

This graph shows the economic recession that occurred in the U.S. in 1953. During recessions, the government can use the multiplier effect in order to stimulate the economy.

## Criticisms

Although the multiplier effect usually measures values of one, there have been cases where multipliers of less than one are measured. This suggests that types of government spending can crowd out private investment or consumer spending that would have taken place without the government spending. Crowding out can occur because the initial increase in spending can cause an increase in the interest rates or the price level.

It has been argued that when a government relies heavily on fiscal multipliers, externalities such as environmental degradation, unsustainable

resource depletion, and social consequences can be neglected. Over reliance on fiscal multipliers can cause increased government spending on activities that create negative externalities (pollution, climate change, and resource depletion) instead of positive externalities (increased educational standards, social cohesion, public health, etc.).

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# 24.2: Introducing Aggregate Demand and Aggregate Supply

## 24.2.1: Explaining Fluctuations in Output

In the short run, output fluctuates with shifts in either aggregate supply or aggregate demand; in the long run, only aggregate supply affects output.

### Learning Objective

Differentiate between short-run and long-run effects of nominal fluctuations

### Key Points

- In the short run, output is determined by both the aggregate supply and aggregate demand within an economy. Anything that causes labor, capital, or efficiency to go up or down results in fluctuations in economic output.
- Aggregate supply and aggregate demand are graphed together to determine equilibrium. The equilibrium is the point where supply and demand meet.
- According to Hume, in the short-run, an increase in the money supply will lead to an increase in production.
- According to Hume, in the long-run, an increase in the money supply will do nothing.

### Key Terms

economic output

The productivity of a country or region measured by the value of goods and services produced.



nominal

Without adjustment to remove the effects of inflation (in contrast to real).

## **Economic Output**

In economics, output is the quantity of goods and services produced in a given time period. The level of output is determined by both the aggregate supply and aggregate demand within an economy. National output is what makes a country rich, not large amounts of money. For this reason, understanding the fluctuations in economic output is critical for long term growth. There are a series of factors that influence fluctuations in economic output including increases in growth and inputs in factors of production. Anything that causes labor, capital, or efficiency to go up or down results in fluctuations in economic output.

## **Aggregate Supply and Aggregate Demand**

Aggregate supply is the total amount of goods and services that firms are willing to sell at a given price in an economy. The aggregate demand is the total amounts of goods and services that will be purchased at all possible price levels.

In a standard AS-AD model, the output (Y) is the x-axis and price (P) is the y-axis. Aggregate supply and aggregate demand are graphed together to determine equilibrium. The equilibrium is the point where supply and demand meet to determine the output of a good or service.

## **Short-run vs. Long-run Fluctuations**

Supply and demand may fluctuate for a number of reasons, and this in turn may affect the level of output. There are noticeable differences between short-run and long-run fluctuations in output.

Over the short-run, an outward shift in the aggregate supply curve would result in increased output and lower prices. An outward shift in the aggregate demand curve would also increase output and raise prices. Short-run nominal fluctuations result in a change in the output level. In the short-run an increase in money will increase production due to a shift in the aggregate supply. More goods are produced because the output is increased and more goods are bought because of the lower prices.

 AS-AD Model

## **AS-AD Model**

This AS-AD model shows how the aggregate supply and aggregate demand are graphed to show economic output. The AD curve shifts to the right which increases output and price.

In the long-run, the aggregate supply curve and aggregate demand curve are only affected by capital, labor, and technology. Everything in the economy is assumed to be optimal. The aggregate supply curve is vertical which reflects economists' belief that changes in aggregate demand only temporarily change the economy's total output. In the long-run an increase in money will do nothing for output, but it will increase prices.

## **24.2.2: Classical Theory**

Classical theory, the first modern school of economic thought, reoriented economics from individual interests to national interests.

### **Learning Objective**

Identify the assumptions fundamental to classical economics

### **Key Points**

- When classical theory emerged, society was undergoing many changes. The primary economic question involved how a society could

be organized around a system in which every individual sought his own monetary gain.

- Classical economics focuses on the growth in the wealth of nations and promotes policies that create national economic expansion.
- Classical theory assumptions include the beliefs that markets self-regulate, prices are flexible for goods and wages, supply creates its own demand, and there is equality between savings and investments.

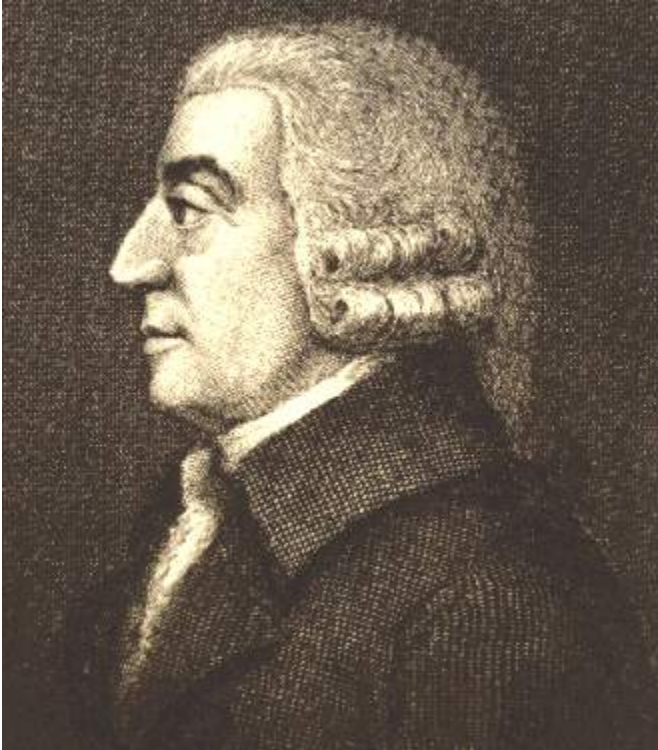
## **Key Term**

self-regulating

Describing something capable of controlling itself.

## **Classical Theory**

Classical theory was the first modern school of economic thought. It began in 1776 and ended around 1870 with the beginning of neoclassical economics. Notable classical economists include Adam Smith, Jean-Baptiste Say, David Ricardo, Thomas Malthus, and John Stuart Mill . During the period in which classical theory emerged, society was undergoing many changes. The primary economic question involved how a society could be organized around a system in which every individual sought his own monetary gain. It was not possible for a society to grow as a unit unless its members were committed to working together. Classical theory reoriented economics away from individual interests to national interests. Classical economics focuses on the growth in the wealth of nations and promotes policies that create national expansion. During this time period, theorists developed the theory of value or price which allowed for further analysis of markets and wealth. It analyzed and explained the price of goods and services in addition to the exchange value.



## **Adam Smith**

Adam Smith was one of the individuals who helped establish classical economic theory.

## **Classical Theory Assumptions**

Classical theory was developed according to specific economic assumptions:

- **Self-regulating markets:** classical theorists believed that free markets regulate themselves when they are free of any intervention. Adam Smith referred to the market's ability to self-regulate as the "invisible hand" because markets move towards their natural equilibrium without outside intervention.
- **Flexible prices:** classical economics assumes that prices are flexible for goods and wages. They also assumed that money only affects price and wage levels.

- Supply creates its own demand: based on Say's Law, classical theorists believed that supply creates its own demand. Production will generate an income enough to purchase all of the output produced. Classical economics assumes that there will be a net saving or spending of cash or financial instruments.
- Equality of savings and investment: classical theory assumes that flexible interest rates will always maintain equilibrium.
- Calculating real GDP: classical theorists determined that the real GDP can be calculated without knowing the money supply or inflation rate.
- Real and Nominal Variables: classical economists stated that real and nominal variables can be analyzed separately.

### **24.2.3: Keynesian Theory**

Keynesian economics states that in the short-run, economic output is substantially influenced by aggregate demand.

#### **Learning Objective**

Differentiate "Chicago School" or "Austrian School" economists from "Keynesian School" economists

#### **Key Points**

- Keynesian theory was first introduced by British economist John Maynard Keynes in his book *The General Theory of Employment, Interest, and Money*, which was published in 1936 during the Great Depression.
- Keynesian theorists believe that aggregate demand is influenced by a series of factors and responds unexpectedly. Shifts in aggregate demand impact production, employment, and inflation in the economy.
- Unemployment is the result of structural inadequacies within the economic system. It is not a product of laziness as believed previously.
- During a recession the economy may not return naturally to full employment. The government must step in and utilize government spending to stimulate economic growth. A lack of investment in goods

and services causes the economy to operate below its potential output and growth rate.

- Overcoming an economic depression required economic stimulus, which could be achieved by cutting interest rates and increasing the level of government investment.

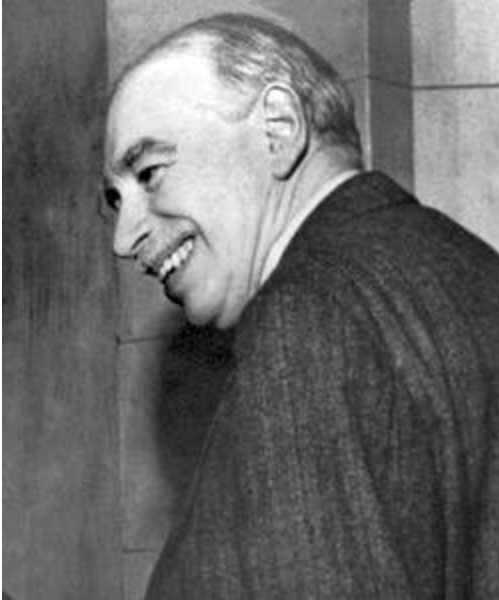
## **Key Term**

### Keynesian Economics

A school of thought that is characterized by a belief in active government intervention in an economy and the use of monetary policy to promote growth and stability.

## **Keynesian Theory**

In economics, the Keynesian theory was first introduced by British economist John Maynard Keynes in his book *The General Theory of Employment, Interest, and Money* which was published in 1936 during the Great Depression . Keynesian economics states that in the short-run, especially during recessions, economic output is substantially influenced by aggregate demand (the total spending in the economy). According to the Keynesian theory, aggregate demand does not necessarily equal the productive capacity of the economy. Keynesian theorists believe that aggregate demand is influenced by a series of factors and responds unexpectedly. The shift in aggregate demand impacts production, employment, and inflation in the economy.



## **John Maynard Keynes**

John Maynard Keynes introduced Keynesian theory in his book, *The General Theory of Employment, Interest, and Money*.

### **Economic Thought**

At the time that Keynesian theory was developed, mainstream economic thought believed that the economy existed in a state of general equilibrium. The belief was that the economy naturally consumes whatever it produces because the act of producing creates enough income in the economy for that consumption to take place.

Keynesian theory has certain characteristic beliefs:

- Unemployment is the result of structural inadequacies within the economic system. It is not a product of laziness as believed previously.
- During a recession, the economy may not return naturally to full employment. The government must step in and utilize government spending to stimulate economic growth. A lack of investment in goods and services causes the economy to operate below its potential output and growth rate.

- An active stabilization policy is needed to reduce the amplitude of the business cycle. Keynesian economists believed that aggregate demand for goods and services not meeting the supply was one of the most serious economic problems.
- Excessive saving, saving beyond investment, is a serious problem that encouraged recession and even depression.
- Cutting wages will not cure a recession.
- Overcoming an economic depression requires economic stimulus, which could be achieved by cutting interest rates and increasing the level of government investment.

## Schools of Economic Thought

It is important to understand the stances of the various school of economic thought. Although the beliefs of each school vary, all of the schools of economic thought have contributed to economic theory in some way.

The *Keynesian School* of economic thought emphasized the need for government intervention in order to stabilize and stimulate the economy during a recession or depression. In contrast, the *Chicago School* of economic thought focused on price theory, rational expectations, and free market policies with little government intervention. The *Austrian School* of economic thought focused on the belief that all economic phenomena are caused by the subjective choices of individuals. Unlike other schools, the Austrian school focused on individual actions instead of society as a whole.

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# 24.3: Aggregate Demand

## 24.3.1: Introducing Aggregate Demand

Aggregate demand (AD) is defined as the total demand for final goods and services in a given economy at a specific time.

### Learning Objective

Define Aggregate Demand

### Key Points

- To put it simply, AD is the sum of all demand in an economy. It is often called the effective demand or aggregate expenditure (AE), and is the demand of all gross domestic product (GDP).
- In summary, the calculation of aggregate demand can be represented as follows:  $AD = \text{Consumption} + \text{Investment} + \text{Government spending} + \text{Net export (exports - imports)}$ .
- Many societies have increasingly adopted debt and credit as an integral part of their economic system. This has justified the incorporation of debt (also called the credit impulse) into the larger framework of aggregate demand.
- There is some loss of accuracy in combining such a diverse array of economic inputs when calculating aggregate demand.

### Key Terms

expenditure

The act of incurring a cost or pay out.

aggregate demand

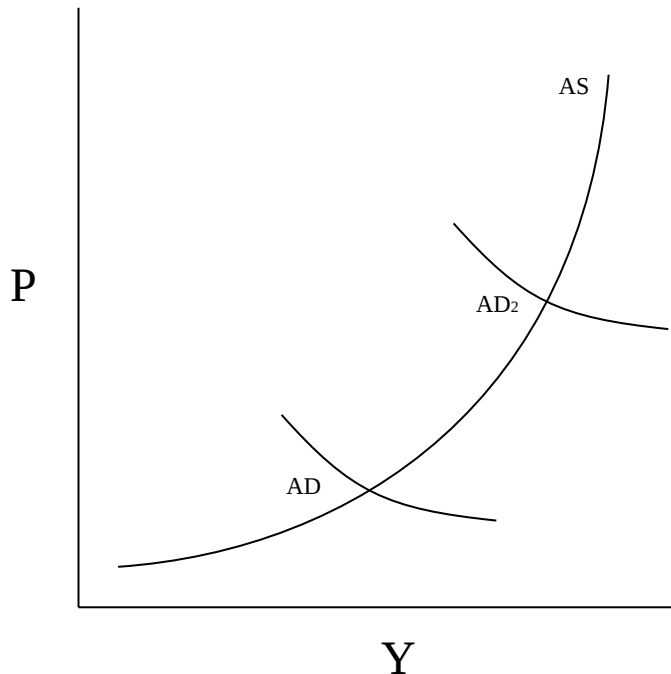
In macroeconomics, aggregate demand (AD) is the total demand for final goods and services in the economy at a given time and price level.

Aggregate demand (AD) is defined as the total demand for final goods and services in a given economy at a specific time. Unlike other illustrations of demand, it is inclusive of all amounts of the product or service purchased at any possible price level. Simply put, AD is the sum of all demand in an economy. It is often called the effective demand or aggregate expenditure (AE), and is the demand of all gross domestic product (GDP).

## Demand Sources

- Consumption (C): This is the simplest and largest component of aggregate demand (usually 40-60% of all demand), and is often what is intuitively thought of as demand. Consumption is just the amount of consumer spending executed in an economy. Taxes play a role in this exchange as well (i.e. sales tax).
- Investment (I): Investment is a relatively large portion of demand as well, and is referred to as Gross Domestic Fixed Capital Formation. This is the money spent by firms on capital investment (new machinery, factories, stocks, etc.). Investment equates to about 10% of GDP in most economies.
- Government Spending (G): This is referred to as General Government Final Consumption, and is the expenditure by the government. This can include welfare, social services, education, military, etc. Fiscal policy is the way in which governments can alter this spending to drive economic change.
- Net Export (NX): This can be put simply as the sale of goods to foreign countries subtracted by the purchase of goods from other countries (X-M). Trade surpluses and deficits can occur based on whether or not exports or imports are higher.

In summary, the calculation of aggregate demand can be represented as follows:  $AD = C + I + G + (X-M)$ . The full sum of all demand in an economy takes into account each of these factors in a quantitative way. This curve is illustrated in the figure .



## Aggregate Demand and Supply

This graph demonstrates the basic relationship between aggregate demand and aggregate supply. The aggregate demand curve is derived via the consumption, investment, government spending, and net export.

## The Role of Debt

Many societies have increasingly adopted debt and credit as an integral part of their economic system. This has justified the incorporation of debt (also called the credit impulse) into the larger framework of aggregate demand. From a quantitative perspective this is simply expressed as:  $\text{Spending} = \text{Income} + \text{Net Increase in Debt}$ . Spending capital prior to the receipt of capital is an important consideration at both the consumer level and the government level (deficit spending).

## The Aggregation Problem

There are some limitations to the aggregation perspective, generally summarized as the aggregation problem. The difficulty arises in treating all

consumer preferences (and thus their respective demands) as homogeneous and continuous. As the numbers of consumers, the tastes of consumers and the distribution levels of incomes will alter, so too will the demand curve. This can create inaccurate assumptions in AD inputs. Simply, there is some loss of accuracy in combining such a diverse array of economic inputs.

## **24.3.2: The Slope of the Aggregate Demand Curve**

Due to Pigou's Wealth Effect, the Keynes' Interest Rate Effect, and the Mundell-Fleming Exchange Rate Effect, the AD curve slopes downward.

### **Learning Objective**

Explain the factors that influence the slope of the aggregate demand curve

### **Key Points**

- Pigou's Wealth Effect, the Keynes' Interest Rate Effect, and the Mundell-Fleming Exchange Rate Effect are all theoretical inputs that reaffirm a downwards slope for aggregate demand (AD).
- The critical takeaway from Keynes's perspective on the slope of the aggregate demand curve is that interest rates affect expenditures more than they affect savings. As a result, insufficient AD is not sustainable in a given system.
- The simplest way to put to wealth effect is that an increase in spending will denote an increase in wealth.
- Robert Mundell and Marcus Fleming noted that incorporating the nominal exchange rate into the mix makes it impossible to maintain free capital movement, a fixed exchange rate and independent monetary policy.
- While these varying effects make the concept of aggregate demand slopes seem somewhat complicated, the most important thing to keep in mind is that people will be demanding more goods when they are cheaper.

### **Key Term**

liquidity trap

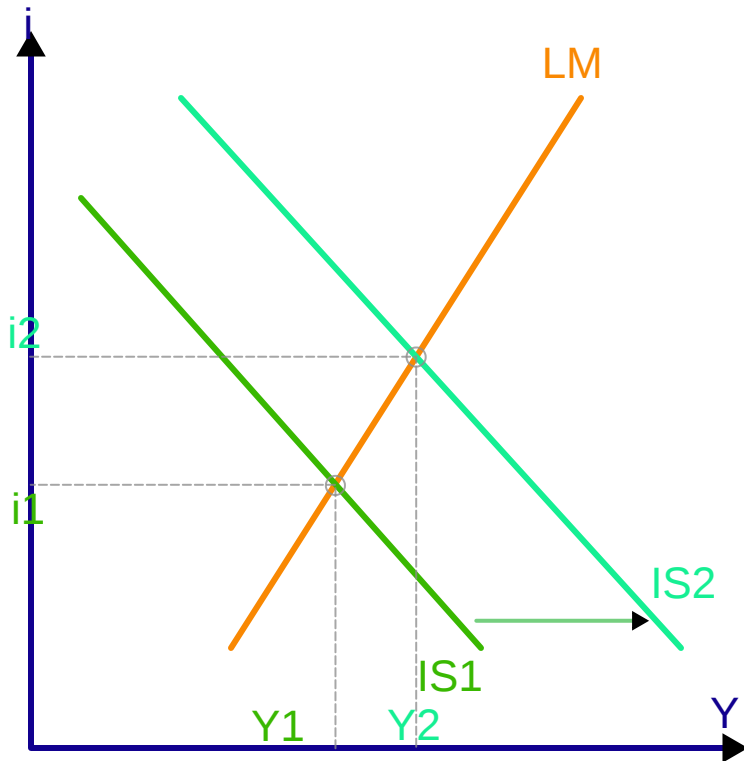
Injections of cash into the private banking system by a central bank fail to lower interest rates and stimulate economic growth.

Aggregate demand (AD) is the total demand for all goods within a given market at a given time, or the summation of demand curves within a system. Understanding the basic graphical representation of this curve is useful in grasping the implications of AD on an economic system, as well as the distinct effects which drive it. As a result of Keynes' interest rate effect, Pigou's wealth effect, and the Mundell-Fleming exchange rate effect, the AD curve is downward sloping.

## **Keynes' Interest Rate Effect**

The critical point from Keynes's perspective on the slope of the aggregate demand curve is that interest rates affect expenditures more than they affect savings. If prices fall, a given amount of money will increase in value. This will drive up interest rates and investments. It is important to note that insufficient demand in a market will not go on forever.

In understanding this fully, it is useful to look at an IS-LM graph (see ). There are only two times when the Keynes observation on the interest rate effect will be inaccurate, and that is if the IS (investment savings) curve were to be vertical or if the LM (liquidity preference money supply) curve were to be horizontal. This makes sense if you think about it, it would basically equate to a liquidity trap. A vertical IS curve or a horizontal LM curve would essentially negate the way in which interest rates could affect aggregate demand.



## IS-LM Model

The IS-LM model takes investments and savings and compares that to liquidity and the overall money supply. It is highly useful in understanding macroeconomics from a Keynesian perspective. Interest rates ( $i$ ) are on the vertical axis, and output ( $y$ ) is on the horizontal axis.

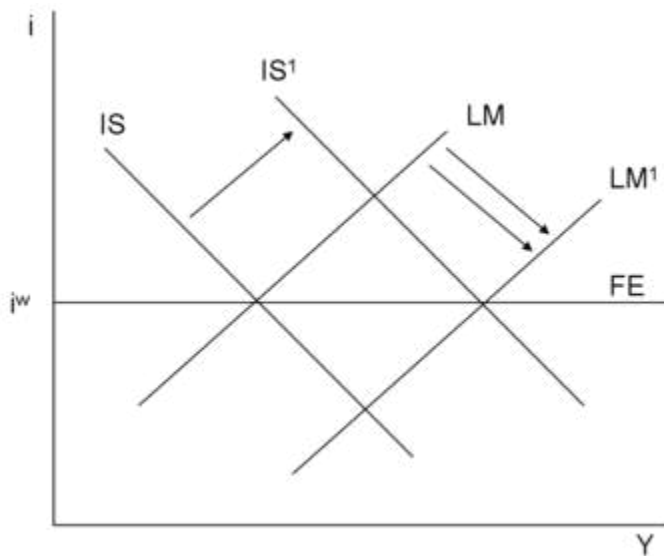
## Pigou's Wealth Effect

In the context of the above discussion on Keynes, Pigou's Wealth Effect underlines the fact that liquidity traps are not sustainable. The simplest way to explain the Wealth Effect is that an increase in spending will denote an increase in wealth. In many ways, what Pigou is putting forward is the idea that downwards spiral on the IS-LM model, as predicted by Keynes due to deflation, will be counterbalanced by an increase in real wages and thus an increase in expenditure. In other words, a decrease in employment and prices will eventually see higher purchasing power and an increase in spending, creating wealth.



## Mundell-Fleming Exchange Rate Effect

Perhaps the most complex of the three inputs underlined in deriving aggregate demand is the Mundell-Fleming Exchange Rate Effect. Just like the previous two, this builds off of the IS-LM model in a way that discusses it in the context of an open economy (as opposed to a closed system). It essentially takes into account a new factor (in addition to interest rates and outputs, as the traditional IS-LM model incorporates). This new factor is the exchange rates, as the name implies. Robert Mundell and Marcus Fleming noted that incorporating the nominal exchange rate into the mix makes it impossible to maintain free capital movement, a fixed exchange rate and independent monetary policy. This is sometimes referred to as the 'impossible trinity,' implying that trade-offs must be made. This concept is illustrated fairly well in this figure, where 'FE' is fixed expenditure.



## Mundell-Fleming Fixed Exchange Rate Illustration

An increase in government spending forces the monetary authority to supply the market with local currency to keep the exchange rate unchanged. Shown here is the case of perfect capital mobility, in which the BoP curve (or, as denoted here, the FE curve) is horizontal.

## Conclusion

While these varying effects make the concept of aggregate demand slopes seem somewhat complicated, the most important thing to keep in mind is that people will be demanding more goods when they are cheaper. The analysis of interest rates displayed above, through the wealth effect in particular, offsets the negative spiral that could occur as a result of deflation and decreased employment. These effects also play a crucial role in understanding the way in which the larger and more complex environment, including investments and fiscal and monetary policy, will retain this downwards slope.

### 24.3.3: Reasons for and Consequences of Shifts in the Aggregate Demand Curve

An increase in any of the four inputs into AD will result in higher real output or an increase in prices.

#### Learning Objective

Describe exogenous events that can shift the aggregate demand curve

#### Key Points

- There are four basic inputs to consider in calculating AD: consumption (C), investment (I), government spending (G) and net exports (NX, which is exports (X) – imports (I)).
- There are a variety of direct and indirect consequences in AD shifts. For the purpose of this discussion, it is most important to keep in mind changes in output and price.
- As the system moves closer to the highest potential output (optimal utilization of resources, or  $Y^*$ ), scarcity will naturally cause prices to increase more than the overall output in a system.
- As the system moves closer to the highest potential output (or optimal utilization of resources, or  $Y^*$ ), scarcity will naturally see the prices

increases more so than the overall output in a system.

## Key Term

exogenous

Received from outside a group

Aggregate demand (AD) is the summation of all demand within a given economy at a given time.

## Inputs

There are four inputs to consider in calculating AD (and deriving the graphical curve which represents it): consumption (C), investment (I), government spending (G), and net exports (NX, which is exports (X) – imports (I)). Changes in these inputs will have some influence on the AD curve. For example, an increase in total expenditures will result in a shift rightwards, while a decrease in expenditure will result in a shift to the left.

## Aggregate Demand Curves

Two specific AD representations are useful to consider:

- Keynesian Cross: The Keynesian Cross is a simple illustration of the relationship between aggregate demand and desired total spending (linear at 45 degrees). The intersecting AD line will generally have an upwards slope, under the assumption that increased national output should result in increased disposable income.
- Aggregate Demand/Aggregate Supply Model (AD/AS): The x-axis represents the overall output, while the y-axis represents the price level. The aggregate quantity demanded ( $Y = C + I + G + NX$ ) is calculated at every given aggregate average price level.

## Exogenous Effects

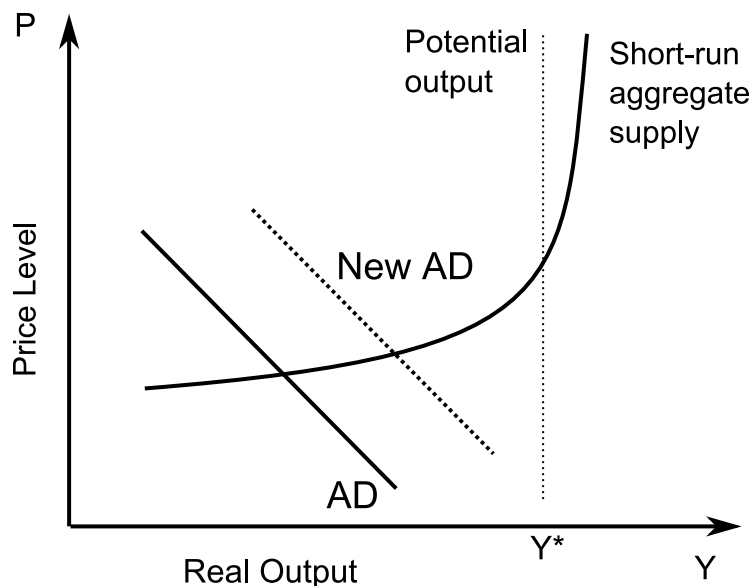
There are a variety of direct and indirect consequences to AD shifts. For the purpose of this discussion, the key consequences to keep in mind are changes in output and price. Below are some of the driving forces that will shift aggregate demand to the right:

- An exogenous increase in consumer spending;
- An exogenous increase in investment spending on physical capital;
- An exogenous increase in intended inventory investment;
- An exogenous increase in government spending on goods and services;
- An exogenous increase in transfer payments from the government to the people;
- An exogenous decrease in taxes levied;
- An exogenous increase in purchases of the country's exports by people in other countries; and
- An exogenous decrease in imports from other countries.

## Short-term Implications

As noted above, any increase in the overall AD will result in an outwards (right-ward) shift of the AD curve. (Conversely, a decrease in aggregate demand will cause a leftward shift of the AD curve. ) This means that an increase in any of the four inputs to AD will result in a higher quantity of real output or an increase in prices across the board (this is also known as inflation). However, different levels of economic activity will result in different combinations of output and price increases.

is useful for understanding the distribution between price increases and output increases that will result in a given economy when AD increases. To put simply, the lower the utilization of available resources in a system, the more an increase in AD will result in higher output and thus higher employment and GDP growth. However, as the system evolves and aligns itself closer to the highest potential output (optimal utilization of resources or  $Y^*$ ), scarcity will naturally cause the prices to increase more than the overall output in a system. This is somewhat intuitive economically when scarcity and utilization are taken into account. The more difficult it is to generate a supply increase the more likely a shift in AD will drive up prices.



## Aggregate Supply/Aggregate Demand

This graph illustrates the relationship between price and output within a given economic system in the context of aggregate demand and supply.

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# 24.4: Aggregate Supply

## 24.4.1: Introducing Aggregate Supply

Aggregate supply is the total supply of goods and services that firms in a national economy plan to sell during a specific time period.

### Learning Objective

Define Aggregate Supply

### Key Points

- Aggregate supply is the relationship between the price level and the production of the economy.
- In the short-run, the aggregate supply is graphed as an upward sloping curve.
- The short-run aggregate supply equation is:  $Y = Y^* + \alpha(P - P_e)$ . In the equation,  $Y$  is the production of the economy,  $Y^*$  is the natural level of production of the economy, the coefficient  $\alpha$  is always greater than 0,  $P$  is the price level, and  $P_e$  is the expected price level from consumers.
- In the long-run, the aggregate supply is graphed vertically on the supply curve.
- The equation used to determine the long-run aggregate supply is:  $Y = Y^*$ . In the equation,  $Y$  is the production of the economy and  $Y^*$  is the natural level of production of the economy.

### Key Terms

output

Production; quantity produced, created, or completed.

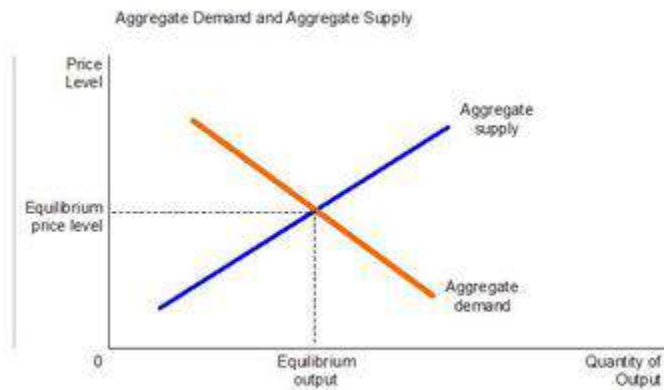
factor of production



A resource employed to produce goods and services, such as labor, land, and capital.

## Aggregate Supply

In economics, aggregate supply is the total supply of goods and services that firms in a national economy plan to sell during a specific time period. It is the total amount of goods and services that the firms are willing to sell at a given price level in the economy. Aggregate supply is the relationship between the price level and the production of the economy .



## Aggregate Supply

Aggregate supply is the total quantity of goods and services supplied at a given price. Its intersection with aggregate demand determines the equilibrium quantity supplied and price.

## Short-run Aggregate Supply

In the short-run, the aggregate supply is graphed as an upward sloping curve. The equation used to determine the short-run aggregate supply is:  $Y = Y^* + \alpha(P - P_e)$ . In the equation,  $Y$  is the production of the economy,  $Y^*$  is the natural level of production of the economy, the coefficient  $\alpha$  is always

greater than 0,  $P$  is the price level, and  $P_e$  is the expected price level from consumers.

The short-run aggregate supply curve is upward sloping because the quantity supplied increases when the price rises. In the short-run, firms have one fixed factor of production (usually capital). When the curve shifts outward the output and real GDP increase at a given price. As a result, there is a positive correlation between the price level and output, which is shown on the short-run aggregate supply curve.

## **Long-run Aggregate Supply**

In the long-run, the aggregate supply is graphed vertically on the supply curve. The equation used to determine the long-run aggregate supply is:  $Y = Y^*$ . In the equation,  $Y$  is the production of the economy and  $Y^*$  is the natural level of production of the economy.

The long-run aggregate supply curve is vertical which reflects economists' beliefs that changes in the aggregate demand only temporarily change the economy's total output. In the long-run, only capital, labor, and technology affect aggregate supply because everything in the economy is assumed to be used optimally. The long-run aggregate supply curve is static because it is the slowest aggregate supply curve.

### **24.4.2: The Slope of the Short-Run Aggregate Supply Curve**

In the short-run, the aggregate supply curve is upward sloping.

#### **Learning Objective**

Summarize the characteristics of short-run aggregate supply

#### **Key Points**

- The AS curve is drawn using a nominal variable, such as the nominal wage rate. In the short-run, the nominal wage rate is fixed. As a result, an increasing price indicates higher profits that justify the expansion of output.
- The AS curve increases because some nominal input prices are fixed in the short-run and as output rises, more production processes encounter bottlenecks.
- In the short-run, the production can be increased without much diminishing returns. The average price level does not have to rise much in order to justify increased production. In this case, the AS curve is flat.
- When demand is high, there are few production processes that have unemployed fixed outputs. Any increase in demand production causes the prices to increase which results in a steep or vertical AS curve.

## **Key Terms**

supply

The amount of some product that producers are willing and able to sell at a given price, all other factors being held constant.

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

## **Aggregate Supply**

Aggregate supply is the total supply of goods and services that firms in a national economy plan to sell during a specific period of time. It is the total amount of goods and services that firms are willing to sell at a given price level.

## **Short-run Aggregate Supply Curve**

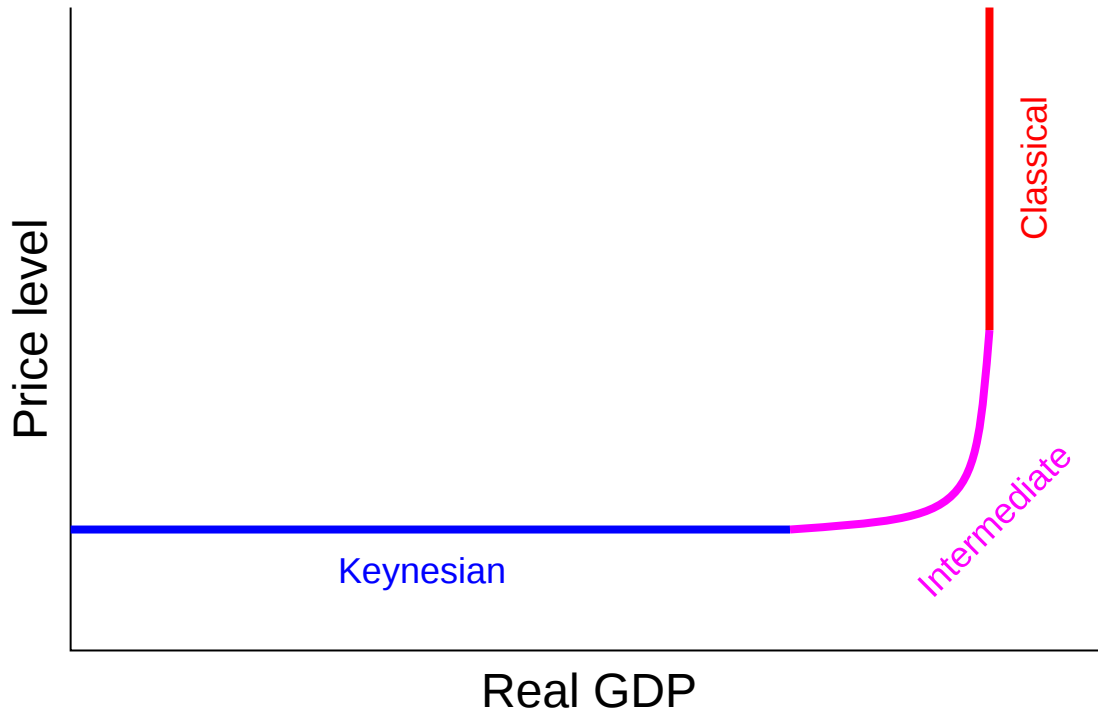
In the short-run, the aggregate supply curve is upward sloping. There are two main reasons why the quantity supplied increases as the price rises:

1. The AS curve is drawn using a nominal variable, such as the nominal wage rate. In the short-run, the nominal wage rate is fixed. As a result, an increasing price indicates higher profits that justify the expansion of output.
2. An alternate model explains that the AS curve increases because some nominal input prices are fixed in the short-run and as output rises, more production processes encounter bottlenecks. At low levels of demand, large numbers of production processes do not make full use of their fixed capital equipment. As a result, production can be increased without much diminishing returns. The average price level does not have to rise much in order to justify increased production. In this case, the AS curve is flat. Likewise, when demand is high, there are few production processes that have unemployed fixed outputs. Any increase in demand production causes the prices to increase which results in a steep or vertical AS curve.

## Short-run Aggregate Supply Equation

The equation used to calculate the short-run aggregate supply is:  $Y = Y^* + \alpha(P - P_e)$ . In the equation,  $Y$  is the production of the economy,  $Y^*$  is the natural level of production, coefficient is always positive,  $P$  is the price level, and  $P_e$  is the expected price level.

In the short-run, firms possess fixed factors of production, including prices, wages, and capital. It is possible for the short-run supply curve to shift outward as a result of an increase in output and real GDP at a given price . As a result, the short-run aggregate supply curve shows the correlation between the price level and output.



## Aggregate Supply Curve

This graph shows the aggregate supply curve. In the short-run the aggregate supply curve is upward sloping. When the curve shifts outward, it is due to an increase in output and real GDP.

### 24.4.3: The Slope of the Long-Run Aggregate Supply Curve

The long-run aggregate supply curve is perfectly vertical; changes in aggregate demand only cause a temporary change in total output.

#### Learning Objective

Assess factors that influence the shape and movement of the long run aggregate supply curve

## Key Points

- The long-run is a planning and implementation phase. It is the conceptual time period in which there are no fixed factors of production.
- In the long-run, only capital, labor, and technology affect the aggregate supply curve because at this point everything in the economy is assumed to be used optimally.
- Aggregate supply is usually inadequate to supply ample opportunity. Often, this is fixed capital equipment. The AS curve is drawn given some nominal variable, such as the nominal wage rate.
- In the long run, the nominal wage rate varies with economic conditions (high unemployment leads to falling nominal wages -- and vice-versa).
- The equation used to calculate the long-run aggregate supply is:  $Y = Y^*$ . In the equation,  $Y$  is the level of economic production and  $Y^*$  is the natural level of production.

## Key Term

long-run

The conceptual time period in which there are no fixed factors of production.

## Aggregate Supply

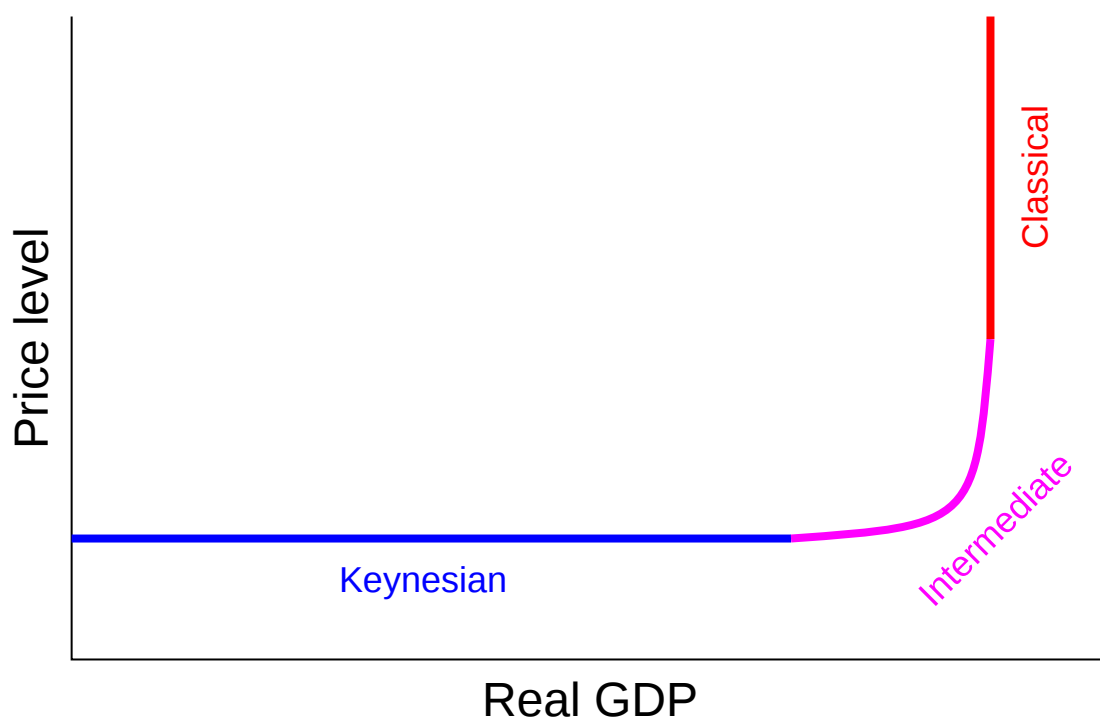
In economics, aggregate supply is defined as the total supply of goods and services that firms in a national economy are willing to sell at a given price level.

## Long-run in Economics

The long-run is the conceptual time period in which there are no fixed factors of production; all factors can be changed. In the long-run, firms change supply levels in response to expected economic profits or losses.

# Long-run Aggregate Supply Curve

In the long-run, only capital, labor, and technology affect the aggregate supply curve because at this point everything in the economy is assumed to be used optimally. The long-run aggregate supply curve is static because it shifts the slowest of the three ranges of the aggregate supply curve. The long-run aggregate supply curve is perfectly vertical, which reflects economists' belief that the changes in aggregate demand only cause a *temporary* change in an economy's total output . In the long-run, there is exactly one quantity that will be supplied.



## Aggregate Supply

This graph shows the aggregate supply curve. In the long-run the aggregate supply curve is perfectly vertical, reflecting economists' belief that changes in aggregate demand only cause a temporary change in an economy's total output.

The long-run aggregate supply curve can be shifted, when the factors of production change in quantity. For example, if there is an increase in the number of available workers or labor hours in the long run, the aggregate supply curve will shift outward (it is assumed the labor market is always in equilibrium and everyone in the workforce is employed). Similarly, changes in technology can shift the curve by changing the potential output from the same amount of inputs in the long-term.

For the short-run aggregate supply, the quantity supplied increases as the price rises. The AS curve is drawn given some nominal variable, such as the nominal wage rate. In the short run, the nominal wage rate is taken as fixed. Therefore, rising  $P$  implies higher profits that justify expansion of output. However, in the long run, the nominal wage rate varies with economic conditions (high unemployment leads to falling nominal wages -- and vice-versa).

The equation used to calculate the long-run aggregate supply is:  $Y = Y^*$ . In the equation,  $Y$  is the level of economic production and  $Y^*$  is the natural level of production.

## **24.4.4: Moving from Short-Run to Long-Run**

In the short-run, the price level of the economy is sticky or fixed; in the long-run, the price level for the economy is completely flexible.

### **Learning Objective**

Recognize the role of capital in the shape and movement of the short-run and long-run aggregate supply curve

### **Key Points**

- When capital increases, the aggregate supply curve will shift to the right, prices will drop, and the quantity of the good or service will increase.
- The short-run aggregate supply curve is an upward slope. The short-run is when all production occurs in real time.



- The long-run curve is perfectly vertical, which reflects economists' belief that changes in aggregate demand only temporarily change an economy's total output. The long-run is a planning and implementation stage.
- Aggregate supply moves from short-run to long-run by considering some equilibrium that is the same for both short and long-run when analyzing supply and demand. That state of equilibrium is then compared to the new short-run and long-run equilibrium state from a change that disturbs equilibrium.

## **Key Term**

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings (structures).

In economics, the short-run is the period when general price level, contractual wages, and expectations do not fully adjust. In contrast, the long-run is the period when the previously mentioned variables adjust fully to the state of the economy.

## **Aggregate Supply**

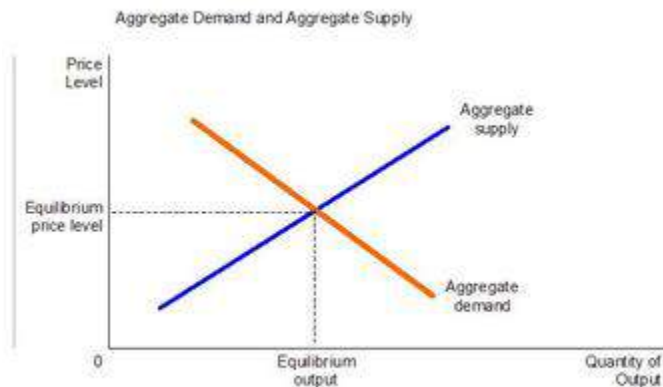
Aggregate supply is the total amount of goods and services that firms are willing to sell at a given price level.

When capital increases, the aggregate supply curve will shift to the right, prices will drop, and the quantity of the good or service will increase.

## **Short-run Aggregate Supply**

During the short-run, firms possess one fixed factor of production (usually capital). It is possible for the curve to shift outward in the short-run, which results in increased output and real GDP at a given price. In the short-run,

there is a positive relationship between the price level and the output . The short-run aggregate supply curve is an upward slope. The short-run is when all production occurs in real time.



## Aggregate Supply

This graph shows the relationship between aggregate supply and aggregate demand in the short-run. The curve is upward sloping and shows a positive correlation between the price level and output.

## Long-run Aggregate Supply

In the long-run only capital, labor, and technology impact the aggregate supply curve because at this point everything in the economy is assumed to be used optimally. The long-run supply curve is static and shifts the slowest of all three ranges of the supply curve. The long-run curve is perfectly vertical, which reflects economists' belief that changes in aggregate demand only temporarily change an economy's total output. The long-run is a planning and implementation stage.

## Moving from Short-run to Long-run

In the short-run, the price level of the economy is sticky or fixed depending on changes in aggregate supply. Also, capital is not fully mobile between

sectors.

In the long-run, the price level for the economy is completely flexible in regards to shifts in aggregate supply. There is also full mobility of labor and capital between sectors of the economy.

The aggregate supply moves from short-run to long-run when enough time passes such that no factors are fixed. That state of equilibrium is then compared to the new short-run and long-run equilibrium state if there is a change that disturbs equilibrium.

## **24.4.5: Reasons for and Consequences of Shifts in the Short-Run Aggregate Supply Curve**

The short-run aggregate supply shifts in relation to changes in price level and production.

### **Learning Objective**

Identify common reasons for shifts in the short-run aggregate supply curve,  
Explain the consequences of shifts in the short-run aggregate supply curve

### **Key Points**

- In the short-run, the aggregate supply curve is upward sloping because some nominal input prices are fixed and as the output rises, more production processes experience bottlenecks.
- At low levels of demand, production can be increased without diminishing returns and the average price level does not rise.
- When the demand is high, few production processes have unemployed fixed inputs. Any increase in demand and production increases the prices.
- Any event that results in a change of production costs shifts the short-run supply curve outwards or inwards if the production costs are decreased or increased.

## Key Term

short-run

When one or more factors are fixed.

## Aggregate Supply

The aggregate supply is the relation between the price level and production of an economy. It is the total supply of goods and services that firms in a national economy plan on selling during a specific time period at a given price level.

## Short-run Aggregate Supply

In the short-run, the aggregate supply curve is upward sloping because some nominal input prices are fixed and as the output rises, more production processes experience bottlenecks. At low levels of demand, production can be increased without diminishing returns and the average price level does not rise. However, when the demand is high, few production processes have unemployed fixed inputs. Any increase in demand and production increases the prices. In the short-run, the general price level, contractual wage rates, and expectations may not fully adjust to the state of the economy.

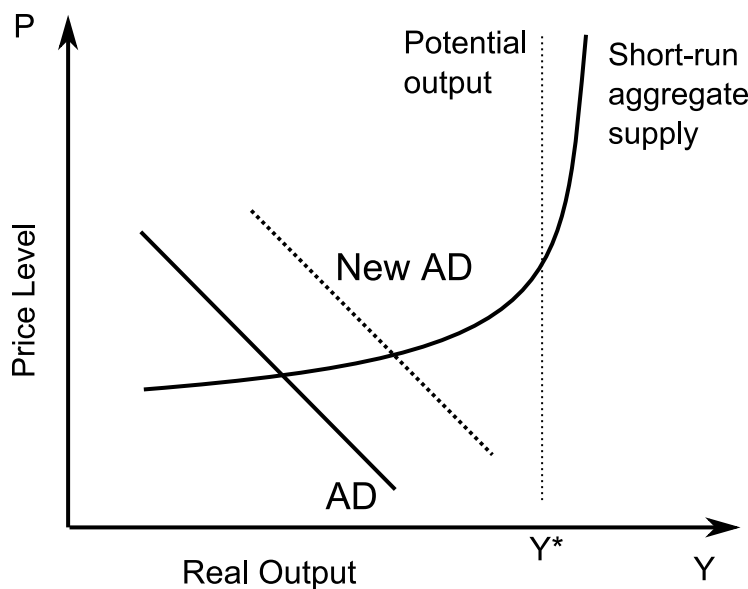
## Shifts in the Short-run Aggregate Supply

The short-run aggregate supply shifts in relation to changes in price level and production. The equation used to determine the short-run aggregate supply is:  $Y = Y^* + \alpha(P - P_e)$ .  $Y$  is the production of the economy,  $Y^*$  is the natural level of production, coefficient  $\alpha$  is always positive,  $P$  is the price level, and  $P_e$  is the expected price level.

In the short-run, examples of events that shift the aggregate supply curve to the right include a decrease in wages, an increase in physical capital stock,

or advancement of technology. The short-run curve shifts to the right the price level decreases and the GDP increases. When the curve shifts to the left, the price level increases and the GDP decreases.

Any event that results in a change of production costs shifts the short-run supply curve outwards or inwards if the production costs are decreased or increased. Factors that impact and shift the short-run curve are taxes and subsidies, price of labor (wages), and the price of raw materials. Changes in the quantity and quality of labor and capital also influence the short-run aggregate supply curve.



## Short-run Aggregate Supply

This graph shows the Aggregate Supply-Aggregate Demand model. In regards to aggregate supply, increases or decreases in the price level and output cause the aggregate supply curve to shift in the short-run.

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# 24.5: The Aggregate Demand-Supply Model

## 24.5.1: Macroeconomic Equilibrium

In economics, the macroeconomic equilibrium is a state where aggregate supply equals aggregate demand.

### Learning Objective

Analyze aggregate demand and supply in the long run

### Key Points

- Equilibrium is the price-quantity pair where the quantity demanded is equal to the quantity supplied.
- In the long-run, increases in aggregate demand cause the output and price of a good or service to increase.
- In the long-run, the aggregate supply is affected only by capital, labor, and technology.
- The aggregate supply determines the extent to which the aggregate demand increases the output and prices of a good or service.

### Key Terms

aggregate

A mass, assemblage, or sum of particulars; something consisting of elements but considered as a whole.

supply

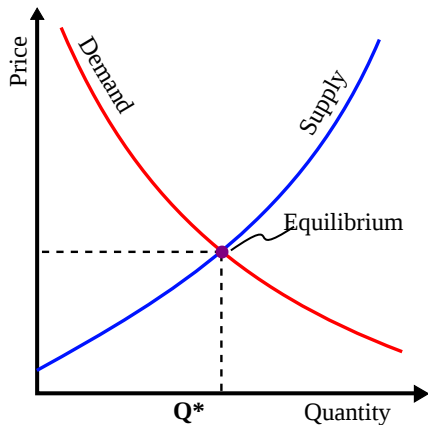
The amount of some product that producers are willing and able to sell at a given price, all other factors being held constant.

demand

The desire to purchase goods and services.

## Economic Equilibrium

In economics, equilibrium is a state where economic forces (supply and demand) are balanced. Without any external influences, price and quantity will remain at the equilibrium value .



## Equilibrium

Similar to microeconomic equilibrium, the macroeconomic equilibrium is the point at which the aggregate supply intersects the aggregate demand.

## Supply and Demand

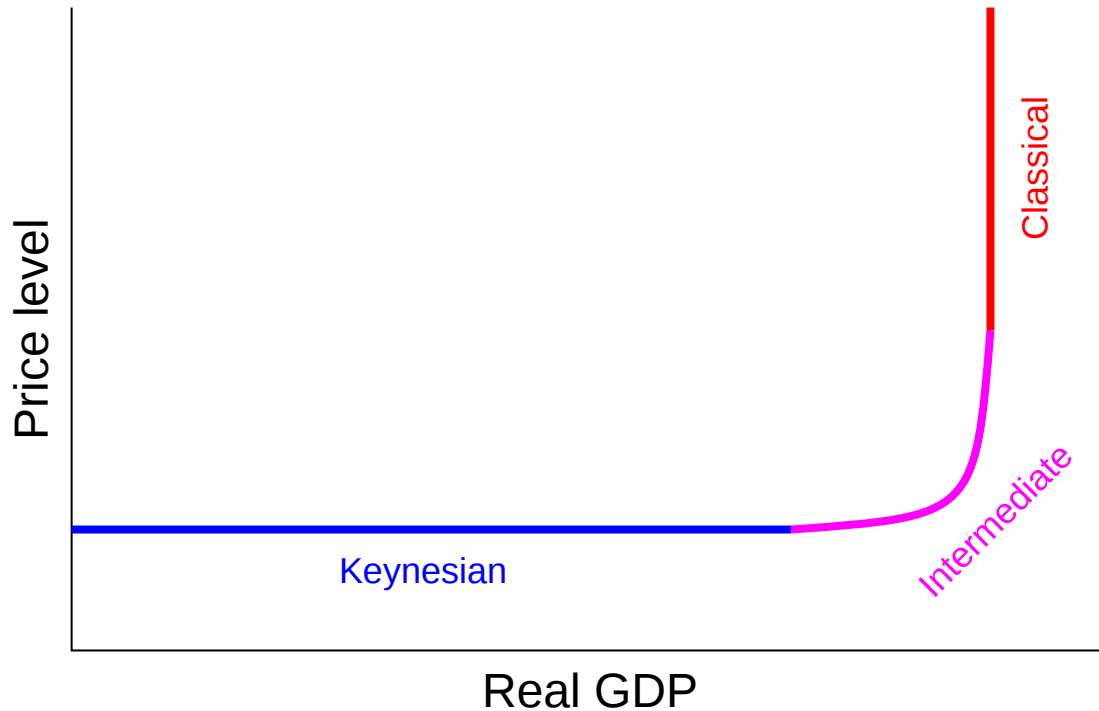
Determining the supply and demand for a good or services provides a model of price determination in a market. In a competitive market, the unit price for a good will vary until it settles at a point where the quantity demanded equals the quantity supplied. The result is the economic equilibrium for that good or service.

There are four basic laws of supply and demand. The laws impact both supply and demand in the long-run.

1. If quantity demand increases and supply remains unchanged, a shortage occurs, leading to a higher price until the quantity demanded is pushed back to equilibrium.
2. If quantity demand decreases and supply remains unchanged, a surplus occurs, leading to a lower price until the quantity demanded is pushed back to equilibrium.
3. If quantity demand remains unchanged and supply increases, a surplus occurs, leading to a lower price until the quantity supplied is pushed back to equilibrium.
4. If quantity demand remains unchanged and supply decreases, a shortage occurs, leading to a higher price until the quantity supplied is pushed back to equilibrium.

## **Aggregate Supply and Aggregate Demand**

Aggregate supply is the total supply of goods and services that firms in a national economy plan on selling during a specific time period. It is the total amount of goods and services that firms are willing to sell at a specific price level in an economy .



## Aggregate supply

This graph shows the three stages of aggregate supply. It is the total supply of goods and services that firms in a national economy plan to sell during a specific time period. Changes in aggregate supply cause shifts along the supply curve.

Aggregate demand is the total demand for final goods and services in an economy at a given time and price level. It is the demand for the gross domestic product (GDP) of a country.

## Aggregate Supply-Aggregate Demand Model

Equilibrium is the price-quantity pair where the quantity demanded is equal to the quantity supplied. It is represented on the AS-AD model where the demand and supply curves intersect. In the long-run, increases in aggregate demand cause the price of a good or service to increase. When the demand increases the aggregate demand curve shifts to the right. In the long-run, the

aggregate supply is affected only by capital, labor, and technology. Examples of events that would increase aggregate supply include an increase in population, increased physical capital stock, and technological progress. The aggregate supply determines the extent to which the aggregate demand increases the output and prices of a good or service.

When the aggregate supply and aggregate demand shift, so does the point of equilibrium. The aggregate demand curve shifts and the equilibrium point moves horizontally along the aggregate supply curve until it reaches the new aggregate demand point.

## **24.5.2: Reasons for and Consequences of Shift in Aggregate Demand**

A short-run shift in aggregate demand can change the equilibrium price and output level.

### **Learning Objective**

Explain the causes of economic fluctuations using aggregate demand curves

### **Key Points**

- The aggregate supply curve determines the extent to which increases in aggregate demand lead to increases in real output or increases in prices.
- The equation used to calculate aggregate demand is:  $AD = C + I + G + (X - M)$ .
- The aggregate demand curve shifts to the right as a result of monetary expansion.
- If the monetary supply decreases, the demand curve will shift to the left.

### **Key Terms**

aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

### Supply curve

A graph that illustrates the relationship between the price of a good and the quantity supplied.

### output

Production; quantity produced, created, or completed.

## **Aggregate Demand**

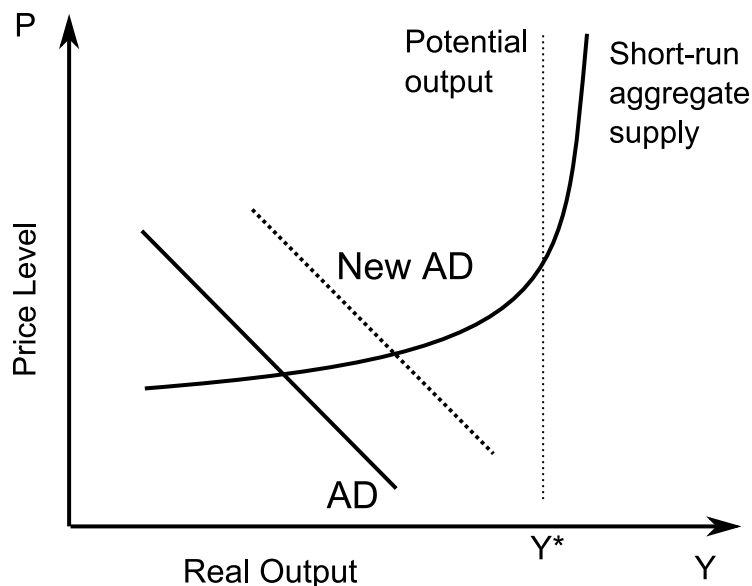
In economics, aggregate demand is the total demand for final goods and services at a given time and price level. It gives the amounts of goods and services that will be demanded at all possible price levels, which, unless there are shortages, is equivalent to GDP. Aggregate demand equals the sum of consumption (C), investment (I), government spending (G), and net export (X -M). This is often written as an equation, which is given by:

$$AD = C + I + G + (X - M).$$

## **Shifts in the Aggregate Supply-Aggregate Demand Model**

The aggregate supply-aggregate demand model uses the theory of supply and demand in order to find a macroeconomic equilibrium. The shape of the aggregate supply curve helps to determine the extent to which increases in aggregate demand lead to increases in real output or increases in prices. An increase in any of the components of aggregate demand shifts the AD curve to the right. When the AD curve shifts to the right it increases the level of production and the average price level. When an economy gets close to potential output, the price will increase more than the output as the AD rises

.



## AS-AD Model

The Aggregate Supply-Aggregate Demand Model shows how equilibrium is determined by supply and demand. It shows how increases and decreases in output and prices impact the economy in the short-run and long-run. The model is also used to show real and potential output.

When price increase dominates an economy, this means that the economy is near its potential output.

## Reasons for Aggregate Demand Shift

The slope of the aggregate demand curve shows the extent to which the real balances change the equilibrium level of spending. The aggregate demand curve shifts to the right as a result of monetary expansion. In an economy, when the nominal money stock is increased, it leads to higher real money stock at each level of prices. The interest rates decrease which causes the public to hold higher real balances. This stimulates aggregate demand, which increases the equilibrium level of income and spending. Likewise, if the monetary supply decreases, the demand curve will shift to the left.

## 24.5.3: Reasons for and Consequences of Shift in Aggregate Supply

In economics, the aggregate supply shifts and shows how much output is supplied by firms at different price levels.

### Learning Objective

Explain shifts in aggregate supply and their impact on the economy

### Key Points

- The aggregate supply curve shows how much output is supplied by firms at different price levels.
- The short-run aggregate supply curve is affected by production costs including taxes, subsidies, price of labor (wages), and the price of raw materials.
- The long-run aggregate supply curve is affected by events that change the potential output of the economy.

### Key Term

supply shock

An event that suddenly changes the price of a commodity or service. It may be caused by a sudden increase or decrease in the supply of a particular good.

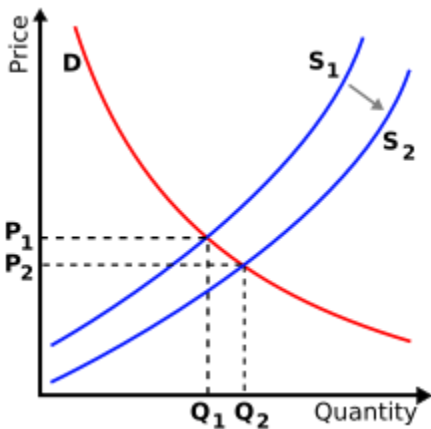
## Aggregate Supply

In economics, aggregate supply is defined as the total supply of goods and services that firms in a national economy produce during a specific period of time. It is the total amount of goods and services that firms are willing to sell at a specific price level in the economy.



# Shift in Aggregate Supply

The aggregate supply curve may shift labor market disequilibrium or labor market equilibrium. If labor or another input suddenly becomes cheaper, there would be a supply shock such that supply curve may shift outward, causing the equilibrium price in to drop and the equilibrium quantity to increase.



## Supply Shift

A supply shock could be caused by changing regulations or a sudden change in the price of an input, among other reasons.

During the short-run, there is one fixed factor of production, usually capital. However, the fixed factor does not stop the curve's ability to shift outward. When the curve shifts to the right, it causes an increase in the output and a decrease in the GDP at a given price. Examples of events that cause the curve to shift to the right in the short-run include a decrease in the wage rate, an increase in physical capital stock, and technological progress.

In the long-run only capital, labor, and technology affect the aggregate supply curve because at this point everything in the economy is assumed to be used optimally. The long run curve is often seen as static because it shift the slowest. The long-run aggregate supply curve is vertical which shows economist's belief that changes in aggregate demand only have a temporary change on the economy's total output. Examples of events that shift the

long-run curve to the right include an increase in population, an increase in physical capital stock, and technological progress.

## Reasons for Shifts

The short-run aggregate supply curve is affected by production costs including taxes, subsidies, price of labor (wages), and the price of raw materials. All of these factors will cause the short-run curve to shift. When there are changes in the quality and quantity of labor and capital the changes affect both the short-run and long-run supply curves. The long-run aggregate supply curve is affected by events that change the potential output of the economy.

Changes in short-run aggregate supply cause the price level of the good or service to drop while the real GDP increases. In the long-run the prices stabilize and the price level of the good or service increase in response to the changes.

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# **25: Major Macroeconomic Theories**

# 25.1: Major Theories in Macroeconomics

## 25.1.1: Keynesian Theory

Keynesian theory posits that aggregate demand will not always meet the supply produced.

### Learning Objective

Explain the main tenets of Keynesian economics

### Key Points

- John Maynard Keynes published a book in 1936 called *The General Theory of Employment, Interest, and Money*, laying the groundwork for his legacy of the Keynesian Theory of Economics.
- Keynes positioned his argument in contrast to this idea, stating that markets are imperfect and will not always self correct.
- Keynes believed that wage reductions in recessions and excessive savings were potential threats to an economy.
- Keynesian theory expects fiscal policy to offset business cycles (employ counter-cyclical strategies).

### Key Terms

Keynesian

Of or pertaining to an economic theory based on the ideas of John Maynard Keynes, as put forward in his book *The General Theory of Employment, Interest, and Money*.

monetary policy

The process of controlling the supply of money in an economy, often conducted by central banks.

fiscal policy

Government policy that attempts to influence the direction of the economy through changes in government spending or taxes.

## Historical Background

John Maynard Keynes published a book in 1936 called *The General Theory of Employment, Interest, and Money*, laying the groundwork for his legacy of the Keynesian Theory of Economics. It was an interesting time for economic speculation considering the dramatic adverse effect of the Great Depression. Keynes's concepts played a role in public economic policy under Roosevelt as well as during World War II, becoming the dominant perspective in Europe following the war.



## John Maynard Keynes

John Maynard Keynes came to fame after publishing his economic theories during the Great Depression.

At the time, the primary school of economic thought was that of the classical economists (which is still a popular school of thought today). The central tenet of the classical argument says that supply can always create demand, and that surpluses will result in price reductions to the point of consumption. Put simply, people have infinite needs and the market will self-correct to the aggregate demands and available resources. This implies a hands-off public policy where markets are capable of taking care of themselves.

Keynes positioned his argument in contrast to this idea, stating that markets are imperfect and will not always self correct. Keynes theorized that natural inefficiencies in the market will see goods that are not met with demand. This wasted capital can result in market losses, unemployment, and market inefficiency (this was called 'general glut' in the classical model, when aggregate demand does not meet supply). Keynes insisted that markets do need moderate governmental intervention through fiscal policy (government investment in infrastructure) and monetary policy (interest rates).

## **Main Tenets**

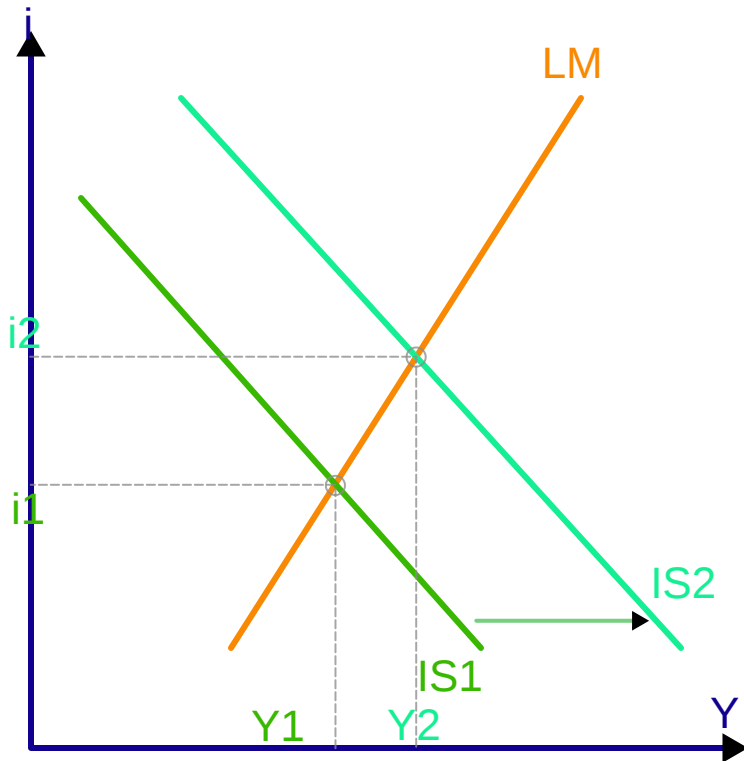
With this overview in mind, Keynesian Theory generally observes the following concepts:

- **Unemployment:** Under the classical model, unemployment is often attributed to high and rigid real wages. Keynes argues there is more complexity than that, specifically that societies are highly resistant to wage cuts and furthermore that reducing wages would pose a great threat to an economy. Specifically, cutting wages reduces spending and may result in a downwards spiral.
- **Excessive Saving:** Keynes's concept here is somewhat complicated, but in short Keynes notes excessive saving as a threat and prospective cause of economic decline. This is because excessive saving leads to reduced investment and reduced spending, which drives down demand and the potential for consumption. This can be another spiraling issue, as money not being exchanged is actively reducing prospective employment, revenues, and future investments.



- **Fiscal Policy:**The key concept in fiscal policy for Keynes is 'counter-cyclical' fiscal policy, which is the expectation that governments can reduce the negative effects of the natural business cycle. This is, generally, achieved through deficit spending in recessions and suppression of inflation during boom times. Simply put, the government should try to curb the extremes of economic fluctuation through informed fiscal policy.
- **The Multiplier Effect:** This idea has in many ways already been implied in the atom, but inversely. Consider the unemployment and excessive savings problems, and how they stand to lead to spiraling decline. The other side of that coin is that positive economic situations can spiral upwards. Take for example a government investment in transportation, putting money in the pockets of various individuals who build trains and tracks. These individuals will spend that extra capital, putting money in the hands of other business (and this will continue). This is called the multiplier effect.
- **IS-LM :** While the IS-LM Model is a complicated byproduct of Keynesian economics, it can be summarized as the relationship between interest rates (y-axis) and the real economic output (x-axis). This is done through analyzing the invest-saving relationship (IS) in contrast to the liquidity preference and money supply relationship (LM), generating an equilibrium where certain interest rates and outputs will be generated.

While Keynesian Theory has been expounded upon significantly over the years, the important takeaway here is that aggregate demand (and thus the amount of supply consumed) is not a perfect system. Instead, demand is affected by various external forces that can create an inefficient market which will in turn affect employment, production, and inflation.



## IS-LM Model

In this figure, the IS (Interest - Saving) curve is shifted outward in a way that raises both interest rates ( $i$ ) and the 'real' economy ( $Y$ ). The implication is that interest rates affect investment levels, and that these investment levels in turn affect the overall economy.

### 25.1.2: Monetarist

Monetarism focuses on the macroeconomic effects of the supply of money and the role of central banking on an economic system.

#### Learning Objective

Explain the main tenets of Monetarism

#### Key Points

- Clark Warburton, in 1945, has been identified as the first thinker to draft an empirically sound argument in favor of monetarism. This was taken more mainstream by Milton Friedman in 1956.
- More money in the system results in higher spending and vice versa. This would theoretically provide some control over aggregate demand.
- Historical implementation of monetarism demonstrated some correlation with control over inflation rates and increased economic performance. This could have been a result of other factors however.
- The Austrian school of economic thought perceives monetarism as somewhat narrow-minded, not effectively taking into account the subjectivity involved in valuing capital.
- Due to the globalization of the economy, monetarism may have a negative impact on external economies. This is particularly true of the U.S., whose capital is an international standard.

## **Key Terms**

gold standard

A monetary system where the value of circulating money is linked to the value of gold.

Monetarism

The doctrine that economic systems are controlled by variations in the supply of money.

## **Background**

In the rise of monetarism as an ideology, two specific economists were critical contributors. Clark Warburton, in 1945, has been identified as the first thinker to draft an empirically sound argument in favor of monetarism. This was taken more mainstream by Milton Friedman in 1956 in a restatement of the quantity theory of money. The basic premise these two economists were putting forward is that the supply of money and the role of central banking play a critical role in macroeconomics.

The generation of this theory takes into account a combination of Keynesian monetary perspectives and Friedman's pursuit of price stability. Keynes postulated a demand-driven model for currency; a perspective on printed money that was not beholden to the 'gold standard' (or basing economic value off of rare metal). Instead, the amount of money in a given environment should be determined by monetary rules. Friedman originally put forward the idea of a 'k-percent rule,' which weighed a variety of economic indicators to determine the appropriate money supply.

## **Evidence**

Theoretically, the idea is actually quite straight-forward. When the money supply is expanded, individuals will be induced to higher spending. In turn, when the money supply retracted, individuals would limit their budgetary spending accordingly. This would theoretically provide some control over aggregate demand (which is one of the primary areas of disagreement between Keynesian and classical economists).

Monetarism began to deviate more from Keynesian economics however in the 70's and 80's, as active implementation and historical reflection began to generate more evidence for the monetarist view. In 1979 for example, Jimmy Carter appointed Paul Volcker as Chief of the Federal Reserve, who in turn utilized the monetarist perspective to control inflation. He eventually created a price stability, providing evidence that the theory was sound. In addition, Milton Friedman and Ann Schwartz analyzed the Great Depression in the context of monetarism as well, identifying a shortage of the money supply as a critical component of the recession.

The 1980s were an interesting transitional period for this perspective, as early in the decade (1980-1983) monetary policies controlling capital were attributed to substantial reductions in inflation (14% to 3%)(see ). However, unemployment and the rise of the use of credit are quoted as two alternatives to money supply control being the primary influence of the boom that followed 1983.



## U.S. Inflation Rates

The inflation rates over time in the U.S. represent some of the evidence put forward by monetarist economists, stating that governmental control of the money supply allows for some control over inflation.

## Counter Arguments

As these counter arguments in the 1980s began to arise, critics of monetarism became more mainstream. Of the current monetarism critics, the Austrian school of thought is likely the most well-known. The Austrian school of economic thought perceives monetarism as somewhat narrow-minded, not effectively taking into account the subjectivity involved in valuing capital. That is to say that monetarism seems to assume an objective value of capital in an economy, and the subsequent implications on the supply and demand.

Other criticisms revolve around international investment, trade liberalization, and central bank policy. This can be summarized as the effects of globalization, and the interdependence of markets (and consequently currencies). To manipulate money supply there will inherently be effects on other currencies as a result of relativity. This is particularly important in regards to the U.S. currency, which is considered a standard in international markets. Controlling supply and altering value may have effects on a variety of internal economic variables, but it will also have unintended consequences on external variables.

## 25.1.3: Austrian

Austrian economic thought is about methodological individualism, or the idea that people will act in meaningful ways which can be analyzed.

### Learning Objective

Explain the main tenets of Austrian economics

### Key Points

- The Austrian school of economics is one of the oldest economic perspectives, originating in the 19th century in Vienna.
- Austrian economics is attributed for the identification of opportunity cost, capital and interest, inflation, business cycles and the organizing power of markets.
- Austrian economists do not often place much weight on concepts such as econometrics, experimental economics, and aggregate macroeconomic analysis. In this sense, the Austrian school of thought is something of an outsider relative to other perspectives (i.e. classical, Keynesian, etc. ).
- Paul Krugman criticized Austrian economics as lacking explicit models of analysis, or essentially a lack of clarity in their approach. This results in inadvertent blind spots.

### Key Terms

Opportunity cost

The cost of any activity measured in terms of the value of the next best alternative forgone (that is not chosen).

time value of money

The time value of money is the principle that a certain currency amount of money today has a different buying power (value) than the same currency amount of money in the future.

# Background

The Austrian school of economics originated in the 19th century in Vienna, Austria. While there were a variety of famous economists attributed to the early foundations and later expansions of the Austrian economic perspective, Carl Menger, Friedrich von Weiser, and Eugen von Bohm-Bawerk are widely recognized as critical early pioneers. The general perspective of Austrian economic thought is methodological individualism, or the recognition that people will act in meaningful ways which can be analyzed for trends.

## Central Tenets

The Austrian school of thought provided enormous value to the economic climate, both as a foundation for future economics and as a deliberate counterpoint to more quantitative analysis. Of the most important ideologies, the following central tenets are:

- **Opportunity Cost:** This is a concept you are likely already familiar with, and one of the most important ideas in all of business and economics. Essentially, the price of a good must also incorporate the value sacrificed of the next best alternative. Basically each choice a consumer or business makes intrinsically has the cost of not being able to make an alternative choice.
- **Capital and Interest:** Largely in response to Karl Marx's labor theories, Austrian economist Bohm-Bawerk identified the building blocks of interest rates and profit are supply and demand alongside time preference. In short, present consumption is more valuable than future consumption (the time value of money).
- **Inflation:** The idea that prices and wages must rise as a result of increased money supply is inflation (note: this is different than price inflation). Simply put, more money in the system without a higher demand for that money will drive down the relative value of each dollar.
- **Business Cycles:** The Austrian business cycle theory (ABCT) is the simple observation that the issuance of credit (by banks) creates

economic fluctuations that tend to be cyclical (see ). In simple terms, banks will lend out money at rates lower than the risk in which that money will be used. So when businesses fail more often than they succeed, thus losing interest as opposed to accruing it, will struggle to repay their debts. When the banks call in those debts the business cannot pay, creating negative business cycles.

- **The Organizing Power of Markets:** The idea of this concept is that no one person knows what the appropriate price of a good should be. Instead, markets naturally generate incentives to identify optimal price points. This negates the ideas of socialism common at the time, as communist systems will be unable to identify the appropriate exchange value of each good.

As you can see from the above points, this school of economics is largely about making qualitative observations of the markets. These observations are absolutely critical in understanding the theoretical landscape, but difficult to enact in practice.

## Criticisms

Austrian economists are often criticized for ignoring arithmetic or statistical ways to measure and analyze economics. Indeed, Austrian economists do not often place much weight on concepts such as econometrics, experimental economics, and aggregate macroeconomic analysis. In this sense, the Austrian school of thought is something of an outsider relative to other perspectives (i.e. classical, Keynesian, etc.).

Paul Krugman criticized Austrian economics as lacking explicit models of analysis, or essentially a lack of clarity in their approach. This results in inadvertent blind spots. This is a sensible criticism in many ways, as the fundamental idea behind this economic theory is that it is driven by individuals and individuals are not always rational (indeed, they are quite often irrational). As a result of this, Austrian economics often rests on the integration of social sciences (psychology, sociology, etc.) to explain preferences and consumer behavior, which is often counter-intuitive. As a result, it is very difficult to accurately measure and provide tangible proof of the efficacy of Austrian models.



## 25.1.4: Alternative Views

Neoclassical and neo-Keynesian ideas can be coupled and referred to as the neoclassical synthesis, combining alternative views in economics.

### Learning Objective

Summarize neoclassical and Neo-Keynesian economics

### Key Points

- The history of different economic schools of thought have consistently generated evolving theories of economics as new data and new perspectives are taken into consideration.
- The neoclassical perspective in conjunction with Keynesian ideas is referred to as the neoclassical synthesis, which is largely considered the 'mainstream' economic perspective.
- A critical difference between classical and neoclassical perspectives is the introduction of marginalism. Marginalism notes that economic participants make decisions based on marginal utility or margins.
- Neo-Keynesian economics is the formalization and coordination of Keynes's writings by a number of other economists (most notably John Hicks, Franco Modigliani and Paul Samuelson).
- The important to understand that these economic perspectives add value to one another and the overall efficacy of all economic theory.

### Key Terms

static

Unchanging; that cannot or does not change.

stagflation

Inflation accompanied by stagnant growth, unemployment or recession.

# Background

The history of different economic schools of thought have consistently generated evolving theories of economics as new data and new perspectives are taken into consideration. The two most well-known schools, classical economics and Keynesian economics, have been adapting to incorporate new information and ideas from one another as well as lesser known schools of economics (Chicago, Austrian, etc.). These different perspectives have motivated economists to generate the neoclassical and neo-Keynesian perspectives. The neoclassical perspective, in conjunction with Keynesian ideas, is referred to as the neoclassical synthesis, which is largely considered the 'mainstream' economic perspective.

## Neoclassical

In approaching Neoclassical economics, it is most important to keep in mind the following three principles:

1. People have rational preferences in the context of options or outcomes that can be identified and associated with a given value (usually monetary). In short, people make smart choices regarding how they spend their money.
2. Individuals maximize utility and firms maximize profit. People will try to get the most from their money while corporations will try to invest their time and assets to capture the highest margin.
3. People act independently based upon comprehensive and relevant information. People are influenced by rational forces (mostly information and logic), and will make the best personal purchasing decisions based upon this.

A brief timeline of classical to neoclassical perspectives would begin with thought processes put forward by Adam Smith and David Ricardo (alongside many others). The basic idea is that aggregate demand will adjust to supply, and that value theory and distribution will reflect this rational, cost of production model. The next phase was the observation that consumer goods demonstrated a relative value based on utility, which could

deviate from consumer to consumer. The final phase, and most central to the advent of the neoclassical perspective, is the introduction of marginalism. Marginalism notes that economic participants make decisions based on marginal utility or margins. For example, a company hiring a new employee will not think of the fixed value of that employee, but instead the marginal value of adding that employee (usually in regards to profitability).

## **Neo-Keynesian**

Neo-Keynesian economics is often confused with 'New Keynesian' economics (which attempts to provide microeconomic foundation to Keynesian views, particularly in light of stagflation in the 1970s). Neo-Keynesian economics is actually the formalization and coordination of Keynes's writings by a number of other economists (most notably John Hicks, Franco Modigliani, and Paul Samuelson). Much of the conceptual value is captured in the previous atoms on Keynesian views, but the substantial value of a few neo-Keynesian ideas is worth reiterating:

- IS/LM Model: This model was put forward by John Hicks in order to capture the inherent relationship between investment and savings (IS) relative to liquidity and the overall money supply (LM) (see ). The implications of this graph pertain to the static representation of monetary policy and the effects on an economic system.
- Phillips Curve: Another important model following Keynes's publications is the Phillips Curve, put forward by William Phillips in 1958. The idea here was also largely Keynesian, revolving around the relationship between inflation and unemployment (see ). This implies a trade off between inflation rates and the creation of employment, which governments could consider in policy making. Stagflation (economic stagnation and inflation simultaneously) created issues with this however, necessitating New Keynesian ideas (as discussed briefly above).

## **Synthesis**

When learning about these economic perspectives, it is important to understand the value they add to one another and the overall efficacy of all economic theory. Economists are often the product of multiple schools of thought, and don't fit neatly into one school or another.

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# **26: Fiscal Policy**

# 26.1: Introduction to Fiscal Policy

## 26.1.1: Defining Fiscal Policy

Fiscal policy is the use of government spending and taxation to influence the economy.

### Learning Objective

Define Fiscal Policy

### Key Points

- The government has two levers when setting fiscal policy: it can change the levels of taxation and/or it can change its level of spending.
- There are three types of fiscal policy: neutral policy, expansionary policy, and contractionary policy.
- In expansionary fiscal policy, the government spends more money than it collects through taxes. This type of policy is used during recessions to build a foundation for strong economic growth and nudge the economy toward full employment.
- In contractionary fiscal policy, the government collects more money through taxes than it spends. This policy works best in times of economic booms. It slows the pace of strong economic growth and puts a check on inflation.

### Key Term

fiscal policy

Government policy that attempts to influence the direction of the economy through changes in government spending or taxes.



Fiscal policy is the use of government spending and taxation to influence the economy. Governments use fiscal policy to influence the level of aggregate demand in the economy in an effort to achieve the economic objectives of price stability, full employment, and economic growth.

The government has two levers when setting fiscal policy:

1. Change the level and composition of taxation, and/or
2. Change the level of spending in various sectors of the economy.

There are three main types of fiscal policy:

1. Neutral: This type of policy is usually undertaken when an economy is in equilibrium. In this instance, government spending is fully funded by tax revenue, which has a neutral effect on the level of economic activity.
2. Expansionary: This type of policy is usually undertaken during recessions to increase the level of economic activity. In this instance, the government spends more money than it collects in taxes.
3. Contractionary: This type of policy is undertaken to pay down government debt and to cap inflation. In this case, government spending is lower than tax revenue.

In times of recession, Keynesian economics suggests that increasing government spending and decreasing tax rates is the best way to stimulate aggregate demand. Keynesians argue that this approach should be used in times of recession or low economic activity as an essential tool for building the foundation for strong economic growth and working towards full employment. In theory, the resulting deficit would be paid for by an expanded economy during the boom that would follow.



## **Times of Recession**

In times of recession, the government uses expansionary fiscal policy to increase the level of economic activity and increase employment.

In times of economic boom, Keynesian theory posits that removing spending from the economy will reduce levels of aggregate demand and contract the economy, thus stabilizing prices when inflation is too high.

## **26.1.2: How Fiscal Policy Relates to the AD-AS Model**

Expansionary policy shifts the aggregate demand curve to the right, while contractionary policy shifts it to the left.

### **Learning Objective**

Examine the effect of government fiscal policy on aggregate demand

### **Key Points**

- Aggregate demand is made up of consumption, investment, government spending, and net exports. The aggregate demand curve will shift as a result of changes in any of these components.

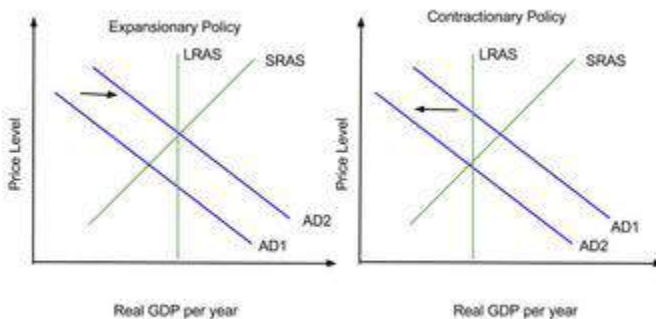
- Expansionary policy involves an increase in government spending, a reduction in taxes, or a combination of the two. It leads to a right-ward shift in the aggregate demand curve.
- Contractionary policy involves a decrease in government spending, an increase in taxes, or a combination of the two. It leads to a left-ward shift in the aggregate demand curve.

## Key Term

fiscal policy

Government policy that attempts to influence the direction of the economy through changes in government spending or taxes.

When setting fiscal policy, the government can take an active role in changing its spending or the level of taxation. These actions lead to an increase or decrease in aggregate demand, which is reflected in the shift of the aggregate demand (AD) curve to the right or left respectively .



## Expansionary and Contractionary Fiscal Policy

Expansionary policy shifts the AD curve to the right, while contractionary policy shifts it to the left.

It is helpful to keep in mind that aggregate demand for an economy is divided into four components: consumption, investment, government spending, and net exports. Changes in any of these components will cause the aggregate demand curve to shift.

Expansionary fiscal policy is used to kick-start the economy during a recession. It boosts aggregate demand, which in turn increases output and employment in the economy. In pursuing expansionary policy, the government increases spending, reduces taxes, or does a combination of the two. Since government spending is one of the components of aggregate demand, an increase in government spending will shift the demand curve to the right. A reduction in taxes will leave more disposable income and cause consumption and savings to increase, also shifting the aggregate demand curve to the right. An increase in government spending combined with a reduction in taxes will, unsurprisingly, also shift the AD curve to the right. The extent of the shift in the AD curve due to government spending depends on the size of the spending multiplier, while the shift in the AD curve in response to tax cuts depends on the size of the tax multiplier. If government spending exceeds tax revenues, expansionary policy will lead to a budget deficit.

A contractionary fiscal policy is implemented when there is demand-pull inflation. It can also be used to pay off unwanted debt. In pursuing contractionary fiscal policy the government can decrease its spending, raise taxes, or pursue a combination of the two. Contractionary fiscal policy shifts the AD curve to the left. If tax revenues exceed government spending, this type of policy will lead to a budget surplus.

### **26.1.3: Expansionary Versus Contractionary Fiscal Policy**

When the economy is producing less than potential output, expansionary fiscal policy can be used to employ idle resources and boost output.

#### **Learning Objective**

Assess the mechanics and outcomes of fiscal policy

#### **Key Points**

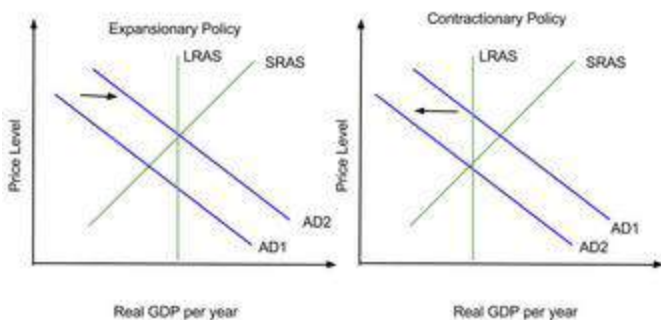
- Keynes advocated counter-cyclical fiscal policies--implementing an expansionary fiscal policy during a recession and a contractionary policy during times of rapid economic expansion.
- In pursuing either expansionary or contractionary fiscal policy, the government has two levers - government spending and taxation levels.
- The effects of fiscal policy can be limited by crowding out.

## Key Term

### multiplier

A ratio used to estimate total economic effect for a variety of economic activities.

Keynesian economists argue that private sector decisions sometimes lead to inefficient macroeconomic outcomes which require active policy responses by the public sector in order to stabilize output over the business cycle. Keynes advocated counter-cyclical fiscal policies (policies that acted against the tide of the business cycle). This means deficit spending and decreased taxes when an economy suffers from a recession and decreased government spending and higher taxes during boom times .



## Counter-cyclical Fiscal Policies

Keynesian economists advocate counter-cyclical fiscal policies. This means increased spending and lower taxes during recessions and lower spending and higher taxes during economic boom times.

According to Keynesian economics, if the economy is producing less than potential output, government spending can be used to employ idle resources and boost output. Increased government spending will result in increased aggregate demand, which then increases the real GDP, resulting in an rise in prices. This is known as expansionary fiscal policy. Conversely, in times of economic expansion, the government can adopt a contractionary policy, decreasing spending, which decreases aggregate demand and the real GDP, resulting in a decrease in prices.



## Highway Construction

The government can implement expansionary fiscal policy through increased spending, such as paying for the construction of new highways.

In instances of recession, government spending does not have to make up for the entire output gap. There is a multiplier effect that boosts the impact of government spending. The government could stimulate a great deal of new production with a modest expenditure increase if the people who receive this money consume most of it. This extra spending allows businesses to hire more people and pay them, which in turn allows a further increase in spending, and so on in a virtuous circle.

In addition to changes in spending, the government can also close recessionary gaps by decreasing income taxes, which increases aggregate demand and real GDP, which in turn increases prices. Conversely, to close

an expansionary gap, the government would increase income taxes, which decreases aggregate demand, the real GDP, and then prices.

The effects of fiscal policy can be limited by crowding out. Crowding out occurs when government spending simply replaces private sector output instead of adding additional output to the economy. Crowding out also occurs when government spending raises interest rates, which limits investment.

## **26.1.4: Fiscal Levers: Spending and Taxation**

Tax cuts have a smaller affect on aggregate demand than increased government spending.

### **Learning Objective**

Analyze the use of changes in the tax rate as a form of fiscal policy

### **Key Points**

- In expansionary policy, the extent to which government spending and tax cuts increase aggregate demand depends on spending and tax multipliers.
- The tax multiplier is smaller than the spending multiplier. This is because the entire government spending increase goes towards increasing aggregate demand, but only a portion of the increased disposable income (resulting from lower taxes) is consumed.
- The multiplier effect of a tax cut can be affected by the size of the tax cut, the marginal propensity to consume, as well as the crowding out effect.

### **Key Term**

Tax multiplier

The change in aggregate demand caused by a change in taxation levels.

Spending and taxation are the two levers available to the government for setting fiscal policy. In expansionary fiscal policy, the government increases its spending, cuts taxes, or a combination of both. The increase in spending and tax cuts will increase aggregate demand, but the extent of the increase depends on the spending and tax multipliers.

The government spending multiplier is a number that indicates how much change in aggregate demand would result from a given change in spending. The government spending multiplier effect is evident when an incremental increase in spending leads to an rise in income and consumption. The tax multiplier is the magnification effect of a change in taxes on aggregate demand. The decrease in taxes has a similar effect on income and consumption as an increase in government spending.

However, the tax multiplier is smaller than the spending multiplier. This is because when the government spends money, it directly purchases something, causing the full amount of the change in expenditure to be applied to the aggregate demand. When the government cuts taxes instead, there is an increase in disposable income. Part of the disposable income will be spent, but part of it will be saved. The money that is saved does not contribute to the multiplier effect .





## Spending and Saving

The tax multiplier is smaller than the government expenditure multiplier because some of the increase in disposable income that results from lower taxes is not just consumed, but saved.

The multipliers are calculated as follows:

- \_\_\_\_\_
- \_\_\_\_\_

where MPC is the marginal propensity to consume (the change in consumption divided by the change in disposable income), and MPS is the marginal propensity to save (the change in savings divided by the change in disposable income).

The government spending multiplier is always positive. In contrast, the tax multiplier is always negative. This is because there is an inverse relationship between taxes and aggregate demand. When taxes decrease, aggregate demand increases.

The multiplier effect of a tax cut can be affected by the size of the tax cut, the marginal propensity to consume, as well as the crowding out effect. The crowding out effect occurs when higher income leads to an increased demand for money, causing interest rates to rise. This leads to a reduction in investment spending, one of the four components of aggregate demand, which mitigates the increase in aggregate demand otherwise caused by lower taxes.

## 26.1.5: How Fiscal Policy Can Impact GDP

Fiscal policy impacts GDP through the fiscal multiplier.

### Learning Objective

Discuss the mechanisms that allow the fiscal policy to affect GDP

### Key Points

- The fiscal multiplier is the ratio of change in national income to the change in governments spending that causes it.
- The multiplier effect occurs when an initial incremental amount of spending leads to an increase in income and consumption, which further increases income, which further increases consumption, and so on in a virtuous circle, resulting in an overall increase in the GDP.
- The multiplier effect is evident when the multiplier is greater or less than one.
- In certain cases, multiplier values of less than one have been empirically measured, suggesting that government spending can crowd out private investment or consumer spending.

### Key Term

fiscal multiplier

The ratio of a change in national income to the change in government spending that causes it.

Expansionary fiscal policy can impact the gross domestic product (GDP) through the fiscal multiplier. The fiscal multiplier (which is not to be confused with the monetary multiplier) is the ratio of a change in national income to the change in government spending that causes it. When this multiplier exceeds one, the enhanced effect on national income is called the multiplier effect.

The multiplier effect arises when an initial incremental amount of government spending leads to increased income and consumption, increasing income further, and hence further increasing consumption, and so on, resulting in an overall increase in national income that is greater than the initial incremental amount of spending. In other words, an initial change in aggregate demand may cause a change in aggregate output (and hence the aggregate income that it generates) that is a multiple of the initial change. The multiplier effect has been used as an argument for the efficacy of government spending or taxation relief to stimulate aggregate demand.

For example, suppose the government spends \$1 million to build a plant . The money does not disappear, but rather becomes wages to builders, revenue to suppliers, etc. The builders then will have more disposable income, and consumption may rise, so that aggregate demand will also rise. Suppose further that recipients of the new spending by the builder in turn spend their new income, raising demand and possibly consumption further, and so on. The increase in the gross domestic product is the sum of the increases in net income of everyone affected. If the builder receives \$1 million and pays out \$800,000 to sub contractors, he has a net income of \$200,000 and a corresponding increase in disposable income (the amount remaining after taxes). This process proceeds down the line through subcontractors and their employees, each experiencing an increase in disposable income to the degree the new work they perform does not displace other work they are already performing. Each participant who experiences an increase in disposable income then spends some portion of it on final (consumer) goods, according to his or her marginal propensity to consume, which causes the cycle to repeat an arbitrary number of times, limited only by the spare capacity available.



## **Fiscal Multiplier Example**

The money spent on construction of a plant becomes wages to builders. The builders will have more disposable income, increasing their consumption and the aggregate demand.

In certain cases multiplier values of less than one have been empirically measured, suggesting that certain types of government spending crowd out private investment or consumer spending that would have otherwise taken place.

## **26.1.6: Fiscal Policy and the Multiplier**

Fiscal policy can have a multiplier effect on the economy.

### **Learning Objective**

Describe the effects of the multiplier beyond its relevance to fiscal policy

## **Key Points**

- The size of the increase in GDP depends on the type of fiscal policy.
- The multiplier on changes in government spending is larger than the multiplier on changes in taxation levels.
- The taxation multiplier is smaller than the spending multiplier because part of any change in taxes is absorbed by savings.

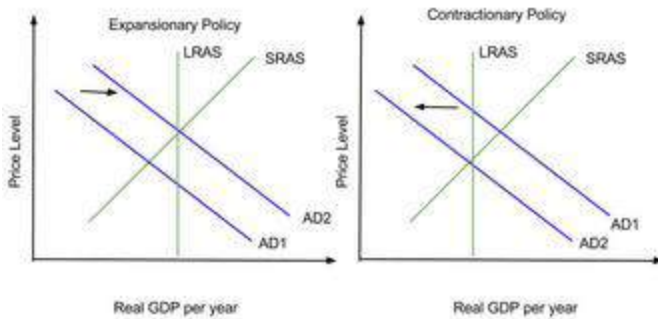
## **Key Term**

fiscal multiplier

The ratio of a change in national income to the change in government spending that causes it.

Fiscal policy can have a multiplier effect on the economy. For example, if a \$100 increase in government spending causes the GDP to increase by \$150, then the spending multiplier is 1.5. In addition to the spending multiplier, other types of fiscal multipliers can also be calculated, like multipliers that describe the effects of changing taxes. The size of the multiplier effect depends upon the fiscal policy.

Expansionary fiscal policy can lead to an increase in real GDP that is larger than the initial rise in aggregate spending caused by the policy. Conversely, contractionary fiscal policy can lead to a fall in real GDP that is larger than the initial reduction in aggregate spending caused by the policy .



## Multiplier Effect

The multiplier effect determines the extent to which fiscal policy shifts the aggregate demand curve and impacts output.

The size of the shift of the aggregate demand curve and the change in output depend on the type of fiscal policy. The multiplier on changes in government purchases,  $1/(1 - MPC)$ , is larger than the multiplier on changes in taxes,  $MPC/(1 - MPC)$ , because part of any change in taxes or transfers is absorbed by savings. In both of these equations, recall that MPC is the marginal propensity to consume.

For example, the government hands out \$50 billion in the form of tax cuts. There is no direct effect on aggregate demand by government purchases of goods and services. Instead, GDP goes up only because households spend some of that \$50 billion. But how much will they spend? Households will spend  $MPC * \$50$  billion (where MPC is the marginal propensity to consume). If MPC is equal to 0.6, the first-round increase in consumer spending will be \$30 billion ( $0.6 * \$50$  billion = \$30 billion). The initial rise in consumer spending will lead to a series of subsequent rounds in which the real GDP, disposable income, and consumer spending rise further.

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# 26.2: Evaluating Fiscal Policy

## 26.2.1: Automatic Stabilizers

Automatic stabilizers are modern government budget policies that act to dampen fluctuations in real GDP.

### Learning Objective

Explain the role of automatic stabilizers in regulating economic fluctuations

### Key Points

- During recessions, government spending automatically increases, which raises aggregate demand and offsets decreases in consumer demand. Government revenue automatically decreases.
- During economic booms, government spending automatically decreases, which prevents bubbles and the economy from overheating. Government revenue automatically increases.
- The fiscal multiplier is the ratio of a change in national income to the change in government spending that causes it. An initial change in aggregate demand may cause a change in aggregate output (and hence the aggregate income that it generates) that is a multiple of the initial change.

### Key Terms

fiscal multiplier

The ratio of a change in national income to the change in government spending that causes it.

automatic stabilizer

A budget policy that automatically changes to stabilize fluctuations in GDP.

In macroeconomics, the concept of automatic stabilizers describes how modern government budget policies, particularly income taxes and welfare spending, act to dampen fluctuations in real GDP. The size of the government budget deficit tends to increase when a country enters a recession, which tends to keep national income higher by maintaining aggregate demand. This effect happens automatically depending on GDP and household income, without any explicit policy action by the government, and acts to reduce the severity of recessions.

Here is an example of how automatic stabilizers would work in a recession. When the country takes an economic downturn, more people become unemployed. As a result more people file for unemployment and other welfare measures, which increases government spending and aggregate demand. The unemployed also pay less in taxes because they are not earning a wage, which in turn decreases government revenue. The result is an increase in the federal deficit without Congress having to pass any specific law or act.

Similarly, the budget deficit tends to decrease during booms, which pulls back on aggregate demand. Because more people are earning wages during booms, the government can collect more taxes. Also, because fewer individuals need social services support during a boom, government spending also decreases. As spending decreases, aggregate demand decreases. Therefore, automatic stabilizers tend to reduce the size of the fluctuations in a country's GDP.

## **Fiscal Multiplier Effect**

What makes automatic stabilizers so effective in dampening economic fluctuations is the fiscal multiplier effect. The fiscal multiplier is the ratio of a change in national income to the change in government spending that causes it. When this multiplier exceeds one, the enhanced effect on national income is called the multiplier effect.

The multiplier effect occurs as a chain reaction. The increased funds received from the government by citizens allows them to increase their consumption. As a result, producers must increase their production, which requires firms to hire more workers. Because of the increased purchases and lower unemployment, people have more money to spend and increase their consumption. This consumption-production-consumption cycle leads to the multiplier effect, resulting in an overall increase in national income greater than the initial incremental amount of spending. In other words, an initial change in aggregate demand may cause a change in aggregate output (and hence the aggregate income that it generates) that is a multiple of the initial change.

**1040** Department of the Treasury—Internal Revenue Service **2005**  
**U.S. Individual Income Tax Return**

For the year Jan. 1-Dec. 31, 2005, or other tax year beginning 2005, ending 2005  
 U.S. Use Only—Do not write in block in this section

**Label** (see instructions on page 15.)  
 Use the IRS label. Otherwise, please print or type.

**Presidential Election Campaign** Check here if you, or your spouse if filing jointly, want \$3 to go to this fund (see page 10)  Yes  No

**Filing Status** Check only one box.  
 1  Single  
 2  Married filing jointly (even if only one had income)  
 3  Married filing separately. Enter spouse's SSN above and full name here.  
 4  Head of household with qualifying person. (See page 17.) If the qualifying person is a child but not your dependent, enter the child's name here.  
 5  Qualifying widow(er) with dependent child (see page 17)

**Exemptions**  
 6a  Yourself. If someone can claim you as a dependent, do not check box 6a.  
 6b  Spouse  
 6c  Dependents:  
 (i) First name Last name (ii) Dependent's social security number (iii) Dependent's relationship to you (iv) Qualifying child or other child (see page 15)  
 6d  Other dependents (see page 17)  
 6e  Total number of exemptions claimed

**Income**  
 7 Wages, salaries, tips, etc. (Attach Form(s) W-2) 7  
 8a Taxable interest. Attach Schedule B if required 8a  
 8b Tax-exempt interest. Do not include on line 8b  
 9a Ordinary dividends. Attach Schedule B if required 9a  
 9b Qualified dividends (see page 23) 9b  
 10 Taxable refunds, credits, or offsets of state and local income taxes (see page 23) 10  
 11 Alimony received 11  
 12 Business income or loss. Attach Schedule C or C-EZ 12  
 13 Capital gain or loss. Attach Schedule D if required. If not required, check here  13  
 14 Other gains or losses. Attach Form 4797 14  
 15a IRA distributions 15a  
 15b Taxable amount (see page 23) 15b  
 16a Pensions and annuities 16a  
 16b Taxable amount (see page 23) 16b  
 17 Rental real estate, royalties, partnerships, S corporations, trusts, etc. Attach Schedule E 17  
 18 Farm income or loss. Attach Schedule F 18  
 19 Unemployment compensation 19  
 20a Social security benefits 20a  
 20b Taxable amount (see page 21) 20b  
 21 Other income. List type and amount (see page 29) 21  
 22 Add the amounts in the right column for lines 7 through 21. This is your total income 22

**Adjusted Gross Income**  
 23 Educator expenses (see page 28) 23  
 24 Certain business expenses of reservists, performing artists, and non-taxicab government officials. Attach Form 2106 or 2106-EZ 24  
 25 Health savings account deduction. Attach Form 8889 25  
 26 Moving expenses. Attach Form 3903 26  
 27 One-half of self-employment tax. Attach Schedule SE 27  
 28 Self-employed SEP, SIMPLE, and qualified plans 28  
 29 Self-employed health insurance deduction (see page 30) 29  
 30 Penalty on early withdrawal of savings 30  
 31a Alimony paid  Recipient's SSN  31a  
 32 IRA deduction (see page 31) 32  
 33 Student loan interest deduction (see page 33) 33  
 34 Tuition and fees deduction (see page 34) 34  
 35 Domestic production activities deduction. Attach Form 8883 35  
 36 Add lines 23 through 31a and 32 through 35 36  
 37 Subtract line 36 from line 22. This is your adjusted gross income 37

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# Tax Form 1040

Taxes are a part of the automatic stabilizers a country uses to minimize fluctuations in their real GDP. During boom times when the economy is doing well, people earn more income and this translates to higher tax revenues for the government, lowering the budget deficit.

## 26.2.2: Automatic Stabilizers Versus Discretionary Policy

Automatic stabilizers and discretionary policy differ in terms of timing of implementation and what each approach sets out to achieve.

### Learning Objective

Describe the differences between automatic stabilizers and discretionary policy

## Key Points

- Discretionary policy is a macroeconomic policy based on the judgment of policymakers in the moment as opposed to policy set by predetermined rules. Examples may include passing a new spending bill that promotes a certain cause, such as green technology, or the creation of a federal jobs program.
- When the economy begins to go through an economic fluctuation, automatic stabilizers immediately respond without any official or government body having to take action. With discretionary policy there is a significant time lag before action can be taken.
- Automatic stabilizers are limited in that they focus on managing the aggregate demand of a country. Discretionary policies can target other, specific areas of the economy.
- Automatic stabilizers exist prior to economic booms and busts. Discretionary policies are enacted in response to changes in the economy.

## Key Terms

discretionary policy

Actions taken in response to changes in the economy. These acts do not follow a strict set of rules, rather, they use subjective judgment to treat each situation in unique manner.

automatic stabilizer

A budget policy that automatically changes to stabilize fluctuations in GDP.

In fiscal policy, there are two different approaches to stabilizing the economy: automatic stabilizers and discretionary policy. Both approaches

focus on minimizing fluctuations in real GDP but have different means of doing so.

## **Discretionary Policy**

Discretionary policy is a macroeconomic policy based on the judgment of policymakers in the moment, as opposed to a policy set by predetermined rules. Discretionary policies refer to actions taken in response to changes in the economy, but they do not follow a strict set of rules; rather, they use subjective judgment to treat each situation in unique manner. In practice, most policy changes are discretionary in nature. Examples may include passing a new spending bill that promotes a certain cause, such as green technology, or the creation of a federal jobs program .



# WORK PROGRAM



## **WPA**

The Works Progress Administration (WPA) was part of the New Deal. The WPA is an example of a Depression-era discretionary policy meant to reduce unemployment by providing jobs for the unemployed.

Discretionary policies are generally laws enacted by Congress, which requires that any policy go through the same vetting and marking up process as any other law.

## **Automatic Stabilizers and Discretionary Policy**

The key difference between these two types of financial policy approaches is timing of implementation. When the economy begins to go through an economic fluctuation, automatic stabilizers immediately respond without any official or government body having to take action. With discretionary



policy there is a significant time lag. Before action can be taken, Congress must first determine that there is an issue and that action needs to be taken. Then Congress needs to design and implement a policy response. Then the law needs to be passed and the relevant agencies need to adjust and alter any necessary procedures so they can carry out the law. It is due to these significant lags that economists like Milton Friedman believed that discretionary fiscal policy could be destabilizing.

On the other hand, automatic stabilizers are limited in that they focus on managing the aggregate demand of a country. Discretionary policies can target other, specific areas of the economy. Discretionary policies can address failings of the economy that are not strictly tied to aggregate demand. For example, if an economy is going through a recession because its workers lack a certain set of skills, automatic stabilizers cannot address that problem. Government programs, such as retraining, can address this problem.

Finally, automatic stabilizers, such as the tax code and social service agencies, exist prior to an economic fluctuation. Discretionary policies are made in response to a fluctuation and only come into existence once a fluctuation starts to occur.

Of course, it is not possible to create an automatic stabilizer for every potential economic issue, so discretionary policy allows policymakers flexibility.

### **26.2.3: The Role of the Federal Budget**

The federal budget dictates how much money the government plans to raise and how it plans to spend it in the upcoming year.

#### **Learning Objective**

Describe how the federal budget is created and its economic role

#### **Key Points**

- Congressional decisions are governed by rules and legislation regarding the federal budget process. Budget committees set spending limits for the House and Senate committees. Appropriations subcommittees then approve individual appropriations bills to allocate funding to various federal programs.
- If Congress fails to pass an annual budget, a series of appropriations bills must be passed as "stop gap" measures.
- The budget is a method of conducting fiscal policy and reflect government intervention in markets.

## **Key Term**

appropriations bill

A legislative motion that authorizes the government to spend money.

The Federal Budget is the roadmap for how the national government plans to spend its money of the course of the upcoming year. It dictates which programs will receive funding and how much money the government will spend on each.

## **How the Federal Budget is Created**

The Budget of the United States Government often begins as the president's proposal to the U.S. Congress which recommends funding levels for the next fiscal year, beginning October 1. However, Congress is the body required by law to pass a budget annually and to submit the budget passed by both houses to the president for signature. To help Congress pass the best budget possible, several government agencies provide data and analysis. These include the Government Accountability Office (GAO), Congressional Budget Office (CBO), the Office of Management and Budget (OMB), and the U.S. Treasury Department.

Congressional decisions are governed by rules and legislation regarding the federal budget process. Budget committees set spending limits for the House and Senate committees. Appropriations subcommittees then approve

individual appropriations bills to allocate funding to various federal programs.

If Congress fails to pass an annual budget, a series of appropriations bills must be passed as "stop gap" measures. After Congress approves an appropriations bill, it is sent to the president, who may sign it into law, or may veto it (as he would a budget when passed by the Congress). A vetoed bill is sent back to Congress, which can pass it into law with a two-thirds majority in each chamber. Congress may also combine all or some appropriations bills into an omnibus reconciliation bill. In addition, the president may request and the Congress may pass supplemental appropriations bills or emergency supplemental appropriations bills.

## **Economic Role of the Federal Budget**

The federal budget is meant to provide the larger American economy with a sense of direction regarding where the Federal government is going to go and what they are going to do. The Federal budget discloses how much the government plans to tax and how it plans to spend its money. Individuals and businesses can then adjust their actions to accommodate what they'll have to pay in taxes and what resources will be available to them in the government.

The federal budget also is one mechanism for conducting fiscal policy. The government can choose to expand or contract the budget to conduct expansionary or fiscal policy.

The specific items in the budget also have important policy implications: social welfare, social insurance, and government intervention in markets may all be reflected in the budget.



## **Congress**

The U.S. Congress is responsible for passing the Federal Budget. If it cannot pass a Federal Budget, it must pass appropriation bills as a "stop gap. "

### **26.2.4: Arguments for and Against Balancing the Budget**

Balanced budgets, and the associated topic of budget deficits, are a contentious point within both academic economics and politics.

#### **Learning Objective**

Describe arguments against maintaining a balanced budget in the United States

#### **Key Points**

- A balanced budget is a budget where revenues equal expenditures. A balanced budget can also refer to a budget where revenues are greater than expenditures.
- Most economists have also agreed that a balanced budget would decrease interest rates, increase savings and investment, shrink trade deficits and help the economy grow faster over a longer period of time.

- Keynesians argue for balanced budgets over the course of the business cycle. If a country rigidly pursues a balanced budget regardless of the circumstances, critics argue that economic downturns would be needlessly painful.

## **Key Term**

### balanced budget

A (usually government) budget in which income and expenditure are equal over a set period of time.

A balanced budget, particularly a government budget, is a budget with revenues equal to expenditures. There is neither a budget deficit nor a budget surplus; in other words, "the accounts balance. " More generally, it refers to a budget with no deficit, but possibly with a surplus. A cyclically balanced budget is a budget that is not necessarily balanced year-to-year, but is balanced over the economic cycle, running a surplus in boom years and running a deficit in lean years, with these offsetting over time .



## **John Maynard Keynes**

John Maynard Keynes founded the Keynesian school, which promotes balanced governmental budgets over the course of the business cycle as opposed to annual balanced budgets.

Balanced budgets, and the associated topic of budget deficits, are a contentious point within academic economics and within politics.

## **Arguments for a Balanced Budget**

Most economists agree that a balanced budget would:

- decrease interest rates, making it easier for businesses and individuals to invest;

- increase savings and investment, which would provide security to individuals;
- shrink trade deficits; and
- help the economy grow faster over a longer period of time.

In the US, every state other than Vermont has a version of a balanced budget amendment, which prohibits some deficits. The federal government does not have such an amendment.

## **Arguments Against a Balanced Budget**

The mainstream economic view is that having a balanced budget in every year is not desirable. If a country rigidly pursues a balanced budget regardless of the circumstances, critics argue that economic downturns would be needlessly painful. If balanced budgets were required and if the budget was in deficit during a recession, critics argue that the required cuts would make the economy even worse off.

Keynesian economists argue that government budgets should be balanced over the business cycles. During recessions governments should run deficits. Keynesians argue that increasing government spending and decreasing taxes can minimize the painful effects of a recession. Once an economy moves into a growth cycle, Keynesians believe the government should shift its perspective and try to run a budget surplus by decreasing spending and increasing taxes. By balancing deficits in recessions and surpluses in growth, Keynesians believe that the government can obtain the benefits of a balanced budget without facing the risks of making recessions worse due to spending and revenue limitations.

### **26.2.5: Long-Run Implications of Fiscal Policy**

Expansionary fiscal policy can lead to decreased private investment, decreased net imports, and increased inflation.

#### **Learning Objective**

Identify the long-run consequences of fiscal policy

## Key Points

- Fiscal policy is the use of government revenue collection (taxation) and expenditure (spending) to influence the economy.
- When government borrowing increases interest rates, it can attract foreign capital from foreign investors, which can increase demand for that country's currency and raise its value. This increase in the currency's value increases the price of exports.
- When governments fund a deficit with the issuing of government bonds, interest rates can increase across the market, because government borrowing creates higher demand for credit in the financial markets. This causes a lower aggregate demand for goods and services.
- In theory, fiscal stimulus does not cause inflation when it uses resources that would have otherwise been idle.

## Key Term

inflation

An increase in the general level of prices or in the cost of living.

Fiscal policy is the use of government revenue collection (taxation) and expenditure (spending) to influence the economy. The two main instruments of fiscal policy are changes in the level and composition of taxation and government spending in various sectors.

It is important to underline that fiscal policy is heavily debated, and that expected outcomes are not achieved with complete certainty. That being said, these changes in fiscal policy can affect the following macroeconomic variables in an economy:

- Aggregate demand and the level of economic activity;
- The distribution of income;



- The pattern of resource allocation within the government sector and relative to the private sector.

## **Decreased Private Investment**

Economists still debate the effectiveness of fiscal policy to influence the economy, particularly when it comes to using expansionary fiscal policy to stimulate the economy. When the government runs a budget deficit, funds will need to come from public borrowing (the issue of government bonds), overseas borrowing, or monetizing the debt. When governments fund a deficit with the issuing of government bonds, interest rates can increase across the market, because government borrowing creates higher demand for credit in the financial markets. This causes a lower aggregate demand for goods and services, contrary to the objective of a fiscal stimulus.

## **Decreased Net Exports**

Some also believe that expansionary fiscal policy also decreases net exports, which has a mitigating effect on national output and income. When government borrowing increases interest rates it attracts foreign capital from foreign investors. This is because, all other things being equal, the bonds issued from a country executing expansionary fiscal policy now offer a higher rate of return. In other words, companies wanting to finance projects must compete with their government for capital so they offer higher rates of return. To purchase bonds originating from a certain country, foreign investors must obtain that country's currency. Therefore, when foreign capital flows into the country undergoing fiscal expansion, demand for that country's currency increases. The increased demand causes that country's currency to appreciate. Once the currency appreciates, goods originating from that country now cost more to foreigners than they did before and foreign goods now cost less than they did before. Consequently, exports decrease and imports increase.

## **Increased Inflation**

Other possible problems with fiscal stimulus include inflationary effects driven by increased demand. Simply put, increasing the capital in a given system will eventually devalue the currency itself if there is an increase in money supply in circulation. Similarly, if stimulus capital is invested in creating jobs, the overall spending in a given economy will increase (that is, if jobs are actually created). This spending increase will shift demand to potentially increase price points. Whenever fiscal policy decisions are made, modeling the likelihood of inflation is a critical consideration.



## WIN

If a country pursues an expansionary fiscal policy, high inflation becomes a concern.

### 26.2.6: Problems of Long-Run Government Debt

Government debt limits future government actions and can be hard to pay off because Congressmen are unwilling to do what is necessary to pay down the debt.

## **Learning Objective**

Evaluate the consequences of imbalances in the government budget

## **Key Points**

- To raise the necessary funds to pay down debt, governments will ultimately have to lower costs and/or raise taxes. Because cutting spending and raising taxes is unpopular, Congressmen may be hesitant to take those actions because it might prevent them from being re-elected.
- To pay off the debt, the government must maintain a certain level of income. This could limit the government's ability to pursue expansionary fiscal policies to address future recessions.
- If the government chooses to delay paying down the debt, the compounding interest will lead to more debt which will lead to a higher annual interest expense that future generations will have to pay.

## **Key Term**

cyclically balanced budget

Occurs when the government runs a deficit during recessions and lean years but a surplus during periods of significant growth.

Deficit spending during times of recession widely seen as a beneficial policy that can mitigate the effects of an economic downturn. However, even Keynesians that support deficit spending during recessions advise that governments balance this deficit spending with surpluses during the eventual economic boom. This means generating a government surplus by cutting expenses and raising taxes. This is known as a cyclically balanced budget; the government runs a deficit during recessions and lean years but a surplus during periods of significant growth.

## Paying Down Debt

During periods of expansionary fiscal policy, the government will often fund programs by issuing debt . The problem with debt is that it must be paid off with future revenues.



## Government debt

Publicly issued debt is one means governments use to fund expansionary fiscal policy. The problem with debt is that it needs to be paid off with future revenues, which curtails future government spending.

To pay off the debt, the government must maintain a certain level of income. This could limit the government's ability to pursue expansionary fiscal policies to address future recessions. On the other hand, if the government chooses to delay paying down the debt, the compounding interest will lead to more debt which will lead to a higher annual interest expense that future generations will have to pay.

## **Cutting Expenses and Raising Taxes**

To offset the budgetary deficits and raise the necessary funds to pay down debt, governments will ultimately have to lower costs and raise taxes. In any democracy, especially in the U.S., doing those two things are incredibly difficult because both options are unpopular with voters. Since Congress is responsible for making budgetary, spending and taxation decisions, and because these elected officials may be disinclined to do anything that would hurt their chances to be re-elected, taking the necessary steps to balance out the periods of deficit spending during economic boom is difficult.

## **Credit Rating**

A credit rating is an evaluation of the creditworthiness of a government, but not individual consumers. The evaluation is made by a credit rating agency of the country's ability to pay back the debt and the likelihood of default. A sovereign credit rating is the credit rating of a sovereign entity (i.e., a national government). The sovereign credit rating indicates the risk level of the investing environment of a country and is used by investors looking to invest abroad. It takes political risk into account, as well as the amount of debt the country has outstanding.

If a country has a bad credit rating, it generally must have a higher interest rate on the debt it issues. This means it will be more expensive for that country to raise funds by issuing debt.

## **26.2.7: Limits of Fiscal Policy**

Two key limits of fiscal policy are coordination with the nation's monetary policy and differing political viewpoints.

## **Learning Objective**

Identify the political and economic limits of fiscal policy

## **Key Points**

- Conservatives are more likely to reject Keynesianism and argue that government should always run a balanced budget (and a surplus to pay down any outstanding debt) than Democrats.
- Liberals are more likely to be Keynesian and Post-Keynesians than Republicans; they are more likely to argue that deficit spending is necessary, either to create the money supply (Chartalism) or to satisfy demand for savings in excess of what can be satisfied by private investment.
- There is a dilemma as to whether these monetary and fiscal policies are complementary, or act as substitutes to each other for achieving macroeconomic goals.

## **Key Term**

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

While fiscal policy can be a powerful tool for influencing the economy, there are limits in how effective these policies are.

## **Coordination with Monetary Policy**

Fiscal policy and monetary policy are the two primary tools used by the State to achieve its macroeconomic objectives. While the main objective of fiscal policy is to influence the aggregate output of the economy, the main

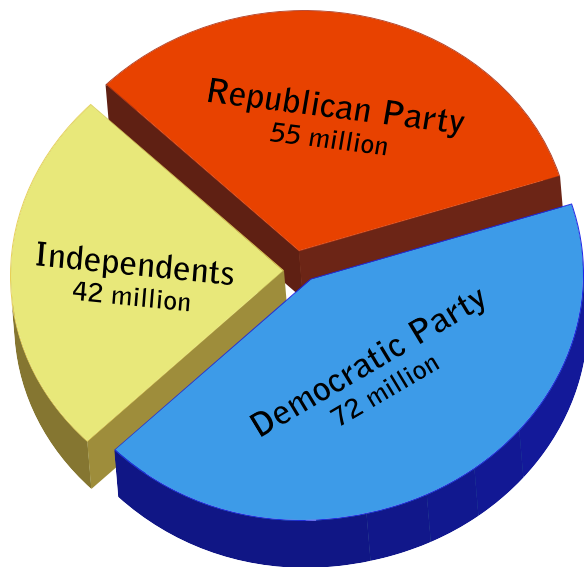
objective of the monetary policies is to control the interest and inflation rates. Fiscal policies have an impact on the goods market and monetary policies have an impact on the asset markets and since the two markets are connected to each other via the two macrovariables — output and interest rates - the policies interact while influencing the output or the interest rates.

There is controversy regarding whether these two policies are complementary or act as substitutes to each other for achieving macroeconomic goals. Policy makers are viewed to interact as strategic substitutes when one policy maker's expansionary (contractionary) policies are countered by another policy maker's contractionary (expansionary) policies. For example: if the fiscal authority raises taxes or cuts spending, then the monetary authority reacts to it by lowering the policy rates and vice versa. If they behave as strategic complements, then an expansionary (contractionary) policy of one authority is met by expansionary (contractionary) policies of other.

The issue of interaction and the policies being complement or substitute to each other arises only when the authorities are independent of each other. But when, the goals of one authority is made subservient to that of others, then the dominant authority solely dominates the policy making and no interaction worthy of analysis would arise. Also, it is worthy to note that fiscal and monetary policies interact only to the extent of influencing the final objective. So long as the objectives of one policy is not influenced by the other, there is no direct interaction between them.

## **Political Conflict**

Fiscal policy is also a source of significant political conflict along party lines. Conservatives are more likely to reject Keynesianism and are more likely to argue that government should always run a balanced budget (and a surplus to pay down any outstanding debt), and that deficit spending is always bad policy .



## American political divide

There are two different approaches to fiscal policy in the US. Broadly, Democrats tend to be more Keynesian than Republicans.

Fiscal conservatism has academic support, predominantly associated with the neoclassical-inclined Chicago school of economics, and has significant political and institutional support, with all but one state of the United States (Vermont is the exception) having a balanced budget amendment to its state constitution. Fiscal conservatism was the dominant position until the Great Depression.

Liberals are more likely to be Keynesian and Post-Keynesians than Republican. They are more likely to argue that deficit spending is necessary, either to create the money supply (Chartalism) or to satisfy demand for savings in excess of what can be satisfied by private investment.

Chartalists argue that deficit spending is logically necessary because, in their view, fiat money is created by deficit spending: one cannot collect fiat money in taxes before one has issued it and spent it, and the amount of fiat money in circulation is exactly the government debt – money spent but not collected in taxes.



# Fiscal Multiplier

The fiscal multiplier is the ratio of a change in national income to the change in government spending that causes it. When this multiplier exceeds one, the enhanced effect on national income is called the multiplier effect. The mechanism that can give rise to a multiplier effect is that an initial incremental amount of spending can lead to increased consumption spending, increasing income further and hence further increasing consumption, etc., resulting in an overall increase in national income greater than the initial incremental amount of spending. In other words, an initial change in aggregate demand may cause a change in aggregate output that is a multiple of the initial change.

How effective fiscal policy is depends on the multiplier. The greater the multiplier, the more effective the policy. If for some reason outside of the control of the government the multiplier remains low, the effectiveness of fiscal policy will remain limited at best.

## 26.2.8: Difficulty in Getting the Timing Right

Discretionary fiscal policy relies on getting the timing right, but this can be difficult to determine at the time decisions must be made.

### Learning Objective

Explain the effect of timing on the use of fiscal policy tools

### Key Points

- Automatic stabilizers are designed to respond to evolving economic conditions without anyone taking action; timing is not an issue.
- Good economic data are a precondition to effective macroeconomic management. The problem with this is that it could be weeks, or even months, before the necessary data is collected and organized in a way that would reveal there is a problem.

- Once a discretionary program is in place, the next step is to measure its effectiveness. Again, measurement becomes a problem. Because it takes so long to measure fluctuations in the economy, it may be months before the program's effect on the economy can be seen.

## **Key Term**

discretionary fiscal policy

A fiscal policy achieved through government intervention, as opposed to automatic stabilizers.

A nation can respond to economic fluctuations through automatic stabilizers or through discretionary policy. With regards to automatic stabilizers, timing is not an issue. Automatic stabilizers are designed to respond to evolving economic conditions without anyone taking action.

With discretionary fiscal policy, timing plays a very significant role. Discretionary policy often requires that a set of laws must be passed through a legislature. This means that the problem has to be identified first, which means collecting macroeconomic data.

Good economic data are a precondition to effective macroeconomic management. With the complexity of modern economies and the lags inherent in macroeconomic policy instruments, a country must have the capacity to promptly identify any adverse trends in its economy and to apply the appropriate corrective measure. This cannot be done without economic data that is complete, accurate and timely. The problem with this is that it could be weeks, or even months, before the necessary data is collected and organized in a way that would reveal there is a problem.

Once the problem has been established, Congress must then arrive at a plan and hold debates. Any legislation must pass through committees in both chambers, and both chambers must approve. Then, it must be presented to the President for his signature. This entire process would take weeks at least, but would more likely take months .



## **President Coolidge Signing a Bill into Law**

It can take many months before Congress can pass a bill that would address current economic fluctuations.

Once the discretionary program is in place, the next step is to measure its effectiveness. Again, measurement becomes a problem. Because it takes so long to measure fluctuations in the economy, it may be months before the program's effect on the economy can be seen.

### **26.2.9: Crowding-Out Effect**

Usually the term "crowding out" refers to the government using up financial and other resources that would otherwise be used by private enterprise.

#### **Learning Objective**

Explain the crowding out effect

#### **Key Points**

- Some commentators and other economists use "crowding out" to refer to government providing a service or good that would otherwise be a business opportunity for private industry.
- An increase in the demand for loanable funds by the government shifts the loanable funds demand curve rightwards and upwards, increasing

the real interest rate. A higher real interest rate increases the opportunity cost of borrowing money, decreasing investment and consumption.

- If the economy is at capacity or full employment, the government suddenly implementing a stimulus program could create competition with the private sector for scarce funds available for investment, resulting in reduced private investment.

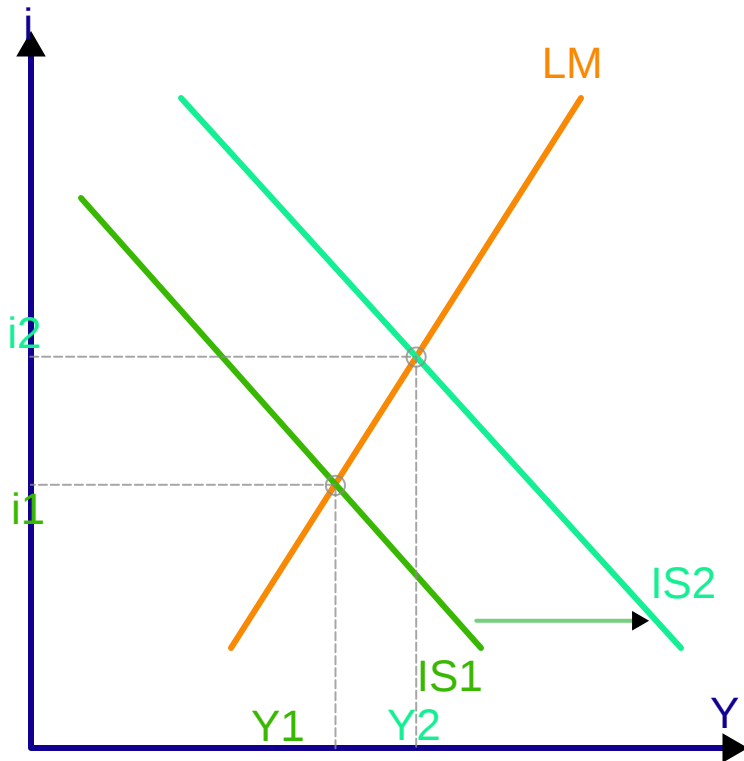
## Key Term

interest rate

The percentage of an amount of money charged for its use per some period of time (often a year).

Usually when economists use the term *crowding out* they are referring to the government using up financial and other resources that would otherwise be used by private enterprise. However, some commentators and other economists use *crowding out* to refer to government providing a service or good that would otherwise be a business opportunity for private industry.

The macroeconomic theory behind crowding out provides some useful intuition. What happens is that an increase in the demand for loanable funds by the government (e.g. due to a deficit) shifts the loanable funds demand curve rightwards and upwards, increasing the real interest rate. A higher real interest rate increases the opportunity cost of borrowing money, decreasing the amount of interest-sensitive expenditures such as investment and consumption. Thus, the government has crowded out investment .



## Crowding out Chart

When crowding-out occurs, the Investment-Savings (IS) curve moves to the right, causing higher interest rates ( $i$ ) and expansion in the "real" economy (real GDP, or  $Y$ ). LM stands for Liquidity Preference - Money Supply.

## Borrowing and Crowding Out

In economics, crowding-out occurs when increased government borrowing reduces investment spending. The increased borrowing crowds out private investing.

If an increase in government spending and/or a decrease in tax revenues leads to a deficit that is financed by increased borrowing, then the borrowing can increase interest rates, leading to a reduction in private investment. There is some controversy in modern macroeconomics on the subject, as different schools of economic thought differ on how households

and financial markets would react to more government borrowing under various circumstances.

## **Crowding-Out and Stimulus Programs**

The extent to which crowding out occurs depends on the economic situation. If the economy is at capacity or full employment, then the government suddenly increasing its budget deficit (e.g., via stimulus programs) could create competition with the private sector for scarce funds available for investment, resulting in an increase in interest rates and reduced private investment or consumption. Therefore, the effect of the stimulus is offset by the effect of crowding out.

### **26.2.10: Evaluating the Recent United States Stimulus Package**

The American Recovery and Reinvestment Act of 2009 (ARRA) was drafted in response to the Great Recession, primarily in order to create jobs.

#### **Learning Objective**

Summarize the effects of the use of stimulus in the wake of the Great Recession

#### **Key Points**

- Secondary objectives of the ARRA were to provide temporary relief programs for those most impacted by the recession and invest in infrastructure, education, health, and renewable energy.
- Reports on the effectiveness of the ARRA's ability to create jobs were mixed. One conservative estimate said that the ARRA saved or created 1.6 to 1.8 million jobs and forecast a total impact of 2.5 million jobs saved by the time the stimulus is completed.
- A sizeable number of projects funded by the stimulus could not be started right away, diminishing its immediate impact.

## **Key Terms**

infrastructure

The basic facilities, services and installations needed for the functioning of a community or society

quarter

Related to a three-month term, a quarter of a year.

The American Recovery and Reinvestment Act of 2009 (ARRA), otherwise known as the Stimulus or The Recovery Act, was an economic stimulus package was signed into law on February 17, 2009.

The ARRA was drafted in response to the Great Recession. The primary objective for ARRA was to save and create jobs almost immediately. Secondary objectives were to provide temporary relief programs for those most impacted by the recession and invest in infrastructure, education, health, and renewable energy .



## Composition of Stimulus

Tax incentives — includes \$15 B for Infrastructure and Science, \$61 B for Protecting the Vulnerable, \$25 B for Education and Training and \$22 B for Energy, so total funds are \$126 B for Infrastructure and Science, \$142 B for Protecting the Vulnerable, \$78 B for Education and Training, and \$65 B for Energy. State and Local Fiscal Relief — Prevents state and local cuts to health and education programs and state and local tax increases.

The approximate cost of the economic stimulus package was estimated to be \$787 billion at the time of passage, later revised to \$831 billion between 2009 and 2019. The Act included direct spending in infrastructure, education, health, and energy, federal tax incentives, and expansion of unemployment benefits and other social welfare provisions. The rationale for ARRA came from Keynesian macroeconomic theory, which argues that during recessions, the government should offset the decrease in private spending with an increase in public spending in order to save jobs and stop further economic deterioration.

## The Stimulus's Impact on Unemployment

The primary justification for the stimulus package was to minimize unemployment. The Obama administration and Democratic proponents



presented a graph in January 2009 showing the projected unemployment rate with and without the ARRA. The graph showed that if ARRA was not enacted the unemployment rate would exceed 9%; but if ARRA was enacted it would never exceed 8%. After ARRA became law, the actual unemployment rate exceeded 8% in February 2009, exceeded 9% in May 2009, and exceeded 10% in October 2009. The actual unemployment rate was 9.2% in June 2011 when it was projected to be below 7% with the ARRA. However, supporters of ARRA claim that this can be accounted for by noting that the actual recession was subsequently revealed to be much worse than any projections at the time when the ARRA was drawn up.

One year after the stimulus, several independent firms, including Moody's and IHS Global Insight, estimated that the stimulus saved or created 1.6 to 1.8 million jobs and forecast a total impact of 2.5 million jobs saved by the time the stimulus is completed. The Congressional Budget Office considered these estimates conservative. The CBO estimated that, according to its model, 2.1 million jobs were saved in the last quarter of 2009, boosting the country's GDP by up to 3.5% and lowering the unemployment rate by up to 2.1%.

In 2013, the Reason Foundation conducted a study of the results of the ARRA. Only 23% of 8,381 sampled companies hired new workers and kept all of them when the project was completed. Only 41% of sampled companies hired workers at all. 30% of sampled companies laid off all workers once the government money stopped funding. These results cast doubt on previously stated estimates of job creation numbers, which do not take into account those companies that did not retain their workers.

## **Shovel-Ready Projects**

One of the primary purposes and promises of the Act was to launch a large number projects to stimulate the economy. However, a sizable number of these projects, many of which pertained to infrastructure, took longer to implement than they had expected by most. Just because the money was there for the projects did not mean that the projects were "shovel-ready": there was a delay between when the funding became available and when the project could actually begin. Since the stimulus only is impactful when the

money is actually spent, delays could have reduced the overall effectiveness of the stimulus.

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# **27: The Monetary System**

# 27.1: Introducing Money

## 27.1.1: The Definition of Money

Money is any object that is generally accepted as payment for goods and services and the repayment of debt.

### Learning Objective

Distinguish between the three main functions of money: a medium of exchange, a unit of account, and a store of value

### Key Points

- Money comes in three forms: commodity money, fiat money, and fiduciary money. Most modern monetary systems are based on fiat money.
- Commodity money derives its value from the commodity of which it is made, while fiat money has value only by the order of the government.
- Money functions as a medium of exchange, a unit of account, and a store of value.

### Key Term

Fiat money

Money that is given value because those who use it believe it has value; the value is not derived from any inherent characteristic.

Money is any object that is generally accepted as payment for goods and services and repayment of debts in a given socioeconomic context or country. Money comes in three forms: commodity money, fiat money, and fiduciary money.



Many items have been historically used as commodity money, including naturally scarce precious metals, conch shells, barley beads, and other things that were considered to have value . The value of commodity money comes from the commodity out of which it is made. The commodity itself constitutes the money, and the money is the commodity.



## **Commodity Money**

Conch shells have been used as commodity money in the past. The value of commodity money is derived from the commodity out of which it is made.

Fiat money is money whose value is not derived from any intrinsic value or guarantee that it can be converted into a valuable commodity (such as gold). Instead, it has value only by government order (fiat). Usually, the government declares the fiat currency to be legal tender, making it unlawful to not accept the fiat currency as a means of repayment for all debts. Paper money is an example of fiat money.

Fiduciary money includes demand deposits (such as checking accounts) of banks. Fiduciary money is accepted on the basis of the trust its issuer (the bank) commands.

Most modern monetary systems are based on fiat money. However, for most of history, almost all money was commodity money, such as gold and silver coins.

## **Functions of Money**

Money has three primary functions. It is a medium of exchange, a unit of account, and a store of value:

1. **Medium of Exchange:** When money is used to intermediate the exchange of goods and services, it is performing a function as a medium of exchange.
2. **Unit of Account:** It is a standard numerical unit of measurement of market value of goods, services, and other transactions. It is a standard of relative worth and deferred payment, and as such is a necessary prerequisite for the formulation of commercial agreements that involve debt. To function as a unit of account, money must be divisible into smaller units without loss of value, fungible (one unit or piece must be perceived as equivalent to any other), and a specific weight or size to be verifiably countable.
3. **Store of Value:** To act as a store of value, money must be reliably saved, stored, and retrieved. It must be predictably usable as a medium of exchange when it is retrieved. Additionally, the value of money must remain stable over time.

Economists sometimes note additional functions of money, such as that of a standard of deferred payment and that of a measure of value. A "standard of deferred payment" is an acceptable way to settle a debt--a unit in which debts are denominated. The status of money as legal tender means that money can be used for the discharge of debts. Money can also act as a standard measure and common denomination of trade. It is thus a basis for quoting and bargaining prices. Its most important usage is as a method for comparing the values of dissimilar objects.

### **27.1.2: The Functions of Money**

The monetary economy is a significant improvement over the barter system, in which goods were exchanged directly for other goods.

## **Learning Objective**

Analyze how the characteristics of money make it an effective medium of exchange

## **Key Points**

- The barter system has a number of limitations, including the double coincidence of wants, the absence of a common measure of value, indivisibility of certain goods, difficulty of deferred payments, and difficulty of storing wealth.
- Despite the numerous limitations, the barter system works well when currency is unstable or unavailable for conducting commerce.
- Money is durable, divisible, portable, liquid, and resistant to counterfeiting.
- Money serves as a medium of exchange, a unit of account, a store of value, and a standard of deferred payment.

## **Key Term**

barter

An exchange goods or services without involving money.

Barter is a system of exchange in which goods or services are directly exchanged for other goods or services without using a medium of exchange, such as money . The reciprocal exchange is immediate and not delayed in time. It is usually bilateral, though it can be multilateral, and usually exists parallel to monetary systems in most developed countries, though to a very limited extent. The barter system has a number of limitations which make transactions very inefficient, including:



## Barter

In a barter system, individuals possessing something of value could exchange it for something else of similar or greater value.

- Double coincidence of wants: The needs of a seller of a commodity must match the needs of a buyer. If they do not, the transaction will not occur.
- Absence of common measure of value: In a monetary economy, money plays the role of a measure of value of all goods, making it possible to measure the values of goods against each other. This is not possible in a barter economy.
- Indivisibility of certain goods: If a person wants to buy a certain amount of another's goods, but only has payment of one indivisible good which is worth more than what the person wants to obtain, a barter transaction cannot occur.
- Difficulty of deferred payments: It is impossible to make payments in installments and difficult to make payments at a later point in time.
- Difficulty storing wealth: If society relies exclusively on perishable goods, storing wealth for the future may be impractical.

Despite the long list of limitations, the barter system has some advantages. It can replace money as the method of exchange in times of monetary crisis, such as when a the currency is either unstable (e.g. hyperinflation or deflationary spiral) or simply unavailable for conducting commerce. It can also be useful when there is little information about the credit worthiness of trade partners or when there is a lack of trust.

The money system is a significant improvement over the barter system. It provides a way to quantify the value of goods and communicate it to others. Money has several defining characteristics. It is:

- Durable.
- Divisible.
- Portable.
- Liquid.
- A unit of account.
- Legal tender.
- Resistant to counterfeiting.

Money serves four primary purposes. It is:

- A medium of exchange: an object that is generally accepted as a form of payment.
- A unit of account: a means of keeping track of how much something is worth.
- A store of value: it can be held and exchanged later for goods and services at an approximate value.
- A standard of deferred payments (this is not considered a defining purpose of money by all economists).

The use of money as a medium of exchange has removed the major difficulty of double coincidence of wants in the barter system. It separates the act of sale and purchase of goods and services and helps both parties in obtaining maximum satisfaction and profits independently.

### **27.1.3: Measuring the Money Supply: M1**

M1 captures the most liquid components of the money supply, including currency held by the public and checkable deposits in banks.

#### **Learning Objective**

Define M1

## **Key Points**

- The Federal Reserve measures the money supply using three monetary aggregates: M1, M2, and M3.
- M1 is the narrowest measure of the money supply, including only money that can be spent directly.
- M2 is a broader measure, encompassing M1 and near monies.
- M3 includes M2 plus relatively less liquid near monies. However, this measure is no longer used in practice.

## **Key Term**

### M1

The amount of cash in circulation plus the amount in bank checking accounts.

The Federal Reserve measures the money supply using three main monetary aggregates: M1, M2, and M3.

M1 is the narrowest measure of the money supply, including only money that can be spent directly. More specifically, M1 includes currency and all checkable deposits. Currency refers to the coins and paper money in the hands of the public. Checkable deposits refer to all spendable deposits in commercial banks and thrifts.



## M1

The M1 measure includes currency in the hands of the public and checkable deposits in commercial banks.

A broader measure of money than M1 includes not only all of the spendable balances in M1, but certain additional assets termed "near monies". Near monies cannot be spent as readily as currency or checking account money, but they can be turned into spendable balances with very little effort or cost. Near monies include what is in savings accounts and money-market mutual funds. The broader category of money that embraces all of these assets is called M2. M3 encompassed M2 plus relatively less liquid near monies. In practice, the measure of M3 is no longer used by the Federal Reserve.

Imagine that Laura deposits \$900 in her checking account in a world with no other money ( $M1 = \$900$ ). The bank sets 10% of the amount aside for required reserves, while the remaining \$810 can be lent out by the bank as credit. The M1 money supply increases by \$810 when the loan is made

( $M1 = \$1,710$ ). In the meantime, Laura writes a check for \$400. The total M1 money supply didn't change; it includes the \$400 check and the \$500 left in the checking account ( $M1 = \$1,710$ ). Laura's check is accidentally destroyed in the laundry. M1 and her checking account do not change, because the check is never cashed ( $M1 = \$1,710$ ). Meanwhile, the bank lends Mandy the \$810 credit that it has created. Mandy deposits the money in a checking account at another bank. The bank must keep 10% as reserves and has \$729 available for loans. This creates promise-to-pay money from a previous promise-to-pay, inflating the M1 money supply ( $M1 = \$2,439$ ). Mandy's bank now lends the money to someone else who deposits it in a checking account at another bank, and the process repeats itself.

## 27.1.4: Measuring the Money Supply: M2

M2 is a broader measure of the money supply than M1, including all M1 monies and those that could be quickly converted to liquid forms.

### Learning Objective

Define M2

### Key Points

- M2 consists of all the components of M1 plus near-monies.
- Near monies are relatively-liquid financial assets that can be quickly converted into M1 money.
- Near monies include savings deposits, small time deposits, and money market mutual funds.

### Key Term

M2

The amount of cash in circulation plus bank accounts, savings accounts and small deposits.



There is no single "correct" measure of the money supply. Instead there are several measures, classified along a continuum between narrow and broad monetary aggregates. Narrow measures include only the most liquid assets, the ones most easily used to spend (for example, currency and checkable deposits). Broader measures add less liquid types of assets (certificates of deposit, etc.). The continuum corresponds to the way that different types of money are more or less controlled by monetary policy. Narrow measures include those more directly affected and controlled by monetary policy, whereas broader measures are less closely related to monetary policy actions.

The different types of money are typically classified as "M"s. Around the world, they range from M0 (the narrowest) to M3 (broadest), but which of the measures is actually the focus of policy formulation depends on a country's central bank.

M2 is one of the aggregates by which the Federal Reserve measures the money supply . It is a broader classification of money than M1 and a key economic indicator used to forecast inflation. M2 consists of all the liquid components of M1 plus near-monies. Near monies are relatively liquid financial assets that may be readily converted into M1 money. More specifically, near monies include savings deposits, small time deposits (less than \$100,000) that become readily available at maturity, and money market mutual funds.



## Federal Reserve

Historically, the Federal Reserve has measured the money supply using the aggregates of M1, M2, and M3. The M2 aggregate includes M1 plus near-monies.

Imagine that Laura writes a check for \$1,000 and brings it to the bank to start a money market account. This would cause M1 to decrease by \$1,000, but M2 to stay the same. This is because M2 includes the money market account in addition to all the money counted in M1.

### 27.1.5: Other Measurements of the Money Supply

In addition to the commonly used M1 and M2 aggregates, several other measures of the money supply are used as well.

#### Learning Objective

Explain how the money supply is measured

#### Key Points

- M0 is a measure of all the physical currency and coinage in circulation in an economy.

- MB is a measure that captures all physical currency, coinage, and Federal Reserve deposits (special deposits that only banks can have at the Fed).
- The different forms of money in the government money supply statistics arise from the practice of fractional-reserve banking. Whenever a bank gives out a loan in a fractional-reserve banking system, a new sum of money is created, which makes up the non-M0 components in the M1-M3 statistics.

## **Key Terms**

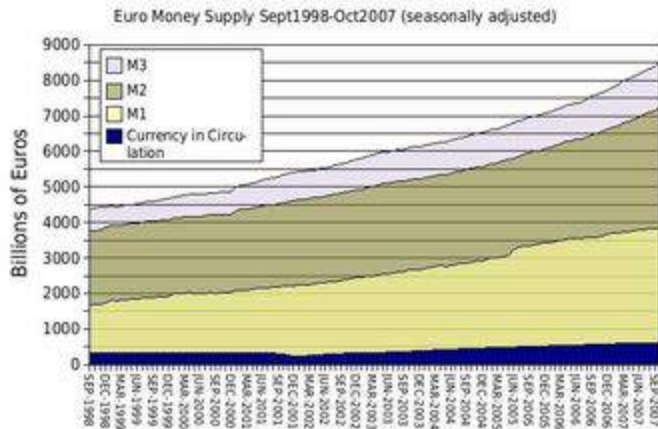
M0

The amount of coin and banknotes in circulation.

MB

The portion of the commercial banks' reserves that is maintained in accounts with their central bank plus the total currency circulating in the public.

In addition to the commonly used M1 and M2 aggregates, there are several other measurements of the money supply that are used as well . More specifically:



## Euro Money Supply

The measures of the money supply are all related, but the use of different measures may lead economists to different conclusions.

- M0: The total of all physical currency including coinage. M0 = Federal Reserve Notes + US Notes + Coins .
- MB: Stands for "monetary base," referring to the base from which all other forms of money are created. MB is the total of all physical currency plus Federal Reserve Deposits (special deposits that only banks can have at the Fed). MB = Coins + US Notes + Federal Reserve Notes + Federal Reserve Deposits.
- M1: The total amount of M0 (cash/coin) outside of the private banking system plus the amount of demand deposits, travelers checks and other checkable deposits.
- M2: M1 + most savings accounts, money market accounts, retail money market mutual funds, and small denomination time deposits (certificates of deposit of under \$100,000).
- M3: M2 + all other certificates of deposit (large time deposits, institutional money market mutual fund balances), deposits of eurodollars and repurchase agreements.
- M4-: M3 + commercial paper.
- M4: M4- + treasury bills (or M3 + commercial paper + T-bills)
- MZM: "Money Zero Maturity" is one of the most popular aggregates in use by the Fed because its velocity has historically been the most

accurate predictor of inflation. It is M2 – time deposits + money market funds.

- L: The broadest measure of liquidity that the Federal Reserve no longer tracks. M4 + Bankers' Acceptance.

The different forms of money in the government money supply statistics arise from the practice of fractional-reserve banking. Fractional-reserve banking is the practice whereby a bank retains only a portion of its customers' deposits as readily available reserves from which to satisfy demands for withdrawals. Whenever a bank gives out a loan in a fractional-reserve banking system, a new sum of money is created. This new type of money is what makes up the non-M0 components in the M1-M3 statistics.

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# 27.2: Introducing the Federal Reserve

## 27.2.1: Introduction to Monetary Policy

Monetary policy is the process by which a monetary authority controls the money supply, often to produce stable prices and low unemployment.

### Learning Objective

Justify expansionary and contractionary monetary policy.

### Key Points

- Monetary policy is referred to as either being expansionary or contractionary, where an expansionary policy increases the money supply more rapidly than usual, and contractionary policy expands the money supply more slowly than usual.
- Expansionary policy is traditionally used to try to combat unemployment by lowering interest rates. A monetary authority will typically pursue expansionary monetary policy when there is an output gap.
- Contractionary policy is intended to slow inflation in order to avoid the resulting distortions and deterioration of asset values.

### Key Terms

inflation

An increase in the general level of prices or in the cost of living.

output gap

The difference between an economy's actual GDP and its long-run potential GDP

Monetary policy is the process by which the monetary authority of a country, which could be a government agency or a central bank, controls the supply of money, often targeting a rate of interest for the purpose of promoting economic growth and stability. The official goals usually include relatively stable prices and low unemployment.

Monetary policy is referred to as either being expansionary or contractionary, where an expansionary policy increases the total supply of money in the economy more rapidly than usual, and contractionary policy expands the money supply more slowly than usual or even shrinks it. Expansionary policy is traditionally used to try to combat unemployment in a recession by easing credit to entice businesses into expanding. Contractionary policy is intended to slow inflation in order to avoid the resulting distortions and deterioration of asset values, or to cool an overheating economy. Monetary policy differs from fiscal policy, which refers to taxation, government spending, and associated borrowing.

## **Expansionary Monetary Policy**

A monetary authority will typically pursue expansionary monetary policy when there is an output gap - that is, a country is producing output at a lower level than its potential output. Without a policy intervention the output gap may correct itself, if falling wages and prices shift the short-run aggregate supply curve to the right until the economy returns to the long-run equilibrium. Alternatively, the monetary authority could intervene in order to increase aggregate demand and close the output gap. Expansionary monetary policy consists of the tools that a central bank uses to achieve this increase in aggregate demand.

In practice, this means that a monetary authority will use the tools at its disposal in order to increase the money supply and decrease interest rates. Since interest rates represent the price of money, lower interest rates will cause the quantity of money demanded to increase, stimulating investment and spending. In addition, lower interest rates make a currency worth less in

the currency exchange market. This reduces the demand for and increases the supply of dollars in the currency market, reducing the exchange rate (in foreign currency per dollar). A lower exchange rate makes a country's goods relatively more affordable for the rest of the world, stimulating exports and further increasing output.

## **Contractionary Monetary Policy**

By contrast, a monetary authority will pursue a contractionary monetary policy when it considers inflation a threat. Suppose, for example, that high short-run aggregate demand creates an equilibrium in which prices are higher than in the long-run equilibrium. This will cause high levels of inflation. In response, the monetary authority may reduce the money supply and thereby raise the interest rate. Investment falls as the interest rate rises. The higher interest rate also increases the demand for dollars as foreign investors shift their investments to the United States. Likewise, the supply of dollars declines. Consumers in the United States purchase domestic interest-bearing assets rather than purchasing assets abroad, taking advantage of the higher domestic interest rate. Increased demand and decreased supply cause an increase in the exchange rate, which boots imports while reducing exports. Thus, contractionary monetary policy causes aggregate demand to fall, thereby reducing the rate of inflation. .



## Money Supply and Inflation

The graph shows the relationship between the money supply and the inflation rate. By controlling the money supply, monetary authorities hope to influence the rate of inflation.

### 27.2.2: The Creation of the Federal Reserve

The Federal Reserve was created to promote financial stability, provide regulation and banking services, and conduct monetary policy.

#### Learning Objective

Explain monetary policy as the main function of a central bank

#### Key Points

- The Federal Reserve (the Fed) was originally created in response to a series of bank panics. While its policy goals were originally unclear, today the Fed has a dual mandate: to achieve maximum employment and stable prices.
- The Fed has three main policy tools: setting reserve requirements, operating the discount window and other credit facilities, and conducting open-market operations.

- The Fed sets the required ratio of reserves that banks must hold relative to their deposit liabilities.
- The discount rate is the interest rate charged by the Fed when it lends reserves to banks.
- The buying and selling of federal government bonds by the Fed are called open-market operations.

## **Key Terms**

### central bank

The principal monetary authority of a country or monetary union; it normally regulates the supply of money, issues currency and controls interest rates.

### reserve requirement

The minimum amount of deposits each commercial bank must hold (rather than lend out).

## **The Federal Reserve Act of 1913**

Until 1913, the United States did not have a true central bank. The US suffered through a number of financial crises that eventually drove Congress to create the US central bank, the Federal Reserve (the Fed), through the Federal Reserve Act of 1913.

The Act established three key objectives for monetary policy: maximum employment, stable prices, and moderate long-term interest rates. The first two objectives are sometimes referred to as the Federal Reserve's dual mandate and are the most emphasized of the three.

Over the years, the Fed has expanded its duties to include conducting monetary policy, supervising and regulating banking institutions, maintaining the stability of the financial system, and providing financial services.

# **How the Fed Conducts Monetary Policy**

The Fed has three main policy tools: setting reserve requirements, operating the discount window and other credit facilities, and conducting open-market operations.

## **Reserve Requirements**

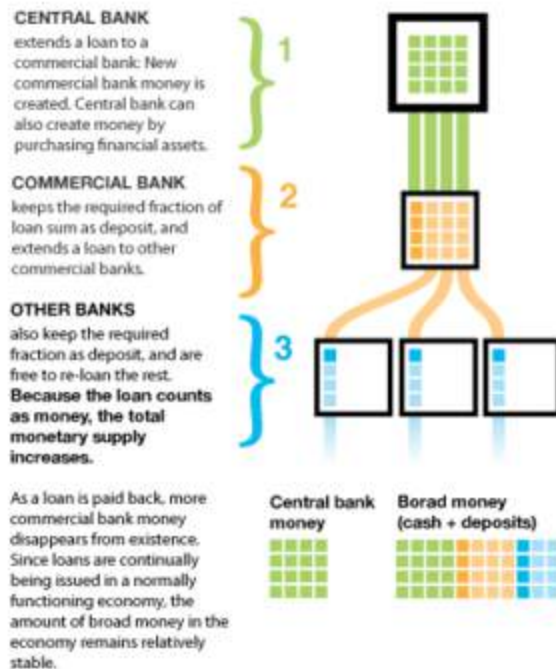
Commercial banks are required to hold a certain proportion of their deposits in reserves and not lend them out. This proportion is called the reserve requirement and is controlled by the Fed. By changing the reserve requirement, the Fed can impact the amount of money available for lending, and by extension, spending and investment.

## **Discount Window**

Commercial banks are required to have a certain amount of reserves on hand at the end of each day. If they are going to come up short, they must borrow from other banks or the Fed. The Fed extends these loans through the discount window and charges what is called the discount rate. The discount rate is set by the Fed, and is important because it radiates throughout the economy: if it becomes more expensive to borrow at the discount window, interest rates will rise and borrowing will become more expensive economy-wide. In this way, the Fed can use the discount window to affect interest rates and the money supply .

# Money creation

through fractional reserve banking (expansionary monetary policy)



## Increasing the Money Supply

The diagram shows how the central bank can increase the money supply by lending money through the discount window or purchasing bonds (open market operations).

## Open-Market Operations

The government borrows by issuing bonds. Recall that the interest rate that the government pays is determined by the price of the bond: the higher the price of the bond, the lower the interest rate. The Fed can affect the interest rate by conducting open-market operations (OMOs) in which it buys or sells bonds. Buying or selling bonds changes the demand or supply of the bonds, and therefore their price. By extension, OMOs change the interest rate, hopefully to achieve one of the Fed's monetary goals.

## 27.2.3: Structure of the Federal Reserve

The Federal Reserve System (The Fed) was designed in order to maintain the central bank's independence and promote decentralized power.

### Learning Objective

Recall the structure of the Federal Reserve System of the United States

### Key Points

- The Fed is a system of 12 regional banks, each of which has its own board of directors and rotating representative to the Federal Open Market Committee (FOMC).
- The Fed is run by a Board of Governors, the head of which is the Chairperson.
- The Federal Open Market Committee (FOMC) consists of the seven members of the Board of Governors and five rotating regional bank presidents. It is primarily responsible for buying and selling federal government bonds in order to conduct monetary policy.

### Key Terms

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

open market operations

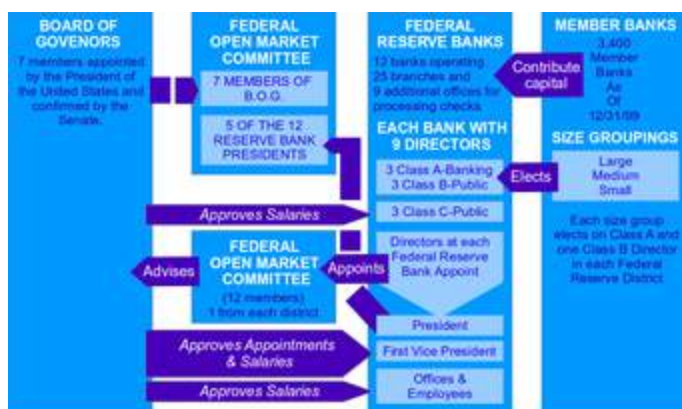
An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

The Federal Reserve (the Fed) was designed to be independent of the Congress and the government. The idea justification for independence is that it allows the Fed to operate without being put under political pressure



to take actions that may not be in the best long-term economic interest of the country.

The Federal Reserve System is composed of five parts :



Source: Board of Governors of the Federal Reserve System

## Structure of the Federal Reserve

The diagram shows the relationship between the different organizations that compose the Federal Reserve System

1. The presidentially appointed Board of Governors (or Federal Reserve Board), an independent federal government agency located in Washington, D.C. Each governor serves a 14 year term. As of February 2014, the Chair of the Board of Governors is Janet Yellen, who succeeded Ben Bernanke.
2. The Federal Open Market Committee (FOMC), composed of the seven members of the Federal Reserve Board and five of the 12 Federal Reserve Bank presidents, which oversees open market operations, the principal tool of U.S. monetary policy.
3. Twelve regional Federal Reserve Banks located in major cities throughout the nation, which divide the nation into twelve Federal Reserve districts. The Federal Reserve Banks act as fiscal agents for the U.S. Treasury, and each has its own nine-member board of directors.
4. Numerous other private U.S. member banks, which own required amounts of non-transferable stock in their regional Federal Reserve Banks.

## 5. Various advisory councils.

The Fed can be thought of as having both private and public organization characteristics, though it considers itself to be private. On one hand, the Fed works toward achieving public goals such as moderate inflation and low unemployment. It does not exist to make money. On the other hand, it is, by design, separate from the government. It operates independently, and is not subject to political pressures directly as is Congress or the President.

## **27.2.4: The Federal Open Market Committee and the Role of the Fed**

The Federal Open Market Committee is responsible for conducting open market operations in order to achieve a target interest rate.

### **Learning Objective**

Describe the structure and operations of the Federal Open Market Committee (FOMC)

### **Key Points**

- Open market operations are the buying and selling of federal government bonds in order to influence the money supply and interest rate.
- The Fed sets targets for the federal funds rate and then conducts operations to maintain that rate. To achieve a lower federal funds rate, for example, the Fed goes into the open market to buy securities and thus increase the money supply.
- The FOMC decides on a target federal funds rate by looking at monetary targets such as inflation, interest rates, or exchange rates.

### **Key Terms**

reserve

Banks' holdings of deposits in accounts with their central bank.

federal funds rate

The interest rate at which depository institutions actively trade balances held at the Federal Reserve with each other.

One of the primary tools used by the Federal Reserve (the Fed) to conduct monetary policy is open market operations: the buying and selling of federal government bonds in order to influence the money supply and interest rate. These operations are the primary responsibility of the Federal Open Market Committee (FOMC). The FOMC is a twelve-person committee composed of the seven members of the Board of Governors, plus a rotating combination of five presidents of the Federal Reserve Regional Banks. The president of the New York regional bank is always a member of the FOMC; the other four seats are filled by four of the other eleven bank presidents.

When conducting monetary policy the Fed sets a target for the federal funds rate, which it attempts to achieve using open market operations. To lower the federal funds rate, for example, the Fed buys securities on the open market, increasing the money supply. In order to raise the federal funds rate, on the other hand, the Fed sells securities and thereby reduces the money supply.

## **Open Market Operations**

As mentioned previously, the aim of open market operations is to manipulate the short term interest rate and the total money supply. This involves meeting the demand for money at the target interest rate by buying and selling government securities or other financial instruments. Monetary targets, such as inflation, interest rates, or exchange rates, are used to guide this implementation.

Imagine the Fed is targeting a federal funds rate of 3%. If there is an increased demand for money and the Fed takes no action, interest rates will rise. This may produce unintended contractionary effects in the economy.

Instead, the FOMC responds to an increase in the demand for money by going to the open market to buy a financial asset, such as government bonds, foreign currency, or gold. To pay for these assets, the Fed transfers bank reserves to the seller's bank and the seller's account is credited. Since the bank now has more reserves than it had before, it can lend out more money and the money supply increases. Thus, the increase in demand for money is met with an increase in supply, and the interest rate remains unchanged.

Conversely, if the central bank sells its financial assets on the open market, reserves are transferred from the buyer's bank back to the Fed. This reduces the amount of money that a bank may loan out and the total money supply falls. The process works because the central bank has the authority to bring money in and out of existence. They are the only point in the whole system with the unlimited ability to produce money.



## **FOMC Meeting**

The members of the FOMC meet eight times a year in order to vote on current monetary policies.

## **27.2.5: The Federal Reserve and the Financial Crisis of 2008**

The Fed responded to the financial crisis with conventional open market operations and unconventional credit facilities and bailouts.

## **Learning Objective**

Summarize the monetary policy tools used by the Federal Reserve in response to the financial crisis of 2008.

## **Key Points**

- In late 2007, the bursting of the U.S. housing bubble triggered the worst financial crisis since the Great Depression of the 1930s.
- The Fed cut the target federal funds rate and the discount lending rate seven times. Normally, a low federal funds rate would encourage banks to make loans, stimulating the economy, but this failed to work following the crisis.
- Unable to rely on conventional tools, the Fed created a variety of credit facilities to provide liquidity to the economy.
- The Fed also provided emergency funds to support financial institutions deemed "too big to fail".

## **Key Terms**

liquidity

The degree to which an asset can be easily converted into cash.

discount rate

An interest rate that a central bank charges to depository institutions that borrow reserves from it.

open market operations

An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

In late 2007, the bursting of the U.S. housing bubble triggered the worst financial crisis since the Great Depression of the 1930s. It resulted in the threat of total collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world. The crisis caused the failure of businesses, huge declines in consumer wealth, and a downturn in economic activity that led to the 2008-2012 global recession.

The Federal Reserve's response to the 2008 crisis saw the use of both conventional and new monetary tools in order to stabilize the economy, support market liquidity, and encourage economic activity. Conventional monetary policy suggests that in an economic downturn, a central bank should conduct open market operations in order to increase the money supply and lower interest rates. Lower interest rates stimulate loans, spending, and investment and help an economy escape from recession. Further, this type of financial crisis meant that banks' assets were suddenly worth far less; open market operations can ensure that these banks have the liquidity they need to carry out their financial activities.

## **Conventional Monetary Tools**

The Federal Reserve (the Fed) did engage in these types of conventional operations in 2007 and 2008, cutting the target federal funds rate and the discount rate seven times. Normally, a low federal funds rate would encourage banks to borrow money in order to lend it out to firms and individuals, stimulating the economy, but in the aftermath of the financial crisis the Fed was unable to lower interest rates enough to successfully induce banks to make loans. One reason why traditional monetary policies failed is due to the zero lower bound and the low levels of inflation that accompanied the crisis.

The zero lower bound refers to the fact that the central bank cannot push nominal interest rates below 0%. This is because any creditor can do better by keeping their money in cash than by loaning it out at an interest rate below 0%. When inflation is high, however, central banks may be able to push the real interest rate below 0%. Recall that the nominal interest rate is the sum of the real interest rate and the expected inflation rate. If the

nominal interest rate is 1% and inflation is 3%, the real interest rate is -2%. However, following the crisis, the U.S. experienced very low levels of inflation, and cutting the federal funds rate failed to provide enough economic stimulus to get the country out of the recession.

## **Unconventional Monetary Tools**

Unable to create interest rates low enough to encourage banks to resume lending money, the Fed turned to other, untried policy tools to encourage economic activity. To deal with the shrinking credit markets, the Fed created a selection of new credit facilities. The Primary Dealer Credit Facility (PDCF) allows the banks that normally handle open market operations on behalf of the Fed to apply for overnight loans. The Term Asset-Backed Securities Loan Facility uses the primary dealers to give companies access to loans based on asset-backed securities, such as those related to credit card or small business debt. These new credit facilities were created based on the hope that increasing liquidity in the market would induce firms and consumers to borrow and spend.

The Fed also provided targeted assistance to bail out large financial institutions that would have otherwise collapsed. During the crisis, housing prices fell and the number of foreclosures increased dramatically. Investors, banks, and other financial institutions came under pressure as their mortgage-based assets lost value. The Fed provided credit to these institutions in an attempt to mitigate the effect of falling asset prices and stem the crisis. This included bailouts of two housing finance firms - Fannie Mae and Freddie Mac - which had been established by the government in order to encourage home ownership and stimulate the housing market.

The Fed also provided billions of dollars of assistance to AIG, an insurance firm that had invested heavily in mortgage loans. Without the assistance the firm would have collapsed, possibly causing a chain reaction of failing financial institutions. The Fed determined that these consequences were too severe to be allowed - that is, that AIG was "too big to fail." Many argue that when the Fed provided this type of emergency aid, it encouraged banks to take even more extreme risks, safe in the knowledge that they would be

bailed out if their investments failed. Others praise the Fed for avoiding an even deeper financial crisis.

## **27.2.6: The Structure and Function of Other Banks**

While central banks share responsibility for monetary policy, their structures, methods, and primary goals differ across countries.

### **Learning Objective**

Summarize the structure of the ECB, the Bank of England, and the People's Bank of China

### **Key Points**

- The European Central Bank controls interest rates through auctions rather than the bond market, and is responsible for maintaining price stability over all other goals.
- The Bank of England is the second-oldest central bank in the world. Monetary policy is dictated by the Monetary Policy Committee, and recently the Financial Policy Committee was formed in order to regulate the UK's financial sector.
- The People's Bank of China conducts monetary policy and is the largest central bank in the world.

### **Key Terms**

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

Eurozone



Those European Union member states whose official currency is the euro.

price stability

A state of economy characterized by low inflation, and thus a stable value of money.

The primary function of a central bank is to manage the nation's money supply (monetary policy), through active duties such as managing interest rates, setting the reserve requirement, and acting as a lender of last resort to the banking sector during times of bank insolvency or financial crisis. Central banks usually also have supervisory powers, intended to prevent bank runs and to reduce the risk that commercial banks and other financial institutions engage in reckless or fraudulent behavior. Central banks in most developed nations are institutionally designed to be independent from political interference. However, the structure, tools, and primary goals of these banks differ between countries.

## **European Central Bank**

The European Central Bank (ECB) is the central bank for the euro and administers the monetary policy of the Eurozone, which consists of 17 EU member states and is one of the largest currency areas in the world. The bank was established by the Treaty of Amsterdam in 1998, and is headquartered in Frankfurt, Germany. In contrast with the Federal Reserve, the ECB has the primary objective of maintaining price stability within the Eurozone, but is not charged with regulating unemployment or economic output.

In the U.S., liquidity is furnished to the economy primarily through the purchase of Treasury bonds by the Federal Reserve (the Fed), but the European system uses a different method. Instead, there are about 1,500 eligible banks that can bid for short term repurchase contracts, or "repos". The banks borrow cash, and when the repo notes come due the participating banks bid again. Because the loans have a short duration, the ECB can

adjust interest rates and money supply by varying the quantity of notes offered at auction.

The ECB has three decision-making bodies: the Executive Board, the Governing Council, and the General Council. The Executive Board is responsible for implementing monetary policy and the day-to-day running of the bank. The Governing Council makes decisions about what monetary policies to implement. The General Council deals with the transitional issues that come about as new countries adopt the euro.

## **The Bank of England**

The Bank of England is the central bank of the United Kingdom and the model on which most modern central banks have been based. Established in 1694, it is the second oldest central bank in the world . It was established to act as the English Government's banker, and was privately owned from its foundation in 1694 until it was nationalized in 1946. In 1998, it became an independent public organization, owned by the Treasury Solicitor on behalf of the government, with independence in setting monetary policy. The primary goals of the Bank of England are to maintain price stability and support the economic policies of the government.



## Bank of England Charter

The illustration shows the sealing of the Bank of England Charter in 1694. The structure and function of the Bank of England served as a model for the central banks formed later.

The Monetary Policy Committee is responsible for formulating monetary policy and for setting interest rates in order to maintain a given inflation target. The recently-established Financial Policy Committee is responsible for regulating the UK's financial sector in order to maintain financial stability.

## The People's Bank of China

The People's Bank of China (PBC) is the central bank of the People's Republic of China with the power to control monetary policy and regulate financial institutions in mainland China. The People's Bank of China has the most financial assets of any single public finance institution. It is responsible for making and implementing monetary policy for safeguarding the overall financial stability and provision of financial services.

The PBC has nine regional branches, as well as many sub-branches and six overseas representative offices. It is divided into 18 functional departments that oversee such issues as monetary policy, financial stability, anti-money

laundering, and legal affairs. The top management of the PBC is composed of the governor and a certain number of deputy governors. The PBC adopts a governor responsibility system under which the governor supervises the overall work of the PBC while the deputy governors provide assistance to the governor to fulfill his or her responsibility.

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# 27.3: Creating Money

## 27.3.1: The Fractional Reserve System

A fractional reserve system is one in which banks hold reserves whose value is less than the sum of claims outstanding on those reserves.

### Learning Objective

Examine the impact of fractional reserve banking on the money supply

### Key Points

- The main way that banks earn profits is through issuing loans. Because their depositors do not typically all ask for the entire amount of their deposits back at the same time, banks lend out most of the deposits they have collected.
- The fraction of deposits that a bank keeps in cash or as a deposit with the central bank, rather than loaning out to the public, is called the reserve ratio.
- A minimum reserve ratio (or reserve requirement) is mandated by the Fed in order to ensure that banks are able to meet their obligations.
- Because banks are only required to keep a fraction of their deposits in reserve and may loan out the rest, banks are able to create money.
- A lower reserve requirement allows banks to issue more loans and increase the money supply, while a higher reserve requirement does the opposite.

### Key Terms

deposit

Money placed in an account.



reserves

Banks' holdings of deposits in accounts with their central bank, plus currency that is physically held in the bank's vault.

Banks operate by taking in deposits and making loans to lenders. They are able to do this because not every depositor needs her money on the same day. Thus, banks can lend out some of their depositors' money, while keeping some on hand to satisfy daily withdrawals by depositors. This is called the fractional-reserve banking system: banks only hold a fraction of total deposits as cash on hand.

## **Reserve Ratio**

The fraction of deposits that a bank must hold as reserves rather than loan out is called the reserve ratio (or the reserve requirement) and is set by the Federal Reserve. If, for example, the reserve requirement is 1%, then a bank must hold reserves equal to 1% of their total customer deposits. These assets are typically held in the form of physical cash stored in a bank vault and in reserves deposited with the central bank.

Banks can also choose to hold reserves in excess of the required level. Any reserves beyond the required reserves are called excess reserves. Excess reserves plus required reserves equal total reserves. In general, since banks make less money from holding excess reserves than they would lending them out, economists assume that banks seek to hold no excess reserves.

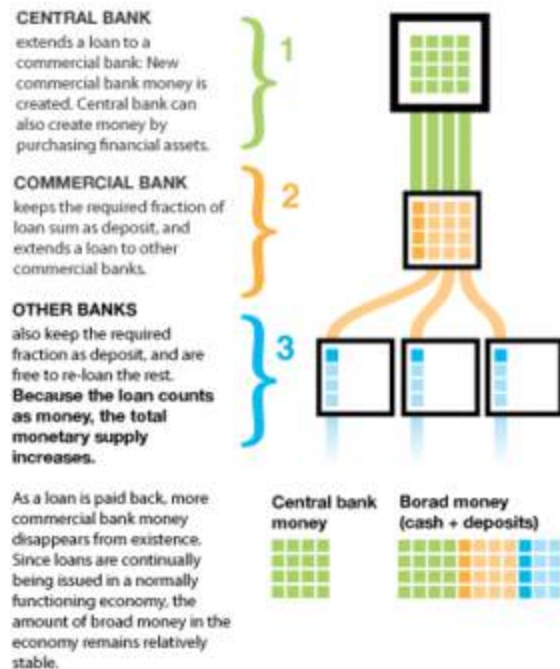
## **Money Creation**

Because banks are only required to keep a fraction of their deposits in reserve and may loan out the rest, banks are able to create money. To understand this, imagine that you deposit \$100 at your bank. The bank is required to keep \$10 as reserves but may lend out \$90 to another individual or business. This loan is new money; the bank created it when it issued the loan. In fact, the vast majority of money in the economy today comes from

these loans created by banks. Likewise when a loan is repaid, that money disappears from the economy until the bank issues another loan .

## Money creation

through fractional reserve banking (expansionary monetary policy)



## Money Creation in a Fractional Reserve System

The diagram shows the process through which commercial banks create money by issuing loans.

Thus, there are two ways that a central bank can use this process to increase or decrease the money supply. First, it can adjust the reserve ratio. A lower reserve ratio means that banks can issue more loans, increasing the money supply. Second, it can create or destroy reserves. Creating reserves means that commercial banks have more reserves with which they can satisfy the reserve ratio requirement, leading to more loans and an increase in the money supply.

## Why Have Reserve Requirements?

Fractional-reserve banking ordinarily functions smoothly. Relatively few depositors demand payment at any given time, and banks maintain a buffer of reserves to cover depositors' cash withdrawals and other demands for funds. However, banks also have an incentive to loan out as much money as possible and keep only a minimum buffer of reserves, since they earn more on these loans than they do on the reserves. Mandating a reserve requirement helps to ensure that banks have the ability to meet their obligations.

### 27.3.2: Example Transactions Showing How a Bank Can Create Money

The amount of money created by banks depends on the size of the deposit and the money multiplier.

#### Learning Objective

Calculate the change in money supply given the money multiplier, an initial deposit and the reserve ratio

#### Key Points

- When a deposit is made at a bank, that bank must keep a portion the form of reserves. The proportion is called the required reserve ratio.
- Loans out a portion of its reserves to individuals or firms who will then deposit the money in other bank accounts.
- Theoretically, this process will repeat until there are no excess reserves left.
- The total amount of money created with a new bank deposit can be found using the deposit multiplier, which is the reciprocal of the reserve requirement ratio. Multiplying the deposit multiplier by the amount of the new deposit gives the total amount of money that may be created.

## Key Terms

deposit multiplier

The maximum amount of commercial bank money that can be created by a given unit of reserves.

currency

Paper money.

To understand the process of money creation, let us create a hypothetical system of banks. We will focus on two banks in this system: Anderson Bank and Brentwood Bank. Assume that all banks are required to hold reserves equal to 10% of their customer deposits. When a bank's excess reserves equal zero, it is loaned up.

Anderson and Brentwood both operate in a financial system with a 10% reserve requirement. Each has \$10,000 in deposits and no excess reserves, so each has \$9,000 in loans outstanding, and \$10,000 in deposit balances held by customers.

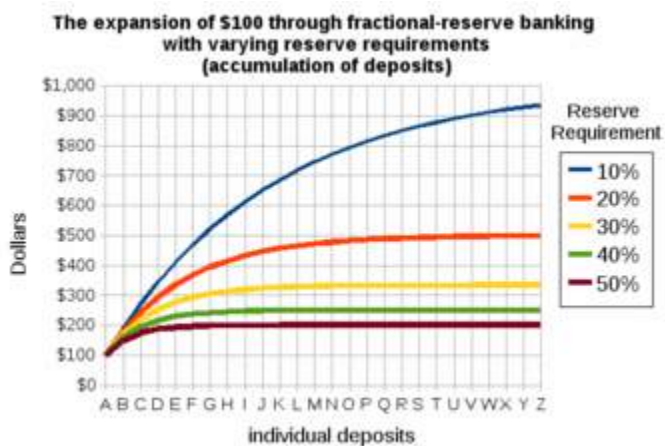
Suppose a customer now deposits \$1,000 in Anderson Bank. Anderson will loan out the maximum amount (90%) and hold the required 10% as reserves. There are now \$11,000 in deposits in Anderson with \$9,900 in loans outstanding.

The debtor takes her \$900 loan and deposits it in Brentwood bank. Brentwood's deposits now total \$10,900. Thus, you can see that total deposits were \$20,000 before the initial \$1,000 deposit, and are now \$21,900 after. Even though only \$1,000 were added to the system, the amount of money in the system increased by \$1,900. The \$900 in checkable deposits is new money; Anderson created it when it issued the \$900 loan.

Mathematically, the relationship between reserve requirements ( $rr$ ), deposits, and money creation is given by the deposit multiplier ( $m$ ). The deposit multiplier is the ratio of the maximum possible change in deposits to the change in reserves. When banks in the economy have made the

maximum legal amount of loans (zero excess reserves), the deposit multiplier is equal to the reciprocal of the required reserve ratio ( ).

In the above example the deposit multiplier is  $1/0.1$ , or 10. Thus, with a required reserve ratio of 0.1, an increase in reserves of \$1 can increase the money supply by up to \$10 .



## Money Creation and Reserve Requirements

The graph shows the total amount of money that can be created with the addition of \$100 in reserves, using different reserve requirements as examples.

### 27.3.3: The Money Multiplier in Theory

The money multiplier measures the maximum amount of commercial bank money that can be created by a given unit of central bank money.

#### Learning Objective

Explain how the money multiplier works in theory

#### Key Points

- The total supply of commercial bank money is, at most, the amount of reserves times the reciprocal of the reserve ratio (the money multiplier).
- When banks have no excess reserves, the supply of total money is equal to reserves times the money multiplier. Theoretically, banks will never have excess reserves.
- According to the theory, a central bank can change the money supply in an economy by changing the reserve requirements.

## Key Terms

### money multiplier

The maximum amount of commercial bank money that can be created by a given unit of central bank money.

### central bank

The principal monetary authority of a country or monetary union; it normally regulates the supply of money, issues currency and controls interest rates.

### commercial bank

A type of financial institution that provides services such as accepting deposits, making business loans, and offering basic investment products to the public.

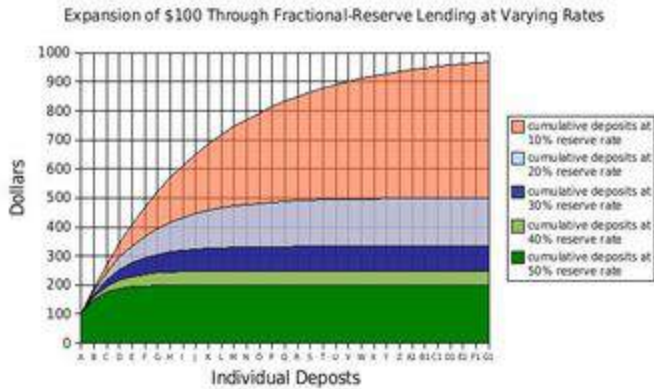
In order to understand the money multiplier, it's important to understand the difference between commercial bank money and central bank money. When you think of money, what you probably imagine is commercial bank money. This consists of the dollars in your bank account - the money that you use when you write a check or use a debit or credit card. This money is created when commercial banks make loans to companies or individuals. Central bank money, on the other hand, is the money created by the central bank and used within the banking system. It consists of bank reserves held in accounts with the central bank, as well as physical currency held in bank vaults.

The money multiplier measures the maximum amount of commercial bank money that can be created by a given unit of central bank money. That is, in a fractional-reserve banking system, the total amount of loans that commercial banks are allowed to extend (the commercial bank money that they can legally create) is a multiple of reserves; this multiple is the reciprocal of the reserve ratio. We can derive the money multiplier mathematically, writing  $M$  for commercial bank money (loans),  $R$  for reserves (central bank money), and  $RR$  for the reserve ratio. We start with the reserve ratio requirement that the the fraction of deposits that a bank keeps as reserves is at least the reserve ratio:

Taking the reciprocal:

Therefore:

The above equation states that the total supply of commercial bank money is, at most, the amount of reserves times the reciprocal of the reserve ratio (the money multiplier) .



## Money Creation and the Money Multiplier

The graph shows the theoretical amount of money that can be created with different reserve requirements.

If banks lend out close to the maximum allowed by their reserves, then the inequality becomes an approximate equality, and commercial bank money is central bank money times the multiplier. If banks instead lend less than the maximum, accumulating excess reserves, then commercial bank money will be less than central bank money times the theoretical multiplier. In theory banks should always lend out the maximum allowed by their reserves, since they can receive a higher interest rate on loans than they can on money held in reserves.

Theoretically, then, a central bank can change the money supply in an economy by changing the reserve requirements. A 10% reserve requirement creates a total money supply equal to 10 times the amount of reserves in the economy; a 20% reserve requirement creates a total money supply equal to five times the amount of reserves in the economy.

### 27.3.4: The Money Multiplier in Reality

In reality, it is very unlikely that the money supply will be exactly equal to reserves times the money multiplier.

#### Learning Objective



Explain factors that prevent the money multiplier from working empirically as it does theoretically

## **Key Points**

- Some banks may choose to hold excess reserves, leading to a money supply that is less than that predicted by the money multiplier.
- Customers may withdraw cash, removing a source of reserves against which banks can create money.
- Individuals and businesses may not spend the entire proceeds of their loans, removing the multiplier effect on money creation.

## **Key Terms**

money multiplier

The maximum amount of commercial bank money that can be created by a given unit of central bank money.

reserve requirement

The minimum amount of deposits each commercial bank must hold (rather than lend out).

The money multiplier in theory makes a number of assumptions that do not always necessarily hold in the real world. It assumes that people deposit all of their money and banks lend out all of the money they can (they hold no excess reserves). It also assumes that people instantaneously spend all of their loans. In reality, not all of these are true, meaning that the observed money multiplier rarely conforms to the theoretical money multiplier.

## **Excess Reserves**

First, some banks may choose to hold excess reserves. In the decades prior to the financial crisis of 2007-2008, this was very rare - banks held next to no excess reserves, lending out the maximum amount possible. During this time, the relationship between reserves, reserve requirements, and the

money supply was relatively close to that predicted by economic theory. After the crisis, however, banks increased their excess reserves dramatically, climbing above \$900 billion in January of 2009 and reaching \$2.3 trillion in October of 2013 . The presence of these excess reserves suggests that the reserve requirement ratio is not exerting an influence on the money supply.



## U.S. Monetary Base

The monetary base is the sum of currency and reserves held in accounts at the central bank. After the financial crisis the monetary base increased dramatically: the result of banks starting to hold excess reserves as well as the central bank increasing the supply of reserves.

## Cash

Second, customers may hold their savings in cash rather than in bank deposits. Recall that when cash is stored in a bank vault it is included in the bank's supply of reserves. When it is withdrawn from the bank and held by consumers, however, it no longer serves as reserves and banks cannot use it to issue loans. When people hold more cash, the total supply of reserves available to banks goes down and the total money supply falls.

## Loan Proceeds

Third, some loan proceeds may not be spent. Imagine that the reserve requirement ratio is 10% and a customer deposits \$1,000 into a bank. The bank then uses this deposit to make a \$900 loan to another one of its customers. If the customer fails to spend this money, it will simply sit in the bank account and the full multiplier effect will not apply. In this case, the \$1,000 deposit allowed the bank to create \$900 of new money, rather than the \$10,000 of new money that would be created if the entire loan proceeds were spent.

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# **28: Monetary Policy**

# 28.1: Introduction to Monetary Policy

## 28.1.1: The Demand for Money

In economics, the demand for money is the desired holding of financial assets in the form of money (cash or bank deposits).

### Learning Objective

Relate the level of the interest rate to the demand for money

### Key Points

- Money provides liquidity which creates a trade-off between the liquidity advantage of holding money and the interest advantage of holding other assets.
- The quantity of money demanded varies inversely with the interest rate.
- While the demand of money involves the desired holding of financial assets, the money supply is the total amount of monetary assets available in an economy at a specific time.
- In the United States, the Federal Reserve System controls the money supply. The Fed has the ability to increase the money supply by decreasing the reserve requirement.

### Key Terms

money supply

The total amount of money (bills, coins, loans, credit, and other liquid instruments) in a particular economy.

asset

Something or someone of any value; any portion of one's property or effects so considered.

## **The Demand for Money**

In economics, the demand for money is generally equated with cash or bank demand deposits. Generally, the nominal demand for money increases with the level of nominal output and decreases with the nominal interest rate.

The equation for the demand for money is:  $M_d = P * L(R, Y)$ . This is the equivalent of stating that the nominal amount of money demanded ( $M_d$ ) equals the price level ( $P$ ) times the liquidity preference function  $L(R, Y)$ --the amount of money held in easily convertible sources (cash, bank demand deposits). Specific to the liquidity function,  $L(R, Y)$ ,  $R$  is the nominal interest rate and  $Y$  is the real output.

Money is necessary in order to carry out transactions. However inherent to the holding of money is the trade-off between the liquidity advantage of holding money and the interest advantage of holding other assets.

When the demand for money is stable, monetary policy can help to stabilize an economy. However, when the demand for money is not stable, real and nominal interest rates will change and there will be economic fluctuations.

## **Impact of the Interest Rate**

The interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor). It is viewed as a "cost" of borrowing money. Interest-rate targets are a tool of monetary policy. The quantity of money demanded varies inversely with the interest rate. Central banks in countries tend to reduce the interest rate when they want to increase investment and consumption in the economy. However, low interest rates can create an economic bubble where large amounts of investments are made, but result in large unpaid debts and economic crisis. The interest rate is adjusted to keep inflation, the demand for money, and the health of the economy in a certain range. Capping or adjusting the interest rate parallel with economic growth protects the momentum of the economy.

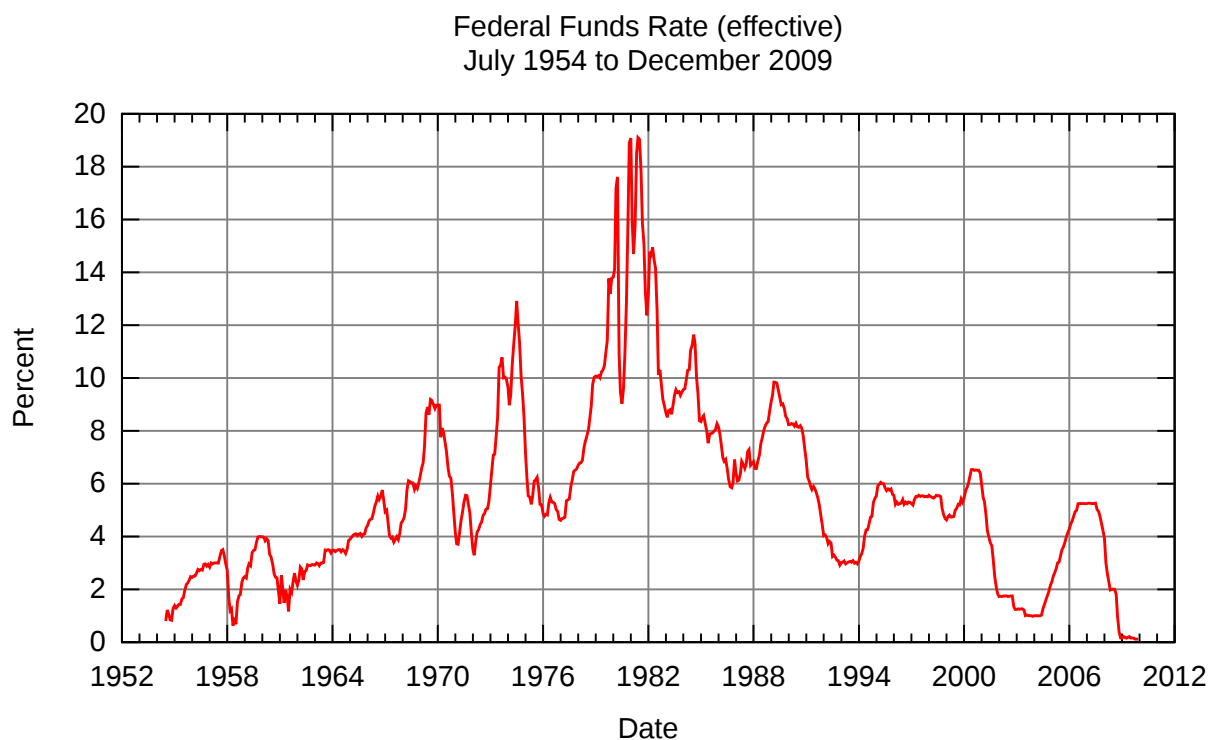
# Control of the Money Supply

While the demand of money involves the desired holding of financial assets, the money supply is the total amount of monetary assets available in an economy at a specific time. Data regarding money supply is recorded and published because it affects the price level, inflation, the exchange rate, and the business cycle.

Monetary policy also impacts the money supply. Expansionary policy increases the total supply of money in the economy more rapidly than usual and contractionary policy expands the supply of money more slowly than normal. Expansionary policy is used to combat unemployment, while contractionary is used to slow inflation.

In the United States, the Federal Reserve System controls the money supply. The reserves of money are kept in Federal Reserve accounts and U.S. banks. Reserves come from any source including the federal funds market, deposits by the public, and borrowing from the Fed itself. The Fed can attempt to change the money supply by affecting the reserve requirement and through other monetary policy tools .





## Federal Funds Rate

This graph shows the fluctuations in the federal funds rate from 1954-2009. The Federal Reserve implements monetary policy through the federal funds rate.

### 28.1.2: Shifts in the Money Demand Curve

A shift in the money demand curve occurs when there is a change in any non-price determinant of demand, resulting in a new demand curve.

#### Learning Objective

Explain factors that cause shifts in the money demand curve, Explain the implications of shifts in the money demand curve

#### Key Points

- The real demand for money is defined as the nominal amount of money demanded divided by the price level.
- The nominal demand for money generally increases with the level of nominal output (the price level multiplied by real output).
- The demand for money shifts out when the nominal level of output increases.
- The demand for money is a result of the trade-off between the liquidity advantage of holding money and the interest advantage of holding other assets.

## Key Terms

asset

Something or someone of any value; any portion of one's property or effects so considered.

nominal interest rate

The rate of interest before adjustment for inflation.

## Demand for Money

In economics, the demand for money is the desired holding of financial assets in the form of money. The nominal demand for money generally increases with the level of nominal output (the price level multiplied by real output). The interest rate is the price of money. The quantity of money demanded increases and decreases with the fluctuation of the interest rate. The real demand for money is defined as the nominal amount of money demanded divided by the price level. A demand curve is used to graph and analyze the demand for money.

## Factors that Cause Demand to Shift

A demand curve has the price on the vertical axis (y) and the quantity on the horizontal axis (x). The shift of the money demand curve occurs when there is a change in any non-price determinant of demand, resulting in a new

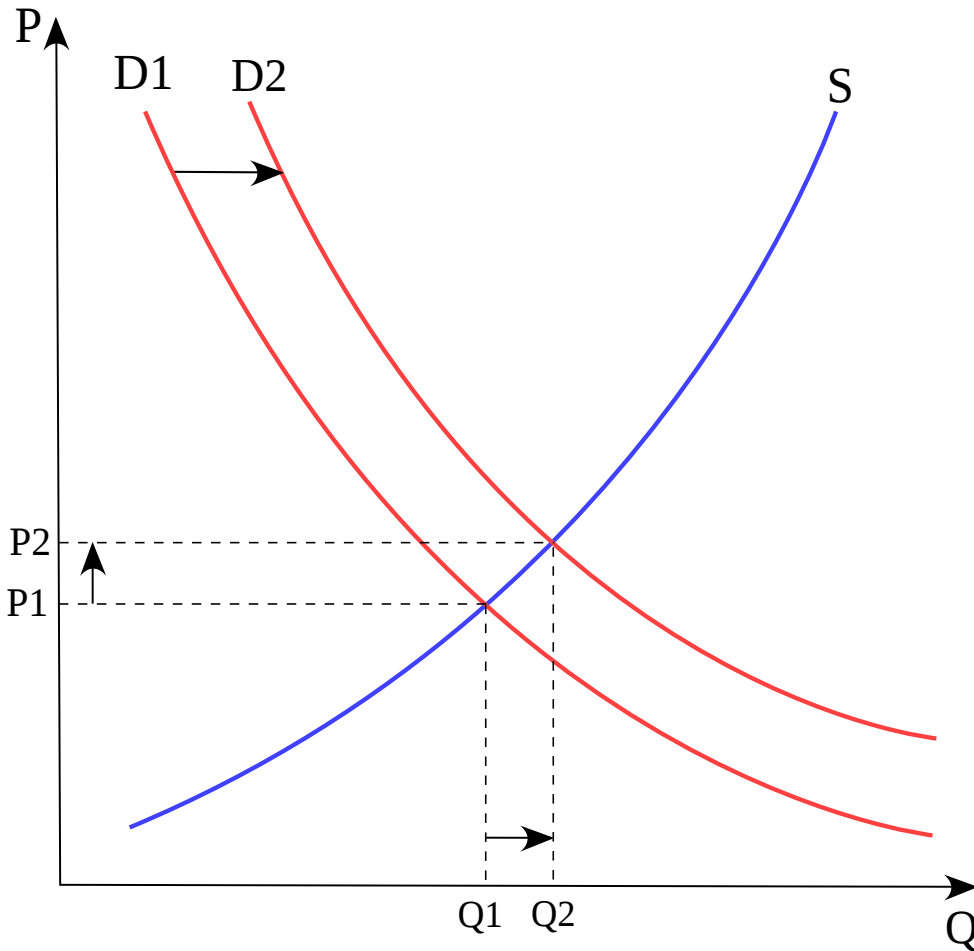
demand curve. Non-price determinants are changes cause demand to change even if prices remain the same. Factors that influence prices include:

- Changes in disposable income
- Changes in tastes and preferences
- Changes in expectations
- Changes in price of related goods
- Population size

Factors that change the demand include:

- Decrease in the price of a substitute
- Increase in the price of a complement
- Decrease in consumer income if the good is a normal good
- Increase in consumer income if the good is an inferior good

The demand for money shifts out when the nominal level of output increases. It shifts in with the nominal interest rate.



## Shift of the Demand Curve

The graph shows both the supply and demand curve, with quantity of money on the x-axis (Q) and the price of money as interest rates on the y-axis (P). When the quantity of money demanded increase, the price of money (interest rates) also increases, and causes the demand curve to increase and shift to the right. A decrease in demand would shift the curve to the left.

## Implications of Demand Curve Shift

The demand for money is a result of the trade-off between the liquidity advantage of holding money and the interest advantage of holding other assets. The demand for money determines how a person's wealth should be held. When the demand curve shifts to the right and increases, the demand

for money increases and individuals are more likely to hold on to money. The level of nominal output has increased and there is a liquidity advantage in holding on to money. Likewise, when the demand curve shifts to the left, it shows a decrease in the demand for money. The nominal interest rate declines and there is a greater interest advantage in holding other assets instead of money.

## **28.1.3: The Equilibrium Interest Rate**

In a economy, equilibrium is reached when the supply of money is equal to the demand for money.

### **Learning Objective**

Use the concept of market equilibrium to explain changes in the interest rate and money supply

### **Key Points**

- The interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor).
- Factors that contribute to the interest rate include: political gains, consumption, inflation expectations, investments and risks, liquidity, and taxes.
- In the case of money supply, the market equilibrium exists where the interest rate and the money supply are balanced.
- The real interest rate measures the purchasing power of interest receipts. It is calculated by adjusting the nominal rate charge to take inflation into account.

### **Key Terms**

equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

interest rate

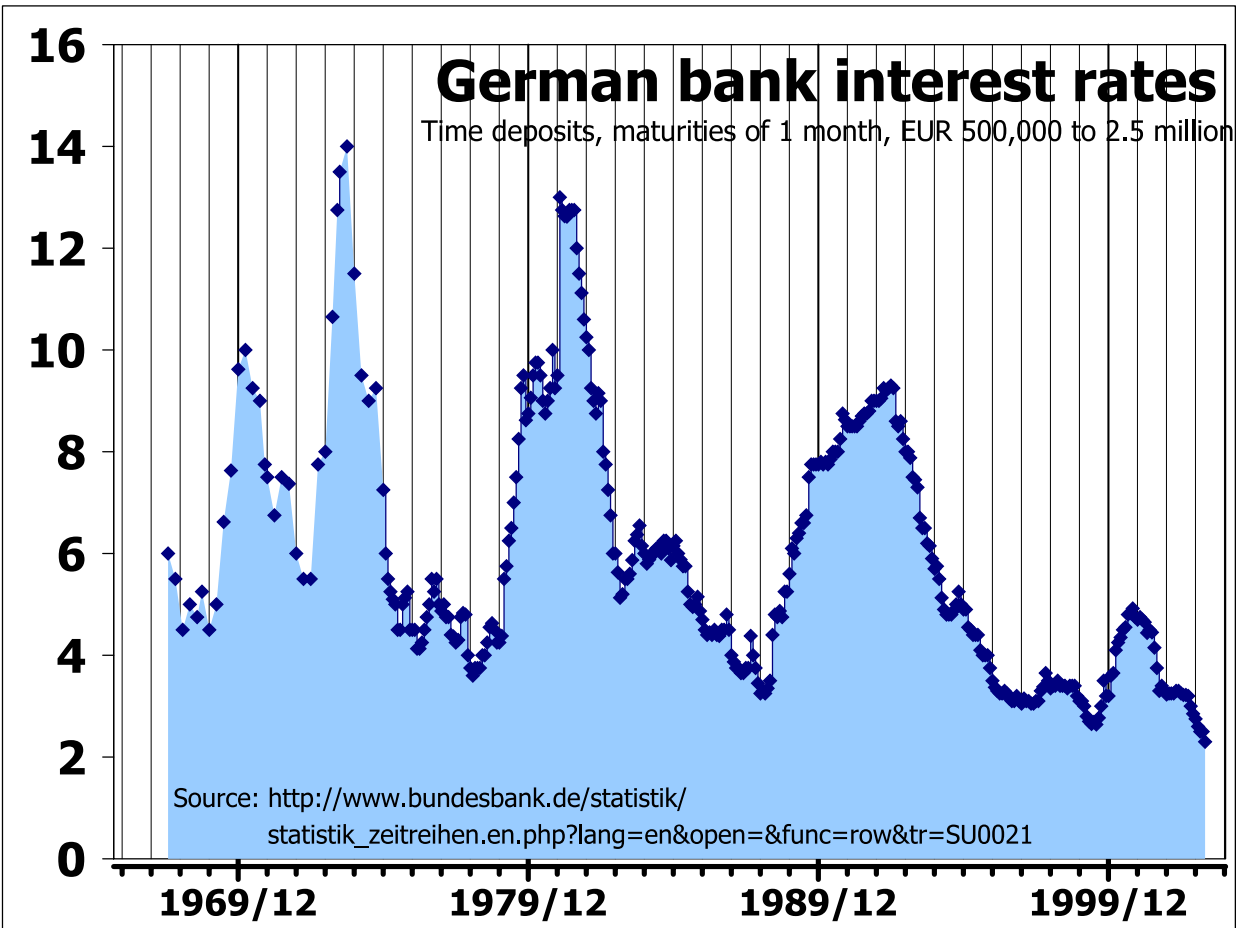
The percentage of an amount of money charged for its use per some period of time (often a year).

## **Interest Rate**

The interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor). Equilibrium is reached when the supply of money is equal to the demand for money. Interest rates can be affected by monetary and fiscal policy, but also by changes in the broader economy and the money supply.

## **Factors that Influence the Interest Rate**

Interest rates fluctuate over time in the short-run and long-run . Within an economy, there are numerous factors that contribute to the level of the interest rate:



## Fluctuation in Interest Rates

This graph shows the fluctuation in interest rates in Germany from 1967 to 2003. Interest rates fluctuate over time as the result of numerous factors. In Germany, the interest rates dropped from 14% in 1967 to almost 2% in 2003. This graph illustrates the fluctuations that can occur in the short-run and long-run. Interest rates fluctuate based on certain economic factors.

- Political gain: both monetary and fiscal policies can affect the money supply and demand for money.
- Consumption: the level of consumption (and changes in that level) affect the demand for money.
- Inflation expectations: inflation expectations affect a the willingness of lenders and borrowers to transact at a given interest rate. Changes in expectations will therefore affect the equilibrium interest rate.

- Taxes: changes in the tax code affect the willingness of actors to invest or consume, which can therefore change the demand for money.

## Market Equilibrium

In economics, equilibrium is a state where economic forces such as supply and demand are balanced and without external influences, the equilibrium will stay the same. Market equilibrium refers to a condition where a market price is established through competition where the amount of goods and services sought by buyers is equal to the amount of goods and services produced by the sellers. In the case of money supply, the market equilibrium exists where the interest rate and the money supply are balanced. The money supply is the total amount of monetary assets available in an economy at a specific time. Without external influences, the interest rate and the money supply will stay in balance.

## Attributions

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# 28.2: Monetary Policy Tools

## 28.2.1: The Reserve Ratio

The reserve ratio is the percentage of deposits that a bank is required to hold in reserves, or funds that are not allowed to be loaned.

### Learning Objective

Identify the effects of reserve requirements on monetary policy

### Key Points

- The required reserve ratio is a tool in monetary policy, given that changes in the reserve ratio directly impacts the amount of loanable funds available.
- Money growth in the economy can occur through the multiplier effect resulting from the reserve ratio.
- The higher the reserve requirement is set, the less the amount of funds banks will have to loan out, leading to lower money creation. Alternatively, the higher the reserve requirement the, lower the supply of loanable funds, the higher the interest rate and the slower the resulting economic growth.

### Key Terms

loanable funds

Money available to be issued as debt.

money supply

The total amount of money (bills, coins, loans, credit, and other liquid instruments) in a particular economy.

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

Banks assume responsibility for consumer deposits and make money by loaning out deposited funds. Therefore, banks with relatively higher deposits are able to supply a larger amount of loanable funds. The supply of loanable funds directly impacts growth and interest rates in an economy. Typically, an increase in the supply of loanable funds is associated with a decrease in interest rates. The greater the accessibility of loanable funds, as conferred by access and cost, the greater opportunity for businesses and consumers to make investment purchases and increase production and labor supply, respectively.

However, in economic downturns the amount of outstanding loans may be counter to a bank's longevity, as depositors may seek to cash-out holdings. In order to reduce the risk of a panic or "run on bank" from the perception that a bank may not have adequate liquidity to meet depositor access to cash deposits, central banks have adopted policies to ensure that banks use prudent judgement when assessing the amount of deposits to loan.

## **Reserve Ratio**

The reserve ratio is a central bank regulatory tool employed by most, but not all, of the world's central banks. The ratio is a set percentage of customer deposits that a bank is required to hold in reserves, or funds that are not allowed to be loaned. Required reserves are normally in the form of cash stored physically in a bank vault (vault cash) or deposits made with a central bank. The required reserve ratio is a tool in monetary policy, given that changes in the reserve ratio directly impact the amount of loanable funds available .

 Federal Reserve-US Central Bank

## **Federal Reserve-US Central Bank**

The Federal Reserve is charged with maintaining sustainable economic growth. To carry out its responsibilities, the "Fed" uses policies including the reserve ratio to adjust the money supply to either incentivize growth or slow down growth, as needed.

## **Monetary policy tool**

Money growth in the economy can occur through the multiplier effect resulting from the reserve ratio. For example, a reserve ratio of 20% will result in 80% of any given initial deposit being loaned out and if the process of loaning is assumed to continue, the maximum increase in money expansion specific to an initial deposit at a 20% reserve ratio will be equal to the reserve multiplier  $1/(\text{reserve ratio}) \times \text{the initial deposit}$ .

For example, with the reserve ratio (RR) of 20 percent, the money multiplier,  $m$ , will be calculated as:

This then signifies that any initial deposit will contribute to an expansion in money supply up to 5 times its original value.

The conventional view in economic theory is that a reserve requirement can act as a tool of monetary policy. The higher the reserve requirement is set, the theory supposes, the less the amount of funds banks will have to loan out, leading to lower money creation. Alternatively, the higher the reserve requirement the, lower the supply of loanable funds, the higher the interest rate and the slower the resulting economic growth.

## **28.2.2: The Discount Rate**

The rate that member banks charge each other is the federal funds rate and the rate the Fed charges is referred to as the discount rate.

### **Learning Objective**

Illustrate the effects of the discount rate on monetary policy

## Key Points

- The Fed targets the rate for federal funds via its open market operations.
- The Fed seeks to be the lender of last resort by charging banks a higher rate than the federal funds rate.
- The discount rate difference over the fed funds rate can be varied by the Fed based on bank liquidity needs.

## Key Terms

fed funds rate

Short for Federal Funds rate. The interest rate at which depository institutions actively trade balances held at the Federal Reserve, called federal funds, with each other, usually overnight, on an uncollateralized basis.

discount rate

An interest rate that a central bank charges to depository institutions that borrow reserves from it.

open market operations

An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

The central bank of the United States is the Federal Reserve (the Fed). The Fed employs monetary policy through direct controls on the money supply through open market operations to achieve economic stability and growth.


Open market operations entail Fed intervention in the buying and selling of government bonds to achieve a change in the money supply and the corresponding change in the interest rate. The Fed sells bonds to reduce the

money supply and increase the prevailing interest rate and buys bonds to increase the money supply and reduce the prevailing interest rate. The interest rate is an active target and is set as a target rate range by the Fed; it is conveyed to the public by the Federal Reserve Open Market Committee (FOMC) as the fed funds target rate (short for the Federal Funds rate).

Coincident with the Fed's open market operations is the Fed's selection of a reserve requirement which corresponds to a required percentage of deposits (reserves) that banks must keep on site or at the Fed on a daily basis. Given their daily activities, banks may fall short of their required daily reserve requirement. When this occurs, banks may either turn to the Fed or Fed member banks for overnight or short-term loans to satisfy their liquidity short-fall. The rate that member banks charge each other is referred to as the federal funds rate and the rate the Fed charges banks is referred to as the discount rate.

This distinction is particularly important. The discount rate is the rate that the central bank actual controls. It is the rate the central bank charges its member banks to borrow overnight. However, the rate that the central bank actually cares about is the fed funds rate. That is the rate banks charge each other, and is influenced by the discount rate.

The Fed targets the rate for federal funds via its open market operations and seeks to be the lender of last resort by charging banks a higher rate than the federal funds rate .

 Historical discount and fed fund target rates

## **Historical discount and fed fund target rates**

The discount rate is higher than the fed funds target rate and the variance serves as a disincentive for banks to seek funds or short-term borrowings from the Fed.

For example, the difference or spread of the primary credit rate (rate to member banks in solid financial standing) over the FOMC's target federal funds rate was initially 1 percent. During the financial crisis, this spread

was reduced to one-half of one percent on August 17, 2007, and was further reduced, to a quarter of 1 percent, on March 16, 2008.

Typically, the discount rate along with the fed funds target rate are mechanisms that the Fed uses to discourage banks from excess lending, as part of a contractionary or restrictive policy scheme. Given that lending has an expansionary effect, to the extent that the fed funds target rate and discount rate diminish the profitability of excess loaning, these parameters place limits to the expansion of the money supply via the loanable funds market. However, as noted in the aforementioned historical example, the discount rate, in conjunction with the fed funds target rate, may be purposely maintained at a lower interest level to encourage borrowing and increase growth when the economy is showing signs of either slowing or contracting. In this manner, the discount rate in tandem with the fed funds target rate are part of an expansionary policy mechanism.

### **28.2.3: The Federal Funds Rate**

The Federal Funds rate is the interest rate at which depository institutions actively trade balances held at the Federal Reserve.

#### **Learning Objective**

Discuss the importance of the Federal Funds Rate as a monetary policy tool

#### **Key Points**

- Banks may borrow reserves from one another overnight in order to maintain their required reserve ratio. The rate of interest negotiated between banks for these loans is the Federal Funds rate.
- The Federal Funds rate is directly related to the interest rate paid by firms and individuals. If a bank can borrow reserves cheaply, it can afford to offer loans to the public at lower rates. Thus, a high Federal Funds rate is contractionary, while a low federal funds rate is expansionary.

- The Federal Reserve doesn't control the Federal Funds rate directly, but it does set a target interest rate and uses open market operations in order to achieve that rate.
- The Fed doesn't control the federal funds rate directly, but it does set a target interest rate and uses open market operations in order to achieve that rate.

## Key Terms

reserve

Banks' holdings of deposits in accounts with their central bank.

federal funds rate

The interest rate at which depository institutions actively trade balances held at the Federal Reserve with each other.

The Federal Funds rate (or fed funds rate) is the interest rate at which depository institutions (primarily banks) actively trade balances held at the Federal Reserve. In the US, banks are obligated to maintain certain levels of reserves, either in the form of reserves with the Fed or as vault cash. Each day, banks receive deposits, which contribute to a bank's reserves, and issue loans, which are liabilities against the bank. These daily activities change their ratio of reserves to liabilities. If, by the end of the day, the bank's reserve ratio has dropped below the legally required minimum, it must add to its reserves in order to remain compliant with the law. Banks do this by borrowing reserves from other banks with excess reserves, and the weighted average of these interest rates paid by borrowing banks determines the federal funds rate.

The Federal Funds rate is directly related to the interest rate paid by firms and individuals. If a bank can borrow reserves cheaply, it can afford to offer loans to the public at lower rates and still make a profit. On the other hand, if the Federal Funds rate is high, banks will not borrow reserves in order to issue low-interest loans to the public. In fact, many mortgages and credit card interest rates are indexed to the Federal Funds rate - a homeowner might pay an adjustable interest rate that is set at the level of the Federal



Funds rate plus four percent, for example. A high Federal Funds rate, therefore, has a contractionary effect on economic activity, while a low Federal Funds rate has an expansionary effect.

The Fed doesn't control the Federal Funds rate directly - it is negotiated between borrowing and lending banks - but it does set a target interest rate and uses open market operations in order to achieve that rate. The target Federal Funds rate is decided by the governors at the Federal Open Market Committee (FOMC) meetings, who will either increase, decrease, or leave the target rate unchanged based on the economic conditions within the country. Influencing the Federal Funds rate is the primary monetary policy tool that the Fed uses to achieve its dual mandate of stable prices and low unemployment.

 Federal Funds Rate 1954-2009

## **Federal Funds Rate 1954-2009**

The graph shows the federal funds rate for the past fifty years. The peak in the 1980s reflects the contractionary monetary policy the Fed instituted to combat high levels of inflation due to oil shocks, and the low rate in the late 2000s reflects expansionary monetary policy meant to combat the effects of recession.

### **28.2.4: Open Market Operations**

Open market operations (OMOs) are the purchase and sale of securities in the open market by a central bank.

#### **Learning Objective**

Discuss the use of open market operations to implement monetary policy

#### **Key Points**

- In the United States, the Federal Reserve Bank of New York uses open market operations to implement monetary policy.
- This occurs under the oversight of the Federal Reserve Open Market Committee (FOMC).
- The short-term objective for open market operations is specified by the FOMC and is publicly communicated following the FOMC meeting.
- Historically, the Federal Reserve has used OMOs to adjust the supply of reserve balances so as to keep the federal funds rate--the interest rate at which depository institutions lend reserve balances to other depository institutions overnight--around the target established by the FOMC.

## Key Terms

open market operations

An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

fed funds target rate

The interest rate at which depository institutions actively trade balances held at the Federal Reserve, called federal funds, with each other, usually overnight, on an uncollateralized basis.

The Federal Reserve has several tools at its disposal to reach its monetary policy objectives. These include the discount rate, the fed funds target rate, and the reserve requirement, and open market operations (OMOs). OMOs are considered to be the most flexible option for the Federal Reserve out of all of these.

On a general level, OMO are the purchase and sale of securities in the open market by a central bank, as a means of controlling the money supply and the related prevailing interest rate.

 US Treasury Bill Yields

# US Treasury Bill Yields

By buying and selling US Treasury bills on the open market, the Federal Reserve hopes to change their yields, which will then affect the interest rates in the broader market.

In the United States, the Federal Reserve Bank of New York conducts open market operations. They are under the oversight of the Federal Reserve Open Market Committee (FOMC). The FOMC makes a plan for open market operations over the short term, and publicly announce it after their regularly scheduled meetings.

Historically, the Federal Reserve has used OMOs to adjust the supply of reserve balances so as to keep the federal funds rate--the interest rate at which depository institutions lend reserve balances to other depository institutions overnight--around the target established by the FOMC.

## OMO Mechanism

OMOs are typically either expansionary or contractionary in nature. In an expansionary platform, the OMO will seek to increase the money supply and reduce interest rates in order to promote economic growth. In a contractionary scheme, the OMO will seek to reduce the money supply and increase interest rates in an effort to deter economic growth. Therefore, the implementation of contractionary policy will result in the selling of bonds (cash in exchange for debt holding) and an expansionary policy (buy bonds in exchange for cash) will result in an increase in the money supply at a lower interest rate as a means to enhance growth opportunities and revitalize the economy.

The interest rate targeted through the OMO manipulation of the money supply is the fed funds target rate or the rate that member Fed banks charge one another for overnight loans. The target rate is important monetary tool from the perspective that the higher the fed funds rate relative to the return on loanable funds, the greater the incentive for banks to meet their reserve requirement (the bank will lose money) thereby placing limits on the

growth of the money supply through the loanable funds market. In addition to this direct interest rate channel, the fed funds rate influences many other interest rates in the economy and by so doing contributed to either incentivizing borrowing for growth or disincentivizing the same.

## **28.2.5: Setting and Achieving the Interest Rate Target**

The Federal Reserve (Fed) has an ability to directly influence economic growth and stability through the use of monetary policy.

### **Learning Objective**

Describe the way in which the Federal Reserve targets the interest rate

### **Key Points**

- Though the Fed can directly influence the money supply through open market operations, the majority of the Fed's activities seek to target interest rates, the outcome of changes in money supply.
- Using its open market channel, the Fed buys government bonds to increase the money supply and sells the same bonds to reduce it.
- The Fed actively adjusts the buying and selling of bonds to achieve the target interest rate. This in turn impacts the rate that Fed member banks are willing to charge each other for overnight loans, or the fed funds rate.

### **Key Terms**

reserve ratio

A central bank regulation employed by most, but not all, of the world's central banks, that sets the minimum fraction of customer deposits and notes that each commercial bank must hold as reserves (rather than lend out).

open market operations

An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

fed funds rate

Short for Federal Funds rate. The interest rate at which depository institutions actively trade balances held at the Federal Reserve, called federal funds, with each other, usually overnight, on an uncollateralized basis.

The Federal Reserve (Fed) has an ability to directly influence economic growth and stability through the use of monetary policy. Though the central bank can directly influence the money supply the majority of its activities center around interest rates, the outcome of changes to the money supply.

## **Interest Rate Mechanism**

The Fed can set a reserve ratio, which is in effect the required reserves (percentage of deposits) that a bank must hold either on site or at the Fed. The requirement must be satisfied on a daily basis. However, given daily bank dynamics of withdrawals, deposits and loan of funds some banks may fall short of their daily reserve requirement. For banks in need of reserve funds, the overnight or short-term bank loan market is available.

Banks can seek to borrow from other banks holding funds at the Fed. The rate that Fed member banks charge one another is referred to as the Federal Funds rate, or Fed Funds rate for short (rate for funds held at the Fed). The rate is indirectly influenced and targeted by the Fed via a direct channel of open market operations and is communicated to the public as a Fed Funds target range as a standard part of the Fed Open Market Committee communications. It is important to note that the Fed does not set the fed funds target rate, it only issues a range that it targets through active management of the money supply.

Using its open market channel, the Fed buys government bonds to increase the money supply and sells the same bonds to reduce it. Adding to the money supply will typically lead to lower interest rates, while reducing the money supply will increase interest rates. The Fed actively adjusts the buying and selling of bonds to achieve the target interest rate. This in turn impacts the rate that Fed member banks are willing to charge each other for overnight loans, or the Fed Funds rate. The fed funds rate will be within the range of the target; if not the Fed will adjust its open market operations (buying and selling of bonds) to achieve the range .

 Historical effective federal funds target rate

## Historical effective federal funds target rate

The graphic depicts the movement in the effective federal funds target rate. The target rate has historically been set in terms of a range; the current range as depicted in the graph is 0.00 to 0.25 percent.

### 28.2.6: Executing Expansionary Monetary Policy

Central banks initiate expansionary policy during periods of economic slowing, increasing the money supply and reducing interest rates.

#### Learning Objective

Explain common expansionary monetary policy tools

#### Key Points

- In an expansionary policy regime, the Fed would reduce the reserve requirement, thereby effectively increasing the amount of loans that a bank can issue.
- Expansionary monetary policy will seek to reduce the fed funds target rate (a range).

- In an expansionary policy regime, the Fed purchases government securities via open market operations from a bank in exchange for cash; the Fed's purchase increases the supply of reserves (money) to the banking system, and the federal funds rate (interest rate) falls.

## Key Terms

reserve requirement

The minimum amount of deposits each commercial bank must hold (rather than lend out).

open market operations

An activity by a central bank to buy or sell government bonds on the open market. A central bank uses them as the primary means of implementing monetary policy.

fed funds rate

Short for Federal Funds rate. The interest rate at which depository institutions actively trade balances held at the Federal Reserve, called federal funds, with each other, usually overnight, on an uncollateralized basis.

Monetary policy is based on the relationship between money supply and interest rates, where the interest rate is essentially the price of money. The two variables have an inverse relationship. As a result, as the money supply in an economy is increased, the interest rate will generally decrease and if the money supply is contracted, interest rates will generally increase .

 Relationship between money supply and interest rates

## Relationship between money supply and interest rates

As money supply increases, the interest rate decreases, as depicted in the graph above.

The money supply is a monetary policy mechanism available to a central bank as part of its mandate to promote economic growth and maintain full employment. Central banks use monetary policy to stabilize the economy; during periods of economic slowing central banks initiate expansionary policy, whereby the bank increases the money supply in order to lower prevailing interest rates. As the cost of money falls the demand for funds increases, thereby expanding consumer and investment spending and promoting economic growth.

## **Expansionary policy**

An active expansionary policy increases the size of the money supply, decreasing the interest rate. Central banks can increase the money supply through open market operations and changes in the reserve requirement.

## **Bank reserves**

Banks and other depository institutions are required to keep a certain amount of funds in reserve in order to maintain enough liquidity to meet unexpected demand for deposits. Banks can keep these reserves as cash in their vaults or as deposits with the Federal Reserve (the Fed). By adjusting the reserve requirement, the Fed can effectively change the availability of loanable funds.

In an expansionary policy regime, the Fed would reduce the reserve requirement. Banks would be able to issue more loans with the same reserves, thereby increasing the supply of money and the level of economic activity and investment.

## **Federal Funds market**



From day to day, the amount of reserves a bank wants to hold may change as its deposits and transactions change. When a bank needs additional reserves on a short-term basis, it can borrow them from other banks that happen to have more reserves than they need. These loans take place in a private financial market called the federal funds market.

The interest rate on the overnight borrowing of reserves is called the Federal Funds rate or simply the "fed funds rate." It adjusts to balance the supply of and demand for reserves. For example, if the supply of reserves in the fed funds market is greater than the demand, then the funds rate falls, and if the supply of reserves is less than the demand, the funds rate rises.

At a lower fed funds rate, banks are more likely to increase loans, thereby expanding investment activity (in factories, for example, not financial instruments) and promoting economic growth.

Expansionary monetary policy will seek to reduce the fed funds target rate (a range). The Fed does not control this rate directly but does control the interest rate indirectly through open market operations.

## **Open market operations**

The major tool the Fed uses to affect the supply of reserves in the banking system is open market operations—that is, the Fed buys and sells government securities on the open market. These operations are conducted by the Federal Reserve Bank of New York.

In an expansionary policy regime, the Fed purchases government securities from a bank in exchange for cash. Payment for the bonds increases the bank's reserves. As a result, the bank may have more reserves than required. The bank can lend these unneeded reserves to another bank in the federal funds market. Thus, the Fed's open market purchase increased the supply of reserves (money) to the banking system, and the federal funds rate (interest rate) falls.

### **28.2.7: Executing Restrictive Monetary Policy**

The central bank may initiate a contractionary or restrictive monetary policy to slow growth.

## Learning Objective

Explain common restrictive monetary policy tools

## Key Points


- In a contractionary policy regime, the Fed may increase the reserve requirement, thereby effectively restricting the funds that banks have available for loans.
- Restrictive monetary policy will seek to increase the fed funds rate, which is the interest banks charge on loans to other banks.
- In a contractionary policy regime, the Fed uses open market operations to sell government securities from a bank in exchange for cash and thereby reduce the money supply and increase interest rates.

## Key Term

full employment

A state when an economy has no cyclical or deficient-demand unemployment.

Monetary policy is based on the relationship between money supply and interest rates, where the interest rate is the price of money. The interest rate, therefore, has an inverse relationship with the money supply. As a result, as the money supply in an economy is decreased, the interest rate is assumed to increase and if the money supply is increased, interest rates are typically assumed to decrease .

 Contractionary monetary policy

## Contractionary monetary policy

Contractionary monetary policy results in a reduction in the money supply, depicted as a leftward shift, which results in an increase in interest rates as well as a decrease in the quantity of loanable funds.

The money supply is a monetary policy mechanism available to a central bank as part of its initiatives to promote economic growth and maintain full employment. Central banks use monetary policy to stabilize the economy; during periods of economic slowing central banks initiate expansionary policy, whereby the bank increases the money supply in order to lower prevailing interest rates. As the cost of money falls, economic theory assumes that the demand for funds will increase, thereby expanding consumer and investment spending and promoting economic growth. During periods where the economy is showing signs of growing too quickly or operating above full employment, the central bank may initiate a contractionary or restrictive monetary policy by reducing the money supply and allowing interest rates to increase and economic growth to slow.

## **Restrictive policy**

An active contractionary policy restricts the size of the money supply, increasing the interest rate. Central banks can decrease the money supply through open market operations and changes in the reserve requirement.

## **Bank reserves**

Banks and other depository institutions keep a certain amount of funds in reserve to meet unexpected outflows. Banks can keep these reserves as cash in their vaults or as deposits with the Fed. By adjusting the reserve requirement, the Fed can effectively change the availability of loanable funds.

In a contractionary policy regime, the Fed would increase the reserve requirement, thereby effectively restricting the funds that banks have available for loans.

## **Federal funds market**

From day to day, the amount of reserves a bank wants to hold may change as its deposits and transactions change. When a bank needs additional reserves on a short-term basis, it can borrow them from other banks that happen to have more reserves than they need. These loans take place in a private financial market called the federal funds market.

The interest rate on the overnight borrowing of reserves is called the federal funds rate or simply the "funds rate." It adjusts to balance the supply of and demand for reserves. For example, if the supply of reserves in the fed funds market is lower than the demand, then the funds rate increases.

At higher fed funds rates, banks are more likely to limit borrowing and their provision of loanable funds, thereby decreasing access to loanable funds and reducing economic growth.

Restrictive monetary policy will seek to increase the fed funds target rate. The Fed does not control this rate directly but does control the interest rate indirectly through open market operations.

## **Open market operations**

The major tool the Fed uses to affect the supply of reserves in the banking system is open market operations—that is, the Fed buys and sells government securities on the open market. These operations are conducted by the Federal Reserve Bank of New York.

In a contractionary policy regime, the Fed sells government securities from a bank in exchange for cash. Payment for the bonds decreases the bank's reserves, reducing the supply of funds that the bank has for loans. The Fed's open market purchase decreases the supply of reserves (money) to the banking system, and the federal funds rate (interest rate) increases. In net, this reduces the financial resources available to stimulate growth and leads to a contraction in the economy.

## 28.2.8: The Taylor Rule

Taylor's rule was designed to provide monetary policy guidance for how a central bank should set short-term interest rates.

### Learning Objective

Explain the Taylor Rule and its use by central banks

### Key Points

- The rule states that the real short-term interest rate (that is, the interest rate adjusted for inflation) should be determined according to three factors.
- The rule recommends a relatively high interest rate (contractionary monetary policy) when inflation is above its target or when the economy is above its full employment level.
- The rule recommends a relatively low interest rate (expansionary monetary policy) when inflation is below its target or when the economy is below its full employment level.

### Key Term

Taylor Rule

A way of determining the appropriate change in interest rates for a given change in inflation.

The Taylor rule is a formula developed by Stanford economist John Taylor. It was designed to provide monetary policy guidance for the Federal Reserve. The formula suggests short-term interest rates depending on changing economic conditions, in order to keep the economy stable in the short term, and minimize inflation over the long term.

The rule stipulates how much a central bank should change the nominal interest rate (real rate plus inflation) in response to changes in inflation,

output, or other economic conditions. In particular, the rule stipulates that for each one-percent increase in inflation, the central bank should raise the nominal interest rate by more than one percentage point.

 Professor John Taylor

## Professor John Taylor

Stanford University Professor John Taylor is the creator of the Taylor Rule, a monetary policy instrument developed to promote stable economic growth and limit short-run economic disruption related to inflation.

The factors that the Taylor rule suggests taking into account when setting inflation-adjusted short-term interest rates are:

1. the level of actual inflation relative to the target,
2. how far economic activity is above or below its "full employment" level, and
3. what the level of the short-term interest rate is that would be consistent with full employment.

The Taylor rule advocates setting interest rates relatively high (contractionary policy) when inflation is high or when the employment rate exceeds the economy's full employment level. Expansionary policies with low interest rates are recommended by the Taylor rule in times when the economy is slow (i.e. unemployment is high, or inflation is low).

The Taylor rule doesn't always provide an easy answer. For example, in times of stagflation, inflation may be high while unemployment is also high. However, the Taylor rule can still provide a handy "rule of thumb" to policy makers on how to balance these conflicting issues when setting the interest rates.

The Taylor rule fairly accurately demonstrates how monetary policy has been conducted under recent leaders of the Federal Reserve, such as Volker and Greenspan. However, the Federal Reserve does not follow the Taylor rule as an explicit policy.

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# 28.3: Impacts of Federal Reserve Policies

## 28.3.1: The Impact of Monetary Policy on Aggregate Demand, Prices, and Real GDP

Changes in a country's money supply shifts the country's aggregate demand curve.

### Learning Objective

Recognize the impact of monetary policy on aggregate demand

### Key Points

- Aggregate demand (AD) is the sum of consumer spending, government spending, investment, and net exports.
- The AD curve assumes that money supply is fixed.
- The decrease in the money supply is mirrored by an equal decrease in the nominal output, otherwise known as Gross Domestic Product (GDP).
- The decrease in the money supply will lead to a decrease in consumer spending. This decrease will shift the AD curve to the left.
- The increase in the money supply is mirrored by an equal increase in nominal output, or Gross Domestic Product (GDP).
- The increase in the money supply will lead to an increase in consumer spending. This increase will shift the AD curve to the right.
- Increased money supply causes reduction in interest rates and further spending and therefore an increase in AD.

### Key Term

aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

Aggregate demand (AD) is the total demand for final goods and services in the economy at a given time and price level. It is the combination of consumer spending, investments, government spending, and net exports within a given economic system (often written out as  $AD = C + I + G + nX$ ). As a result of this, increases in overall capital within an economy impacts the aggregate spending and/or investment. This creates a relationship between monetary policy and aggregate demand.

This brings us to the aggregate demand curve. It specifies the amounts of goods and services that will be purchased at all possible price levels. This is the demand for the gross domestic product of a country. It is also referred to as the effective demand.

The aggregate demand curve illustrates the relationship between two factors - the quantity of output that is demanded and the aggregated price level. Another way of defining aggregate demand is as the sum of consumer spending, government spending, investment, and net exports. The aggregate demand curve assumes that money supply is fixed. Altering the money supply impacts where the aggregate demand curve is plotted.

## **Contractionary Monetary Policy**

Contractionary monetary policy decreases the money supply in an economy . The decrease in the money supply is mirrored by an equal decrease in the nominal output, otherwise known as Gross Domestic Product (GDP). In addition, the decrease in the money supply will lead to a decrease in consumer spending. This decrease will shift the aggregate demand curve to the left. This reduction in money supply reduces price levels and real output, as there is less capital available in the economic system.

 Aggregate Demand Graph

## **Aggregate Demand Graph**

This graph shows the effect of expansionary monetary policy, which shifts aggregate demand (AD) to the right.

## **Expansionary Monetary Policy**

Expansionary monetary policy increases the money supply in an economy. The increase in the money supply is mirrored by an equal increase in nominal output, or Gross Domestic Product (GDP). In addition, the increase in the money supply will lead to an increase in consumer spending. This increase will shift the aggregate demand curve to the right.

In addition, the increase in money supply would lead to movement up along the aggregate supply curve. This would lead to a higher prices and more potential real output.

### **28.3.2: The Effect of Expansionary Monetary Policy**

An expansionary monetary policy is used to increase economic growth, and generally decreases unemployment and increases inflation.

#### **Learning Objective**

Analyze the effects of expansionary monetary policy

#### **Key Points**

- The primary means a central bank uses to implement an expansionary monetary policy is through purchasing government bonds on the open market.
- Another way to enact an expansionary monetary policy is to increase the amount of discount window lending.
- A third method of enacting a expansionary monetary policy is by decreasing the reserve requirement.

## Key Terms

### unemployment

The state of being jobless and looking for work.

### expansionary monetary policy

Traditionally used to try to combat unemployment in a recession by lowering interest rates in the hope that easy credit will entice businesses into expanding.

Monetary policy is referred to as either being expansionary or contractionary. Expansionary policy seeks to accelerate economic growth, while contractionary policy seeks to restrict it. Expansionary policy is traditionally used to try to combat unemployment in a recession by lowering interest rates in the hope that easy credit will entice businesses into expanding. This is done by increasing the money supply available in the economy.

Expansionary policy attempts to promote aggregate demand growth. As you may remember, aggregate demand is the sum of private consumption, investment, government spending and imports. Monetary policy focuses on the first two elements. By increasing the amount of money in the economy, the central bank encourages private consumption. Increasing the money supply also decreases the interest rate, which encourages lending and investment. The increase in consumption and investment leads to a higher aggregate demand.

It is important for policymakers to make credible announcements. If private agents (consumers and firms) believe that policymakers are committed to growing the economy, the agents will anticipate future prices to be higher than they would be otherwise. The private agents will then adjust their long-term plans accordingly, such as by taking out loans to invest in their business. But if the agents believe that the central bank's actions are short-term, they will not alter their actions and the effect of the expansionary policy will be minimized.

# **The Basic Mechanics of Expansionary Monetary Policy**

A central bank can enact an expansionary monetary policy several ways. The primary means a central bank uses to implement an expansionary monetary policy is through open market operations. Commonly, the central bank will purchase government bonds, which puts downward pressure on interest rates. The purchases not only increase the money supply, but also, through their effect on interest rates, promote investment.

Because the banks and institutions that sold the central bank the debt have more cash, it is easier for them to make loans to its customers. As a result, the interest rate for loans decrease. Businesses then, presumably, use the money it borrowed to expand its operations. This leads to an increase in jobs to build the new facilities and to staff the new positions.

The increase in the money supply is inflationary, though it is important to note that, in practice, different monetary policy tools have different effects on the level of inflation.

## **Other Methods of Enacting Expansionary Monetary Policy**

Another way to enact an expansionary monetary policy is to increase the amount of discount window lending. The discount window allows eligible institutions to borrow money from the central bank, usually on a short-term basis, to meet temporary shortages of liquidity caused by internal or external disruptions. Decreasing the rate charged at the discount window, the discount rate, will not only encourage more discount window lending, but will put downward pressure on other interest rates. Low interest rates encourage investment .

 Bank of England Interest Rates

## **Bank of England Interest Rates**

The Bank of England (the central bank in England) undertook expansionary monetary policy and lowered interest rates, promoting investment.

Another method of enacting a expansionary monetary policy is by decreasing the reserve requirement. All banks are required to have a certain amount of cash on hand to cover withdrawals and other liquidity demands. By decreasing the reserve requirement, more money is made available to the economy at large.

### **28.3.3: The Effect of Restrictive Monetary Policy**

A restrictive monetary policy will generally increase unemployment and decrease inflation.

#### **Learning Objective**

Analyze the effects of restrictive monetary policy

#### **Key Points**

- Another way to enact a restrictive monetary policy is to decrease the amount of discount window lending.
- A final method of enacting a restrictive monetary policy is by increasing the reserve requirement.
- The primary means a central bank uses to implement an expansionary monetary policy is through open market operations. The central bank can issue or resell its debt in exchange for cash. It can also sell off some of its reserves in gold or foreign currencies.

#### **Key Term**

contractionary monetary policy

Central bank actions designed to slow economic growth.



Monetary policy is can be classified as expansionary or restrictive (also called contractionary). Restrictive monetary policy expands the money supply more slowly than usual or even shrinks it, while and expansionary policy increases the money supply. It is intended to slow economic growth and/or inflation in order to avoid the resulting distortions and deterioration of asset values

 Business cycle

## **Business cycle**

Restrictive monetary policy is used during expansion and boom periods in the business cycle to prevent the overheating of the economy.

Contractionary policy attempts to slow aggregate demand growth. As you may remember, aggregate demand is the sum of private consumption, investment, government spending and imports. Monetary policy focuses on the first two elements. By decreasing the amount of money in the economy, the central bank discourages private consumption. Increasing the money supply also increase the interest rate, which discourages lending and investment. The higher interest rate also promotes saving, which further discourages private consumption. The decrease in consumption and investment leads to a decrease in growth in aggregate demand.

It is important for policymakers to make credible announcements. If private agents (consumers and firms) believe that policymakers are committed to limiting inflation through restrictive monetary policy, the agents will anticipate future prices to be lower than they would be otherwise. The private agents will then adjust their long-term strategies accordingly, such as by putting plans to expand their operations on hold. But if the agents believe that the central bank's actions will soon be reversed, they may not alter their actions and the effect of the contractionary policy will be minimized.

## **The Basic Mechanics of Expansionary Monetary Policy**

A central bank can enact a contractionary monetary policy several ways. The primary means a central bank uses to implement an expansionary monetary policy is through open market operations. The central bank can issue debt in exchange for cash. This results in less cash being in the economy.

Because the banks and institutions that purchased the debt from the central bank have less cash, it is harder for them to make loans to its customers. As a result, the interest rate for loans increase. Businesses then, presumably, have less money to use to expand its operations or even maintain its current levels. This could lead to an increase in unemployment.

The higher interest rates also can slow inflation. Consumption and investment are discouraged, and market actors will choose to save instead of circulating their money in the economy. Effectively, the money supply is smaller, and there is reduced upward pressure on prices since demand for consumption goods and services has dropped.

## **Other Methods of Enacting Restrictive Monetary Policy**

Another way to enact a contractionary monetary policy is to decrease the amount of discount window lending. The discount window allows eligible institutions to borrow money from the central bank, usually on a short-term basis, to meet temporary shortages of liquidity caused by internal or external disruptions

A final method of enacting a contractionary monetary policy is by increasing the reserve requirement. All banks are required to have a certain amount of cash on hand to cover withdrawals and other liquidity demands. By increasing the reserve requirement, less money is made available to the economy at large.

### **28.3.4: Limitations of Monetary Policy**

Limitations of monetary policy include liquidity traps, deflation, and being canceled out by other factors.

## **Learning Objective**

Describe obstacles to the Federal Reserve's monetary policy objectives

## **Key Points**

- A liquidity trap is a situation where injections of cash into the private banking system by a central bank fail to lower interest rates and therefore fail to stimulate economic growth.
- Deflation is a decrease in the general price level of goods and services. Deflation is a problem in a modern economy because it increases the real value of debt and may aggravate recessions and lead to a deflationary spiral.
- Fiscal policy can also directly influence employment and economic growth. If these two policies do not work in concert, they can cancel each other out.

## **Key Term**

deflation

A decrease in the general price level, that is, in the nominal cost of goods and services.


Monetary policy is the process by which the monetary authority of a country controls the supply of money with the purpose of promoting stable employment, prices, and economic growth. Monetary policy can influence an economy but it cannot control it directly. There are limits as to what monetary policy can accomplish. Below are some of the factors that can make monetary policy less effective.

## **Multiple Factors Influencing Economy**

While monetary policy can influence the elements listed above, it is not the only thing that does. Fiscal policy can also directly influence employment and economic growth. If these two policies do not work in concert, they can cancel each other out. This is an especially significant problem when fiscal policy and monetary policy are controlled by two different parties. One party might believe that the economy is teetering on recession and may pursue an expansionary policy. The other group may believe the economy is booming and pursue a contractionary policy. The result is that the two would cancel each other, so that neither would influence the direction of the economy.

## Liquidity Trap

A liquidity trap is a situation where injections of cash into the private banking system by a central bank fail to lower interest rates and therefore fail to stimulate economic growth. Usually central banks try to lower interest rates by buying bonds with newly created cash. In a liquidity trap, bonds pay little to no interest, which makes them nearly equivalent to cash. Under the narrow version of Keynesian theory in which this arises, it is specified that monetary policy affects the economy only through its effect on interest rates. Thus, if an economy enters a liquidity trap, further increases in the money stock will fail to further lower interest rates and, therefore, fail to stimulate.

 Liquidity Trap

## Liquidity Trap

Sometimes, when the money supply is increased, as shown by the Liquidity Preference-Money Supply (LM) curve shift, it has no impact on output (GDP or Y) or on interest rates. This is a liquidity trap.

A liquidity trap is caused when people hoard cash because they expect an adverse event such as deflation, insufficient aggregate demand, or war. Signature characteristics of a liquidity trap are short-term interest rates that

are near zero and fluctuations in the monetary base that fail to translate into fluctuations in general price levels.

## **Deflation**

Deflation is a decrease in the general price level of goods and services. Deflation occurs when the inflation rate falls below 0%. This should not be confused with disinflation, a slowdown in the inflation rate. Inflation reduces the real value of money over time; conversely, deflation increases the real value of money. This allows one to buy more goods with the same amount of money over time.

From a monetary policy perspective, deflation occurs when there is a reduction in the velocity of money and/or the amount of money supply per person. The velocity of money is the frequency at which one unit of currency is used to purchase domestically-produced goods and services within a given time period. In other words, it is the number of times one dollar is spent to buy goods and services per unit of time. If the velocity of money is increasing, then more transactions are occurring between individuals in an economy.

Deflation is a problem in a modern economy because it increases the real value of debt and may aggravate recessions and lead to a deflationary spiral. If monetary policy is too contractionary for too long, deflation could set in.

### **28.3.5: Using Monetary Policy to Target Inflation**

Inflation targeting occurs when a central bank attempts to steer inflation towards a set number using monetary tools.

#### **Learning Objective**

Assess the use of inflation targets and goals in monetary policy

## Key Points

- Because interest rates and the inflation rate tend to be inversely related, the likely moves of the central bank to raise or lower interest rates become more transparent under the policy of inflation targeting.
- If inflation appears to be above the target, the bank is likely to raise interest rates; if inflation appears to be below the target, the bank is likely to lower interest rates.
- Increases in inflation, measured by the consumer price index (CPI), are not necessarily coupled to any factor internal to country's economy and strictly or blindly adjusting interest rates will potentially be ineffectual and restrict economic growth when it was not necessary to do so.

## Key Term

consumer price index

A statistical estimate of the level of prices of goods and services bought for consumption purposes by households.

Inflation targeting is an economic policy in which a central bank estimates and makes public a projected, or "target", inflation rate and then attempts to steer actual inflation towards the target through the use of interest rate changes and other monetary tools .

 Fed Reserve Seal

## Fed Reserve Seal

The United States Federal Reserve uses a form of inflation targeting when coordinating its monetary policy.

Because interest rates and the inflation rate tend to be inversely related, the likely moves of the central bank to raise or lower interest rates become more transparent under the policy of inflation targeting. Examples include:

- if inflation appears to be above the target, the bank is likely to raise interest rates. This usually has the effect over time of cooling the economy and bringing down inflation;
- if inflation appears to be below the target, the bank is likely to lower interest rates. This usually has the effect over time of accelerating the economy and raising inflation.

Under the policy, investors know what the central bank considers the target inflation rate to be and therefore may more easily factor in likely interest rate changes in their investment choices. This is viewed by inflation targeters as leading to increased economic stability.

The United States Federal Reserve, the country's central bank, practices a version of inflation targeting. Instead of setting a specific number, the Fed sets a target range.

## Criticisms of Inflation Targeting

Increases in inflation, measured by changes in the consumer price index (CPI), are not necessarily coupled to any factor internal to country's economy. Strictly or blindly adjusting interest rates will potentially be ineffectual and restrict economic growth when it was not necessary to do so.

It has been argued that focusing on inflation may inhibit stable employment and exchange rates. Supporters of a nominal income target also criticize the tendency of inflation targeting to ignore output shocks by focusing solely on the price level. They argue that a nominal income target is a better goal.

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# 28.4: Historical Federal Reserve Policies

## 28.4.1: Volcker Disinflation

Paul Volcker, the 12th Chairman of the Federal Reserve, became known for lowering the inflation rate and achieving price stability.

### Learning Objective

Evaluate the benefits and consequences of Paul Volcker's actions as chairman of the Federal Reserve Board of Governors

### Key Points

- During his time as the chairman of the Fed, Volcker is credited with ending the high levels of inflation that the United States experienced during the 1970s and early 1980s.
- When he became chairman in 1979, inflation was high and peaked in 1981 at 13.5%. However, due to the work of Volcker and the rest of the board, the inflation rate dropped to 3.2% by 1983.
- Volcker raised the federal funds rate from 11.2% in 1979 to 20% in June of 1981. The unemployment rate became higher than 10% during this time as well.
- Volcker chose to enact a policy of preemptive restraint during the economic upturn which increased the real interest rates.
- Despite his level of success, Volcker's Federal Reserve board drew some of the strongest political attacks and protests in the history of the Federal Reserve. The protests were a result of the negative effects that the high interest rates had on the construction and farming industries.

### Key Terms

stagflation

Inflation accompanied by stagnant growth, unemployment, or recession.

inflation

An increase in the general level of prices or in the cost of living.

## **Paul Volcker**

Paul Volcker is an American economist who was appointed by President Carter in 1979 to be the 12th Chairman of the Federal Reserve of the United States (the Fed). He was reappointed by President Reagan and served as chairman until August of 1987. During his time as the Chairman of the Fed, Volcker is credited with ending the high levels of inflation that the United States experienced during the 1970s and early 1980s . Volcker was also appointed as the chairman of the Economic Recovery Advisory Board under President Obama from 2009 to 2011.



## **Paul Volcker**

Paul Volcker was the 12th Chairman of the Federal Reserves. He became known for decreasing inflation during the early 1980s.

## **Benefits During Volcker's Tenure**

During his time as chairman, Paul Volcker led the Federal Reserve board and helped to end the stagflation crisis of the 1970s. The inflation rate had remained high throughout the 1970s, while the growth rate was slow and the unemployment was high. When he became chairman in 1979, inflation was high and peaked in 1981 at 13.5%. However, due to the work of Volcker and the rest of the board, the inflation rate dropped to 3.2% by 1983.

Volcker raised the federal funds target rate from 11.2% in 1979 to 20% in June of 1981. The unemployment rate became higher than 10% during this time as well. The economy was restored by 1982 as a result of the tight-money policy put in place by the Fed. Volcker chose to enact a policy of preemptive restraint during the economic upturn which increased the real interest rates. Volcker's policy also pushed the President and Congress to adopt a plan to balance the budget. Volcker's tenure as the chairman of the Federal Reserve resulted in sound monetary and fiscal integrity that achieved the goal of price stability.

## **Consequences From Volcker's Tenure**

Despite his level of success in certain areas, Volcker's Federal Reserve board drew some of the strongest political attacks and protests in the history of the Federal Reserve. The protests were a result of the negative effects that the high interest rates had on the construction and farming industries. Nobel laureate Joseph Stiglitz explained "Paul Volcker, the previous Fed Chairman known for keeping inflation under control, was fired because the Reagan Administration didn't believe he was an adequate deregulator. "

Despite the protests, Paul Volcker was respected for the work that he did while he was the chairman of the Federal Reserve. Congressman Ron Paul was a harsh critic of the Fed, but he commented about Volcker by saying, "If I had to name a Federal Reserve chairman that did a little bit of good, that would be Paul Volcker. " Volcker received the U.S. Senator John Heinz

Award for Greatest Public Service by an elected or Appointed Official in 1983.

## **28.4.2: Greenspan Era**

Alan Greenspan was Chairman of the Federal Reserve from 1987 to 2006.

### **Learning Objective**

Summarize the actions taken during Alan Greenspan's tenure as chairman of the Federal Reserve Board of Governors

### **Key Points**

- In 1987, Greenspan stated that the Fed was ready "to serve as a source of liquidity to support the economic and financial system" following the stock market crash.
- Greenspan influenced each presidency during his tenure as chairman. He provided economic consultation for President Clinton and assisted in the deficit reduction program in 1993.
- He raised interest rates several times in 2000 which was likely this cause of the bursting of the dot-com bubble. In 2001, Greenspan began to lower interest rates. By 2004, the Federal Funds rate was 1%.
- In 2004, Greenspan urged homeowners to take out ARMS. Over the next two years, the interest rates increased to 5.25% which contributed to the mortgage crisis in 2007.

### **Key Term**

interest rate

The percentage of an amount of money charged for its use per some period of time (often a year).

## **Alan Greenspan**

Alan Greenspan is an American economist who served as the Chairman of the Federal Reserve of the United States from 1987 to 2006. He had the second longest tenure in the position. He was appointed by Ronald Reagan in 1987 and reappointed in four-year intervals, finally retiring on January 31, 2006 .



## **Alan Greenspan**

Alan Greenspan was the 13th Chairman of the Federal Reserve. He held the position from 1987 until 2006. His tenure as the chairman was marked by low interest rates which eventually were blamed for the 2007 mortgage crisis in the United States.

## **Chairman of the Federal Reserve**

The stock market crashed in 1987 shortly after Greenspan became Chairman of the Federal Reserve (the Fed). He stated the the Fed was ready "to serve as a source of liquidity to support the economic and financial system. " Throughout his early years as chairman, Greenspan impacted all the presidencies in various ways. President George H.W. Bush blamed federal policy when he was not reappointed for a second term.

During President Clinton's terms in office, Greenspan was consulted regarding economic affairs and assisted in the 1993 deficit reduction program. As a whole, the 1990s saw healthy economic growth.

The most notable actions taken during Greenspan's tenure as chairman began in 2000. He raised interest rates several times in 2000 which was likely this cause of the bursting of the dot-com bubble. In 2001, Greenspan and the Fed initiated a series of interest cuts that brought the Federal Funds rate down to 3% following the September 11, 2001 terror attacks. The Federal Funds rate continued to drop until it was 1% in 2004. Greenspan believed that a group in rates would lead to a surge in home sales and refinancing. In February of 2004, Greenspan suggested that homeowners should consider taking out adjustable-rate mortgages (ARMS) where the interest rate adjusts to the current interest rate in the market. A few months later, Greenspan began raising the interest rates. Interest rate funds increased to 5.25% about two years later.

## **The Housing Bubble**

In 2007, only months after Greenspan retired, the subprime mortgage crisis occurred in the United States. It is suggested that Greenspan's easy-money policies were the leading cause of the mortgage crisis. When homeowners took out subprime ARMS in 2004, the interest rates were set much higher than what the homeowners paid the first few years of the mortgages. In 2009, Robert Reich explained that the lower interest rates in 2004 allowed banks to borrow money for free. As a result, the banks borrowed large amounts of money, lent it out to borrowers, and earned substantial profits. Without government oversight for lending institutions, banks lent money to unfit borrowers. Greenspan did not think the oversight was necessary. He trusted that the market would weed out bad credit risks, but it did not. In



2008, Greenspan admitted during Congressional testimony that he had put too much faith in the self-correcting power of free markets. He had not anticipated the self-destructive power of irresponsible mortgage lending. Greenspan did not accept responsibility for creating the housing bubble that led to the mortgage crisis. He simply stated that he did not believe in deregulation as strongly following the crisis.

### **28.4.3: Bernanke Era**

The Bernanke Era has included challenges faced by the Federal Reserve such as the financial crisis, strengthening federal policy, and reducing the deficit.

#### **Learning Objective**

Review the challenges faced by Ben Bernanke during his time as chairman of the Federal Reserve Board of Governors

#### **Key Points**

- During his tenure as chairman, Bernanke has been responsible for overseeing the Federal Reserve's response to the financial crisis.
- Ben Bernanke was one of the first individuals to discuss "the Great Moderation" which is the theory that traditional business cycles have declined in volatility in recent decades because of structural changes that have occurred in the international economy.
- The financial crisis in the later-2000s brought the period of the Great Moderation to an end.
- The main controversies surrounding Bernanke's terms as chairman include how he handled the financial crisis, particularly failing to see the crisis, for bailing out Wall Street, and for injecting \$600 billion into the banking system to give the slow economic recovery a boost.
- Bernanke also focused on the importance of reducing the deficit and reforming entitlement programs in order to achieve financial stability and economic growth.

## **Key Terms**

deflation

A decrease in the general price level, that is, in the nominal cost of goods and services.

inflation

An increase in the general level of prices or in the cost of living.

financial crisis

A period of serious economic slowdown characterized by devaluing of financial institutions often due to reckless and unsustainable money lending.

## **Ben Bernanke**

Ben Bernanke is an American economist and chairman of the Federal Reserve (the Fed) through January 2014. He was appointed chairman by President Bush and reappointed by President Obama. During his tenure as chairman, Bernanke has been responsible for overseeing the Federal Reserve's response to the financial crisis .



## **Ben Bernanke**

Ben Bernanke (right) was appointed chairman of the Federal Reserve by President Bush and he was reappointed by President Obama. Throughout his time as chairman, Bernanke has influenced the financial crisis, the Wall Street bailout, and the economic stimulus.

## **The Great Moderation**

Ben Bernanke was one of the first individuals to discuss "the Great Moderation" which is the theory that traditional business cycles have declined in volatility in recent decades because of structural changes that have occurred in the international economy. The primary structural changes include increases in the economic stability of developing nations and the diminished influence of monetary and fiscal policy.

The Great Moderation is important because while Bernanke was chairman of the Federal Reserve, it is speculated that the economic and financial crisis in the later-2000s brought the period of the Great Moderation to an end. The period was known for predictable policy, low inflation, and modest business cycles.

## **The Bernanke Doctrine**

Ben Bernanke gave a speech in 2002, before he became chairman of the Federal Reserve. He emphasized that Congress gave the Fed responsibility for preserving price stability - avoiding inflation and deflation. He also identified seven specific measures for the Fed to reduced deflation. These seven measures were:

1. Increase the money supply
2. Ensure liquidity makes its way into the financial system
3. Lower interest rates all the way down to 0%
4. Control the yield on corporate bonds and other privately issued securities
5. Depreciate the U.S. dollar
6. Execute a de facto depreciation
7. Buy industries throughout the U.S. economy with "newly created money"

## **Chairman of the Federal Reserve**

As Chairman of the Federal Reserve, Bernanke sits on the Financial Stability Oversight Board and is also Chairman of the Federal Open Market Committee, the Fed's principal monetary policy making body. One of Bernanke's first main challenges was balancing his comments and how they were influenced by the media. As an advocate for more transparent federal policy, Bernanke stated clearer inflation goals, but his public statements negatively impacted the stock market. As a result, he did not continue to make public statements about the direction of the Federal Reserve.

The main controversies surrounding Bernanke's terms as chairman include how he handled the financial crisis, particularly failing to see the crisis, for bailing out Wall Street, and for injecting \$600 billion into the banking system to give the slow economic recovery a boost.

Two areas that received prominent attention include:

- The Merrill Lynch merger with Bank of America: New York state Attorney General Andrew Cuomo wrote a letter to Congress in 2009 accusing Bernanke and the treasury secretary of fraud concerning the

acquisition of Merrill Lynch by Bank of America. Cuomo stated that the extent of Merrill Lynch's losses were not disclosed to Bank of America by Bernanke or the treasury secretary. Bernanke was questioned in Congressional hearings as to whether he bullied individuals when the merger was invoked. Bernanke stated that the Fed did nothing illegal when they tried to convince Bank of America to not end the merger.

- **AIG bailout:** It was stated that Bernanke had overruled recommendations from his staff regarding the AIG bailout. The question arose as to whether it had been necessary to bailout AIG. Senators from both parties supported Bernanke and said that the AIG bailout averted worse problems. They stated that act of averting worse problems outweighed any responsibility that he had for the financial crisis.

In 2010, Bernanke also expressed his views regarding deficit reduction and reforming Social Security/Medicare. He favored reducing the U.S. budget deficit. He stated that reforming Social Security and Medicare entitlement programs would help reduce the deficit. He believed that a credible plan needed to be developed in order to address the funding crisis that is pending. He explained that without reform, the U.S. will not have financial stability or healthy economic growth. His comments were directed at Congress and the President since reform in fiscal exercise is not in the power of the Federal Reserve. He emphasized that deficit reduction would need to consist of raising taxes, cutting entitlement payments, and reducing government spending.

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# **29: The Financial System**

# 29.1: Introducing the Financial System

## 29.1.1: Institutions, Markets, and Intermediaries

A financial intermediary is an institution that facilitates the flow of funds between individuals or other economic entities.

### Learning Objective

Review the purpose and types of financial intermediaries

### Key Points

- Financial intermediaries provide access to capital.
- Banks convert short-term liabilities (demand deposits) into long-term assets by providing loans; thereby transforming maturities.
- Through diversification of loan risk, financial intermediaries are able to mitigate risk through pooling of a variety of risk profiles.

### Key Terms

pooling

grouping together of various resources or assets

financial intermediary

A financial institution that connects surplus and deficit agents.

A financial intermediary is an institution that facilitates the flow of funds between individuals or other economic entities having a surplus of funds



(savers) to those running a deficit of funds (borrowers). Banks are a classic example of financial institutions.

Banks provide a safe and accessible environment for individuals and economic entities to deposit excess funds. Additionally, banks also provide a service by packaging deposits into loans that are made available to economic agents (individuals and entities) in need of funds.

 Banks are the most common financial intermediaries

## **Banks are the most common financial intermediaries**

Banks convert deposits to loans and thereby increase access to capital by serving as a financial intermediary between savers and borrowers.

Though, perhaps the most well-known of financial intermediaries, banks represent only one intermediary within a larger group. Other financial intermediaries include: credit unions, private equity, venture capital funds, leasing companies, insurance and pension funds, and micro-credit providers.

## **Major functions of financial intermediaries**

As noted, financial intermediaries provide access to capital. However, in conjunction with increasing access to funds, through their ability to aggregate funds, intermediaries also reduce the transaction and search costs between lenders and borrowers.

By repurposing funds from savers to borrowers financial intermediaries are able to promote economic growth by providing access to capital. Through diversification of loan risk, financial intermediaries are able to mitigate risk through pooling of a variety of risk profiles and through creating loans of varying lengths from investor monies or demand deposits, these intermediaries are able to convert short-term liabilities to assets of varying maturities.

Returning to the example of a bank used above, banks convert short-term liabilities (demand deposits) into long-term assets by providing loans; thereby transforming maturities. Additionally, through diversified lending practices, banks are able to lend monies to high-risk entities and by pooling with low-risk loans are able to gain in yield while implementing risk management.

## **29.1.2: Role in Matching Savings and Investment Spending**

Savings are income after-consumption and investment is what is facilitated by saving.

### **Learning Objective**

Explain the connection between savers and investors

### **Key Points**

- The marginal propensity to save (MPS), the percentage of after-tax income that an economic agent will choose to save.
- Savings marketed by financial intermediaries, all consist of stocks, bonds, and cash balances, which in turn pay for the investment capital that increases productivity, efficiency and output of goods and services.
- Financial intermediaries are a significant component to the transformation of savings into investment.

### **Key Term**

real interest rates

The rate of interest an investor expects to receive after allowing for inflation.

A popular national income accounting framework for discussing the economy is the GDP expenditure equation:


$Y = C + I + G + (X - M)$ , where C refers to consumption spending, I references investment spending, G is government spending, and X - M is net exports (X, exports; M, imports). Savings is defined as income that is not consumed. C, is consumption. Investment, I, is made into capital (plant and machinery, also 'human capital' - training and education), with intent to increase productivity, efficiency and output of goods and services. I can be generally defined as purchases of good that will be used to produce more goods and services in the future. In national accounting terms, stocks, bonds, mutual funds, and other cash equivalents, are not classified as investments but rather are classified as savings. Savings from this perspective facilitates capital purchase which are included in investments

Saving is what households (participants in the consumption account) do. The level of saving in the economy depends on a number of factors:

- A higher real interest rates increases returns to saving.
- Poor expectations for future economic growth, increase households' savings as a precaution.
- More disposable income after fixed expenditures (such as mortgage, heating bill, basic goods purchases) have been made increases saving.
- Perceived likelihood of reduced return through regulation or taxation on savings will make saving less attractive.

## **Marginal propensity to save**

The factors as stated affect the marginal propensity to save (MPS), the percentage of after-tax income that an economic agent will choose to save. The greater the MPS, the more saving households will do as a proportion of each additional increment of income. Stocks and bonds are considered to be important intermediary forms of savings as these get transformed into a capital investment that produces value .

 Bonds are a type of savings

## **Bonds are a type of savings**

Savings are used to fund investments, where investments are defined as expenditures on factory plants, equipment and homes.

## **Savings and Investment**

Assuming a closed economy, one where there is no export or import activity to interfere with the domestic savings level, on an aggregate basis individual savings creates the supply of loanable funds available for investment purposes. The amount of savings available in the economy is equal to the amount of funding available for investment activity. The higher the level of savings, typically the lower the relative interest rate, ceteris paribus. On a macroeconomic theory basis, a higher the savings rate promotes business activity by lessening the cost of money and increasing risk taking activities to facilitate growth or production of goods and services.

Financial intermediaries can assist with increasing the incentive to save through developing financial products that offer ease of liquidation but provide a higher return than a savings account. In this manner, financial intermediaries are a significant component to the transformation of savings into investment. Mutual funds, pension obligations, insurance annuities, and other forms of savings marketed by financial intermediaries all consist of stocks, bonds, and cash balances, which in turn pay for the investment capital that increases productivity, efficiency and output of goods and services.

### **29.1.3: Role in Providing a Market for Loanable Funds**

The loanable funds market is a conceptual market where savers (suppliers) and borrowers (demanders) are able to establish a market clearing.

#### **Learning Objective**

Summarize the mechanics of the loanable funds market.

## Key Points

- In the loanable funds market, market clearing is defined as the interest rate/loanable funds quantity where savings equal investment (the amount of capital needed for property, plant, and equipment based investments).
- The interest rate is the cost of borrowing or demanding loanable funds and is the amount of money paid for the use of a dollar for a year.
- Loanable funds are often used to invest in new capital goods. Therefore, the demand and supply of capital is usually discussed in terms of the demand and supply of loanable funds.

## Key Term

loanable funds

Money available to be issued as debt.

In economics, the loanable funds market is a conceptual market where savers (suppliers) and borrowers (demanders) are able to establish a market clearing quantity and price (interest rate). In the loanable funds market, market clearing is defined as the interest rate/loanable funds quantity where savings equal investment (the amount of capital needed for property, plant, and equipment based investments) . Loanable funds are typically cash, but can also include other financial assets to serve as an intermediary.

 Equilibrium in the loanable funds market

## Equilibrium in the loanable funds market

When the supply and demand for loanable funds are equal, savings is equal to investment and the loanable funds market is in equilibrium at the prevailing interest rate.

For instance, buying bonds will transfer savers' money to the institution issuing the bond, which can be a firm or government. In return, the borrower's (institution issuing the bond) demand for loanable funds is satisfied when the institution receives cash in exchange for the bond.

Loanable funds are often used to invest in new capital goods. Therefore, the demand and supply of capital is usually discussed in terms of the demand and supply of loanable funds.

## Interest rate

The interest rate is the cost of borrowing or demanding loanable funds and is the amount of money paid for the use of a dollar for a year. The interest rate can also describe the rate of return from supplying or lending loanable funds.

As an example, consider this: a firm that borrows \$10,000 in funds for one year, at an annual interest rate of 10%, will have to pay the lender \$11,000 at the end of the year. This amount includes the original \$10,000 borrowed plus \$1,000 in interest; in mathematical terms, this can be written as  $\$10,000 \times 1.10 = \$11,000$ .

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# 29.2: Tools of Finance

## 29.2.1: Present Value and the Time Value of Money

The time value of money is the principle that a certain amount of money today has a different buying power (value) than in the future.

### Learning Objective

Calculate the present and future value of money

### Key Points

- Time value of money:  $(1 + r)^t \times$  (the value of the initial investment) = future value; where  $r$  is the annual interest rate and  $t$  is the number of years.
- The time value of money is the central concept in finance theory. However, the explanation of the concept typically looks at the impact of interest and assumes, for simplicity, that inflation is neutral.
- The time value of money is the principle that a certain amount of money today has a different buying power (value) than the same currency amount of money in the future.

### Key Terms

time value of money

The principle that a certain currency amount of money today has a different buying power (value) than the same currency amount of money in the future.

present value



The value of an asset in today's dollars after adjusting for an increase in the asset values as a result of interest earned during the period.

The time value of money is the principle that a certain amount of money today has a different buying power (value) than the same currency amount of money in the future. The value of money at a future point of time would take account of interest earned or inflation accrued over a given period of time. This notion exists both because there is an opportunity to earn interest on the money and because inflation will drive prices up, thus changing the "value" of the money.

For example, assume that an investor has \$100 today and can invest this money at a 5% return for one year. A year from now the original investment will equal \$105,  $(100) \times (1.05)$ . The return of \$5 represents the time value of money over the one year interval .



## Money

Assuming a 5% interest rate, \$100 invested today will be worth \$105 in one year ( $\$100$  multiplied by 1.05). Conversely, \$100 received one year from now is only worth \$95.24 today ( $\$100$  divided by 1.05), assuming a 5% interest rate.

Time value of money:  $(1 + r)^t \times (\text{the value of the initial investment}) = \text{future value}$ ; where  $r$  is the annual interest rate and  $t$  is the number of years.

Alternatively, if an investment is valued at \$125 and this value includes the 7% return generated over a one year time horizon, the original value of the investment or its present value is equal to  $(125)/(1.07)$  or 117.

Present value:  $(\text{the value of the investment at a future time})/(1 + r)^n$ ; where  $r$  is the annual interest rate and  $n$  is the number of years the investment has occurred.

The time value of money is the central concept in finance theory. However, the explanation of the concept typically looks at the impact of interest and assumes, for simplicity, that inflation is neutral.

## **29.2.2: Measuring and Managing Risk**

Risk is pervasive in the economy and is an essential component in the derivation of an asset's investment return.

### **Learning Objective**

Explain the relationship between time, money, and risk

### **Key Points**

- Investment returns compensate holders for the time to maturity via a risk premium.
- Risk premium compensates holders for risks inherent to an investment and are incorporated in the rate of return quoted for an investment.
- To compensate investors for taking on reinvestment risk, issuers will provide a risk premium to incentivize the investor to purchase the investment.

### **Key Terms**

time horizon

A fixed point of time in the future where certain processes will be evaluated or assumed to end.

risk premium

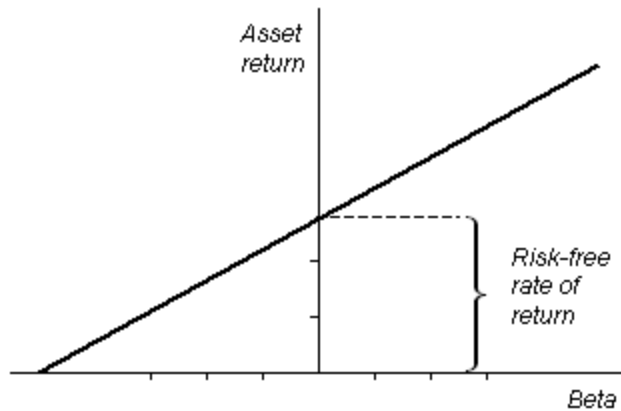
The minimum amount of money by which the expected return on a risky asset must exceed the known return on a risk-free asset

Assets can have varying maturity dates and potential for default, the attribution of time to maturity and timely payments involve an assessment of risk. Risk is pervasive in the economy and is an essential component in the derivation of an asset's investment return.

## **Time and Risk**

Time is a component of risk for varying reasons; however, the two most common are related to the increase in general uncertainty rising with the time horizon and reinvestment risk.

In our everyday lives, we are faced with momentary uncertainties that become increasingly harder to predict as we move from a five minute horizon to a five day, five month, or even five year period. This same phenomenon is true of financial assets. Though the attribution of acceptable inflation can be incorporated into an investment return, the actual pricing and resulting purchasing power of the investment at maturity is unknown and the uncertainty increases with time. Therefore, investment returns compensate holders for the time to maturity via a *risk premium* .



## Return expectations are based on risk analysis

In finance and economics, as depicted in the graph above of the capital asset pricing model, risk is evaluated to set the boundary for acceptable return.

Risk premium compensates holders for risks inherent to an investment and are incorporated in the rate of return quoted for an investment. For example, if asset A and asset B both pay a 5% coupon on an annual basis, but asset B matures in 5 years and asset A matures in 1 year, all else equal (asset quality and issuer solvency), we would expect asset A to trade at a higher price than asset B. Remembering that yield and price are inversely related, the higher price on A implies that it has a lower yield than B. The differential in yield can be attributed to a risk premium for time to maturity.

Another aspect of time horizon is reinvestment risk. For some investments, there is a potential for an issuer to call or redeem a security prior to maturity. Given that at the time that the investment is called prevailing rates may be lower than at the purchase of the asset, the holder is taking a reinvestment risk at the time of purchase. To compensate investors for taking on this type of risk, the issuer will provide a risk premium to incentivize the investor to purchase the investment.

### 29.2.3: The Value of Diversification

The compensation adjustment for holding an asset of a given risk profile can be further enhanced through asset diversification.

## **Learning Objective**

Explain the rationale for diversification

## **Key Points**

- Diversification strategies can be as simple as not "placing all your eggs in one basket" or be as complex as routine evaluation of investment correlation and risk and dynamic rebalancing of investment holdings.
- Whether a common sense or highly quantitative approach is taken, the benefit of diversification is to limit risk and enhance consistency of return. A diversified portfolio will earn a return that is always higher than its lowest performing asset.
- Most asset managers would advocate holdings that are diversified across sectors and asset classes to further the benefit of growth and reduce the risk of performance volatility that may be attributable to a company, sector, or asset class.
- Investors may enter into hedging strategies in order to ensure a constant return over market volatility. For a fee, a hedging strategy offers a constant return on an investment. The party on the other side of the hedge absorbs the volatility of the investment and pays out a consistent return.

## **Key Terms**

asset clas

A group of economic resources sharing similar characteristics, such as riskiness and return.

risk premium

The minimum amount of money by which the expected return on a risky asset must exceed the known return on a risk-free asset

prospectus

A document, distributed to prospective members, investors, buyers, or participants, which describes an institution (such as a university), a publication, or a business and what it has to offer.

Each asset class has specific investment objectives; these are typically stated in a prospectus or investment description. However, all investments have some degree of risk in meeting the stated investment objectives or return.

The risks that are inherent to a specific investment can be compensated for by a market-assessed risk premium, whereby market participants adjust the price of an asset, impacting its overall return, based on the risk characteristics of the asset. However, the compensation adjustment for holding an asset of a given risk profile can be further enhanced through asset diversification.

## **The Value of Diversification**

Diversification strategies can be as simple as not "placing all your eggs in one basket. " It can also be as complex as a routine evaluation of investment correlation and risk, and dynamic rebalancing of investment holdings. However, whether a common sense or a highly quantitative approach is taken, the benefit of diversification is to limit risk and enhance consistency of return.

By holding varying investments, even if they are within the same company or sector, an investor still has the benefit of reducing risk inherent from the default of one asset. For example, stock and bonds provide different returns; while a stock may exhibit no growth for a period of time, the bond may continue to pay its coupon and provide a return. Through diversification, an investor's entire portfolio can perform better than its worst-performing asset.

In general, most asset managers would advocate holdings that are diversified across sectors and asset classes to further the benefit of growth

and reduce the risk of performance volatility that may be attributable to a company, sector, or asset class . In some cases where the return on investment needs to be met, managers may advocate for the use of hedging instruments to transfer risk of return objectives being met to another party in lieu of a consistent return.

Hedging strategies can be relatively complex but, in general, they serve the role of insuring that an investor is able to meet investment performance objectives. Typically, an investor pays a fee and enters into the hedging strategy, which transfer the risk inherent in an investment for a constant return. The party on the opposite side of the hedge absorbs both the upside and downside return potential of the asset, along with the fee for taking on the risk of uncertainty, and pays the first party a constant return as part of the agreement.

## **Systematic Risk**

It's important to note that diversification does not remove all of the risk from the portfolio. Diversification can reduce the risk of any single asset, but there will still be systematic risk (or undiversifiable risk). Systematic risk arises from market structure or dynamics which produce shocks or uncertainty faced by all agents in the market. For example, government policy, international economic forces, or acts of nature can shock the entire market. Systematic risk will affect the portfolio, regardless of how diversified it is.

### **29.2.4: The Relationship Between Risk and Return and the Security Market Line**

The security market line is useful to determine if an asset being considered for a portfolio offers a reasonable expected return for risk.

#### **Learning Objective**

Explain how the security market line relates risk and return

## Key Points

- In finance, the capital asset pricing model (CAPM) is used to determine the required rate of return of an asset taking into account an asset's sensitivity to non-diversifiable risk.
- The security market line essentially graphs the results from the capital asset pricing model formula. The intercept of the SML is the nominal risk-free rate available for the market, while the slope is the market premium.
- If the security's expected return versus risk is plotted above the SML, it is undervalued since the investor can expect a greater return for the inherent risk. A security plotted below the SML is overvalued since the investor would be accepting less return for the amount of risk assumed.

## Key Terms

systematic risk

The risk associated with an asset that is correlated with the risk of asset markets generally, often measured as its beta.

non-systematic risk

Risk that is unique to a specific company; can be reduced through diversification.

capital asset pricing model

Used to determine the required rate of return of an asset taking into account an asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk).

security market line

A line representing the relationship between expected return and systematic risk; thus a graphical representation of the capital asset pricing model.



Investment assets are typically characterized as having two performance risks: systematic (or market risk) and non-systematic risk. Systematic risk arises from market structure or dynamics, which produce shocks or uncertainty faced by all agents in the market. Non-systematic risk is unique to a specific company and can be reduced through diversification.

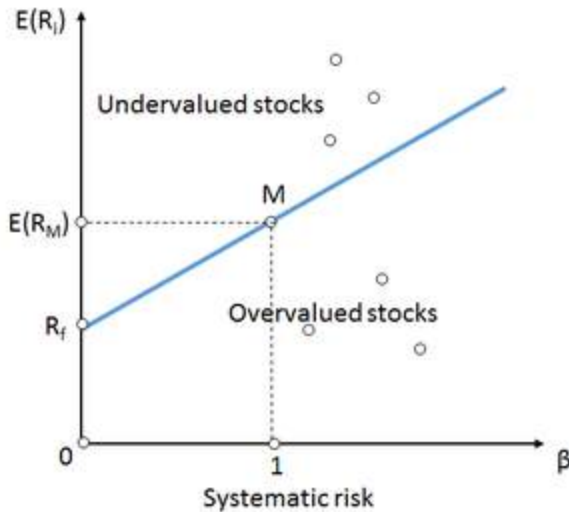
## **Capital Asset Pricing Model (CAPM)**

In finance, the capital asset pricing model (CAPM) is used to determine the required rate of return of an asset, taking into account an asset's sensitivity to non-diversifiable or systematic risk. Non-diversifiable risk is noted by the variable beta ( $\beta$ ), where beta is greater than one if the asset's price sensitivity is greater than the market; equal to one when the asset's sensitivity is equal to the market; and less than one if the asset exhibits less pricing volatility than the market.

The CAPM is a model for pricing an individual security or portfolio. The expected return of an asset is equal to the risk free rate plus the excess return of the market above the risk-free rate, adjusted for the asset's overall sensitivity to market fluctuations or its beta. Mathematically, the capital asset pricing model can be written as:  $E(R_i) = R_f + \beta(E(R_m) - R_f)$ , where  $R$  is the return,  $E(R)$  is the expected return,  $i$  denotes any asset,  $f$  is the risk-free asset, and  $m$  is the market.

## **Security Market Line (SML)**

For individual securities, the security market line (SML) and its relation to expected return and systematic risk (beta) depicts an individual security in relation to their security risk class. The SML essentially graphs the results from the capital asset pricing model formula. The x-axis represents the risk (beta), and the y-axis represents the expected return. The market risk premium is determined from the slope of the SML. The relationship between  $\beta$  and required return is plotted on the SML, which shows expected return as a function of  $\beta$ . The intercept is the nominal risk-free rate available for the market, while the slope is the market premium,  $E(R_m) - R_f$ .



## Security market line

The security market line depicts the the return on a security relative to its own risk.

The SML is a useful tool in determining if an asset being considered for a portfolio offers a reasonable expected return for risk. Individual securities are plotted on the SML graph. If the security's expected return versus risk is plotted above the SML, it is undervalued since the investor can expect a greater return for the inherent risk. A security plotted below the SML is overvalued since the investor would be accepting a smaller return for the amount of risk assumed.

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# **30: Current Topics in Macroeconomics**

# 30.1: Questions for Debate

## 30.1.1: Arguments For and Against Discretionary Monetary Policy

Discretionary policies refer to subjective actions taken in response to changes in the economy.

### Learning Objective

Contrast discretionary and rules-based monetary policy.

### Key Points

- A discretionary policy allows policymakers to respond quickly to events.
- A rule-based policy can be more credible because it is more transparent and easier to anticipate, unlike discretionary policy.
- A strict rules-based approach does not allow for flexibility and as a result may limit choices or be inapplicable in certain circumstances, creating a need for a compromise between discretionary and rules-based policy.

### Key Term

discretionary policy

Actions taken in response to changes in the economy. These acts do not follow a strict set of rules, rather, they use subjective judgment to treat each situation in unique manner.

Discretionary policies refer to actions taken in response to changes in the economy, but they do not follow a strict set of rules; instead, they use subjective judgment to treat each situation in a unique manner. For much of

the 20th century, governments adopted discretionary policies to correct the business cycle. These typically used fiscal and monetary policy to adjust inflation, output, and unemployment. However, following the stagflation of the 1970s, policymakers were attracted to policy rules.

## **Discretionary Policy**

A discretionary policy is supported because it allows policymakers to respond quickly to events. However, discretionary policy can be subject to dynamic inconsistency: a government may say it intends to raise interest rates indefinitely to bring inflation under control, but then relax its stance later. This could make the policy noncredible and ultimately ineffective.

## **Rules-based Policy**

A rule-based policy can be more credible, because it is more transparent and easier to anticipate, unlike discretionary policy. Policy is implemented based on indicator events in the economy and the policy is expected and carried out in a timely manner. Further, as commented by Milton Friedman who argued in favor of a rules-based approach, the dynamics of discretionary policy present a lag between observation and implementation. This can create compounding issues related to the discretionary policy enacted. However, a strict rules-based approach does not allow for flexibility and as a result may limit choices or be inapplicable in certain circumstances.

Milton Friedman

## **Milton Friedman**

Milton Friedman was a Nobel Prize (1976) recipient in the field of Economics and was a supporter of rules-based monetary policy.

## **Compromise**

A compromise between strict discretionary and strict rule-based policy is to grant discretionary power to an independent body. For instance, the Federal Reserve Bank, European Central Bank, Bank of England, and Reserve Bank of Australia all set interest rates without government interference, but do not adopt a strict rules-based policy stance. In this case the central banking authorities have autonomy and are able to use monetary policy to enable their mandate of economic growth and full employment. The policies they enact cannot be destabilized by government fiscal policy.

## **30.1.2: Arguments For and Against Fighting Recession with Expansionary Monetary Policy**

Expansionary monetary policy is traditionally used to try to combat unemployment in a recession by lowering interest rates.

### **Learning Objective**

Assess the value of discretionary expansionary monetary policy and the associated shortcomings.

### **Key Points**

- The success of monetary policy intervention rests on the credibility of the central bank on one hand and the understanding of central bank operations related to interest rates and money supply effects on the part of the public, in general.
- Without central bank credibility with respect to low interest rate targets, economic agents may assume that expansionary policy will lead to inflation and begin augmenting behavior to initiate the outcome expected, higher inflation.
- Announcements can be made credible in various ways. One method would be to establish an independent central bank with low inflation targets (but no output targets).

### **Key Terms**



discretionary

Available at one's discretion; able to be used as one chooses; left to or regulated by one's own discretion or judgment.

expansionary monetary policy

Traditionally used to try to combat unemployment in a recession by lowering interest rates in the hope that easy credit will entice businesses into expanding.

Expansionary monetary policy is traditionally used to try to combat unemployment in a recession by lowering interest rates in the hope that easy credit will entice businesses into investing, leading to overall economic growth. Monetary policy, to a great extent, is the management of expectations between interest rates, the price of the use of money, and the total supply of money. Monetary policy uses a variety of discretionary tools to control one or both of these to influence outcomes like economic growth, inflation, exchange rates with other currencies, and unemployment. When the central bank is in complete control of the money supply, the monetary authority has the ability to alter the money supply and influence the interest rate to achieve policy goals .

 Money supply

## **Money supply**

The increase in the money supply is the primary conduit for expansionary monetary policy.

However, the success of monetary policy intervention rests on the credibility of the central bank on one hand and the understanding of central bank operations related to interest rates and money supply effects on the part of the public, in general. For example, if the central bank is implementing expansionary policy but is committed to keeping interest rates low, the central bank needs to convey this policy with credibility, otherwise economic agents may assume that expansionary policy will lead

to inflation and begin augmenting behavior to initiate the outcome expected, higher inflation.

Announcements can be made credible in various ways. One is to establish an independent central bank with low inflation targets (but no output targets). Hence, private agents know that inflation will be low because it is set by an independent body.

### **30.1.3: Arguments For and Against Fighting Recession with Expansionary Fiscal Policy**

Expansionary fiscal policies, which are usually implemented during recessions, attempt to increase economic demand.

#### **Learning Objective**

Evaluate the pros and cons of fiscal policy intervention during recession

#### **Key Points**

- Government can enact changes in fiscal policy by changing taxes and government spending levels in various sectors.
- Fiscal stimulus through the debt creation channel, may result in reducing the availability of loanable funds, increasing interest rate which may in turn cause a lower aggregate demand for goods and services, contrary to the objective of a fiscal stimulus.
- Fiscal stimulus is implemented with the view that tax relief through a reduction in tax rate and or direct government spending through investment will provide stimulus to increase economic growth by directly influencing consumption or the government expenditure component of GDP.

#### **Key Terms**

crowding out

A drop in private investment caused by increase in government investment.

fiscal stimulus

Involves government spending exceeding tax revenue, and is usually undertaken during recessions.

Fiscal policy is a broad term, describing the policies enacted around government revenue and expenditure in order to influence the economy. Governments can increase their revenue by increasing taxes, or increase their expenditure by spending money on programs.

Expansionary fiscal policies are usually implemented during recessions because they attempt to increase economic demand, and as a result, increase economic output which is reduced during a recession. Expansionary fiscal policies involve reducing taxes or increasing government expenditure.

Remember that government revenue is based on collected taxes. When taxes exceed government spending, the government is characterized as having a surplus. When taxes equal government expenditures, the government has a balanced budget. When the government spends more than the revenue it collects, it has a deficit. Increasing government spending, creating a budget deficit, and financing the shortfall through debt issuance are typical policy actions in an expansionary fiscal policy scenario.

Due to the funding process of expansionary policy, there is a lack of consensus among economists with respect to the merits of fiscal stimulus. The discord mostly centers on crowding out, defined as government borrowing leading to higher interest rates that in turn may offset the stimulative impact of government spending. When the government runs a budget deficit, funds will need to come from public or foreign borrowing. As a result, the government issues bonds. This raises interest rates across the economy because government borrowing increases demand for credit in the financial markets. This may in turn reduce aggregate demand for goods and services, which defeats the purpose of a fiscal stimulus.

Fiscal stimulus is implemented with the view that tax relief through a reduction in tax rate and or direct government spending through investment (infrastructure, repair, construction) will provide stimulus to increase economic growth by directly influencing consumption or the government expenditure component of GDP .

Fiscal policy: Taxes

## **Fiscal policy: Taxes**

Taxes have not only been a way to initiate fiscal policy intervention, but have also been used to solidify popular approval. In the picture above former President George W. Bush is signing into effect the Tax Relief Reconciliation Act of 2001.

### **30.1.4: Arguments For and Against Inflation Targeting Policy Interventions**

Inflation targeting often succeeds in controlling inflation and anchoring expectations, but may limit a central bank's flexibility.

#### **Learning Objective**

Argue that central banks should maintain inflation targets, Argue that central banks should not maintain inflation targets

#### **Key Points**

- Inflation targeting is an economic policy in which a central bank publicly determines a target inflation rate and then attempts to steer actual inflation towards the target.
- Inflation targeting has often been successful in keeping inflation levels low and avoiding many of its negative effects.
- Inflation targeting is a transparent way to explain interest rate policy and to anchor consumers' expectations about future inflation.

- On the other hand, if the rule is implemented very strictly, an inflation target could severely limit the central bank's flexibility in responding to changing economic conditions.
- Others argue that, since inflation isn't necessarily coupled to any factor internal to a country's economy, inflation isn't the best variable to target.

## **Key Terms**

### inflation

An increase in the general level of prices or in the cost of living.

### central bank

The principal monetary authority of a country or monetary union; it normally regulates the supply of money, issues currency and controls interest rates.

Inflation targeting is an economic policy in which a central bank publicly determines a target inflation rate and then attempts to steer actual inflation towards the target. For example, in the United States, the Federal Reserve implicitly maintains a target inflation range of 1.7%-2.0%. When inflation falls below this range, the Fed would lower interest rates and raising the money supply in order to push inflation up. Likewise, when inflation rises above the target range, the Fed would raise interest rates and decrease the money supply in order to suppress the high level of inflation . While the inflation rate and the interest rate generally have an inverse relationship, these tools are not always successful in affecting inflation - for example, in response to the 2008 financial crisis and ensuing recession, the Fed raised its target inflation level to 2% and lowered interest rates to nearly zero. This did not, however, succeed in raising inflation to 2%.

## **Inflation Targeting**

The relationship between the money supply and the inflation rate is not exact, but it suggests that a central bank can often affect inflation by adjusting the money supply through higher or lower interest rates.

### **Argument in Favor of Inflation Targeting**

Proponents of inflation targeting argue that a volatile inflation rate has negative effects for an economy. High levels of inflation eat away at savings, increase menu costs and shoe-leather costs, discourage lending, and may create an inflationary spiral that leads to hyperinflation. Inflation targeting has been successful in keeping inflation levels low and avoiding many of these negative effects.

Further, inflation targeting is a transparent way to explain interest rate policy and to anchor consumers' expectations about future inflation. When the central bank announces an inflation target of 2%, the public knows that if inflation goes too far above or below that level, the central bank will take action. This certainty stimulates economic activity. Further, the public's expectations about inflation tend to be a self-fulfilling prophecy. When consumers expect high inflation they spend their money immediately, attempting to avoid higher future prices. This increase in demand leads to higher prices, causing more inflation. Likewise, when consumers expect deflation they tend to save their money, delaying consumption until prices fall. This decrease in demand causes producers to sell their goods at lower prices, and the cycle continues. Inflation targeting sets consumers' expectations, making a certain inflation level easier to maintain.

### **Arguments Against Inflation Targeting**

On the other hand, some argue that the costs of inflation targeting exceed the benefits. If the rule is implemented very strictly, an inflation target could severely limit the central bank's flexibility in responding to changing

economic conditions. During a recession, for example, central banks shouldn't raise the interest rate even if inflation is above the target level. Further, sometimes higher inflation is a good thing because it stimulates spending. A central bank with a strict inflation targeting rule, however, would not allow that higher inflation rate even if it were otherwise beneficial.

Others argue that, since inflation isn't necessarily coupled to any factor internal to a country's economy, inflation isn't the best variable to target. Adherents of market monetarism, for example, argue that targeting a nominal national income (nominal GDP) would be more effective than targeting inflation. Others suggest targeting long-run inflation, which takes the exchange rate into account, rather than the short-term inflation rate.

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# **31: International Trade**

# 31.1: Introduction to International Trade

## 31.1.1: Reasons for Trade

Countries benefit when they specialize in producing goods for which they have a comparative advantage and engage in trade for other goods.

### Learning Objective

Discuss the reasons that international trade may take place

### Key Points

- International trade is the exchange of capital, goods, and services across international borders or territories.
- Each nation should produce goods for which its domestic opportunity costs are lower than the domestic opportunity costs of other nations and exchange those goods for products that have higher domestic opportunity costs compared to other nations.
- Benefits of trade include lower prices and better products for consumers, improved political ties among nations, and efficiency gains for domestic producers.

### Key Term

comparative advantage

The ability of a party to produce a particular good or service at a lower marginal and opportunity cost over another.

International trade is the exchange of capital, goods, and services across international borders or territories. Trading-partners reap mutual gains when

each nation specializes in goods for which it holds a comparative advantage and then engages in trade for other products. In other words, each nation should produce goods for which its domestic opportunity costs are lower than the domestic opportunity costs of other nations and exchange those goods for products that have higher domestic opportunity costs compared to other nations .



## International Trade

Countries benefit from producing goods in which they have comparative advantage and trading them for goods in which other countries have the comparative advantage.

In addition to comparative advantage, other reasons for trade include:

- Differences in factor endowments: Countries have different amounts of land, labor, and capital. Saudi Arabia may have a lot of oil, but perhaps not enough lumber. It will thus have to trade for lumber. Japan may be able to produce technological goods of superior quality, but it may lack many natural resources. It may trade with Indonesia for inputs.
- Gains from specialization: Countries may gain economies of scale from specialization, experiencing long run average cost declines as output increases.
- Political benefits: Countries can leverage trade to forge closer cultural and political bonds. International connections also help promote diplomatic (rather than military) solutions to international problems.
- Efficiency gains: Domestic firms will be forced to become more efficient in order to be competitive in the global market.

- Benefits of increased competition: A greater degree of competition leads to lower prices for consumers, greater responsiveness to consumer wants and needs, and a wider variety of products.

To summarize, international trade benefits mostly all incumbents and generates substantial value for the global economy.

## **31.1.2: Understanding Production Possibilities**

The production possibility frontier shows the combinations of output that could be produced using available inputs.

### **Learning Objective**

Explain the benefits of trade and exchange using the production possibilities frontier (PPF)

### **Key Points**

- The production possibilities curve shows the maximum possible production level of one commodity for any production level of another, given the existing levels of the factors of production and the state of technology.
- Points outside the production possibilities curve are unattainable with existing resources and technology if trade does not occur with an external producer.
- Without trade, each country consumes only what it produces. However, because of specialization and trade, the absolute quantity of goods available for consumption is higher than the quantity that would be available under national economic self-sufficiency.

### **Key Terms**

Autarky

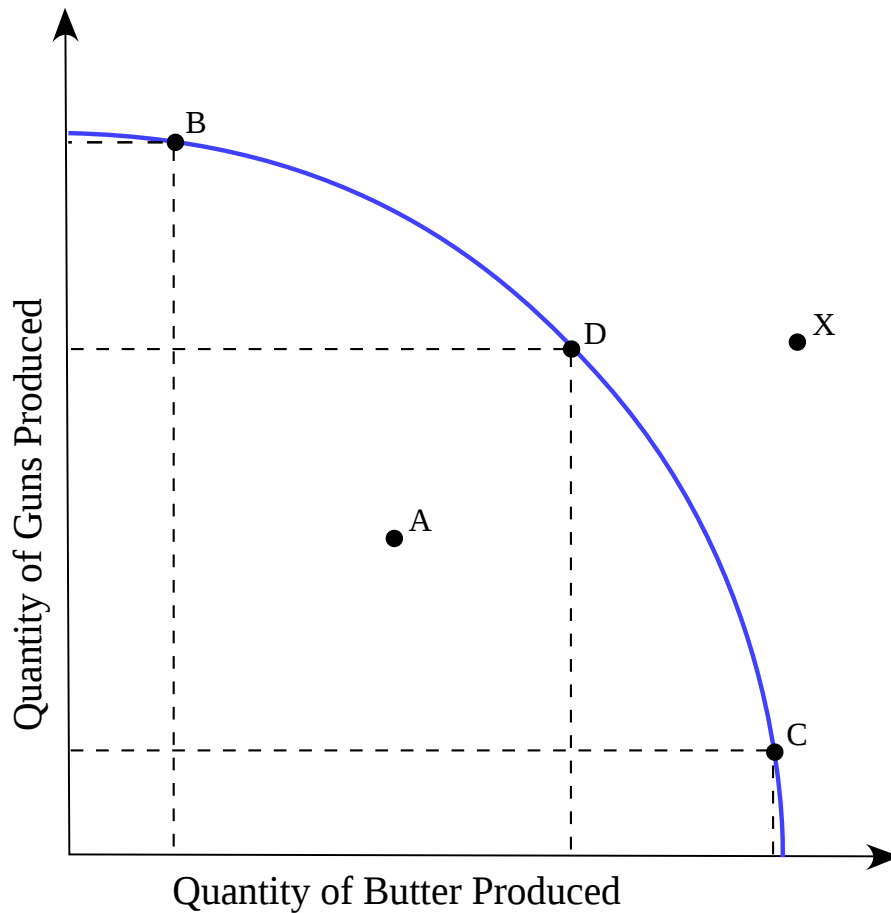
National economic self-sufficiency.

## Production possibilities frontier

A graph that shows the combinations of two commodities that could be produced using the same total amount of each of the factors of production.

In economics, the production possibility frontier (PPF) is a graph that shows the combinations of two commodities that could be produced using the same total amount of the factors of production. It shows the maximum possible production level of one commodity for any production level of another, given the existing levels of the factors of production and the state of technology.

PPFs are normally drawn as extending outward around the origin, but can also be represented as a straight line . An economy that is operating on the PPF is productively efficient, meaning that it would be impossible to produce more of one good without decreasing the production of the other good. For example, if an economy that produces only guns and butter is operating on the PPF, the production of guns would need to be sacrificed in order to produce more butter . If production is efficient, the economy can choose between combinations (i.e., points) on the PPF: B if guns are of interest, C if more butter is needed, or D if an equal mix of butter and guns is required.



## Production Possibilities Frontier

If production is efficient, the economy can choose between combinations on the PPF. Point X, however, is unattainable with existing resources and technology if trade does not occur.

If the economy is operating below the curve, it is operating inefficiently, because resources could be reallocated in order to produce more of one or both goods without decreasing the quantity of either. Points outside the curve are unattainable with existing resources and technology if trade does not occur with an outside producer.

The PPF will shift outwards if more inputs (such as capital or labor) become available or if technological progress makes it possible to produce more output with the same level of inputs. An outward shift means that

more of one or both outputs can be produced without sacrificing the output of either good. Conversely, the PPF will shift inward if the labor force shrinks, the supply of raw materials is depleted, or a natural disaster decreases the stock of physical capital.

Without trade, each country consumes only what it produces. In this instance, the production possibilities frontier is also the consumption possibilities frontier. Trade enables consumption outside the production possibility frontier. The world PPF is made up by combining countries' PPFs. When countries' autarkic productions are added (when there is no trade), the total quantity of each good produced and consumed is less than the world's PPF under free trade (when nations specialize according to their comparative advantage). This shows that in a free trade system, the absolute quantity of goods available for consumption is higher than the quantity available under autarky.

### **31.1.3: Defining Absolute Advantage**

A country has an absolute advantage in the production of a good when it can produce it more efficiently than other countries.

#### **Learning Objective**

Relate absolute advantage, productivity, and marginal cost

#### **Key Points**

- A country that has an absolute advantage can produce a good at lower marginal cost.
- A country with an absolute advantage can sell the good for less than the country that does not have the absolute advantage.
- Absolute advantage differs from comparative advantage, which refers to the ability to produce specific goods at a lower opportunity cost.

#### **Key Term**

## Absolute advantage

The capability to produce more of a given product using less of a given resource than a competing entity.

Absolute advantage refers to the ability of a country to produce a good more efficiently than other countries. In other words, a country that has an absolute advantage can produce a good with lower marginal cost (fewer materials, cheaper materials, in less time, with fewer workers, with cheaper workers, etc.). Absolute advantage differs from comparative advantage, which refers to the ability of a country to produce specific goods at a lower opportunity cost.

A country with an absolute advantage can sell the good for less than a country that does not have the absolute advantage. For example, the Canadian economy, which is rich in low cost land, has an absolute advantage in agricultural production relative to some other countries. China and other Asian economies export low-cost manufactured goods, which take advantage of their much lower unit labor costs .





## China and Consumer Electronics

Many consumer electronics are manufactured in China. China can produce such goods more efficiently, which gives it an absolute advantage relative to many countries.

Imagine that Economy A can produce 5 widgets per hour with 3 workers. Economy B can produce 10 widgets per hour with 3 workers. Assuming that the workers of both economies are paid equally, Economy B has an absolute advantage over Economy A in producing widgets per hour. This is because Economy B can produce twice as many widgets as Economy A with the same number of workers.

Party	Widgets per hour	Number of Employees
A	5	3
B	10	3

## Absolute Advantage

Party B has an absolute advantage in producing widgets. It can produce more widgets with the same amount of resources than Party A.

If there is no trade, then each country will consume what it produces. Adam Smith said that countries should specialize in the goods and services in which they have an absolute advantage. When countries specialize and trade, they can move beyond their production possibilities frontiers, and are thus able to consume more goods as a result.

### **31.1.4: Defining Comparative Advantage**

A country has a comparative advantage over another when it can produce a good or service at a lower opportunity cost.

#### **Learning Objective**

Analyze the relationship between opportunity cost and comparative advantage

#### **Key Points**

- Even if one country has an absolute advantage in the production of all goods, it can still benefit from trade.
- Countries should import goods if the opportunity cost of importing is lower than the cost of producing them locally.
- Specialization according to comparative advantage results in a more efficient allocation of world resources. A larger quantity of outputs becomes available to the trading nations.
- Competitive advantage is distinct from comparative advantage because it has to do with distinguishing attributes which are not necessarily related to a lower opportunity cost.

#### **Key Terms**

##### **Opportunity cost**

The cost of an opportunity forgone (and the loss of the benefits that could be received from that opportunity); the most valuable forgone alternative.

competitive advantage

Something that places a company or a person above the competition

comparative advantage

The ability of a party to produce a particular good or service at a lower marginal and opportunity cost over another.

## **Comparative Advantage**

In economics, comparative advantage refers to the ability of a party to produce a particular good or service at a lower marginal and opportunity cost over another. Even if one country is more efficient in the production of all goods (has an absolute advantage in all goods) than another, both countries will still gain by trading with each other. More specifically, countries should import goods if the opportunity cost of importing is lower than the cost of producing them locally.

Specialization according to comparative advantage results in a more efficient allocation of world resources. Larger outputs of both products become available to both nations. The outcome of international specialization and trade is equivalent to a nation having more and/or better resources or discovering improved production techniques.

## **Determining Comparative Advantage**

Imagine that there are two nations, Chiplandia and Entertainia, that currently produce their own computer chips and CD players. Chiplandia uses less time to produce both products, while Entertainia uses more time to produce both products. Chiplandia enjoys an absolute advantage, an ability to produce an item with fewer resources. However, the accompanying table shows that Chiplandia has a comparative advantage in computer chip production, while Entertainia has a comparative advantage in the production of CD players. The nations can benefit from specialization and trade, which would make the allocation of resources more efficient across both countries.

Production without Trade

Product	Chiplandia	Entertainia
1 Computer Chip	5 hours	24 hours
1 CD Player	10 hours	12 hours
Total	15 hours	36 hours

Opportunity Cost of Production

Product	Chiplandia	Entertainia
1 Computer Chip	$\frac{1}{2}$ CD Player	2 CD Players
1 CD Player	2 Computer Chips	$\frac{1}{2}$ Computer Chip

Production with Trade

Chiplandia		Entertainia	
1 Computer Chip for Chiplandia	5 hours	1 CD Player for Entertainia	12 hours
1 Computer Chip for Entertainia	5 hours	1 CD Player for Chiplandia	12 hours
Total	10 hours		24 hours

## Comparative Advantage

Chiplandia has a comparative advantage in producing computer chips, while Entertainia has a comparative advantage in producing CD players. Both nations can benefit from trade.

For another example, if the opportunity cost of producing one more unit of coffee in Brazil is  $\frac{2}{3}$  units of wheat, while the opportunity cost of producing one more unit of coffee in the United States is  $\frac{1}{3}$  wheat, then the U.S. should produce coffee, while Brazil should produce wheat (assuming Brazil has the lower opportunity cost of producing wheat).

## Comparative vs Competitive Advantage

It is important to distinguish between comparative advantage and competitive advantage. Though they sound similar, they are different concepts. Unlike comparative advantage, competitive advantage refers to a distinguishing attribute of a company or a product. It may or may not have anything to do with opportunity cost or efficiency. For example, having good brand recognition or relationships with suppliers is a competitive advantage, but not a comparative advantage. In the context of international trade, we more often discuss comparative advantage.

## 31.1.5: Absolute Advantage Versus Comparative Advantage

Absolute advantage refers to differences in productivity of nations, while comparative advantage refers to differences in opportunity costs.

### Learning Objective

Differentiate between absolute advantage and comparative advantage

### Key Points

- The producer that requires a smaller quantity inputs to produce a good is said to have an absolute advantage in producing that good.
- Comparative advantage refers to the ability of a party to produce a particular good or service at a lower opportunity cost than another.
- The existence of a comparative advantage allows both parties to benefit from trading, because each party will receive a good at a price that is lower than its opportunity cost of producing that good.

### Key Terms

Absolute advantage

The capability to produce more of a given product using less of a given resource than a competing entity.

comparative advantage

The ability of a party to produce a particular good or service at a lower marginal and opportunity cost over another.

Absolute advantage compares the productivity of different producers or economies. The producer that requires a smaller quantity inputs to produce a good is said to have an absolute advantage in producing that good.

The accompanying figure shows the amount of output Country A and Country B can produce in a given period of time . Country A uses less time than Country B to make either food or clothing. Country A makes 6 units of food while Country B makes one unit, and Country A makes three units of clothing while Country B makes two. In other words, Country A has an absolute advantage in making both food and clothing.

Output per Day of Work

	Food	Clothing
Country A	6	3
Country B	1	2

## Absolute Advantage

Country A has an absolute advantage in making both food and clothing, but a comparative advantage only in food.

Comparative advantage refers to the ability of a party to produce a particular good or service at a lower opportunity cost than another. Even if one country has an absolute advantage in producing all goods, different countries could still have different comparative advantages. If one country has a comparative advantage over another, both parties can benefit from trading because each party will receive a good at a price that is lower than its own opportunity cost of producing that good. Comparative advantage drives countries to specialize in the production of the goods for which they have the lowest opportunity cost, which leads to increased productivity.

For example, consider again Country A and Country B in . The opportunity cost of producing 1 unit of clothing is 2 units of food in Country A, but only 0.5 units of food in Country B. Since the opportunity cost of producing clothing is lower in Country B than in Country A, Country B has a comparative advantage in clothing.

Thus, even though Country A has an absolute advantage in both food and clothes, it will specialize in food while Country B specializes clothing. The countries will then trade, and each will gain.

Absolute advantage is important, but comparative advantage is what determines what a country will specialize in.

## **31.1.6: Benefits of Specialization**

Specialization leads to greater economic efficiency and consumer benefits.

### **Learning Objective**

Discuss the effects of specialization on production

### **Key Points**

- Whenever countries have different opportunity costs in production they can benefit from specialization and trade.
- Benefits of specialization include greater economic efficiency, consumer benefits, and opportunities for growth for competitive sectors.
- The disadvantages of specialization include threats to uncompetitive sectors, the risk of over-specialization, and strategic vulnerability.

### **Key Term**

comparative advantage

The ability of a party to produce a particular good or service at a lower marginal and opportunity cost over another.

Whenever a country has a comparative advantage in production it can benefit from specialization and trade. However, specialization can have both positive and negative effects on a nation's economy. The effects of specialization (and trade) include:

- Greater efficiency: Countries specialize in areas that they are naturally good at and also benefit from increasing returns to scale for the production of these goods. They benefit from economies of scale, which means that the average cost of producing the good falls (to a

certain point) because more goods are being produced . Similarly, countries can benefit from increased learning. They simply are more skilled at making the product because they have specialized in it. These effects both contribute to increased overall efficiency for countries. Countries become better at making the product they specialize in.

- Consumer benefits: Specialization means that the opportunity cost of production is lower, which means that globally more goods are produced and prices are lower. Consumers benefit from these lower prices and greater quantity of goods.
- Opportunities for competitive sectors: Firms gain access to the whole world market, which allows them to grow bigger and to benefit further from economies of scale.
- Gains from trade: Suppose that Britain and Portugal each produce wine and cloth. Britain has a comparative advantage in cloth and Portugal in wine . By specializing and then trading, Britain can get a unit of wine for only 100 units of labor by trading cloth for labor instead of taking 110 units of labor to produce the wine itself (assuming the price of Cloth to Wine is 1). Similarly, Portugal can specialize in wine and get a unit of cloth for only 80 units of labor by trading, instead of the 90 units of labor it would take to produce the cloth domestically. Each country will continue to trade until the price equals the opportunity cost, at which point it will decide to just produce the other good domestically instead of trading. Thus (in this example with no trade costs) both countries benefit from specializing and then trading.

Of course, there are also some potential downsides to specialization:

- Threats to uncompetitive sectors: Some parts of the economy may not be able to compete with cheaper or better imports. For example, firms in United States may see demand for their products fall due to cheaper imports from China. This may lead to structural unemployment.
- Risk of over-specialization: Global demand may shift, so that there is no longer demand for the good or service produced by a country . For example, the global demand for rubber has fallen due the the availability of synthetic substitutes. Countries may experience high



levels of persistent structural unemployment and low GDP because demand for their products has fallen.

- **Strategic vulnerability:** Relying on another country for vital resources makes a country dependent on that country. Political or economic changes in the second country may impact the supply of goods or services available to the first.

As a whole, economists generally support specialization and trade between nations.

## **31.1.7: Relationship Between Specialization and Trade**

Comparative advantage is the driving force of specialization and trade.

### **Learning Objective**

Discuss how countries determine which goods to produce and trade

### **Key Points**

- Nations decide whether they should export or import goods based on comparative advantages.
- Generally, nations can consume more by specializing in a good and trading it for other goods.
- When countries decide which country will specialize in which product, the essential question becomes who could produce the product at a lower opportunity cost.

### **Key Term**

Opportunity cost

The cost of an opportunity forgone (and the loss of the benefits that could be received from that opportunity); the most valuable forgone alternative.

Specialization refers to the tendency of countries to specialize in certain products which they trade for other goods, rather than producing all consumption goods on their own. Countries produce a surplus of the product in which they specialize and trade it for a different surplus good of another country. The traders decide on whether they should export or import goods depending on comparative advantages.

Imagine that there are two countries and both countries produce only two products. They can both choose to be self-sufficient, because they have the ability to produce both products. However, specializing in the product for which they have a comparative advantage and then trading would allow both countries to consume more than they would on their own.

One might assume that the country that is most efficient at the production of a good would choose to specialize in that good, but this isn't always the case. Rather than absolute advantage, comparative advantage is the driving force of specialization. When countries decide what products to specialize in, the essential question becomes who could produce the product at a lower opportunity cost. Opportunity cost refers to what must be given up in order to obtain some item. It requires calculating what one could have gotten if one produced another product instead of one unit of the given product.

For example, the opportunity cost to Bob of 1 bottle of ketchup is  $\frac{1}{2}$  bottle of mustard. This means that in the same amount of time that Bob could produce one bottle of ketchup, he could have produced  $\frac{1}{2}$  bottle of mustard. Tom could have produced  $\frac{1}{3}$  bottle of mustard during the time that he was making one bottle of ketchup. Tom will have the comparative advantage in producing ketchup because he has to give up less mustard for the same amount of ketchup. In sum, the producer that has a smaller opportunity cost will have the comparative advantage. It follows that Bob will have a comparative advantage in the production of mustard.

Amount produced in 12 hours

	Ketchup	Mustard
Bob	6 bottles	3 bottles
Tom	12 bottles	4 bottles

## Comparative Advantage

Tom has the comparative advantage in producing ketchup, while Bob has the comparative advantage in producing mustard.

There is one case in which countries are not better off trading: when both face the same opportunity costs of production. This doesn't mean that both countries have the same production function - one could still be absolutely more productive than the other - but neither has a comparative advantage over the other. In this case, specialization and trade will result in exactly the same level of consumption as producing all goods domestically.

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# 31.2: Gains from Trade

## 31.2.1: Exports: The Economic Impacts of Selling Goods to Other Countries

Exporting is a form of international trade which allows for specialization, but can be difficult depending on the transaction.

### Learning Objective

Evaluate the effects of international trade on exporting countries

### Key Points

- Export is defined as the act of shipping goods and services out of the port of a country.
- Legal restrictions and trade barriers are in place internationally to control trade, whether goods are being exported or imported.
- When legal restrictions and trade barriers are lessened or lifted the producer surplus increases and so does the amount of the goods and services that are exported from the country.
- Exporting allows a country's producers to gain ownership advantages and develop low-cost and differentiated products.
- Due to an extra layer in the chain of distribution which squeezes the margins, exporters may have to offer lower prices to the importers than to domestic wholesalers in order to move their product and generate business.

### Key Terms

export

Any good or commodity, transported from one country to another country in a legitimate fashion, typically for use in trade.

trade

Buying and selling of goods and services on a market.

## **Exports**

Export is defined as the act of a country shipping goods and services out of the port of a country. In international trade, an export refers to the selling of goods and services produced in the home country to other markets (other countries) . The seller of the goods and services is referred to as the "exporter. "

Exports

## **Exports**

The map shows the primary exporters for countries around the globe. The colors indicate the leading merchandise export destination for the indicated country (the United States main export destination is the European Union). Exporting is the act of shipping goods and services to other countries.

## **Protecting Exports**

In order to protect exports, commercial goods are subject to customs authorities for both the exporting and importing countries. Legal restrictions and trade barriers are in place internationally to control trade, whether goods are being exported or imported. When legal restrictions and trade barriers are lessened or lifted the producer surplus increases and so does the amount of the goods and services that are exported to other countries.

## **Impact of Exports**

Exporting goods and services has both advantages and disadvantages for countries involved in international trade.

Exporting allows a country's producers to gain ownership advantages and develop low-cost and differentiated products. It is viewed as a low-risk mode of production and trade. Exporters also experience internationalization advantages which are the benefits of retaining a core competence within a company and threading it through the value chain instead of obtaining a license to outsource or sell the goods or services.

Disadvantages of exporting are mainly the result of manufacturers having to sell their goods to importers. In domestic sales, manufacturers sell directly to wholesalers or even directly to the retailer or customer. For exports, manufacturers face an extra layer in the chain of distribution which squeezes the margins. As a result, manufacturers may have to offer lower prices to the importers than to domestic wholesalers in order to move their product and generate business.

## **31.2.2: Imports: The Economics Impacts of Buying Goods from Other Countries**

Imports are critical for many economies; they are the defining financial transactions of international trade and account for a large portion of the GDP.

### **Learning Objective**

Evaluate the effects of international trade on an importing country

### **Key Points**

- Imports are defined as purchases of good or services by a domestic economy from a foreign economy.
- Protectionism is the economic policy of restraining trade between countries through tariffs on imported goods, restrictive quotas, and government regulations.
- In most countries, international trade and importing goods represents a significant share of the gross domestic product (GDP).

- International trade is generally more expensive than domestic trade due to additionally imposed costs, taxes, and tariffs.
- On a business level, companies take part in direct-imports; a major retailer imports goods from an overseas manufacturer in order to save money.

## **Key Terms**

protectionism

A policy of protecting the domestic producers of a product by imposing tariffs, quotas or other barriers on imports.

trade

Buying and selling of goods and services on a market.

import

To bring (something) in from a foreign country, especially for sale or trade.

## **Imports**

Imports are defined as purchases of good or services by a domestic economy from a foreign economy. The domestic purchaser of the good or service is called an importer. Imports and exports are critical for many economies and they are the defining financial transactions of international trade.

## **Protecting Imports**

Due to the economic importance of imports, countries enact specific laws, barriers, and policies in order to regulate international trade. Protectionism is the economic policy of restraining trade between countries through tariffs on imported goods, restrictive quotas, and government regulations. When

trade barriers and policies of protectionism are eliminated, consumer surplus increases. The price of a good or service will decrease while the quantity consumed will increase.

## Impacts of Buying Imported Goods

On a national level, in most countries international trade and importing goods represents a significant share of the gross domestic product (GDP). International trade has a significant economic, social, and political importance in many countries. Imports provide countries with access to goods and services from other nations. Without imports, a country would be limited to the goods and services within its own borders .

 Imports

## Imports

The map shows the largest importers on an international scale. The color indicates the leading source of merchandise imports for the indicated country (the United States' imports the largest percentage of its goods from China). Imports account for a significant share in the gross domestic product (GDP) of a country.

International trade is generally less expensive than domestic trade despite additionally imposed costs, taxes, and tariffs. However, the factors of production are usually more mobile domestically than internationally (capital and labor). It is common for countries to import goods rather than a factor of production. For example, the U.S. imports labor-intensive goods from China. Instead of importing Chinese labor, the U.S. imports goods that were produced in China by Chinese labor.

On a business level, companies take part in direct-imports, which occur when a major retailer imports goods that are designed locally from an overseas manufacturer. The direct-import program allows the retailer to bypass the local supplier and purchase the final product directly from the

manufacturer. Direct imports save retailers money by eliminating the local supplier.

### **31.2.3: Costs of Trade**

Free trade is a policy where governments do not discriminate against imports and exports; creates a large net gain for society.

#### **Learning Objective**

Identify the groups that benefit and the groups that are harmed by free trade policies

#### **Key Points**

- Free trade eliminates export tariffs, import quotas, and export quotas; all of which cause more losses than benefits for a country.
- With free trade in place the producers in exporting countries and the consumers in importing countries all benefit.
- One of the main disadvantages is the selective application of free trade. Economic inefficiency can be created through trade diversion.
- Trade restricts displaces workers, makes overcoming unemployment challenging, increases economic inequality, and can lower wages.
- When free trade is applied to only the high cost producer it can lead to trade diversion and a net economic loss.
- Another disadvantage is that by increasing returns to scale, can cause certain industries to settle in an geographically area where there is not comparative advantage.

#### **Key Terms**

welfare

Health, safety, happiness and prosperity; well-being in any respect.

tariff

A system of government-imposed duties levied on imported or exported goods; a list of such duties, or the duties themselves.

free trade

International trade free from government interference, especially trade free from tariffs or duties on imports.

## Free Trade

Free trade is a policy where governments do not discriminate against exports and imports. There are few or no restrictions on trade and markets are open to both foreign and domestic supply and demand.

## Advantages

Free trade is beneficial to society because it eliminates import and export tariffs. Restricted trade affects the welfare of society because although producers experience increases in surplus and additional revenue, the loss faced by consumers is greater than any benefit obtained . When a country trades freely with the rest of the world, it should theoretically produce a net gain for society and increases social welfare. Free trade policies consist of eliminating export tariffs, import quotas, and export quotas; all of which cause more losses than benefits for a country. With free trade in place, the producers of the exported good in exporting countries and the consumers in importing countries all benefit.

 Tariffs

## Tariffs

This image shows what happens to societal welfare when free trade is not enacted. Tariffs cause the consumer surplus (green area) to decrease, while the producer surplus (yellow area) and government tax revenue (blue area) increase. The amount of societal loss (pink area) is larger than any benefits

experienced by the producers and government. Free trade does not have tariffs and results in net gain for society.

## **Disadvantages**

One of the main disadvantages is the selective application of free trade. Economic inefficiency can be created through trade diversion. It is economically efficient for a good to be produced in the country with the lowest production costs. However, this does not always occur if a high cost producer has a free trade agreement and the low cost producer does not. When free trade is applied to only the high cost producer it can lead to trade diversion to not the most efficient producer, but the one facing the lowest trade barriers, and a net economic loss. Free trade is highly effective and provides society with a net gain, but only if it is applied.

Due to industry specializations, many workers are displaced and do not receive retraining or assistance finding jobs in other sectors. The nature of industries and trade increases economic inequality. As a result of unskilled workers the wages within the various industries may decline.

Another disadvantage is that by increasing returns to scale, can cause certain industries to settle in an geographically area where there is not comparative advantage. Despite this disadvantage, the level of output that is generated by free trade for both the "winner" and the "loser" is increased substantially.

## **The Results of Free Trade**

Economists have studied free trade extensively and although it creates winners and losers, the main consensus is that free trade generates a large net gain for society. In a 2006 survey of American economists, it was found that 85.7% believed that the U.S. should eliminate any remaining tariffs and trade barriers. Economist professor N. Gregory Mankiw explained that, "few propositions command as much consensus among professional economists as that open world trade increases economic growth and raises living standards. "



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# 31.3: The United States in the Global Economy

## 31.3.1: The Importance of Trade

International trade is an integral part of the modern world economy.

### Learning Objective

Discuss the reasons of the U.S. increase in international trade participation after World War II

### Key Points

- The international market serves as an important place for the exchange of goods and services.
- Economic theory shows that there are gains from trade for both countries involved.
- Advances in transportation has dramatically reduced the costs of moving goods around the globe.
- Technological advances have made international production and trade easier to coordinate.
- Trade barriers between countries have fallen and are likely to continue to fall.

### Key Terms

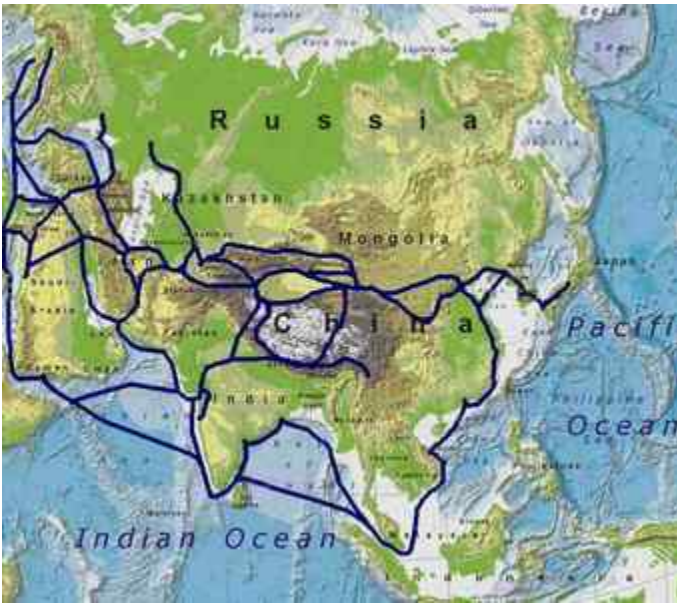
production possibilities curve

The various combinations of amounts of two commodities that could be produced using the same fixed total amount of each of the factors of production

comparative advantage

The ability of a party to produce a particular good or service at a lower margin and opportunity cost over another.

Economists generally support trade because it allows for increased overall utility for both countries . Gains from trade are commonly described as resulting from:



## Silk Road Trade

Even in ancient times, people benefited from widespread international trade. The benefits from international trade have increased as costs decline and the international system becomes better integrated.

- specialization in production from division of labor (according to one's comparative advantage), economies of scale, scope, and agglomeration and relative availability of factor resources in types of output by farms, businesses, location and economies
- a resulting increase in total output possibilities
- trade through markets from sale of one type of output for other, more highly valued goods.

# The Rise of International Trade

International trade is important, and, over time, has become more important. There have been three primary reasons for this increase in importance.

First, there have been large reductions in the cost of transportation and communication. It is now much cheaper to not only operate internationally and trade with foreign partners, but also to exchange information between potential buyers and sellers.

Second, technological advances have made international production and trade easier to coordinate. More efficient telecommunications, from the first transatlantic telephone cable in 1956 to the popularization of the internet in the 1980s and 1990s, have allowed companies to exchange goods more efficiently and lowered the costs of international integration. Technological advances, from the invention of the jet engine to the development of just-in-time manufacturing, have also contributed to the rise in international trade.

Third, trade barriers between countries have fallen and are likely to continue to fall. In particular, the Bretton Woods system of international monetary management has shaped the relationship between the world's major industrial states and has resulted in a much more integrated system of international exchange. Established in 1946 to rebuild the international economic system after World War II, the Bretton Woods Conference set up regulations for production of their individual currencies to maintain fixed exchange rates between countries with the aim of more easily facilitating international trade. This was the foundation of the U.S. vision of postwar world free trade, which also involved lowering tariffs and, among other things, maintaining a balance of trade via fixed exchange rates that would be favorable to the capitalist system. Although the world eventually abolished the system of fixed exchange rates, the goal of more open economies and free international trade remained.

## 31.3.2: The Balance of Trade

The balance of trade is the difference between the monetary value of exports and imports of output in an economy over a certain period.

## **Learning Objective**

Explain the relationship between the trade balance of a nation and its economic well-being

## **Key Points**

- A positive balance is known as a trade surplus if it consists of exporting more than is imported; a negative balance is referred to as a trade deficit or, informally, a trade gap.
- Factors that can affect the balance of trade include the currency exchange rate, cost of inputs, barriers to trade such as tariffs and regulations, and the prices of domestic goods.
- The twin deficits hypothesis contends that there is a strong positive relationship between a national economy's current account balance and its government budget balance.

## **Key Terms**

net capital outflow

The net flow of funds being invested abroad by a country during a certain period of time.

net exports

The difference between the monetary value of exports and imports.

The balance of trade is the difference between the monetary value of exports and imports of output in an economy over a certain period, measured in the currency of that economy. It is the relationship between a nation's imports and exports. It is measured by finding the country's net exports. A positive balance is known as a trade surplus if it consists of

exporting more than is imported; a negative balance is referred to as a trade deficit or, informally, a trade gap.

Factors that can affect the balance of trade include:

- The cost of production (land, labor, capital, taxes, incentives, etc.) in the exporting economy compared to those in the importing economy
- The cost and availability of raw materials, intermediate goods, and other inputs
- Currency exchange rate
- Multilateral, bilateral, and unilateral taxes or restrictions on trade
- Non-tariff barriers such as environmental, health, or safety standards
- The availability of adequate foreign exchange with which to pay for imports
- Prices of goods manufactured at home

In addition, the trade balance is likely to differ across the business cycle. In export-led growth (such as oil and early industrial goods), the balance of trade will improve during an economic expansion. However, with domestic demand led growth (as in the United States and Australia) the trade balance will worsen at the same stage in the business cycle.

## **Twin Deficits Hypothesis**

The twin deficits hypothesis is a concept from macroeconomics that contends that there is a strong link between a national economy's current account balance and its government budget balance. This link can be seen from considering the national accounting model of the economy:

$$Y=C+I+G+(NX)$$

Y represents national income or GDP, C is consumption, I is investment, G is government spending, and NX stands for net exports (exports minus imports). This represents GDP because all the production in an economy (the left hand side of the equation) is used as consumption (C), investment (I), or government spending (G), and the leftover production is exported (NX).

Another equation defining GDP using alternative terms (which in theory results in the same value) is:

$$Y=C+S+T$$

Y is again GDP, C is consumption, S is savings, and T is taxes. This is because national income is also equal to output, and all individual income either goes to pay for consumption (C), to pay taxes (T), or becomes savings (S).

Since  $Y=C+I+G+NX$ , and  $Y-C-T=S$ , then  $S=G-T+NX+I$ , which simplifies to:

$$(S-I)+(T-G)=(NX)$$

If (T-G) is negative, we have a budget deficit. Assuming that the economy is at potential output (meaning Y is fixed), if the budget deficit increases and savings and investment remain the same, then net exports must fall, causing a trade deficit. Thus, budget deficits and trade deficits go hand-in-hand .





## Twin Deficits in the US

In the U.S., net borrowing has tended to have a direct relationship with net imports. The red line represents net imports, which is equivalent to the negative balance of trade, and the black line represents net borrowing, which is equivalent to the government budget deficit. Although the two are not identical, a rise in one tends to accompany a rise in the other, and vice versa.

The twin deficits hypothesis implies that as the budget deficit grows, net capital outflow from a country falls. This is because the nation is financing its spending by selling assets to foreigners. The total rate of national savings falls, which may lead to an increase in the interest rate as lending to the country (i.e. buying bonds and other financial assets) becomes more risky.

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# 31.4: Barriers to Trade

## 31.4.1: Tariffs

Tariffs are taxes levied on goods entering or exiting a country, and have consequences for both domestic consumers and producers.

### Learning Objective

Discuss the consequences of a tariff for a domestic economy

### Key Points

- Tariffs can be levied on goods being imported in a country (import tariff), or exported from a country (export tariff). They may be levied in order to protect domestic producers (protective tariff), or to raise revenue for the government (revenue tariff).
- Specific tariffs levy a fixed duty on a good. Ad valorem tariffs are based on a percentage of the good's value. Compound tariffs are a combination of specific and ad valorem tariffs.
- Tariffs often increase domestic producer surplus and the quantity of a good supplied domestically, but hurt domestic consumer surplus.

### Key Term

tariff

A system of government-imposed duties levied on imported or exported goods; a list of such duties, or the duties themselves.

One barrier to international trade is a tariff. A tariff is a tax that is imposed by a government on imported or exported goods. They are also known as customs duties.

# Types of Tariffs

Tariffs can be classified based on what is being taxed:

- **Import tariffs:** Taxes on goods that are imported into a country. They are more common than export tariffs.
- **Export tariffs:** Taxes on goods that are leaving a country. This may be done to raise tariff revenue or to restrict world supply of a good.

Tariffs may also be classified by their purpose:

- **Protective tariffs:** Tariffs levied in order to reduce foreign imports of a product and to protect domestic industries.
- **Revenue tariffs:** Tariffs levied in order to raise revenue for the government.

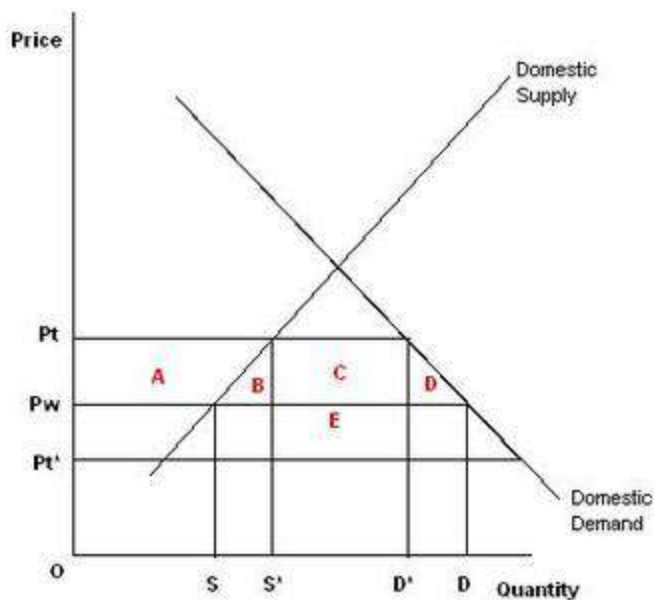
Tariffs can also be classified on how the duty amount is valued:

- **Specific tariffs:** Tariffs that levy a flat rate on each item that is imported. For example, a specific tariff would be a fixed \$1,000 duty on every car that is imported into a country, regardless of how much the car costs.
- **Ad valorem tariffs:** Tariffs based on a percentage of the value of each item. For example, an ad valorem tariff would be a 20% tax on the value of every car imported into a country.
- **Compound tariffs:** Tariffs that are a combination of specific tariffs and ad valorem tariffs. For example, a compound tariff might consist of a fixed \$100 duty plus 10% of the value of every imported car.

## Consequences of Levying a Tariff

To see the effects of levying an import tariff, consider the example shown in . Assume that there is an import tax levied on a good in a domestic country, Home. The domestic supply of the good is represented by the diagonal supply curve, and world supply is perfectly elastic and represented by the horizontal line at  $P_w$ . Before a tariff is levied, the domestic price is at  $P_w$ ,

and the quantity demanded is at D (with quantity S provided domestically, and quantity D-S imported).



## Effects of a Tariff

When a tariff is levied on imported goods, the domestic price of the good rises. This benefits domestic producers by increasing producer surplus, but domestic consumers see a small consumer surplus.

When the tariff is imposed, the domestic price of the good rises to  $P_t$ . Now, more of the good is provided domestically; instead of producing  $S$ , it now produces  $S^*$ . Imports of the good fall, from the quantity  $D-S$  to the new quantity  $D^*-S^*$ . With the higher prices, domestic producers experience a gain in producer surplus (shown as area A). In contrast, because of the higher prices, domestic consumers experience a loss in consumer surplus; consumer surplus shrinks from the area above  $P_w$  to the area above  $P_t$  (it shrinks by the areas A, B, C, and D).

Because the tariff is a tax, the government gains some revenue. The government charges a tariff amount of  $P_t - P_w$  on every imported good. The amount of revenue is equal to the tariff amount times the number of

imported goods, or  $(P_t - P_w)(D^* - S^*)$ . This results in a governmental gain of area C.

In this example, domestic producers and the government both gain from the import tariff, and domestic consumers lose. However, if the world price is higher than the domestic price, a tariff will not change the price or quantity consumed of a good.

## 31.4.2: Quotas

Quotas are limitations on imported goods, come in an absolute or tariff-rate varieties, and affect supply in the domestic economy.

### Learning Objective

Discuss the economic consequences of different kinds of quotas

### Key Points

- There are two types of quotas: absolute and tariff-rate. Absolute quotas are quotas that limit the amount of a specific good that may enter a country. Tariff-rate quotas allow a quantity of a good to be imported under a lower duty rate; any amount above this is subject to a higher duty.
- Justifications for the use of quotas include protection for domestic employment and infant industries, protection against unfair foreign trade practices, and protection of national security.
- Quotas often hurt domestic consumers and benefit domestic producers. Quotas may also provide incentives for administrative corruption and smuggling.

### Key Terms

quota

A restriction on the import of something to a specific quantity.

absolute quota

A limitation of the quantity of certain goods that may enter commerce during a specific period.

tariff-rate quota

Allows a specified quantity of imported goods to be entered at a reduced rate of duty during the quota period, with quantities entered in excess of the quota limit subject to a higher duty rate.

Barriers to trade exist in many forms. A tariff is a barrier to trade that taxes imports or exports, thus increasing the cost of a good. Another barrier to trade is an import quota, which places a limit on the amount of a good that may enter a country.

## **Types of Quotas**

There are two main types of import quota: the absolute quota and the tariff-rate quota.

An absolute quota is a limit on the quantity of specific goods that may enter a country during a certain time period. Once the quota has been fulfilled, no other goods may be imported into the country. An absolute quota may be set globally, in which case goods may be imported from any country until the goal has been reached. An absolute quota may also be set selectively for certain countries. As an example, suppose an absolute, global quota for pens is set at 50 million. The government is setting a limit that, in total, only 50 million pens can be imported. If there were a selective, absolute quota, only 50 million pens would be able to be imported, but this total would be divided among exporting countries. Country A might only be able to export 10 million pens, Country B might be able to export 25 million pens, and Country C might be able to export 15 million pens. Collectively, the total imports equal 50 million pens, but the proportions of pens from each country are set.

A tariff-rate quota is a two-tier quota system that combines characteristics of tariffs and quotas. Under a tariff-rate quota system, an initial quota of a good is allowed to enter the country at a lower duty rate. Once the initial quota is surpassed, imports are not stopped; instead, more of the good may be imported, but at a higher tariff rate. For example, under a tariff-rate quota system, a country may allow 50 million pens to be imported at the low tariff rate of \$1 each. Any pen that is imported after this first-tier quota has been reached would be charged a higher tariff, say \$3 each.



## **Sugar: Tariff-Rate Barriers**

In the US, the import of sugar is regulated by tariff-rate barriers. In 2012, the US allowed over 150,000 tons of raw cane sugar to be imported from Brazil at a reduced tariff rate.

## **Reasons to Implement Quotas**

Quotas are often implemented for similar reasons as other trade barriers. Often, quotas are instituted to:

- **Protect domestic industries and employment:** By reducing the number of foreign imports, domestic suppliers must produce more to meet domestic demand. By producing more, the suppliers must hire more domestic workers, increasing employment. Additionally, setting quotas



- to reduce foreign competition allows domestic "infant industries," or young, small industries, to grow and mature to a competitive level.
- **Protect against unfair trade practices:** Setting a quota helps protect a domestic economy from unfair trade practices such as dumping, the pricing of imports below production cost. By restricting imports, quotas minimize the impact of such activities.
  - **Protect national security:** Import quotas discourage imports and encourage domestic production of goods that may be necessary to the security of the country. By protecting and encouraging the growth of these defense-related industries, a country will not have to be dependent on foreign imports in the event of a war.

## **Consequences of Quotas**

Like other trade barriers, quotas restrict international trade, and thus, have consequences for the domestic market. In particular, quotas restrict competition for domestic commodities, which raises prices and reduces selection. This hurts the domestic consumer, who experiences a loss in consumer surplus. On the other hand, this very action benefits the domestic producer, who sees an increase in producer surplus. Often, the increase in producer surplus is not enough to offset the loss in consumer surplus, so the economy experiences a loss in total surplus.

Quotas may also foster negative economic activities. Import quotas may promote administrative corruption, especially in countries where import quotas are given to selected importers. There are incentives to give the quotas to importers who can provide the most favors or the largest bribes to officials. Quotas may also encourage smuggling. As quotas raise the price of domestic goods, it becomes profitable to try and circumvent the quota by bringing in goods illegally, or in excess of the quota.

### **31.4.3: Other Barriers**

Barriers to trade include specific limitations to trade, customs procedures, governmental participation, and technical barriers to trade.

## Learning Objective

Distinguish different barriers to trade

## Key Points

- Specific limitations to trade barriers include local content requirements and embargoes. This category of barriers comes from trade regulations.
- Customs and administrative procedure barriers include bureaucratic red tape and anti-dumping practices. This category of barriers comes from government procedures.
- Governmental participation barriers include government procurement programs, export subsidies, and countervailing duties. This category of barriers involves the direct participation of government in trade.
- Technical barriers to trade include sanitary regulations, measurement and labeling standards, and ingredient standards. This category of barriers involves health, safety, and measurement standards.

## Key Terms

countervailing duty

A tax levied on an imported article to offset the unfair price advantage it holds due to a subsidy paid to producers or exporters by the government of the exporting country if such imports cause or threaten injury to a domestic industry.

embargo

A ban on trade with another country.

Dumping

Selling goods at less than their normal price, especially in the export market.

In addition to tariffs and quotas, other barriers to trade exist. They can be divided into four separate categories: specific limitations to trade, customs and administrative procedures, government participation, and technical barriers to trade.

## **Specific Limitations to Trade**

This category of trade barriers stems from regulations on international trade. Some examples include:

- Local content requirements, or domestic content requirements, are rules that mandate how much of a product must be produced domestically in order to qualify for lowered tariffs or other preferential treatment.
- Embargoes are prohibitions on trade ban imports or exports, and may apply to certain categories of products, or strictly to goods supplied by certain countries .

## **Customs and Administrative Procedures**

This category of trade barriers refers to trade impediments that stem from governmental procedures and controls. Some examples include:

- Bureaucratic delays: Delays at ports or other country entrances caused by administrative or bureaucratic red-tape increase uncertainty and the cost of maintaining inventory.
- Anti-dumping duties: In international trade, dumping refers to a form of predatory pricing in which exported products are priced below the cost of production or below the price charged in the home market. Anti-dumping duties are usually extra taxes levied on the product to neutralize the predatory pricing and bring the price closer to the "normal value. "

## **Government Participation**

This category of trade barriers represents direct governmental involvement in international trade. Some examples include:

- **Government procurement programs:** Public authorities, such as government agencies, are much like private interests in that they must also buy goods and services. Unlike private interests, governments are more likely to buy domestically produced goods and services, rather than the lowest-cost commodities. Because government procurement often represent a significant portion of a country's GDP, foreign suppliers are at a disadvantage to domestic ones when it comes to these programs.
- **Export subsidies:** Export subsidies are production subsidies granted to exported products, usually by a government. With export subsidies, domestic producers can sell their commodities in foreign markets below cost, which makes them more competitive.
- **Countervailing duties:** Countervailing duties, or anti-subsidy duties, are extra duties levied on imports in order to neutralize an export subsidy. If a country discovers that a foreign country subsidizes its exports, and domestic producers are injured as a result, a countervailing duty can be imposed in order to reduce the export subsidy advantage. In that respect, countervailing duties are similar to anti-dumping duties in that they both bring a imported product's value closer to the "normal value. "

## **Technical Barriers to Trade**

Technical barriers to trade are non-tariff barriers to trade that refer to standards implemented by countries. Because these standards must be met before goods are allowed to enter or leave a country, they represent international trade barriers. Some examples include:

- **Sanitary and phytosanitary measures:** These are health standards for plants, animals, and other products, and are designed to protect humans, animals, and plants from pests or diseases.
- **Rules for product weights, sizes, or packaging.**
- **Standards for labeling and testing products.**
- **Ingredient or identity standards.**

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# 31.5: Arguments for and Against Protectionist Policy

## 31.5.1: National Security Argument

National security protectionist arguments pertain to the risk of dependency upon other nations for economic sustainability.

### Learning Objective

Evaluate the arguments in favor of the use of trade protectionism in the security industry

### Key Points

- Economic interdependence and globalization has resulted in a unique capitalistic system, where each country is largely dependent upon other countries for economic sustainability.
- It has been noted, somewhat intuitively and empirically, that conflict reduces trade. This highlights the risk of conflict harming an economy.
- A more specific context for trade and conflict can be the way in which trade is complicated during wartime. Indeed, trade during wartime can be a substantial threat to a nation, as economic levers such as sanctions can be utilized.
- Iran and North Korea are strong modern examples as well as the recent history of the U.S.-Iraq war. All of these economies struggle(d) against harsh economic sanctions.
- Combining these ideas, it is clear that there is substantial national security value to trade protectionism.

### Key Terms

Self-sufficiency

Able to provide for oneself independently of others.

sanction

A penalty, or some coercive measure, intended to ensure compliance; especially one adopted by several nations, or by an international body.

Economic interdependence and globalization has resulted in a system, where each country is largely dependent upon other countries for economic sustainability (though to varying degrees). This results in a substantial national security threat in the form of conflicting or offensive trade strategies between countries. Indeed, economics is often used directly as a weapon of war and conflict via trade sanctions. This highlights a critical protectionist argument pertaining to the very real risk of dependency upon other nations for economic sustainability.

## **Trade and Conflict**

An interesting discussion in economics is the relationship between trade and conflict. It has been noted, somewhat intuitively and empirically, that conflict reduces trade. However, is it also the case that trade reduces conflict? This question is largely unanswered, although the stances are becoming more highly developed. It is hypothesized that trade does not necessarily reduce conflict, but instead changes the nature of the conflict. Economic levers are much more practical than military levers, and are often used for similar reasons. For this reason, it is difficult to separate trade and conflict completely because there is some critical overlap between the two. This is a fundamental foundation for the trade protectionism logic from a national security perspective.

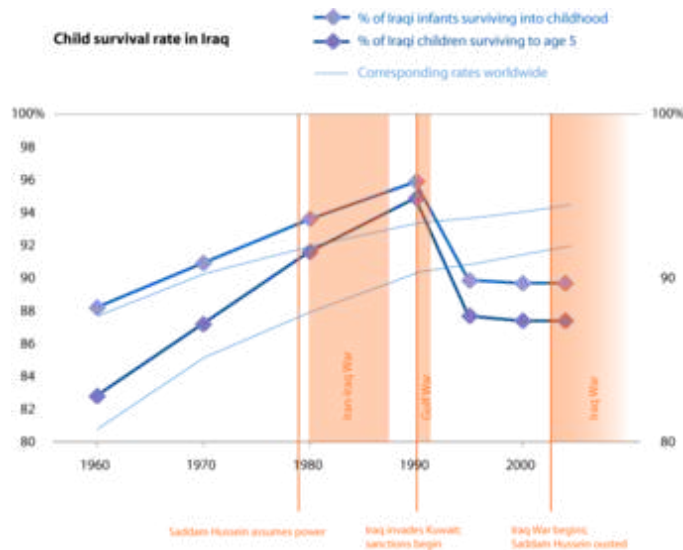
## **Trade During Conflict**

A more specific context for trade and conflict can be the way in which trade is complicated during wartime. Indeed, trade during wartime can be a substantial threat to a nation depending on the scale and scope of the conflict (most notably who is involved). For example, consider World War II. In this scenario Germany was largely isolated in the conflict, and therefore had



extremely limited trade partners. Direct conflict will almost always result in a complete cease in trading not only between the country in which the war is occurring, but also any of that country's allies (who may or may not be directly involved). However, some argue self-sufficiency (via protectionism) in war is not necessary, as friendly nations will still provide trade and economic support.

Sanctions also play a dramatic role as an offensive militaristic maneuver. Iran and North Korea are strong modern examples as well as the recent history of the U.S.-Iraq war. In all of these circumstances, either the U.S. alone or along with a number of allies (representing substantial consumption percentages) actively limited the ability for these countries to trade and generate economic value for their nations (and subsequently their people). While this looks purely economic, it has important social and humanitarian implications as well. The chart makes this case quite clearly, pointing out the death toll in wartime if economic levers are utilized.



## Infant Mortality in Iraq During Sactions

This graphic underlines the indirect consequences of employing economic levers (i.e. sanctions) in a militaristic fashion during a conflict. While the justification for these figures is complex, including other war-related factors, the correlation is quite clear. Diminishing a country's economic prospects will in turn result in loss of life, particularly in developing nations.

# Protectionism

Combining these ideas, it is clear that there is substantial national security value to trade protectionism. However, the opportunity cost of leveraging the ever-growing global markets make this an unattractive prospect if taken to any extreme, as the benefits of global trade rapidly offset the risk of economic dependency upon hostile nations.

## 31.5.2: Infant Industry Argument

Economic markets are inherently competitive and newer economies are vulnerable to their more developed counterparts in other countries.

### Learning Objective

Discuss the use of trade protectionism to promote new industries

### Key Points

- Trade protectionism is national policies restricting international economic trade to alter the balance between imports and goods manufactured domestically through import quotas, tariffs, taxes, anti-dumping legislation, and other limitations.
- The primary advantage to countries with higher economic power and bigger corporations is simply economies of scale, which infant industries in developing countries often protect against.
- The United States was employing heavy tariffs to protect their fragile economic system as the economy began to achieve autonomy after British rule, which proved effective.
- From a broader and more far-reaching perspective, protectionism as a general principle has been heavily criticized (even in infant industry situations). The argument is that free markets add value on a global level, while protectionism confines economic value to the nation employing it.

### Key Terms

## Dumping

Selling goods at less than their normal price, especially in the export market as a means of securing a monopoly.

## Nascent

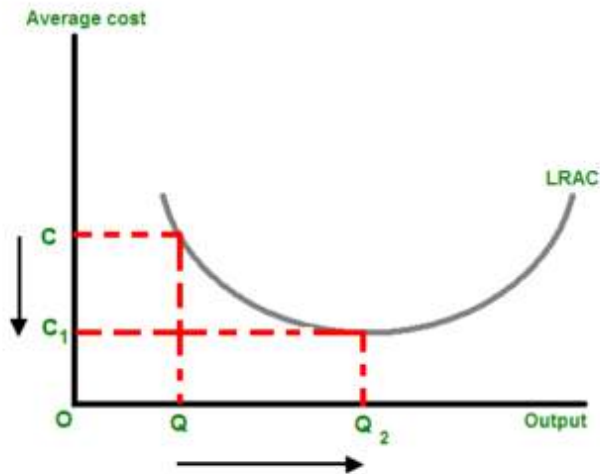
Emerging; just coming into existence.

Trade protectionism is defined as national policy restricting international economic trade to alter the balance between imports and goods manufactured domestically, usually executed via policies and governmental regulations such as import quotas, tariffs, taxes, anti-dumping legislation, and other limitations.

## **Arguments for Protecting Infant Industry**

The primary purpose for this system is as the name implies: protection. Economic markets are inherently competitive, and newer economies are highly vulnerable to their more developed counterparts in other countries for a variety of reasons. The infant industry argument is that new industries need protection until they have become efficient enough to compete in the world market.

Despite the standard argument from mainstream economists postulating that free trade and open markets is the ideal system to allow for capitalistic development, there are many economists who believe that some degree of protectionism is the only way to minimize income gaps and substantial inequity from economy to economy (see ). The primary advantage to countries with higher economic power and bigger corporations is simply economies of scale and economies of scope, in addition to being further along the experience curve.



## Economies of Scale

The basic premise behind economies of scale is that higher production quantity reduces cost per unit, ultimately allowing for the derivation of economic advantage in the market. Infant industries generally do not have the capacity to do this.



## GDP by Country

This map demonstrates the vast difference in overall economic power across the globe, underlining the inequities that need to be addressed in economic policy formulation.

History has proven the value of protection for the countries employing tariff-based international trade policies. Alexander Hamilton first pointed out the inequities of developing economies with young industry in 1790, which was

later picked up and developed by Daniel Raymond and Friedrich List in the 19th century. Around this time frame, the United States was employing heavy tariffs to protect their fragile economic system as the economy began to achieve autonomy after British rule. Indeed, Britain employed similarly protectionist policies during this time frame, setting the tone for large economic expansion in the longer term.

## **Criticism**

Of course, protective policy while industry develops domestically is not a cure all. In Brazil in the 1980's there were heavy protective policies in place to defend Brazil's nascent computer industry from highly evolved competitors internationally. While this seemed practical, what ended up happening was quite damaging for Brazil. Technology advanced rapidly, and without strategic alliances on a global scale, Brazil largely missed out on these advances. This protectionism seems to have damaged industry prospects on a global level for Brazil in this scenario.

From a broader and more far-reaching perspective, protectionism as a general principle has been heavily criticized (even in infant industry situations). The reason for this is quite simply the significant jump in prosperity as international trade expanded, and the huge capacity for specialization, economies of scale, technology sharing, and a host of other advantages that have been a direct result of free global markets. The problem still remains, however, that this prosperity is often unregulated and of the greatest benefit to the influential players in established economies, sometimes at the expense of exploitation of developing nations (cheaper labor, reduced governmental oversight, etc.). As a result of this, protecting infant industries can benefit the nation employing them, but generally with the opportunity cost of global value.

### **31.5.3: Unfair Competition Argument**

One of the strongest arguments for trade protectionism is unfair competition emerging due to differences in policy and enforcement ability.

## **Learning Objective**

Examine the use of protectionism as a way of addressing unfair competitive practices

## **Key Points**

- Protectionist policies are a highly charged topic in economic debates, as economies work to attain the optimal balance of free trade and trade protectionism to capture the most value.
- A recent topic is anti-dumping policies directed at international players looking to undercut domestic business through selling at dramatically reduced prices.
- Another critical risk in the global market is intellectual property (IP) protection as patents are often ignored globally, particularly by countries which lack the infrastructure to enforce IP laws.
- Another unfair competition threat is the emergence of global monopolies. Some of the larger ones attain enough global power and geographic diversification to be difficult to break up via domestic anti-trust laws.

## **Key Terms**

### **Subsidies**

Financial support or assistance, such as a grant.

### **Reverse engineering**

The process of analyzing the construction and operation of a product in order to manufacture a similar one.

### **Dumping**

Selling goods at less than their normal price, especially in the export market as a means of securing a monopoly.

Protectionist policies are a highly charged topic in economic debates, as economies work to attain the optimal balance of free trade and trade protectionism to capture the most value. In many ways, the global markets are torn between pursuing what is best on the global level and what is best at the domestic level, and there is sometimes dissonance between the two. One of the strongest arguments for some degree of trade protectionism is the tendency for unfair competition to emerge, particularly in developing markets without the infrastructure to monitor their businesses and enforce penalties. This is called the unfair competition argument.

## **Dumping**

A popular recent topic is anti-dumping policies directed at international players looking to undercut domestic business through selling at dramatically reduced prices. This can be a substantial threat, particularly from economies where labor laws are lax and workers are exploited to create extremely low cost goods. This is also a risk when governments get too involved in business, a criticism often pointed out in China. Governments can provide subsidies to reduce costs for domestic companies. This can also be a threat in infant industries, where larger and more established players can push out smaller players via undercutting prices, absorbing losses until the competition goes bankrupt.

Offsetting this threat has been an ongoing struggle, with the emergence of international trade agreements and organizations like the World Trade Organization (WTO) playing an increasingly large role. One of the struggles with international trade is the difficulty of enforcement between nations, and the WTO plays a critical role in identifying malpractice and addressing it.

## **Intellectual Property**

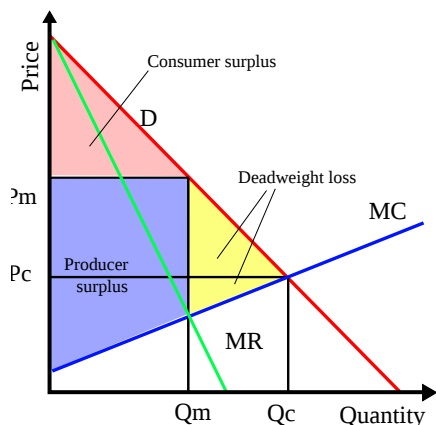
Another critical risk in the global market is intellectual property (IP) protection. Patents, in a domestic system, protect the innovator to allow them to generate returns on the substantial time investment required to invent or innovate new products or technologies. On a global scale, however, it is quite common for developing nations to copy new technologies via reverse engineering. This results in copycats violating the patents in an environment

where the infrastructure domestically will probably not take legal action. This reduces the desire for innovation and places large economic risks on countries dependent upon this for growth.

This is addressed through international patent laws and trade agreements as well, alongside political pressures such as raising tariffs and placing import quotas on countries suspected to be in violation of patents. The downside to this is that utilizing these measures creates political unrest, global factions, and strained business relationships.

## Mergers, Acquisitions, and Market Dominance

Another unfair competition threat is the emergence of global monopolies. Some of the larger ones attain enough global power and geographic diversification to be difficult to break up via domestic antitrust laws. demonstrates the substantial threat of deadweight losses being incurred in economies where consolidation results in a lack of competitive forces to drive down price.



## Economic Losses in a Monopoly

This chart highlights the very real risk of lost economic value in a monopolistic situation (deadweight loss in yellow).

On the domestic level monopolies are widely seen as being addressed (though this is hotly debated by many economists in light of the 'too big to



fail' and 'too big to jail' banks). On a global scale it is even more difficult to regulate, as the size and scale of these companies often extends beyond the power of the governments where these companies are located. This is addressed through international standards and trade agreements, standardizing governmental policy on a global level to reduce the risk of monopoly and unfair consolidation towards market dominance.

### **31.5.4: Jobs Argument**

Many policy makers who are proponents of trade protectionism argue that limiting imports will create or save more jobs at home.

#### **Learning Objective**

Analyze the use of trade restrictions for strategic purposes

#### **Key Points**

- This argument is predicated on the simple fact that buying more domestically will drive up national production, and that this increased production will in turn result in a healthier domestic job market.
- Local governments leverage subsidies, tariffs, import quotas, and anti-dumping policies to maximize strategic capacity domestically, thus creating jobs.
- A sentiment towards protectionism has developed in the U.S. due to the jobs argument in view of an imbalanced trade ratio, where more exports (production and jobs at home) is required to sustain the ongoing consumption of imports.
- Along similar lines, it is common practice for companies to identify strategic alliances abroad and send much of the production work to these locations (outsourcing), motivating governments to bring these jobs back home.
- Local governments leverage subsidies, tariffs, import quotas, and anti-dumping policies to maximize strategic capacity domestically, thus creating jobs.

#### **Key Terms**

## Import Quota

A restriction on the import of something to a specific quantity.

## Trade Balance

The difference between the monetary value of exports and imports in an economy over a certain period of time.

Many policy makers who are proponents of trade protectionism make the argument that limiting imports will create more jobs at home. This argument is predicated on the idea that buying more domestically will drive up national production, and that this increased production will in turn result in a healthier domestic job market. Domestic industries will not have to compete with foreign producers, and are therefore protected from losing marketshare to cheaper imports.

## **Trade Balance**

It is useful to consider the concept of a trade balance, or net exports, in the context of the jobs argument. It is interesting to look at to assess the extremity to which some nations are 'consumer nations' and others are 'producer nations'. The U.S. and China are a great example of opposite sides of the spectrum, where the trade balance is heavy on one side of the spectrum.



## Trade Balances on a Global Scale

It is interesting to look at this graph and assess the extremity to which some nations are 'consumer nations' and others are 'producer nations.' The U.S. and China are a great example of opposite sides of the spectrum, where the trade balance is heavily on one side of the spectrum.

In the U.S. this has created a dramatic push for trade protectionism policies; something the United States has not actively pursued in quite some time. The disastrous 2008 economic collapse via the clear-cut abuses by the banks, and the resulting drop in employment rates, has created an incredibly tangible social and political agenda to bring production back to domestic jobs from overseas. This sentiment towards protectionism is a direct result of the jobs argument in view of an imbalanced trade ratio, where more exports (production and jobs at home) are required to sustain the ongoing consumption of imports.

## Outsourcing

Along similar lines, it is common practice for companies to identify strategic alliances abroad and send much of the production work to these locations. This is often a result of cheaper labor and easier systems of governance in those regions. The obvious perspective, from a policy making context, is that these are jobs lost to overseas competitors. While this perspective is often criticized for being short-sighted and against the modern economic view of free markets, it has resulted in policy makers providing incentives to 'bring jobs back home.'

This idea of limiting outsourcing in light of the protectionist jobs argument has resulted in governmental subsidies that work to offset the costs of manufacturing domestically (in the U.S. particularly). These subsidies are essentially grants or tax breaks for companies operating domestically and creating jobs, driving up employment rates via protectionist strategies.

## **Trade Restriction Strategies**

Offsetting the threats of outsourcing and trade imbalances and driving domestic purchasing, and thus domestic production, is done through a variety of political vehicles. Most notable among them are:

- **Import Quotas:** This is the act of limiting the number of a certain good that can be purchased from a given country, ensuring that domestic producers maintain a portion of the market share.
- **Tariffs:** Tariffs are fairly straight-forward, essentially taxes to bring goods into a given country. High tariffs will raise the cost for foreign producers to sell their goods in a domestic system, providing strategic advantages for local producers. One of the pitfalls of tariffs is the likelihood of retaliation, where the foreign government returns with similar tariffs. This will in turn damage global prospects for domestic suppliers.
- **Anti-dumping:** Anti-dumping legislation actively offsets the ability of low cost or highly subsidized producers in foreign countries to undercut prices in a domestic system. Dumping is the process of selling goods far below market value to drive out competition, often in pursuit of creating a monopoly.
- **Subsidies:** On the other end of the spectrum, and as noted above, governments can provide subsidies to domestic producers to lower their costs and drive up competitive ability. This can in turn create jobs.

### **31.5.5: A Summary of International Trade Agreements**

International trade agreements are agreements across national borders that reduce or eliminate trade barriers to promote economic exchange.

## Learning Objective

Identify at least three main international trade agreements

## Key Points

- International trade encounters a variety of obstacles which reduce trade incentives. This is usually through tariffs, quotas, taxes, and other trade restrictions.
- The WTO is the largest international trade organization, replacing the General Agreement on Tariffs and Trade (GATT) in 1995, designed to enable international trade while reducing unfair practices.
- NAFTA is a trilateral agreement between the United States, Canada and Mexico designed to minimize any trade or investment barriers between any of these countries (primarily in the form of tariffs).
- The APEC forum is a cooperative discussion between 21 countries in the Pacific Rim region promoting free trade, with a focus on newly industrialized economies (NIE).

## Key Terms

Foreign direct investment

Investment into production or business in a country by an individual or company of another country.

tariff

A system of government-imposed duties levied on imported or exported goods; a list of such duties, or the duties themselves.

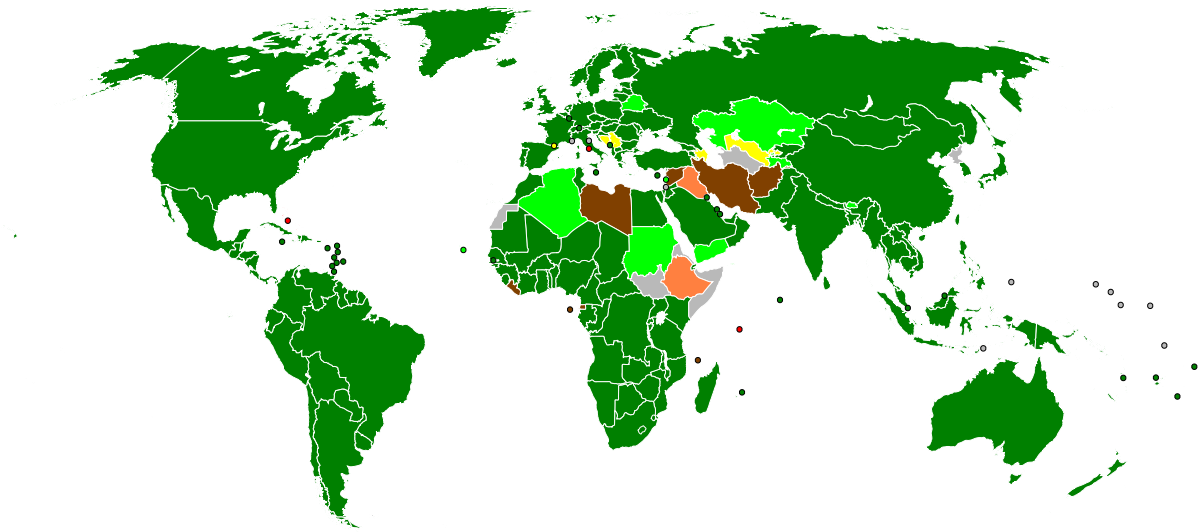
International trade agreements are trade agreements across national borders intended to reduce or eliminate trade barriers to promote economic exchange. International trade encounters a variety of obstacles, some of which pertain to the protectionism identified in other atoms, which reduce trade incentives. This is usually through tariffs, quotas, taxes, and other trade restrictions. It is also useful to create standards and norms across different

countries, particularly for things like intellectual property law recognition, which enables businesses to operate across borders.

There are quite a few international trade agreements, some of which are more formal than others. The trade agreements below provide a fairly comprehensive overview of the current international trade environment:

## **World Trade Organization (WTO)**

The WTO is the largest international trade organization, replacing the General Agreement on Tariffs and Trade (GATT) in 1995, designed to enable international trade while reducing unfair practices. In many ways, the WTO is more complex than other international trade agreements because it incorporates a variety of smaller agreements into a larger framework. The WTO includes upwards of 60 different agreements alongside 159 official members and 25 observers. underlines how effective and universal international trade agreements are becoming. The WTO performs several objective functions as well if trade disputes arise, acting as a framework for assessing appropriate international trade practices.



## **WTO Members**

The World Trade Organization (WTO) is an organization designed to oversee and enable international trade. This map shows how successful this has been on a global scale.

The core of the WTO is the most-favored nation (MFN) rule, which states that each WTO member must be charged the lowest tariffs that an importer places on any country. For example, if the US charges Brazil a 5% tariff on imported clothes, and this is the lowest tariff it has placed on any country in the WTO, all other WTO members must also be charged a 5% tariff. Every WTO member gets charged the lowest tariff that an importer charges any other member.

## **North American Free Trade Agreement (NAFTA)**

Unlike the WTO, which is an entirely global approach, most international agreements stem from geographic proximity. NAFTA is a trilateral agreement between the United States, Canada and Mexico designed to minimize any trade or investment barriers between any of these countries (primarily in the form of tariffs). Generally speaking, the United States demonstrates a trade deficit with these countries relative to goods and a surplus relative to services. The United States also demonstrates high and fast-growing foreign direct investment (FDI) in both regions.



## **NAFTA Participants**

This map outlines each of the countries involved in the North American Free Trade Agreement, an international trade agreement focused on a geographic proximity.

There has been a great deal of controversy surrounding this trade agreement. Agriculture is not included in this agreement, and is often a tough point of discussion for the WTO as well. Mexico is also a point tension due to the fact that it is developing economically (compared to the U.S. and Canada who are considered already developed). Finally, Canadians have often objected to the NAFTA agreements due to the way in which the United



States FDI employs hostile takeovers. These agreements demonstrate some of the validity behind trade protectionism and isolationism (as discussed in other atoms in this chapter).

## Asia-Pacific Economic Cooperation (APEC)

The APEC forum is particularly interesting in the context of the above agreements, as it is slightly less formal than the above two (it is referred to as a 'forum'). The APEC forum is a cooperative discussion between 21 countries in the Pacific Rim region promoting free trade, with a focus on newly industrialized economies (NIE). Developing nations gaining access to capital investment and export agreements is the central outcome of APEC, driving economic growth through controlled global expansion. This region represents over half of the world's GDP and 40% of the overall world population, making this a critical region of the world economy.

 APEC Participants

## APEC Participants

The Asia-Pacific Economic Cooperation (APEC) is a forum of 21 countries in the Pacific Rim region, focusing on free trade and economic cooperation.

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# **32: Open Economy Macroeconomics**

# 32.1: Capital Flows

## 32.1.1: The Balance of Payments

The balance of payments (BOP) is a record of all monetary transactions between a country and the rest of the world.

### Learning Objective

Explain the components and importance of the balance of payments

### Key Points

- Whenever a country receives funds from a foreign source, a credit is recorded on the balance of payments. Whenever a country has an outflow of funds, it is recorded as a debit on the balance of payments.
- When all components of the BOP accounts are included they must sum to zero with no overall surplus or deficit.
- $BOP = \text{Current Account} + \text{Financial Account} + \text{Capital Account} + \text{Balancing Item}$ .
- The current account records the flow of income from one country to another.
- The financial account records the flow of assets from one country to another.
- The capital account is typically much smaller than the other two and includes miscellaneous transfers that do not affect national income.

### Key Term

balance of payments

A record of all monetary transactions between a country and the rest of the world

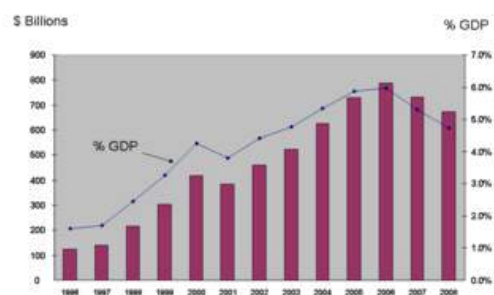
The balance of payments (BOP) is a record of all monetary transactions between a country and the rest of the world. This includes payments for the country's exports and imports, the sale and purchase of assets, and financial transfers. The BOP is given for a specific period of time (usually a year) and in terms of the domestic currency.

Whenever a country receives funds from a foreign source, a credit is recorded on the balance of payments. Sources of funds include exports, the receipt of loans or investment, and income from foreign assets. Whenever a country has an outflow of funds, such as when the country imports goods and services or when it invests in foreign assets, it is recorded as a debit on the balance of payments.

When all components of the BOP accounts are included they must sum to zero with no overall surplus or deficit. For example, if a country is importing more than it exports, its trade balance will be in deficit, but the shortfall will have to be counterbalanced in other ways – such as by

funds earned from its foreign investments, by running down central bank reserves, or by receiving loans from other countries .

U.S. Current Account or Trade Deficit: Dollars and % GDP



Source Data: U.S. Bureau of Economic Analysis (BEA)

## U.S. Current Account

The chart shows the current account deficit of the U.S., both in dollars and as a percent of GDP. Deficits in the current account must be offset by surpluses in the financial and capital accounts.

## Components of the Balance of Payments

The BOP can be expressed as:

The current account records the flow of income from one country to another. It includes the balance of trade (net earnings on exports minus payments for imports), factor income (earnings on foreign investments minus payments made to foreign investors), and cash transfers.

The financial account records the flow of assets from one country to another. It is composed of foreign direct investment, portfolio investment, other investment, and reserve account flows.

The capital account is typically much smaller than the other two and includes miscellaneous transfers that do not affect national income. Debt forgiveness would affect the capital account, as would the purchase of non-financial and non-produced assets such as the rights to natural resources or patents.

The balancing item is simply an amount that accounts for any statistical errors and ensures that the total balance of payments is zero.

### 32.1.2: The Current Account

The current account represents the sum of net exports, factor income, and cash transfers.

#### Learning Objective



Calculate the current account

## Key Points

- The balance of trade is the difference between a nation's exports of goods and services and its imports of goods and services. A nation has a trade deficit if its imports exceeds its exports.
- The net factor income records a country's inflow of income and outflow of payments. Income refers not only to the money received from investments made abroad but also to remittances.
- Cash transfers take place when a certain foreign country simply provides currency to another country with nothing received as a return.
- A country's current account can be calculated by the following formula:  $CA = (X - M) + NY + NCT$ .

## Key Terms

credit

An addition to certain accounts.

balance of trade

The difference between the monetary value of exports and imports in an economy over a certain period of time.

debit

A sum of money taken out of an account.

The current account represents the sum of the balance of trade (net earnings on exports minus payments for imports), factor income (earnings on foreign investments minus payments made to foreign investors), and cash transfers. It is called the current account as it covers transactions in the "here and now" – those that don't give rise to future claims.

The balance of trade is the difference between a nation's exports of goods and services and its imports of goods and services. A nation has a trade deficit if its imports exceed its exports. Because the trade balance is typically the largest component of the current account, a current account surplus is usually associated with positive net exports. This, however, is not always the case. Secluded economies like Australia are more likely to feature income deficits larger than their trade surplus.

The net factor income records a country's inflow of income and outflow of payments. Income refers not only to the money received from investments made abroad (note: the investments themselves are recorded in the capital account but income from investments is recorded in the current account) but also to the money sent by individuals working abroad, known as remittances, to their families back home. If the income account is negative, the country is paying more than it is taking in interest, dividends, etc.

Cash transfers take place when a certain foreign country simply provides currency to another country with nothing received as a return. Typically, such transfers are done in the form of donations, aids, or official assistance.

## Calculating the Current Account

Normally, the current account is calculated by adding up the 4 components of current account: goods, services, income and cash transfers.

Goods are traded by countries all over the world. When ownership of a good is transferred from a local country to a foreign country, this is called an export. When a good's ownership is transferred from a foreign country to a local country, this is called an import. In calculating the current account, exports are marked as a credit (inflow of money) and imports are marked as a debit (outflow of money).

Services can also be traded by countries. This happens frequently in the case of tourism. When a tourist from a local country visits a foreign country, the local country is consuming the foreign services and this is counted as an import. Likewise, when a foreign tourist comes and enjoys the services of a local country, this is counted as an export. Other services can also be transferred between countries, such as when a financial adviser in one country assists clients in another.

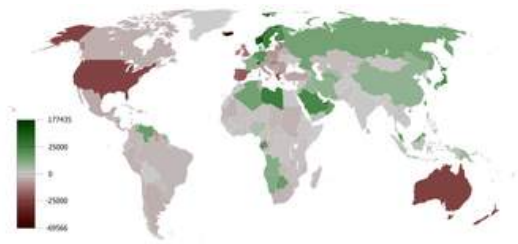
A credit of income happens when a domestic individual or company receives money from a foreign individual or company. This would typically take place when a domestic investor receives dividends from an investment made in a foreign country, or when a worker abroad sends remittances back to the local country. Likewise, a debit in the income account takes place when a foreign entity receives money from an investment in the local economy.

Finally, a credit in the cash transfers column would be a gift of aid from a foreign country to the domestic country. Similarly, a debit in the cash transfers column might be the provision of official assistance by the local economy to a foreign economy.

Thus, a country's current account can be calculated by the following formula:

$$CA = (X-M)+NY+NCT$$

Where CA is the current account, X and M are the export and import of goods and services respectively, NY is net income from abroad, and NCT is the net current transfers. When the sum of these four components is positive, the current account has a surplus.



## Global Current Accounts

The map shows the per capita current accounts surpluses and deficits of countries around the world from 1980 to 2008. Deeper red implies a higher per capita deficit, while deeper green implies a higher per capita surplus.

### 32.1.3: The Financial Account

The financial account measures the net change in ownership of national assets.

#### Learning Objective

Calculate the financial account

#### Key Points

- A financial account surplus means that buyers in the rest of the world are purchasing more of a country's assets than buyers in the domestic economy are spending on rest-of-world assets.
- The financial account has four components: foreign direct investment, portfolio investment, other investment, and reserve account flows.
- Foreign direct investment (FDI) refers to long term capital investment such as the purchase or construction of machinery, buildings, or even whole manufacturing plants.
- Portfolio investment refers to the purchase of shares and bonds.
- Other investment includes capital flows into bank accounts or provided as loans.
- The reserve account is operated by a nation's central bank to buy and sell foreign currencies.

#### Key Terms

interest rate

The percentage of an amount of money charged for its use per some period of time (often a year).

central bank

The principal monetary authority of a country or monetary union; it normally regulates the supply of money, issues currency and controls interest rates.

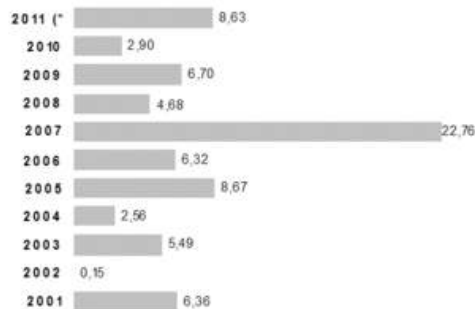
The financial account (also known as the capital account under some balance of payments systems) measures the net change in ownership of national assets. When financial account has a positive balance, we say that there is a financial account surplus. A financial account surplus means that the net ownership of a country's assets is flowing out of a country - that is, foreign buyers are purchasing more domestic assets than domestic buyers are purchasing of assets from the rest of the world. Likewise, we say that there is a financial account deficit when the financial account has a negative balance. This occurs when domestic buyers are purchasing more foreign assets than foreign buyers are purchasing of domestic assets. For example, a financial accounts deficit would exist when Country A's citizens buy \$200 million worth of real estate overseas, while overseas investors purchase only \$100 million worth of real estate within Country A.

## **Calculating the Financial Account**

The financial account has four components: foreign direct investment, portfolio investment, other investment, and reserve account flows.

Foreign direct investment (FDI) refers to long term capital investment such as the purchase or construction of machinery, buildings, or even whole manufacturing plants. If foreigners are investing in a country, that is an inbound flow and counts as a surplus item on the financial account. If a nation's citizens are investing in foreign countries, there is an outbound flow that will count as a deficit. After the initial investment, any yearly profits not re-invested will flow in the opposite direction, but will be recorded in the current account rather than the financial account .

### Net Foreign Direct Investment in Austria In billion euros



\*) 2011 preliminary data  
Source: OeNB, September 2011

## FDI in Austria

Austria has experienced a surplus of foreign direct investment: more foreign investors invest in Austria than Austrian investors do in the rest of the world. This contributes to a financial account surplus.

Portfolio investment refers to the purchase of shares and bonds. It is sometimes grouped together with "other" as short term investment. As with FDI, the income derived from these assets is recorded in the current account; the financial account entry will just be for any buying or selling of the portfolio assets in the international financial markets.

Other investment includes capital flows into bank accounts or provided as loans. Large short term flows between accounts in different nations are commonly seen when the market is able to take advantage of fluctuations in interest rates and/or the exchange rate between currencies. Sometimes this category can include the reserve account.

The reserve account is operated by a nation's central bank to buy and sell foreign currencies; it can be a source of large capital flows to counteract those originating from the market. Inbound capital flows (from sales of the account's foreign currency), especially when combined with a current account surplus, can cause a rise in value (appreciation) of a nation's currency, while outbound flows can cause a fall in value (depreciation). If a government (or, if authorized to operate independently in this area, the central bank itself) does not consider the market-driven change to its currency value to be in the nation's best interests, it can intervene. Such intervention affects the financial account. Purchases of foreign currencies, for example, will increase the deficit and vis versa.

To calculate the total surplus or deficit in the financial account, sum the net change in FDI, portfolio investment, other investment, and the reserve account.

## Interest Rates and the Financial Account

The outflow or inflow of assets in the financial account depends in large part on the domestic interest rate and how it compares to interest rates in other countries. A higher central bank interest rate will tend to increase the interest rate on all domestic financial assets, such as bonds, loans, and government securities. In general, if interest rates are higher in one country than another, an investor would prefer to purchase financial assets in the country with the higher interest rate.

An increase in the domestic interest rate will therefore cause foreign investors to purchase more domestic assets, creating a financial account surplus. Likewise, a fall in the domestic interest rate will cause domestic investors to purchase foreign assets in place of domestic assets, and will cause a financial account deficit.

### **32.1.4: The Capital Account**

The capital account acts as a sort of miscellaneous account, measuring non-produced and non-financial assets, as well as capital transfers.

#### **Learning Objective**

Calculate the Capital Account

#### **Key Points**

- A deficit in the capital account means that money is flowing out of a country and the country is accumulating foreign assets.
- The capital account can be split into two categories: non-produced and non-financial assets, and capital transfers.
- Non-produced and non-financial assets include things like drilling rights, patents, and trademarks.
- Capital transfers include debt forgiveness, the transfer of goods and financial assets by migrants leaving or entering a country, and the transfer of ownership on fixed assets.

#### **Key Term**

debt forgiveness

The partial or total writing down of debt owed by individuals, corporations, or nations.

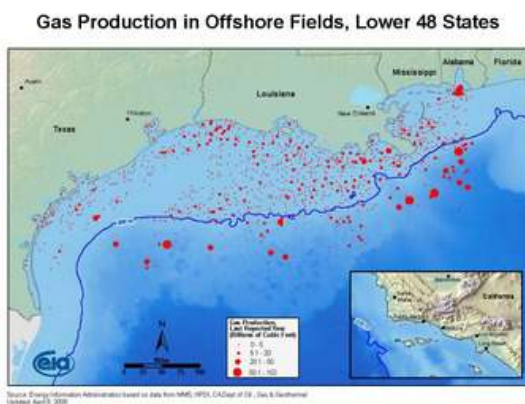
There are two common definitions of the capital account in economics. The first is a broad interpretation that reflects the net change in ownership of national assets. Under the International Monetary Fund (IMF) definition, however, most of these asset flows are captured in the financial account. Instead, the capital account acts as a sort of miscellaneous account, measuring non-produced and non-financial assets, as well as capital transfers. The capital account is normally much smaller than the financial and current accounts.

Like the financial account, a deficit in the capital account means that money is flowing out of a country and the country is accumulating foreign assets. Likewise, a surplus in the capital

account means that a money is flowing into a country and the country is selling (or otherwise disposing of) non-produced, non-financial assets.

## Calculating the Capital Account

The capital account can be split into two categories: non-produced and non-financial assets, and capital transfers. Non-produced and non-financial assets include things like drilling rights, patents, and trademarks. For example, if a domestic company acquires the rights to mineral resources in a foreign country, there is an outflow of money and the domestic country acquires an asset, creating a capital account deficit .



## Natural Gas Rights

If a U.S. company sold its rights to drill for natural gas off the southern coast of the U.S., it would be recorded as a credit in the capital account.

Capital transfers include debt forgiveness, the transfer of goods and financial assets by migrants leaving or entering a country, the transfer of ownership on fixed assets, the transfer of funds received to the sale or acquisition of fixed assets, gift and inheritance taxes, death levies, and uninsured damage to fixed asset. For example, if the domestic country forgives a loan made to a foreign country, this transfer creates a deficit in the capital account.

Thus, the balance of the capital account is calculated as the sum of the surpluses or deficits of net non-produced, non-financial assets, and net capital transfers.

### 32.1.5: Reason for a Zero Balance

Equilibrium in the market for a country's currency implies that the balance of payments is equal to zero.

#### Learning Objective

Discuss the long term equilibrium of a country's balance of payments

## Key Points

- Equilibrium in the foreign exchange market implies that the quantity of currency demanded = quantity of currency supplied .
- The quantity of a currency demanded is from two sources: exports and rest-of-world purchases of domestic assets. The quantity supplied of a currency is also from two sources: imports and domestic purchases of rest-of-world assets.
- Therefore, exports + (rest-of-world purchases of domestic assets) = imports + (domestic purchases or rest-of-world assets).
- Finally, this means that exports - imports = (domestic purchases of rest-of-world assets) - (rest-of-world purchases of domestic assets).
- In other words, the current account balances out the financial account and the balance of payments is zero.

## Key Terms

foreign exchange

The changing of currency from one country for currency from another country.

net exports

The difference between the monetary value of exports and imports.

## Capital Flows

Trade within a country differs in one important way from trade between countries: unless the two nations share a common currency, any trade requires that countries go through the foreign exchange market to trade currency, in addition to trading goods and services. For example, imagine that buyers in France purchase oranges produced in Chile. The French buyers use the euro in order to make the purchase but the Chilean orange producers must be paid with the Chilean peso. This exchange between France and Chile requires that the firms exchange euros for pesos.

In general, there are two reasons for demanding a country's currency: to purchase assets within the country and to purchase a country's exports - that is, the goods and services produced within that country. The country's currency is supplied when it is used to purchase foreign currencies. This also happens for two reasons: to purchase assets in other countries and to import goods or services from other countries.

Imaging that we are analyzing Italy's economy and its currency transactions with the rest of the world. If an American buyer wishes to purchase bonds issued by an Italian corporation, she becomes part of the world demand for euros to buy Italian assets. Adding the demand for exports to the demand for assets outside of a country, we get the total demand for a country's currency.



Likewise, a country's currency is supplied when it is used to purchase currencies in the rest of the world. Italian euros, for example, are supplied when Italian consumers or firms import goods and services from the rest of the world. Italian euros are also supplied when Italian purchasers acquire assets from other countries.

## **Equilibrium and Zero Balance**

When a country's balance of payments is equal to zero, there is equilibrium in the market for that country's currency. Equilibrium occurs when:

Quantity of currency demanded = quantity of currency supplied

We have already seen that the quantity of currency demanded is equal to the demand for exports and demand for domestic assets. The quantity of currency supplied is equal to the demand for imports and the domestic demand for foreign assets. Thus, we can rewrite the relationship:

Exports + (foreign purchases of domestic assets) = imports + (domestic purchases of foreign assets)

Finally, we can rearrange the above formula as:

Exports - imports = (domestic purchases of foreign assets) - (foreign purchases of domestic assets)

The left-hand term is net exports - the difference between the amount of goods and services a country exports and the amount that it imports. We refer to this difference as the current account. When a country exports more goods than it imports, this number is positive and we say that the country has a current accounts surplus. When a country imports more than it exports this number is negative and we say that the country has a current accounts deficit.

The right-hand term is the difference between the foreign assets that people within the country purchase and the domestic assets that are purchased by foreigners. This is called the financial account. These assets include the reserve account (the foreign exchange market operations of a nation's central bank), along with loans and investments between the country and the rest of world (but not the future regular repayments/dividends that the loans and investments yield; those are earnings and will be recorded in the current account). The financial account is also sometimes used in a narrower sense that excludes the foreign exchange operation of the central bank. When a country buys more foreign assets than other countries buy of its assets, this balance is positive and there is a financial account surplus.

If the above equation holds true, then any current account surplus must be matched by a financial account deficit, and vice versa. This holds true when a country's currency market is in equilibrium and there are no external currency controls.



## Exchange Rates

Exchange rates are constantly fluctuating to ensure that the quantity of currency supplied equals the quantity demanded. Because of this, the inflows and outflows of money are equal, creating a balance of payments equal to zero.

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# 32.2: Exchange Rates

## 32.2.1: Introducing Exchange Rates

In finance, an exchange rate between two currencies is the rate at which one currency will be exchanged for another.

### Learning Objective

Explain the concept of a foreign exchange market and an exchange rate

### Key Points

- Exchange rates are determined in the foreign exchange market, which is open to a wide range of buyers and sellers where currency trading is continuous.
- In the retail currency exchange market, a different buying rate and selling rate will be quoted by money dealers.
- The foreign exchange rate is also regarded as the value of one country's currency in terms of another currency.

### Key Term

exchange rate

The amount of one currency that a person or institution defines as equivalent to another when either buying or selling it at any particular moment.

In finance, an exchange rate (also known as a foreign-exchange rate, forex rate, or rate) between two currencies is the rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in terms of another currency . For example, an inter-bank exchange rate of 91 Japanese yen (JPY, ¥) to the United States dollar (USD, US\$)

means that ¥91 will be exchanged for each US\$1 or that US\$1 will be exchanged for each ¥91.



Currency	Buying Rate	Selling Rate
USD	29.75	30.55
GBP	47.85	49.27
EUR	42.21	43.18
CNY	4.28	4.88
JPY	37.45	38.94
MYR	9.21	10.28
AUD	31.68	32.85
HKD	3.77	4.00
KOR	0.022	0.033
PHP	0.47	0.76

## Exchange Rates

In the retail currency exchange market, a different buying rate and selling rate will be quoted by money dealers.

Exchange rates are determined in the foreign exchange market, which is open to a wide range of buyers and sellers where currency trading is continuous. The spot exchange rate refers to the current exchange rate. The forward exchange rate refers to an exchange rate that is quoted and traded today, but for delivery and payment on a specific future date.

## How the Foreign Exchange Market Works

In the retail currency exchange market, a different buying rate and selling rate will be quoted by money dealers. Most trades are to or from the local currency. The buying rate is the rate at which money dealers will buy foreign currency, and the selling rate is the rate at which they will sell the currency. The quoted rates will incorporate an allowance for a dealer's margin (or

profit) in trading, or else the margin may be recovered in the form of a commission or in some other way.

Different rates may also be quoted for different kinds of exchanges, such as for cash (usually notes only), a documentary form (such as traveler's checks), or electronic transfers (such as a credit card purchase). There is generally a higher exchange rate on documentary transactions (such as for traveler's checks) due to the additional time and cost of clearing the document, while cash is available for resale immediately.

## **32.2.2: Finding an Equilibrium Exchange Rate**

There are two methods to find the equilibrium exchange rate between currencies; the balance of payment method and the asset market model.

### **Learning Objective**

Differentiate between the Balance of Payment and Asset Market Models

### **Key Points**

- The balance of payment model holds that foreign exchange rates are at an equilibrium level if they produce a stable current account balance.
- The balance of payments model focuses largely on tradeable goods and services, ignoring the increasing role of global capital flows.
- The asset market model of exchange rate determination states that the exchange rate between two currencies represents the price that just balances the relative supplies of, and demand for, assets denominated in those currencies. This includes financial assets.

### **Key Terms**

depreciate

To reduce in value over time.

purchasing power parity

A theory of long-term equilibrium exchange rates based on relative price levels of two countries.

Countries have a vested interest in the exchange rate of their currency to their trading partner's currency because it affects trade flows. When the domestic currency has a high value, its exports are expensive. This leads to a trade deficit, decreased production, and unemployment. If the currency's value is low, imports can be too expensive though exports are expected to rise.

## **Purchasing Power Parity**

Purchasing power parity is a way of determining the value of a product after adjusting for price differences and the exchange rate. Indeed, it does not make sense to say that a book costs \$20 in the US and £15 in England: the comparison is not equivalent. If we know that the exchange rate is £2/\$, the book in England is selling for \$30, so the book is actually more expensive in England

If goods can be freely traded across borders with no transportation costs, the Law of One Price posits that exchange rates will adjust until the value of the goods are the same in both countries. Of course, not all products can be traded internationally (e.g. haircuts), and there are transportation costs so the law does not always hold.

The concept of purchasing power parity is important for understanding the two models of equilibrium exchange rates below.

## **Balance of Payments Model**

The balance of payments model holds that foreign exchange rates are at an equilibrium level if they produce a stable current account balance. A nation with a trade deficit will experience a reduction in its foreign exchange reserves, which ultimately lowers, or depreciates, the value of its currency. If a currency is undervalued, its nation's exports become more affordable in the global market while making imports more expensive. After an intermediate

period, imports will be forced down and exports will rise, thus stabilizing the trade balance and bringing the currency towards equilibrium.

## Asset Market Model

Like purchasing power parity, the balance of payments model focuses largely on tangible goods and services, ignoring the increasing role of global capital flows. In other words, money is not only chasing goods and services, but to a larger extent, financial assets such as stocks and bonds. The flows from transactions involving financial assets go into the capital account item of the balance of payments, thus balancing the deficit in the current account. The increase in capital flows has given rise to the asset market model.



## Share of Stock

The key difference between the balance of payments and asset market models is that the former includes financial assets, such as stock, in its calculation.

The asset market model views currencies as an important element in finding the equilibrium exchange rate. Asset prices are influenced mostly by people's willingness to hold the existing quantities of assets, which in turn depends on their expectations on the future worth of the assets. The asset market model of exchange rate determination states that the exchange rate between two currencies represents the price that just balances the relative supplies of, and demand for, assets denominated in those currencies. These



assets are not limited to consumables, such as groceries or cars. They include investments, such as shares of stock that is denominated in the currency, and debt denominated in the currency.

### **32.2.3: Real Versus Nominal Rates**

Real exchange rates are nominal rates adjusted for differences in price levels.

#### **Learning Objective**

Calculate the nominal and real exchange rates for a set of currencies

#### **Key Points**

- The measure of the differences in price levels is Purchasing Power Parity. The concept of purchasing power parity allows one to estimate what the exchange rate between two currencies would have to be in order for the exchange to be on par with the purchasing power of the two countries' currencies.
- If all goods were freely tradable, and foreign and domestic residents purchased identical baskets of goods, purchasing power parity (PPP) would hold for the exchange rate and price levels of the two countries, and the real exchange rate would always equal 1.
- When you go online to find the current exchange rate of a currency, it is generally expressed in nominal terms.
- Changes in the nominal value of currency over time can happen because of a change in the value of the currency or because of the associated prices of the goods and services that the currency is used to buy.
- To calculate the nominal exchange rate, simply measure how much of one currency is necessary to acquire one unit of another. The real exchange rate is the nominal exchange rate times the relative prices of a market basket of goods in the two countries.

#### **Key Terms**

nominal exchange rate

The amount of currency you can receive in exchange for another currency.

real exchange rate

The purchasing power of a currency relative to another at current exchange rates and prices.

Currency is complicated and its value can be measured in several different ways. For example, a currency can be measured in terms of other currencies, or it can be measured in terms of the goods and services it can buy. An exchange rate between two currencies is defined as the rate at which one currency will be exchanged for another. However, that rate can be interpreted through different perspectives. Below are descriptions of the two most common means of describing exchange rates.

## **Nominal Exchange Rate**

A nominal value is an economic value expressed in monetary terms (that is, in units of a currency). It is not influenced by the change of price or value of the goods and services that currencies can buy. Therefore, changes in the nominal value of currency over time can happen because of a change in the value of the currency or because of the associated prices of the goods and services that the currency is used to buy.

When you go online to find the current exchange rate of a currency, it is generally expressed in nominal terms. The nominal rate is set on the open market and is based on how much of one currency another currency can buy.

## **Real Exchange Rate**

The real exchange rate is the purchasing power of a currency relative to another at current exchange rates and prices. It is the ratio of the number of units of a given country's currency necessary to buy a market basket of goods in the other country, after acquiring the other country's currency in the

foreign exchange market, to the number of units of the given country's currency that would be necessary to buy that market basket directly in the given country. The real exchange rate is the nominal rate adjusted for differences in price levels.

A measure of the differences in price levels is Purchasing Power Parity (PPP). The concept of purchasing power parity allows one to estimate what the exchange rate between two currencies would have to be in order for the exchange to be on par with the purchasing power of the two countries' currencies. Using the PPP rate for hypothetical currency conversions, a given amount of one currency has the same purchasing power whether used directly to purchase a market basket of goods or used to convert at the PPP rate to the other currency and then purchase the market basket using that currency.



## Groceries

Purchasing Power Parity evaluates and compares the prices of goods in different countries, such as groceries. PPP is then used to help determine real exchange rates.

If all goods were freely tradable, and foreign and domestic residents purchased identical baskets of goods, purchasing power parity (PPP) would hold for the exchange rate and price levels of the two countries, and the real

exchange rate would always equal 1. However, since these assumptions are almost never met in the real world, the real exchange rate will never equal 1.

### Calculating Exchange Rates

Imagine there are two currencies, A and B. On the open market, 2 A's can buy one B. The nominal exchange rate would be A/B 2, which means that 2 As would buy a B. This exchange rate can also be expressed as B/A 0.5.

The real exchange rate is the nominal exchange rate times the relative prices of a market basket of goods in the two countries. So, in this example, say it take 10 A's to buy a specific basket of goods and 15 Bs to buy that same basket. The real exchange rate would be the nominal rate of A/B (2) times the price of the basket of goods in B (15), and divide all that by the price of the basket of goods expressed in A (10). In this case, the real A/B exchange rate is 3.

## 32.2.4: Exchange Rate Policy Choices

A government should consider its economic standing, trade balance, and how it wants to use its policy tools when choosing an exchange rate regime.

### Learning Objective

Explain the factors countries consider when choosing an exchange rate policy

### Key Points

- A free floating exchange rate increases foreign exchange volatility, which can be a significant issue for developing economies since most of their liabilities are denominated in other currencies.
- Floating exchange rates automatically adjust to trade imbalances while fixed rates do not.
- A big drawback of adopting a fixed-rate regime is that the country cannot use its monetary or fiscal policies with a free hand. Because

these tools are reserved for preserving the fixed rate, countries can't use its monetary or fiscal policies to address other economic issues.

## **Key Terms**

fixed exchange rate

A system where a currency's value is tied to the value of another single currency, to a basket of other currencies, or to another measure of value, such as gold.

floating exchange rate

A system where the value of currency in relation to others is allowed to freely fluctuate subject to market forces.

When a country decides on an exchange rate regime, it needs to take several important things in account. Unfortunately, there is no system that can achieve every possible beneficial outcome; there is a trade-off no matter what regime a nation picks. Below are a few considerations a country needs to make when choosing a regime.

## **Stage of Economic Development**

A free floating exchange rate increases foreign exchange volatility, which can be a significant issue for developing economies . Developing economies often have the majority of their liabilities denominated in other currencies instead of the local currency. Businesses and banks in these types of economies earn their revenue in the local currency but have to convert it to another currency to pay their debts. If there is an unexpected depreciation in the local currency's value, businesses and banks will find it much more difficult to settle their debts. This puts the entire economy's financial sector stability in danger.



## **Developing Countries**

The developing countries, marked in light blue, may prefer a fixed or managed exchange rate to a floating exchange rate. This is because sudden depreciation in their currency value poses a significant threat to the stability of their economies.

## **Balance of Payments**

Flexible exchange rates serve to adjust the balance of trade. When a trade deficit occurs in an economy with a floating exchange rate, there will be increased demand for the foreign (rather than domestic) currency which will increase the price of the foreign currency in terms of the domestic currency. That in turn makes the price of foreign goods less attractive to the domestic market and decreases the trade deficit. Under fixed exchange rates, this automatic re-balancing does not occur.

## **Monetary and Fiscal Policy**

A big drawback of adopting a fixed-rate regime is that the country cannot use its monetary or fiscal policies with a free hand. In general, fixed-rates are not established by law, but are instead maintained through government intervention in the market. The government does this through the buying and selling of its reserves, adjusting its interest rates, and altering its fiscal policies. Because the government must commit its monetary and fiscal tools to maintaining the fixed rate of exchange, it cannot use these tools to address other macroeconomics conditions such as price level, employment, and recessions resulting from the business cycle.

## 32.2.5: Exchange Rate Systems

The three major types of exchange rate systems are the float, the fixed rate, and the pegged float.

### Learning Objective

Differentiate common exchange rate systems

### Key Points

- A floating exchange rate or fluctuating exchange rate is a type of exchange rate regime wherein a currency's value is allowed to freely fluctuate according to the foreign exchange market.
- A fixed exchange-rate system (also known as pegged exchange rate system) is a currency system in which governments try to maintain their currency value constant against a specific currency or good.
- Pegged floating currencies are pegged to some band or value, either fixed or periodically adjusted. These are a hybrid of fixed and floating regimes.

### Key Terms

pegged float exchange rate

A currency system that fixes an exchange rate around a certain value, but still allows fluctuations, usually within certain values, to occur.

fixed exchange rate

A system where a currency's value is tied to the value of another single currency, to a basket of other currencies, or to another measure of value, such as gold.

floating exchange rate

A system where the value of currency in relation to others is allowed to freely fluctuate subject to market forces.

exchange rate regime

The way in which an authority manages its currency in relation to other currencies and the foreign exchange market.

## Example

- Examples of floating currencies include the US dollar, the European Union euro, the Japanese yen, and the British pound. Examples of fixed currencies include the Hong Kong dollar, the Danish krone, and the Bermudian dollar.

One of the key economic decisions a nation must make is how it will value its currency in comparison to other currencies. An exchange rate regime is how a nation manages its currency in the foreign exchange market. An exchange rate regime is closely related to that country's monetary policy. There are three basic types of exchange regimes: floating exchange, fixed exchange, and pegged float exchange .



## Foreign Exchange Regimes

The above map shows which countries have adopted which exchange rate regime. Dark green is for free float, neon green is for managed float, blue is for currency peg, and red is for countries that use another country's currency.

## The Floating Exchange Rate



A floating exchange rate, or fluctuating exchange rate, is a type of exchange rate regime wherein a currency's value is allowed to fluctuate according to the foreign exchange market. A currency that uses a floating exchange rate is known as a floating currency. The dollar is an example of a floating currency.

Many economists believe floating exchange rates are the best possible exchange rate regime because these regimes automatically adjust to economic circumstances. These regimes enable a country to dampen the impact of shocks and foreign business cycles, and to preempt the possibility of having a balance of payments crisis. However, they also engender unpredictability as the result of their dynamism.

## **The Fixed Exchange Rate**

A fixed exchange rate system, or pegged exchange rate system, is a currency system in which governments try to maintain a currency value that is constant against a specific currency or good. In a fixed exchange-rate system, a country's government decides the worth of its currency in terms of either a fixed weight of an asset, another currency, or a basket of other currencies. The central bank of a country remains committed at all times to buy and sell its currency at a fixed price.

To ensure that a currency will maintain its "pegged" value, the country's central bank maintain reserves of foreign currencies and gold. They can sell these reserves in order to intervene in the foreign exchange market to make up excess demand or take up excess supply of the country's currency.

The most famous fixed rate system is the gold standard, where a unit of currency is pegged to a specific measure of gold. Regimes also peg to other currencies. These countries can either choose a single currency to peg to, or a "basket" consisting of the currencies of the country's major trading partners.

## **The Pegged Float Exchange Rate**

Pegged floating currencies are pegged to some band or value, which is either fixed or periodically adjusted. These are a hybrid of fixed and floating regimes. There are three types of pegged float regimes:

- **Crawling bands:** The market value of a national currency is permitted to fluctuate within a range specified by a band of fluctuation. This band is determined by international agreements or by unilateral decision by a central bank. The bands are adjusted periodically by the country's central bank. Generally the bands are adjusted in response to economic circumstances and indicators.
- **Crawling pegs:** A crawling peg is an exchange rate regime, usually seen as a part of fixed exchange rate regimes, that allows gradual depreciation or appreciation in an exchange rate. The system is a method to fully utilize the peg under the fixed exchange regimes, as well as the flexibility under the floating exchange rate regime. The system is designed to peg at a certain value but, at the same time, to "glide" in response to external market uncertainties. In dealing with external pressure to appreciate or depreciate the exchange rate (such as interest rate differentials or changes in foreign exchange reserves), the system can meet frequent but moderate exchange rate changes to ensure that the economic dislocation is minimized.
- **Pegged with horizontal bands:** This system is similar to crawling bands, but the currency is allowed to fluctuate within a larger band of greater than one percent of the currency's value.

## **32.2.6: Fixed Exchange Rates**

A fixed exchange rate is a type of exchange rate regime where a currency's value is fixed to a measure of value, such as gold or another currency.

### **Learning Objective**

Explain the mechanisms by which a country maintains a fixed exchange rate

### **Key Points**

- A fixed exchange rate is usually used to stabilize the value of a currency against the currency it is pegged to.
- A fixed exchange rate regime should be viewed as a tool in capital control. As a result, a fixed exchange rate can be viewed as a means to regulate flows from capital markets into and out of the country's capital account.
- Typically, a government maintains a fixed exchange rate by either buying or selling its own currency on the open market.
- Another method of maintaining a fixed exchange rate is by simply making it illegal to trade currency at any other rate.

## **Key Term**

fixed exchange rate

A system where a currency's value is tied to the value of another single currency, to a basket of other currencies, or to another measure of value, such as gold.

A fixed exchange rate, sometimes called a pegged exchange rate, is a type of exchange rate regime where a currency's value is fixed against the value of another single currency, to a basket of other currencies, or to another measure of value, such as gold.

## **Reasons for Fixed Exchange Rate Regimes**

A fixed exchange rate is usually used to stabilize the value of a currency against the currency it is pegged to. This makes trade and investments between the two countries easier and more predictable and is especially useful for small economies in which external trade forms a large part of their GDP.

This belief that fixed rates lead to stability is only partly true, since speculative attacks tend to target currencies with fixed exchange rate regimes, and in fact, the stability of the economic system is maintained mainly through capital control. Capital controls are residency-based measures such as transaction taxes, other limits, or outright prohibitions that

a nation's government can use to regulate flows from capital markets into and out of the country's capital account. A fixed exchange rate regime should be viewed as a tool in capital control.

## **How a Fixed Exchange Regime Works**

Typically a government maintains a fixed exchange rate by either buying or selling its own currency on the open market. This is one reason governments maintain reserves of foreign currencies. If the exchange rate drifts too far below the desired rate, the government buys its own currency in the market using its reserves. This places greater demand on the market and pushes up the price of the currency. If the exchange rate drifts too far above the desired rate, the government sells its own currency, thus increasing its foreign reserves.

Another, method of maintaining a fixed exchange rate is by simply making it illegal to trade currency at any other rate. This method is rarely used because it is difficult to enforce and often leads to a black market in foreign currency. Some countries, such as China in the 1990s, are highly successful at using this method due to government monopolies over all money conversion. China used this method against the U.S. dollar .



## **PRC Flag**

China is well-known for its fixed exchange rate. It was one of the few countries that could impose a fixed rate by making it illegal to trade its currency at any other rate.

### **32.2.7: Managed Float**

Managed float regimes are where exchange rates fluctuate, but central banks attempt to influence the exchange rates by buying and selling currencies.

#### **Learning Objective**

Describe a managed float exchange rate and explain why countries choose managed floats

#### **Key Points**

- Generally the central bank will set a range which its currency's value may freely float between. If the currency drops below the range's floor or grows beyond the range's ceiling, the central bank takes action to bring the currency's value back within range.
- Management by the central bank generally takes the form of buying or selling large lots of its currency in order to provide price support or resistance.
- A managed float regime is a hybrid of fixed and floating regimes. A managed float captures the benefits of floating regimes while allowing central banks to intervene and minimize the risk of harmful effects due to radical currency fluctuations that are a characteristic of floating regimes.

## **Key Term**

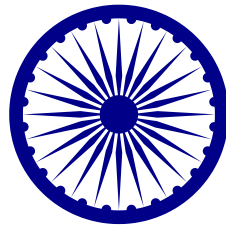
### Managed Float Regime

A system where exchange rates are allowed fluctuate from day to day within a range before the central bank will intervene to adjust it.

Managed float regimes, otherwise known as dirty floats, are where exchange rates fluctuate from day to day and central banks attempt to influence their countries' exchange rates by buying and selling currencies. Almost all currencies are managed since central banks or governments intervene to influence the value of their currencies. So when a country claims to have a floating currency, it most likely exists as a managed float.

## **How a Managed Float Exchange Rate Works**

Generally, the central bank will set a range which its currency's value may freely float between. If the currency drops below the range's floor or grows beyond the range's ceiling, the central bank takes action to bring the currency's value back within range .



## **India**

India has a managed float exchange regime. The rupee is allowed to fluctuate with the market within a set range before the central bank will intervene.

Management by the central bank generally takes the form of buying or selling large lots of its currency in order to provide price support or resistance. For example, if a currency is valued above its range, the central bank will sell some of its currency it has in reserve. By putting more of its currency in circulation, the central bank will decrease the currency's value.

## **Why Do Countries Choose a Managed Float**

Some economists believe that in most circumstances floating exchange rates are preferable to fixed exchange rates. Floating exchange rates automatically adjust to economic circumstances and allow a country to dampen the impact of shocks and foreign business cycles. This ultimately preempts the

possibility of having a balance of payments crisis. A floating exchange rate also allows the country's monetary policy to be freed up to pursue other goals, such as stabilizing the country's employment or prices.

However, pure floating exchange rates pose some threats. A floating exchange rate is not as stable as a fixed exchange rate. If a currency floats, there could be rapid appreciation or depreciation of value. This could harm the country's imports and exports. If the currency's value increases too drastically, the country's exports could become too costly which would harm the country's employment rates. If the currency's value decreases too drastically, the country may not be able to afford crucial imports.

This is why a managed float is so appealing. A country can obtain the benefits of a free floating system but still has the option to intervene and minimize the risks associated with a free floating currency. If a currency's value increases or decreases too rapidly, the central bank can intervene and minimize any harmful effects that might result from the radical fluctuation.

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# 32.3: Equilibrium

## 32.3.1: Open Economy Equilibrium

In an open economy, equilibrium is achieved when no external influences are present; the state of equilibrium between the variables will not change.

### Learning Objective

Summarize the factors that determine the macroeconomic equilibrium state

### Key Points

- In the case of market equilibrium in an open economy, equilibrium occurs when a market price is established through competition.
- The trade balance is a function of savings and investment. Since actors can save or invest domestically or internationally relative changes can have large effects on the trade balance and the health of the economy as a whole.
- There are three properties of equilibrium: the behavior of agents is consistent, no agent has an incentive to change its behavior, and equilibrium is the outcome of some dynamic process (stability).

### Key Terms

output

Production; quantity produced, created, or completed.

equilibrium

The condition of a system in which competing influences are balanced, resulting in no net change.

trade

Buying and selling of goods and services on a market.

## Open Economy

In an open economy there is a flow of funds across borders due to the exchange of goods and services. An open economy can import and export without any barriers to trade, such as quotas and tariffs. Citizens in a country with an open economy typically have access to a larger variety of goods and services. They also have the ability to invest savings outside of the country.

An open economy allows a country to spend more or less than what it earns through the output of goods and services every year. When a country spends more than it makes, it borrows money from abroad. If a country saves more money than it makes, it can lend the difference to foreigners.

The equation used to determine the economic output of a country is

The economy's output ( $Y$ ) equals the sum of the consumption of domestic goods ( $C_d$ ), the investment in domestic goods and services ( $I_d$ ), the government purchase of domestic goods and services ( $G_d$ ), and the net exports of domestic goods and services ( $NX$ ). The sum of  $C$ ,  $I$ , and  $G$  provides the domestic spending of a country, while  $X$  provides the foreign sources of spending.

The amount that a country saves is total of investment and net exports:

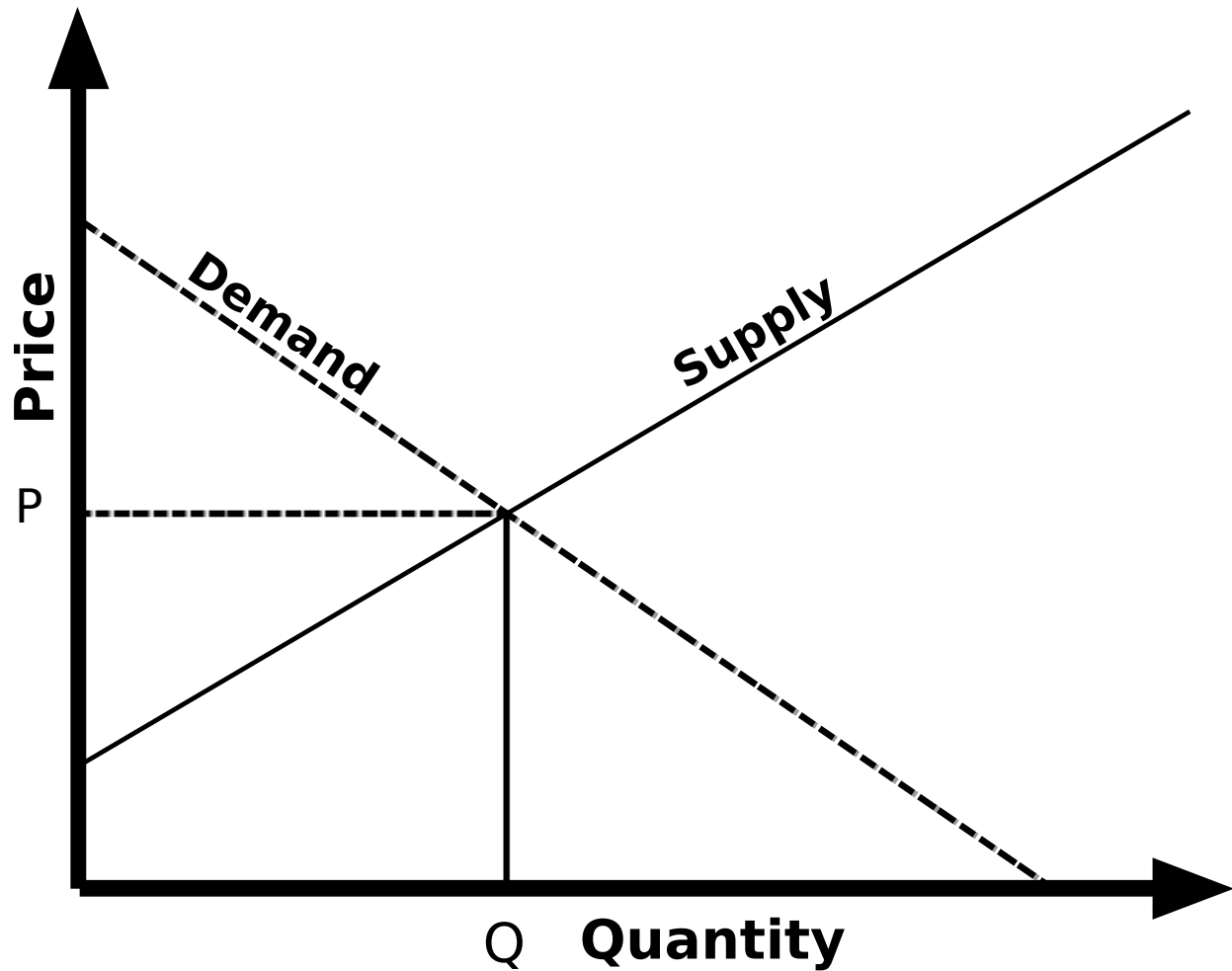
$NX$  can also be considered the trade balance of a country. Therefore

Consider, for example, what happens if domestic interest rates rise relative to foreign interest rates. Savings will increase and investment will drop as investors borrow and invest abroad instead. The balance of trade will increase, affecting the health of the economy. In an open economy, market actors can choose to save, spend, and invest either domestically or

internationally, so relative changes affect not only the flow of capital, but also the health of the economy as a whole.

## **Economic Equilibrium**

In an open economy, equilibrium is achieved when supply and demand are balanced . When no external influences are present, the state of equilibrium between the variables will not change. In the case of market equilibrium in an open economy, equilibrium occurs when a market price is established through competition. For example, when the amount of goods and services sought by buyers is equal to the amount of goods and services produced by sellers. When equilibrium is reached and the market price is established in an open economy, the price of the goods or service will remain the same unless the supply or demand changes.



## Equilibrium

The graph shows that the point of equilibrium is where the supply and demand are equal. In an open economy, equilibrium is achieved when the amount demanded by consumers is equal to the amount of a goods or service provided by producers.

There are three properties of equilibrium:

1. The behavior of agents is consistent,
2. No agent has an incentive to change its behavior, and
3. Equilibrium is the outcome of some dynamic process (stability).

In an open economy, equilibrium is reached through the price mechanism. For example, if there is excess supply (market surplus), this would lead to



prices cuts which would decrease the quantity supplied (reduces the incentive to produce and sell the product) and increase the quantity demanded (by offering bargains), which would eliminate the original excess of supply. The interest rates also adjust to reach equilibrium. Although consumption does not always equal production, the net capital outflow does equal the balance of trade. The capital flows, which depend on interest rates and savings rates, also adjust to reach equilibrium.

## **32.3.2: Impacts of Policies and Events on Equilibrium**

Government policies and outside events may affect the macroeconomic equilibrium by shifting aggregate supply or aggregate demand.

### **Learning Objective**

Analyze the effects that events and policies can have on economic equilibrium

### **Key Points**

- One type of event that can shift the equilibrium is a supply shock - an event that suddenly changes the price of a commodity or service. It may be caused by a sudden increase or decrease in the supply of a particular good.
- An increase in the price level can lower aggregate demand as a result of the wealth effect, the interest rate effect, and the exchange rate effect.
- By implementing protectionism policies such as tariffs and quotas, a government can make foreign goods relatively more expensive and domestic goods relatively cheaper, increasing net exports and therefore aggregate demand.
- Capital flight occurs when assets or money rapidly flow out of a country. This leads to an increase in the supply of the local currency and a drop in the exchange rate. Net exports rise as a component of aggregate demand.

## Key Terms

protectionism

A policy of protecting the domestic producers of a product by imposing tariffs, quotas or other barriers on imports.

nominal

Without adjustment to remove the effects of inflation (in contrast to real).

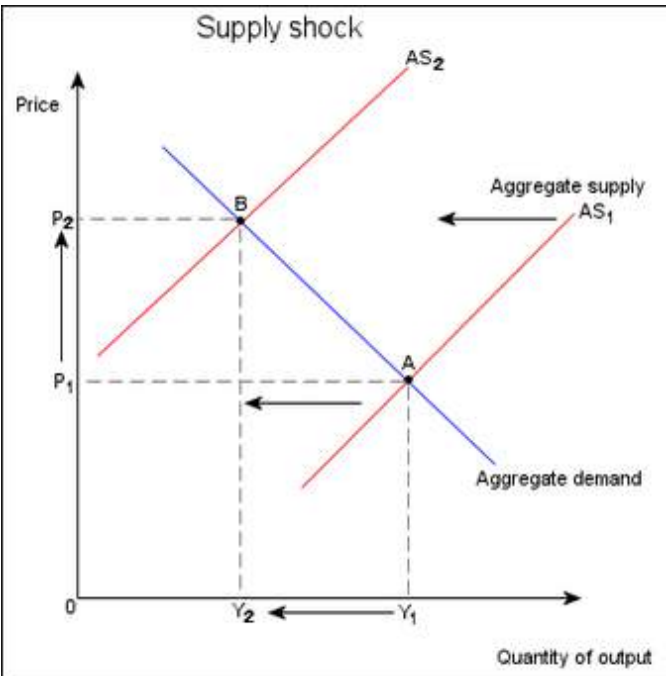
stagflation

Inflation accompanied by stagnant growth, unemployment, or recession.

The macroeconomic equilibrium is determined by aggregate supply and aggregate demand. Much of economics focuses on the determinants of aggregate supply and demand that are endogenous - that is, internal to the economic system. These include factors such as consumer preferences, the price of inputs, and the level of technology. However, there are many factors that affect the macroeconomic equilibrium that are exogenous to the economic system - that is, external to the economic model.

## Supply Shock

One type of event that can shift the equilibrium is a supply shock. This is an event that suddenly changes the price of a commodity or service. It may be caused by a sudden increase or decrease in the supply of a particular good, which in turn affects the equilibrium price. A negative supply shock (sudden supply decrease) will raise prices and shift the aggregate supply curve to the left. A negative supply shock can cause stagflation due to a combination of raising prices and falling output. A positive supply shock (an increase in supply) will lower the price of said good by shifting the aggregate supply curve to the right. A positive supply shock could be an advance in technology (a technology shock) which makes production more efficient, thus increasing output.



## Supply Shock and Equilibrium

A supply shock shifts the aggregate supply curve. In this case, a negative supply shock raises prices and lowers output in equilibrium.

One extreme case of a supply shock is the 1973 Oil Crisis. When the U.S. chose to support Israel during the Yom Kippur War, the Organization of Arab Petroleum Exporting Countries (OAPEC) responded with an oil embargo, which increased the market price of a barrel of oil by 400%. This supply shock in turn contributed to stagflation and persistent economic disarray.

## Inflation

Inflation can result from increased aggregate demand, but can also be caused by expansionary monetary policy or supply shocks that cause large price changes. Changes in prices can shift aggregate demand, and therefore the macroeconomic equilibrium, as a result of three different effects:

- The wealth effect refers to the change in demand that results from changes in consumers' perceived wealth. When individuals feel (or are)

wealthier, they spend more and aggregate demand increases. Since inflation causes real wealth to shrink and deflation causes real wealth to increase, the wealth effect of inflation will cause lower demand and the wealth effect of deflation will cause higher demand.

- The interest rate effect refers to the way in which a change in the interest rate affects consumer spending. When prices rise, a nominal amount of money becomes a smaller real amount of money, which means that the real value of money in the economy falls and the interest rate (i.e. the price of money) rises. A higher interest rate means that fewer people borrow and consumer spending (aggregate demand) falls.
- Finally, the exchange rate effect relates changes in the exchange rate to changes in aggregate demand. As above, inflation typically causes the interest rate to rise. When the domestic interest rate is high compared to that in other countries, capital flows into the country, the international supply of the domestic currency falls, and the price (i.e. exchange rate) of the domestic currency rises. An increase in the exchange rate has the effect of increasing imports and decreasing exports, since domestic goods are relatively more expensive. A decrease in net exports leads to a decrease in aggregate demand, since net exports is one of the components of aggregate demand.

## **Trade Policies**

Trade policies can shift aggregate demand. Protectionism, for example, is a policy that interferes with the free workings of the international marketplace. By implementing protectionism policies such as tariffs and quotas, a government can make foreign goods relatively more expensive and domestic goods relatively cheaper, increasing net exports and therefore aggregate demand. Since the world demands more goods produced in the home country, the demand for the domestic currency increases and the exchange rate rises.

## **Capital Flight**

Capital flight occurs when assets or money rapidly flow out of a country due to an event of economic consequence. Such events could be an increase in

taxes on capital or capital holders, or the government of the country defaulting on its debt that disturbs investors and causes them to lower their valuation of the assets in that country, or otherwise to lose confidence in its economic strength.

This leads to an increase in the supply of the local currency and is usually accompanied by a sharp drop in the exchange rate of the affected country. This leads to dramatic decreases in the purchasing power of the country's assets and makes it increasingly expensive to import goods. Net exports rise as a component of aggregate demand.

### **32.3.3: Effect of a Government Budget Deficit on Investment and Equilibrium**

A budget deficit will typically increase the equilibrium output and prices, but this may be offset by crowding out.

#### **Learning Objective**

Evaluate the consequences of imbalances in the government budget

#### **Key Points**

- A government's budget balance is the difference in government revenues (primarily from taxes) and spending. If spending is greater than revenue, there is a deficit. If revenue is greater than spending, there is a surplus.
- A government deficit can be thought of as consisting of two elements, structural and cyclical. At the lowest point in the business cycle, there is a high level of unemployment. This means that tax revenues are low and expenditures are high, leading naturally to a budget deficit.
- The additional borrowing required at the low point of the cycle is the cyclical deficit. The cyclical deficit will be entirely repaid by a cyclical surplus at the peak of the cycle. This type of deficit serves as an automatic stabilizer.

- The structural deficit is the deficit that remains across the business cycle because the general level of government spending exceeds prevailing tax levels. Structural deficits are the result of discretionary fiscal policy and can shift the aggregate demand curve to the right.
- Crowding out is a negative consequence of budget deficits in which higher interest rates lead to less private investment, higher exchange rates, and fewer exports.
- Crowding out is a negative consequence of budget deficits in which higher interest rates lead to less private investment, higher exchange rates, and fewer exports.

## Key Terms

### cyclical deficit

The deficit experienced at the low point of the business cycle when there are lower levels of business activity and higher levels of unemployment.

### structural deficit

The portion of the public sector deficit which exists even when the economy is at potential; government spending beyond government revenues at times of normal, predictable economic activity.

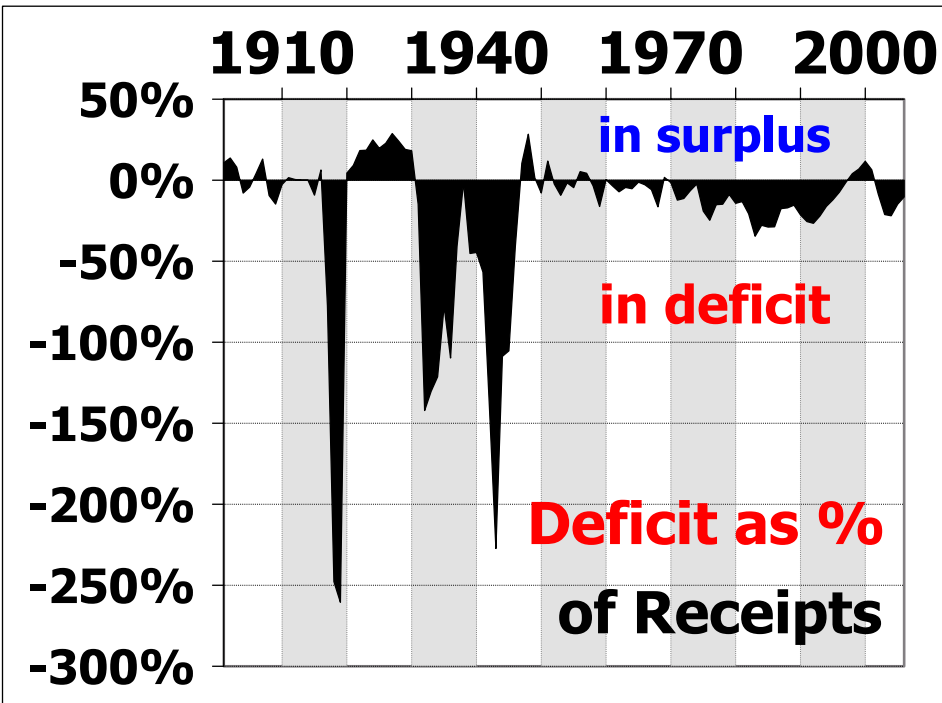
### business cycle

A fluctuation in economic activity between growth and recession.

### aggregate demand

The the total demand for final goods and services in the economy at a given time and price level.

A government's budget balance is determined by the difference in revenues (primarily taxes) and spending. A positive balance is a surplus, and a negative balance is a deficit. The consequences of a budget deficit depend on the type of deficit .



## U.S. Budget Deficits

The graph shows the budget deficits and surpluses incurred by the U.S. government between 1901 and 2006. Although deficits may have an expansionary effect, this is not the primary purpose of running a deficit.

## Cyclical Deficits

A cyclical deficit is a deficit incurred due to the ups and downs of a business cycle. At the lowest point in the business cycle, there is a high level of unemployment. This means that tax revenues are low and expenditures (e.g., on social security and unemployment benefits) are high, naturally leading to a budget deficit. Conversely, at the peak of the cycle, unemployment is low, increasing tax revenue and decreasing spending, which leads to a budget surplus. The additional borrowing required at the low point of the cycle is the cyclical deficit. By definition, the cyclical deficit will be entirely repaid by a cyclical surplus at the peak of the cycle.

This type of budget deficit serves as a stabilizer, insulating individuals from the effects of the business cycle without any specific legislation or other

intervention. This is because budget deficits can have stimulative effects on the economy, increasing demand, spending, and investment. Higher spending on transfer payments puts more money into the economy, supporting demand and investment. Furthermore, lower revenues mean that more money is left in the hands of individuals and businesses, encouraging spending. As the economy grows more quickly, the budget deficit falls and the fiscal stimulus is slowly removed.

## **Structural Deficits**

The structural deficit is the deficit that remains across the business cycle because the general level of government spending exceeds prevailing tax levels. Structural deficits are permanent, and occur when there is an underlying imbalance between revenues and expenses.

This is the budget gap still exists when the economy is at full employment and producing at full potential output levels. It can only be closed by increasing revenues or cutting spending. Unlike the cyclical budget deficit, a structural deficit is the result of discretionary, not automatic, fiscal policy. While automatic stabilizers don't actually shift the aggregate demand curve (because transfer payments and taxes are already built into aggregate demand), discretionary fiscal policy can shift the aggregate demand curve. For example, if the government decides to implement a new program to build military aircraft without adjusting any sources of revenue, aggregate demand will shift to the right, raising prices and output.

Although both types of government budget deficits are typically expansionary during a recession, a structural deficit may not always be expansionary when the economy is at full employment. This is due to a phenomenon called crowding out. When an increase in government expenditure or a decrease in government revenue increases the budget deficit, the Treasury must issue more bonds. This reduces the price of bonds, raising the interest rate. The increase in the interest rate reduces the quantity of private investment demanded (crowding out private investment). The higher interest rate increases the demand for and reduces the supply of dollars in the foreign exchange market, raising the exchange rate. A higher exchange rate reduces net exports. All of these effects work to offset the



increase in aggregate demand that would normally accompany an increase in the budget deficit.

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# **33: Economic Crises**

# 33.1: Fundamentals of Banking Crises

## 33.1.1: Causes of Banking Crises

Banking crises can be caused by inadequate governmental oversight, bank runs, positive feedback loops in the market and contagion.

### Learning Objective

Describe some common causes of a banking crisis, Explain a bank run

### Key Points

- A bank occurs when many people try to withdraw their deposits at the same time. As much of the capital in a bank is tied up in investments, the bank's liquidity will sometimes fail to meet the consumer demand.
- Due to the mass interdependence of economies across the globe, a banking crisis in one nation is likely to dramatically affect other international economies.
- The Great Depression in 1929 resulted from a variety of complex inputs, but the turning point came in the form of a mass stock market crash (Black Tuesday) and subsequent bank runs.
- Irresponsible and unethical leveraging in these assets by the banks, and mass governmental failure to listen to economists predicting this over the past decade, caused the 2008 stock market crash and subsequent depression.
- Irresponsible and unethical leveraging in these assets by the banks, and mass governmental failure to listen to economists predicting this over the past decade, caused the 2008 stock market crash and subsequent depression.

### Key Terms

## Bank Run

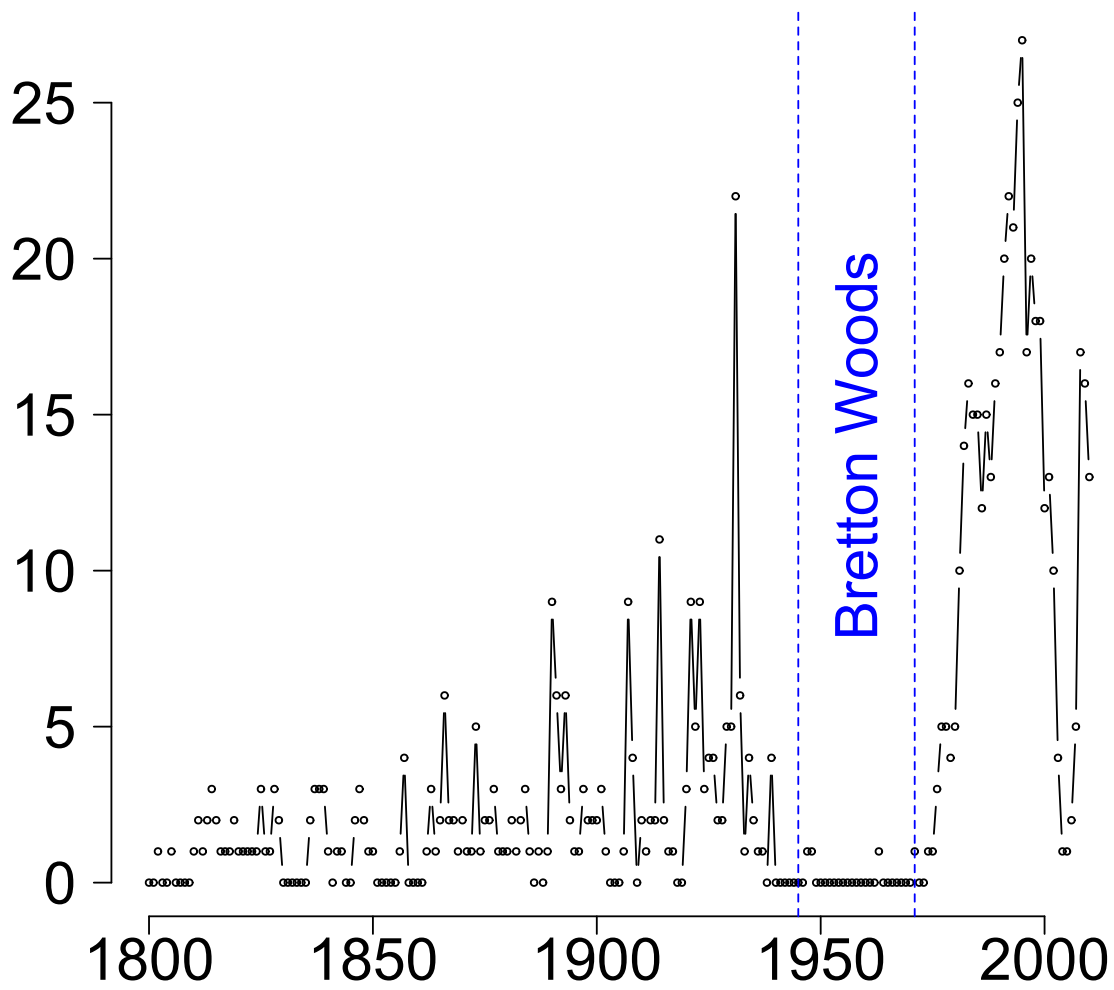
A large number of customers withdraw their deposits from a financial institution at the same time due to a loss of confidence in the banks.

## leverage

The use of borrowed funds with a contractually determined return to increase the ability of a business to invest and earn an expected higher return, but usually at high risk.

In light of recent market and banking failures, the economic analysis of banking crises both historically and presently is a constant source of interest and speculation. Banking crises are when there are widespread bank runs: an abnormal number of depositors try to withdraw their deposits because they don't trust that the bank will have the deposits for withdrawal in the future.

Banking crises are not a new economic phenomenon, and similarly are not the only source of financial crises. Over the course of the past two centuries there have been a surprisingly large number of financial crises, as demonstrated in the attached figure. In understanding banking crises over time, it is useful to identify the causes in context with historic examples of banking collapses.



## Financial Crises Globally since 1800

This chart is an interesting take on the relatively consistent frequency in which financial crises occur across the globe. It is interesting to note both the efficacy of Bretton Woods alongside the increasing risk of financial collapse in modern times.

## Causes of Banking Crises

Banks can fail for several different reasons:

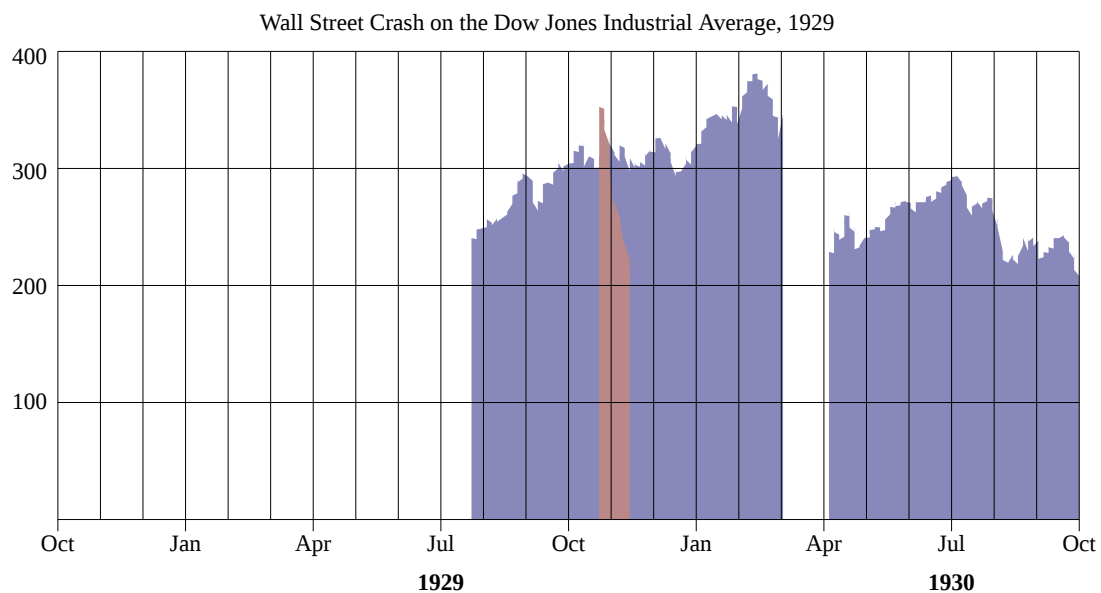
- **Bank Run:** A bank occurs when many people try to withdraw their deposits at the same time. As much of the capital in a bank is tied up in investments, the bank's liquidity will sometimes fail to meet the consumer demand. This can quickly induce panic in the public, driving up withdrawals as everyone tries to get their money back from a system that they are increasingly skeptical of. This leads to a bank panic which can result in a systemic banking crisis, which simply means that all of the free capital in the banking system is withdrawn.
- **Stock Market Positive Feedback Loops:** One particularly interesting cause of banking disasters is a similar positive feedback loop effect in the stock markets, which was a much more dynamic factor in more recent banking crises (i.e. 2007-2009 sub-prime mortgage disaster). John Maynard Keynes once compared financial markets to a beauty contest, where investors are merely trying to pick what is attractive to other investors. There is a profound truth to this, creating an interdependent and potentially self-fulfilling investment thought process. This can create dramatic rises and falls (bubbles and crashes), which in turn can throw banks with poorly designed leverage into huge losses.
- **Regulatory Failure:** One of the simplest ways in which bank crises can occur is a lack of governmental oversight. As noted above, banks often leverage themselves to capture gains despite extremely high risks (such as over-dependence on derivatives).
- **Contagion:** Due to globalization and international interdependence, the failure of one economy can create something of a domino effect. In 2008, when the U.S. economy collapses, the reduced buying power and economic output from that economy dramatically damaged all economies dependent upon it (which includes most of the world). This is called contagion.

## **The Great Depression**

The Great Depression highlights how bank runs caused a banking crisis, which ultimately became a global economic crisis. The Great Depression in 1929 resulted from a variety of complex inputs, but the turning point came in



the form of a mass stock market crash (Black Tuesday) and subsequent bank runs. As fear began to grip consumers across the United States, people became protective of their assets (including their cash). This caused a large number of people to the banks to withdraw, which in turn motivated others to go to the banks and get their capital out also. Since banks lend out some of their deposits, they did not have enough cash on hand to meet the immediate withdrawal requests (they became illiquid) and therefore went bankrupt. Within a few weeks this resulted in a systemic banking crisis (see ).



## 1929 Stock Market Crash

As the market falls, investors create a positive feedback loop and self-fulfilling prophecy due to a lack of confidence that drives it down even further.

### 33.1.2: Consequences of Banking Crises

Banking crises have a range of short-term and long-term repercussions, domestically and globally, that reduce economic output and growth.

#### Learning Objective

Explain consequences of banking crises on the broader economy

## Key Points

- Banks play a critical role in economic growth, primarily through investment and lending.
- After a banking crisis, investment suffers. When banks lack liquidity to invest, growing business depending upon loans struggle to raise the capital required to execute upon their operations.
- The fall in liquidity and investment, in turn, drives up unemployment, drives down governmental tax revenues and reduces investor and consumer confidence.
- Imports and exports play an increasingly large role in the health of most developed economies, and as a result, the relative well-being of trade partners plays an increasingly critical role in the success of domestic economies.

## Key Terms

liquidity

The degree to which an asset can be easily converted into cash.

Economic crisis

A period of economic slowdown characterised by declining productivity and devaluing of financial institutions often due to reckless and unsustainable money lending.

Banking crises have a dramatic negative effect on the overall economy, often resulting in an eventual financial and economic crisis in a given economic system. Banking crises have a range of short-term and long-term repercussions, domestically and globally, that underline the severe repercussions of irresponsible banking practices, poor governmental regulation, and bank runs. The most useful way to frame the consequences of bank crises is by observing the critical role banks play in economic growth, primarily through investment and lending.

## **Domestic Consequences**

Within a given system, banking failures create a range of negative repercussions from an economic perspective. Banks coordinate and economy's savings and investment: the act of pooling money to capture higher returns for everyone while simultaneously funding business dependent upon leveraging debt and equity. With this in mind, a banking crises can have a variety of averse individual and economic consequences within the system.

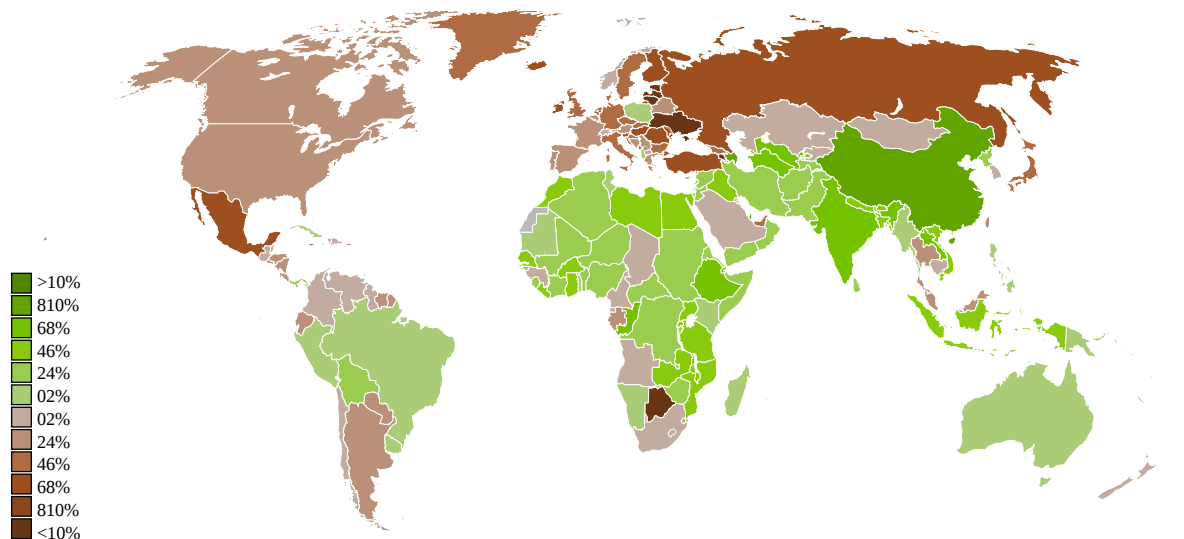
First and foremost, investment suffers. When banks lack liquidity to invest, businesses that depend upon loans struggle to raise the capital required to execute upon their operations. When these businesses cannot produce the capital required to operate optimally, sales decline and prices rise. The overall economic performance of any debt-dependent industries becomes less dependable, driving down consumer and investor confidence while reduce overall economic output. Banks also perform more poorly, due to the fact that they have less capital to invest and returns to acquire.

This drives down the overall economic system, both in the short term and the long term, as companies struggle to succeed. The fall in liquidity and investment drives up unemployment, drives down governmental tax revenues and reduces investor and consumer confidence (damaging equity markets, which in turn limits businesses access to capital). There is a distinctive cyclical nature to these adverse effects, as each are interconnected in a way that creates a domino effect across the domestic economic system.

## **Global Consequences**

While these domestic consequences are expected and, in many ways, intuitive, the global dependency upon foreign trade in modern markets has exacerbated these effects. Imports and exports play an increasingly large role in the health of most developed economies, and as a result the relative well-being of trade partners plays an increasingly critical role in the success of domestic economies.

A good example of this is to look at the way in which the U.S. (and to some extent, European) banking disasters in 2008 and 2009 led to a complete global financial meltdown, destroying economies not involved in the irresponsible investing practices executed by banks in these specific regions. identifies the critical importance of economic well-being in trading partners, as the U.S. banking and financial crises spread rapidly (within the course of just one year) across a substantial portion of the globe (though there are certainly other factors that contributed to the financial crisis and its consequences). The domestic reduction of capital for businesses, income for consumers and tax revenue for governments ultimately results in a reduction of trade and economic activity for other economies.



## 2009 GDP Growth Rates

This figure shows the growth in GDP for world economies in 2009. The slow and negative growth demonstrates all of the economic losses that resulted in part from the U.S. financial crisis, highlighting the dependency of global economies.

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# 33.2: The 2007-2009 Crisis

## 33.2.1: Causes and Immediate Impacts of the Crisis

Banks, consumers, and the government all contributed to improper borrowing and lending, which in turn created a downward spiraling economy.

### Learning Objective

Summarize the causes that led to the 2007 banking crisis

### Key Points

- The recent financial crisis, commonly referred to as the sub-prime mortgage crisis of 2007-2008, began with the failure of a series of derivative-based consolidation of mortgage-backed securities that encapsulated extremely high risk loans to home-owners into a falsely 'safe' investment.
- Banks offered loans to debtors that couldn't afford them, and then bundles these debt instruments and sold them.
- The banking crisis spread into a broader financial crisis as companies were negatively affected by the crisis in financial institutions to which they were connected.
- The government did not regulate the housing market at all, as a result of the elimination of two critical clauses: verification of income and a 20% down payment.
- The U.S. stock market, realizing the scale of errors of the banks, lost all investment confidence. This cut the NYSE in half, drastically reducing the value of the U.S. economy.

### Key Terms

## CDO

A type of asset-backed security and structured credit product constructed from a portfolio of fixed-income assets.

## Sub-prime

Designating a loan (typically at a greater than usual rate of interest) offered to a borrower who is not qualified for other loans (e.g. because of poor credit history).

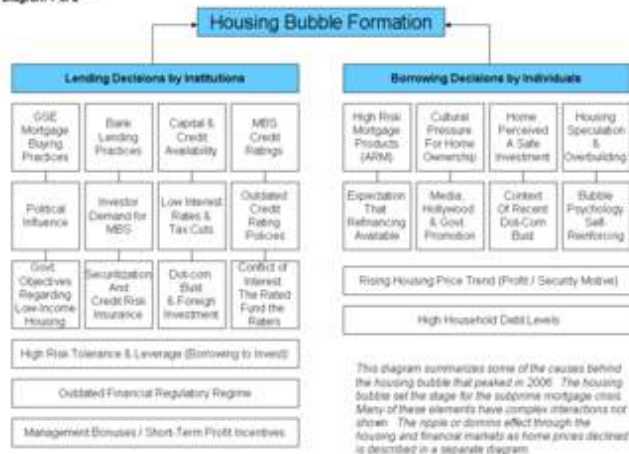
The recent financial crisis, commonly referred to as the sub-prime mortgage crisis of 2007-2008, was borne of the failure of a series of derivative-based consolidation of mortgage-backed securities that encapsulated extremely high risk loans to homeowners into a falsely 'safe' investment. To simplify this, banks pushed mortgages on prospective home owners who could not afford to repay them. Then they combined and packaged varying mortgage-backed securities based off of these loans and sold them as highly dependable and safe investments, either through a lack of due diligence (negligence) or lack of ethical consideration. This created an economic meltdown, starting with the United States, that spread across the global markets.

The inherent complexity of the causes and dramatic repercussions (most of which are still ongoing) require a great deal of context. It is a fiercely debated and widely discussed issue in the field of economics (and in mainstream media), providing a real-life case study for many of the critical concepts of economic theory.

## **How Did This Happen?**

The inputs to the 2007-2008 economic collapse, briefly touched upon above, are complex and still evolving. That being said, there are a few key talking points from an economic perspective that should be discussed. A useful perspective to take is the various stakeholders and their contributions :

Subprime Mortgage Crisis  
Diagram 1 of 2



## Inputs to the Mortgage Crisis

This graph outlines two of the three parties in the collapse (excludes government), as the banks and the buyers both took on ridiculous amounts of risk.

- **Banks:** Simply put, the banks made two critical errors. First, they lent money to people who could not pay it back (to buy homes). They pursued what is referred to as 'predatory lending,' or lending to individuals they knew could never pay it back. Secondly, banks knowingly grouped these loans into bundles called collateralized debt obligations (CDOs) and sold them as extremely safe derivative investments. They were not safe.
- **Consumers:** Consumers played their role as well, acting as easy prey for the banks predatory practices. Individuals bought homes they could not afford utilizing loans they could not pay back. This drove them into debt, to the extent at which they had to default. This meant that the capital banks expected to get back did not arrive, it simply was not there.
- **Government:** The government did not regulate the housing market, as a result of the elimination of two critical legal clauses that required the verification of income and a 20% down payment. In short, the U.S. government used to ensure that prospective home buyers could put down 20% of their borrowing in addition to verify that their income

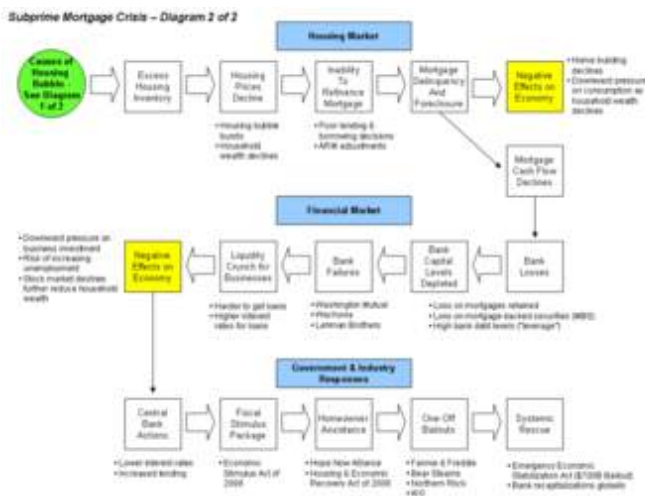


could cover their mortgage payments. Without such verification, it became easier for people to get mortgages they could not afford.

Combining these factors, the problem largely revolved around irresponsible lending and borrowing which was then turned into derivatives that were labeled safe despite their massive risks. This resulted in an economic realization of loans that could not be repaid, which spread through the banking system and turned into large scale obligations that could not be met.

## Economic Impact

What happened next is well captured in the . In short, the banks eventually failed due to their investments. In order to prevent the entire financial system from collapsing, some of the banks (and other financial institutions) were bailed out.



## 2008 Crisis Flow Chart

This chart embodies critical checkpoints in the economic decline reactions to poor mortgage management by the banks. Understanding the implications of each point on this diagram will greatly enhance the larger understanding of the short term effects of this economic collapse.

Of course the negative effects did not stop there. The U.S. stock market lost confidence in financial institutions and some of the companies connected to

them and subsequently crashed. The NYSE fell by half, drastically reducing the value of the U.S. economy. This was then telegraphed into a loss of consumer confidence and business access to investment. Within a few months, there were job cuts, bankruptcies, and reduced spending, as the crisis spread throughout the economy (both domestically and globally).

## **33.2.2: Recovery**

The objective of economic recovery when in crisis is to stabilize the economy and recapture the value lost using economic stimulus strategies.

### **Learning Objective**

Discuss the characteristics of the recovery from the 2007 crisis

### **Key Points**

- One of the key components to the crisis recovery in the United States is an act called the American Recovery and Reinvestment Act of 2009 (ARRA). It invests money in the economy to drive spending and recovery.
- ARRA is largely based on the Keynesian macro-environmental concept of driving spending through enabling spending, in turn driving up demand, creating jobs, and driving spending up further.
- The Troubled Asset Relief Program (TARP) was another recovery strategy, buying toxic assets off the banks to prevent them from failing.
- TARP was criticized for protecting banks who behaved unethically and with a lack of strategic intelligence as businesses, essentially implying that they should have failed.
- While the stock market has recovered and the banks are in better shape now than before the collapse, the average American is still less likely to have a job or to be underemployed.

### **Key Terms**

Economic crises

A period of economic slowdown characterized by declining productivity and devaluing of financial institutions often due to reckless and unsustainable money lending.

stimulus

Anything that may have an impact or influence on a system. In 2009, it is the monetary investments in the economy to recover from the collapse.

The 2007-2009 economic crisis has had far-reaching and profound effects on both the domestic and global markets, primarily as a result of the sub-prime mortgage disaster originating in the United States. Addressing these economic ramifications to induce recovery has been the focal point of global governments and global agencies such as the International Monetary Fund (IMF). The objective of economic recovery when in crisis is to stabilize the economy, and from there recapture the value lost through economic stimulus strategies while addressing the factors which contributed to the collapse in the first place.

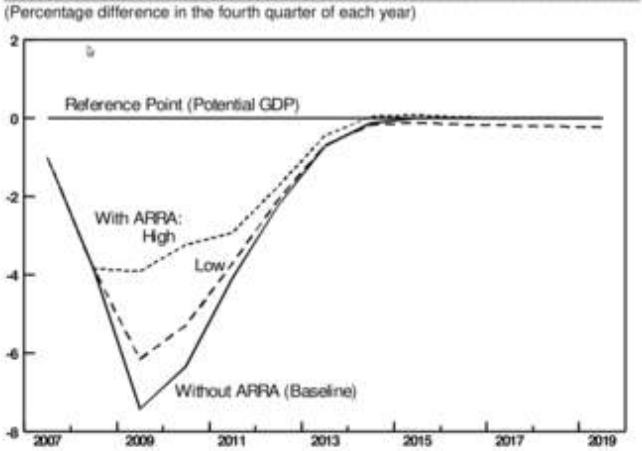
## **Stimulus Package**

One of the key components to the crisis recover in the United States is an act called the American Recovery and Reinvestment Act of 2009 (ARRA), put into place by the Obama administration just as the first days of his term were beginning. This act has seen substantial debate, both positively and negatively, as to the efficacy and overall implementation of the program. Understanding the inputs, and expected outcomes, is critical to understanding the economics behind reacting to economic crises (particularly from a Keynesian perspective).

The stimulus package can be broken down via the attached figure in regards to monetary investment in specific places , totaling \$831 billion (USD) between 2009 and 2019. The goal of investing or providing tax relief and subsidies for individuals and companies is to drive up purchasing behavior and offset the positive feedback loop attributed to economic crises. This is largely based on the Keynesian concept of driving spending through

enabling spending, in turn driving up demand, creating jobs, and driving spending up further. President Obama's administration was criticized by classical economists for employing this as well as Keynesian economists (such as Paul Krugman) for not employing it enough. That being said, the efficacy in the attached figure demonstrates that it was likely a strategic reaction to the economic crisis .

Figure 1. Difference Between Potential GDP in CBO's Baseline and Actual GDP Without and With the Impact of the American Recovery and Reinvestment Act of 2009



Source: Congressional Budget Office.

## ARRA Efficacy Projections

This graph points out the economic opportunity cost of not utilizing the ARRA, which would likely have left the U.S. (and subsequently, the global) economy in significantly worse shape than it is now.



## Stimulus Investments (U.S.) of ARRA

This graphic demonstrates the different silos receiving government aid within the domestic economy, as a direct result of the American Recover and Reinvestment Act (ARRA).

## Troubled Asset Relief Program (TARP)

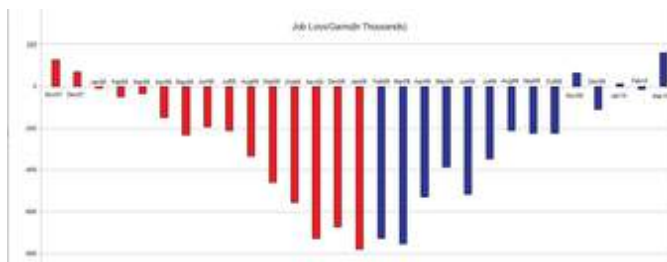
Perhaps more debatable still, is the reaction to the inevitable and deserved bankruptcy of the banks and insurers involved in the toxic mortgage-backed securities (i.e. CDO's) that drove the economy into disaster were bailed out by the government. These companies, such as AIG, Bank of America, Citigroup, and other distributors of toxic investments were handed the required capital by the government to offset their massive losses due to undue risk and poor leveraging. This was in the form of the government utilizing tax money to purchase these securities, removing the toxic assets from the books of the companies involved (who were deemed 'too big to fail'). This move saved the economic decline and restored consumer confidence through direct government intervention.

TARP was also largely criticized, with a high number of seemingly reasonable objections. The first, and most intuitive, is that these businesses deserved to go under. Bad business practice, poor investment, and grossly

unethical behavior deserves bankruptcy. Instead, the government demonstrated that, as long as certain fiscal influence is achieved, these competitive rules are negligible. Secondly, and slightly more complex, is the implementation of the TARP act (which necessitated SIG-TARP, an oversight group ensuring that TARP money went out to those who it was intended for). It was noted on many occasions that TARP money was ill-used.

## Outcomes

While the long-term outcomes of these practices cannot yet be predicted, the progress made so far is worth analyzing economically. First and foremost, job numbers have improved, although not as much as had been hoped or expected (see ). While this is positive, it does not capture the large number of people who are underemployed or the individuals who have abandoned the search for employment. GDP growth has inched along to positive numbers, as has the profitability of many businesses and industries. Interestingly enough, as of the end of 2013, the stock market has not only recovered but expanded beyond 2007 levels.



## U.S. Job Gains and Losses

This graph demonstrates the negative affect that the collapse had on jobs as well as the pacing of economic recovery in the short-term.

### 33.2.3: Global Impacts

The 2007-2009 economic collapse was damaging not only to the U.S. but also global markets, driving the global economy into recession.

## Learning Objective

Analyze the extent to which the 2007 crisis was global

## Key Points

- Modern markets are dependent upon one another across national borders, where global trends in economic growth and well-being will have a dramatic impact on national economic well-being and vice versa.
- In December 2007, the U.S. officially fell into an 18-month long recessionary period of negative GDP growth, which spread rapidly around the map to create a global recession in Q3 and Q4 in 2008 and Q1 of 2009.
- Another indirect global impact that occurred as a result of the economic collapse was political instability, primarily due to the inability of developed nations to pursue altruistic investments and global poverty reduction processes during recessionary times.
- On the upside, many global organizations and countries are actively employing policies to minimize the likelihood of a re-occurrence in the future.

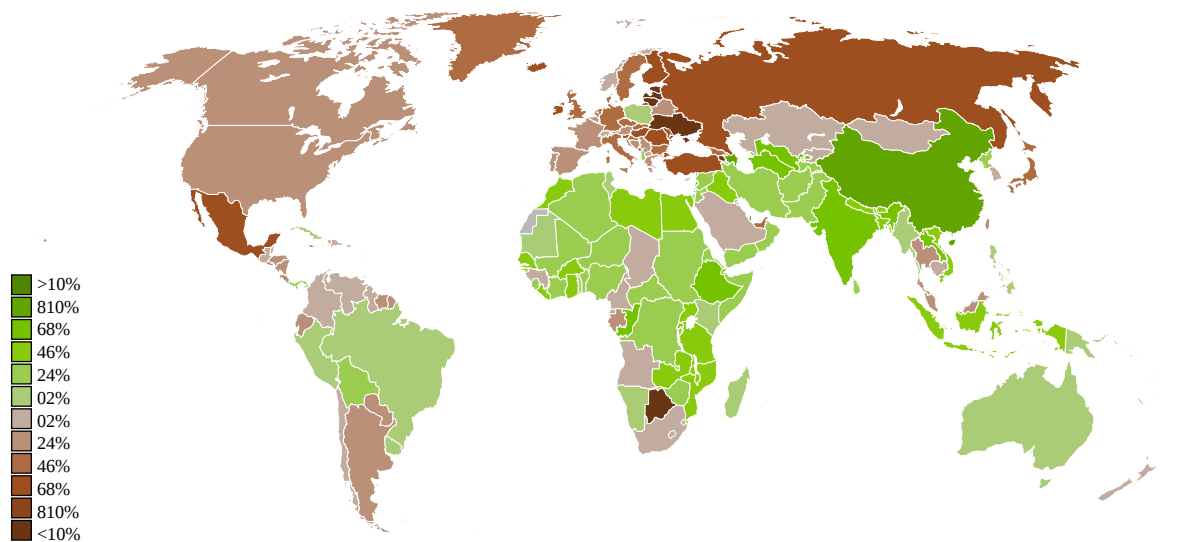
## Key Term

recession

A significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, and industrial production.

Modern markets are dependent upon one another across national borders, where global trends in economic growth and well-being will have a dramatic impact on national economic well-being and vice versa. As a result, the 2007-2009 economic collapse had large effects not only at the origin (in the United States), but also on a global scale. The speed in which the market decline spread across the globe underlines just how far globalization and

international interdependence has come, with GDP growth numbers in 2009 already demonstrating substantial losses across the map (see ).



## 2009 Global GDP Growth and Decline)

As this map illustrates, many international markets fell rapidly into decline as a direct result of the U.S. sub-prime mortgage disaster.

## Recession: Domestic to Global

In December 2007, the U.S. officially fell into an 18-month long recessionary period of negative GDP growth (over two consecutive quarters). This recessionary period spread rapidly around the map, creating a global recession in Q3 and Q4 in 2008 and Q1 of 2009 (defined as a contraction in global GDP growth during that time) as is represented in this figure . To provide additional context to the global adverse effects of the sub-prime mortgage crisis, of 65 countries that record and report GDP only 11 escaped a recessionary period between 2006 and today.





## World GDP Growth

It is quite clear in this graphic, the global GDP growth dropped dramatically following the U.S. crisis, pitching the entire global economy into a recession.

Even countries where double-digit economic growth had been a consistent trend going into 2008, such as China, began to experience growth reductions due to reduced consumer purchasing power on a global scale. China has seen reductions towards the 7%-8% economic GDP growth (year on year), from clear double-digits in previous years.

## Political Instability

Another indirect global impact that occurred as a result of the economic collapse is political instability, primarily due to the inability of developed nations to pursue social welfare investments and global poverty reduction processes during recessionary times. Indeed, these instabilities are not only isolated to developing nations. Countries in the EU, such as Greece, Spain and Italy, have seen dramatic GDP decreases and unemployment numbers reaching or exceeding 20% in some cases. This instability has placed a great deal of pressure on government officials to solve these huge economic problems in the short-term. The United States has also seen an incredible reduction in governmental efficacy with the least effective house of representatives for nearly a century alongside dramatic polarization of public opinion towards left-wing and right-wing ideas.

# Global Responses

Positively, many global organizations and countries are actively employing policies to minimize the likelihood of a re-occurrence in the future. Reducing interest rates to drive up borrowing and investment, providing tax benefits to the unemployed and underemployed, and subsidizing new business have created positive steps towards meaningful recovery globally.

There have also been a series of banking and financial regulatory changes across the world. These global safety nets and prevention policies are setting the tone for future strategies to avoid economic crises and minimize the prospective damage that occurs as a result of these unethical practices.

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# **34: Interest and Profit**

# 34.1: Interest

## 34.1.1: Defining Capital

In economics, capital references non-financial assets used in the production of goods and services.

### Learning Objective

Define and explain capital.

### Key Points

- Fundamentally, capital is any product that is produced and has the ability to enhance the power of an individual to perform economically useful work.
- Capital is directly impacted by both interest and profit. Interest allows capital to be obtained, while profit is the accumulation of the capital.
- Features that determine whether a good is capital include: 1) the good can be used in the production of other goods (this makes it a factor of production), 2) the good is not used up immediately in the process of production, unlike intermediate goods or raw materials, and 3) the good was produced.
- Types of capital include: physical, financial, natural, social, instructional, and human.
- Types of capital include: physical, financial, natural, social, instructional, and human.

### Key Terms

capital

Already-produced durable goods available for use as a factor of production, such as steam shovels (equipment) and office buildings

(structures).

depreciate

To reduce in value over time.

## **Capital**

In economics, capital (also referred to as capital goods, real capital, or capital assets) references non-financial assets used in the production of goods and services. Capital is important because it is a significant factor in the creation of wealth.

Capital goods are used in the production process and may depreciated through accounting practice to incorporate utilization, though they are not consumed. It is possible for capital goods to be maintained or regenerated depending on the type of capital.

## **Classifications of Capital**

In a broad sense, capital can be divided into two categories:

- **Physical Capital:** capital that must be produced by human labor before it can become a factor of production (also referred to as manufactured capital). Examples include machinery and buildings .
- **Natural Capital:** a factor of production that occurs naturally in the environment; for example, land or minerals.

Fundamentally, capital is any product that is produced and has the ability to enhance a person's power to perform work that is economically useful. For example, roads are capital for individuals who live in a city.

Capital is directly impacted by both interest and profit. Interest is a fee that is paid by a borrower of assets. It is a form of compensation for the use of the assets. Commonly, it is the price that is paid for the use of borrowed money. Profit is the accumulation of capital, which is the driving force

behind economic activity. Interest allows capital to be obtained, while profit is the accumulation of the capital.

## **Features of Capital**

There are certain features that determine whether a good is considered capital. These features include:

1. the good can be used in the production of other goods (this makes it a factor of production),
2. the good is not used up immediately in the process of production, unlike intermediate goods or raw materials, and
3. the good was produced.

## **Modern Types of Capital**

There are detailed classifications of capital which include the following types:

- Financial Capital is capital that is liquidated as money for trade, and owned by legal entities. It is a form of capital assets that is traded in financial markets. The value of financial capital is based on the market perception of expected revenues and risk.
- Natural Capital is capital that occurs naturally in the environment and is protected because it supports human life. Examples of natural capital include land and water .
- Social Capital is capital that is captured as goodwill or brand value. It is the general concept of inter-relationships between humans have money-like value that motivates actions.
- Instructional Capital is capital that is defines as the aspect of teaching knowledge and transferring knowledge that is not inherent in individual or social relationships.
- Human Capital is capital that includes social, instructional, and individual human talent combined together. As a term, it is used to define balanced growth where the goal is to improve human capital and economic capital equally.



## 34.1.2: Interest Rates and Economic Rationale

Economic rationale, the reasons or thought processes that impact economic decisions, is influenced substantially by the interest rate.

### Learning Objective

Define and explain the relationship between interest rates and economic rationale.

### Key Points

- The interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money borrowed from a lender (creditor).
- The interest rate guides economic rationale because it is a vital tool of monetary policy.
- The interest rate directly impacts economic choices such as spending, investment, and consumption.
- When interest rates decrease, investment and spending increase. When interest rates increase, investments decrease which causes the national income to fall.

### Key Terms

interest rate

The percentage of an amount of money charged for its use per some period of time (often a year).

monetary policy

The process by which the central bank, or monetary authority manages the supply of money, or trading in foreign exchange markets.

inflation

An increase in the general level of prices or in the cost of living.

# **Economic Rationale**

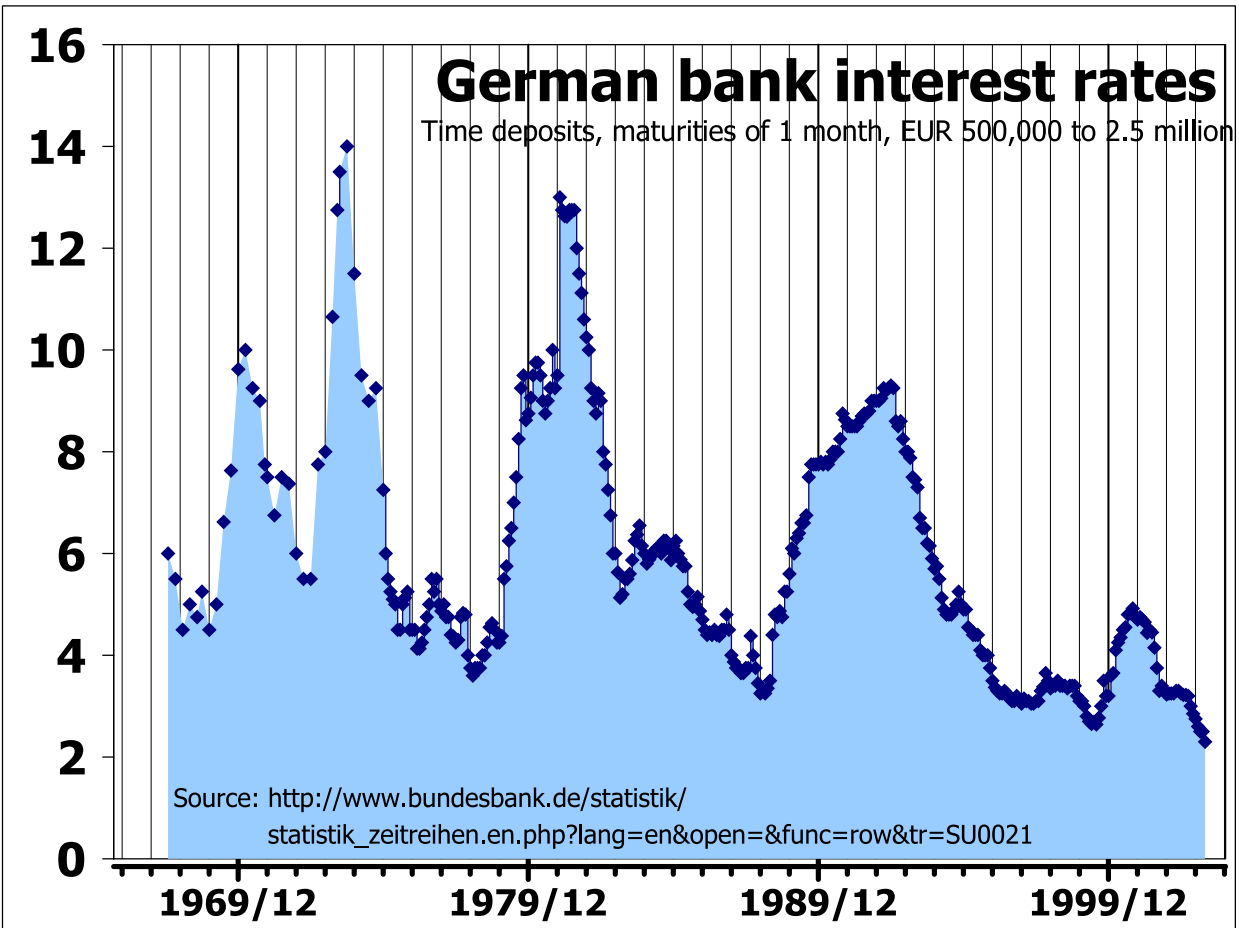
Rationale is defined as an explanation of the basis or fundamental reasons for something. In economics, rationale are the reasons or thought processes that impact economic decisions. The interest rate is one of the primary influences on economic rationale.

## **Interest Rate**

The interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money borrowed from a lender (creditor). It is the percent of principal paid a certain amount of times per period.

## **Impact of the Interest Rate**

The interest rate guides economic rationale because it is a vital tool of monetary policy. The interest rate is taken into account when dealing with economic variables such as investment, inflation, and unemployment. Central banks usually reduce the interest rate to increase investment and consumption in the country's economy. The interest rate directly impacts economic choices such as spending, investment, and consumption .



## Interest Rates

This graph shows the fluctuation in interest rates in Germany from 1967 to 2003. The interest rates reached 14% in 1969 and lowered to 2% by 2003. The interest rate in an economy directly impacts economic choices including spending, investment, and consumption.

Interest rates also influence inflationary expectations. People form an expectation of what will happen to inflation in the future. The current and projected interest rates are influential in these economic expectations. Investments are made based on the nominal interest rate and the degree of risk involved. Low interest rates are enticing, but can be problematic if an economic bubble forms. For example, low interest rates can lead to large amounts of investments poured into the real-estate market and stock market. When these bubbles pop, the investments fail, resulting in large unpaid debts and financial bankruptcy for individuals and banking institutions.

When interest rates increase, investments decrease, which causes the national income to fall. High interest rates do encourage more savings, which over time leads to more investment and higher levels of employment to meet production needs. Higher rates discourage economically unproductive lending such as consumer credit and mortgage lending.

The interest rate also directly impacts money and inflation because the government can affect the markets and alter the total of loans, bonds, and shares that are issued. When the interest rate is lower, it usually increases the broad supply of money. An increase in the money supply leads to inflation.

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# **35: Health Care Economics**

# 35.1: Introducing Health Care Economics

## 35.1.1: Defining Health, Health Care, and Medical Care

Health care economics is a segment of economic study pertaining to the value, effectiveness, and efficiency in health care services.

### Learning Objective

List the parties involved in the healthcare system in the United States

### Key Points

- Kenneth Arrow, in 1963, differentiated health care economics from other economics due to the wide range of unique considerations involved (i.e. infinite demand, wide range of stakeholders, etc. ).
- Health care is a significant concern for patients, insurance companies, governments, businesses, health care providers, researchers, and non-profits. These parties determine the supply, demand, oversight, and externalities of the system.
- Currently, U.S. health care is largely privatized with the exception of medicaid and medicare, the former being for low income groups and the latter for retirees. This is unlike many developed nations, who have socialized support in place.
- The insurance company, the government (medicaid and medicare), or the individual (if they are not covered or if their particular procedure is not covered) is the direct client of the hospitals, pharmacies, and doctor's offices.
- Overall, this system of health care in the U.S. is quite convoluted. There are many players involved and the stakes are extremely high.

## **Key Term**

### Health care

The prevention, treatment, and management of illness or the preservation of mental and physical well-being through the services offered by the medical, nursing, and allied health professions.

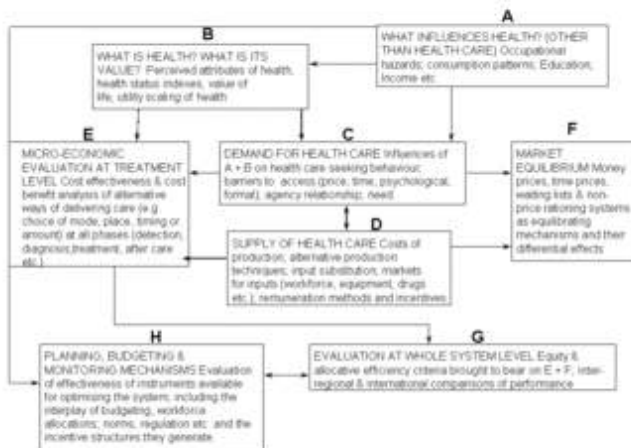
Health care economics is a segment of economic study pertaining to the value, effectiveness, and efficiency in medical care and health care services and issues. The study of health care, from an economic perspective, requires taking a broad lens on a complex system with a wide variety of stakeholders. In 1963, Kenneth Arrow differentiated health care economics from other economics due to the wide range of unique considerations involved. Health care, due to the severity of the need/demand, wide variety of externalities, government intervention, and role of doctors as third-parties (making critical purchasing decisions for other people), cannot be considered from the same perspective as other industries.

## **Defining Health Care**

Health care is a significant concern for patients, insurance companies, governments, businesses, health care providers, researchers, and non-profits. It is a vast economic system with many internal players and externalities. Understanding the basic factors involved, both logistically and economically, will provide useful context in defining health care and the medical care services.

outlines who is involved, and in what fashion.





## Health Care System Flow Chart

This flow chart does an excellent job of outlining the various stakeholders and influences in the broader health care system context.

- Health (Box B): Health metrics for health attributes from a value of life and overall utility-based perspective.
- Demand for Health Care (Box C): The overall health care demand, which is a complex array of inputs that can be summarized as health care seeking behaviors, and what factors influence them (i.e. externalities, price, time, perspectives, etc.).
- Supply of Health Care Costs (Box D): The supply of health care in most systems is quite complex, inclusive of direct inputs such as drugs, medical suppliers, and diagnostics to insurance companies (third parties) to health care professionals (doctors, nurses, etc.) to research.
- Evaluation of the Whole System (Box F): This is where the government factors in, particularly in countries with a more socialized system for health care, alongside the comparisons both internally and externally.

This process flow is what defines health care and the medical industry from an economic standpoint, and the relative influence of each of these components, and the interdependence between them, is worth studying to determine where higher degrees of efficiency and efficacy can be found.

## Health Care System in the U.S.

With this in mind, it is useful to also outline the inputs and outputs of the U.S. health care system, particularly during this transitional time. At the time of this writing (2013), the Affordable Care Act (often referred to as 'Obamacare') will be coming into play shortly. While the details and implications of this are beyond the scope of this discussion, it is useful to understand what the basic construct that exists in the United States currently.

At the moment, health care is largely privatized with the exception of medicaid and medicare, the former being for low income groups and the latter for retirees. For most of us, health care insurance is generally purchased on a capital market by a policy-holder (who may be a company the beneficiary works for or the beneficiary themselves, depending upon the profession and contractual obligations of an employer). This health insurance plan offers a construct for what will be covered under an umbrella of monthly health care payments, and what is considered outside of the plan. There are many large health care insurance providers out there, offering this service to prospective beneficiaries.

Now, either the insurance company, the government (medicaid and medicare), or the individual (if they are not covered or if their particular procedure is not covered) is the direct client of the hospitals, pharmacies, and doctor's offices. These institutions are also quite complicated, and require their own insurances against liability due to the high consequences in the field. Doctors and nurses provide a service, either actively performing a recommended approach (e.g. surgery) or recommending a treatment (e.g. drugs). These medical professionals are largely overseen by the government from a quality control perspective (various standardized test and degree requirements), adding an additional line of complexity to the operation.

Overall, this system of healthcare in the U.S. is quite convoluted. There are many players involved and the stakes are extremely high. Picture a demand curve for a treatment for a deadly disease, what would the price point be? Considering the consequences, healthcare services often fall outside of standard macroeconomic concepts, defying supply and demand frameworks due to the nature of the business (i.e. life and death, the well-being of people). This underlines a social issue: how can we improve healthcare economics to maximize value and minimize costs?

## **35.1.2: Where a Dollar Spent on Health Care Goes: Introducing the Inputs to Health Care**

Health care has many inputs and a variety of incumbents, namely insurance providers, administrators, governments, and pharmaceuticals.

### **Learning Objective**

Discuss the factors that affect the cost of and access to healthcare

### **Key Points**

- While a percentage breakdown of who procures the largest capital gains from health care is difficult to ascertain across such a complex system, it is safe to say that quite a few players contribute to the constantly rising price.
- In short, the dollar value of health care is largely provided by beneficiaries to insurance companies (or governments), and paid out to administrative systems who employ and pay health care providers.
- One of the most discussed topics in health care is accessibility. Governments and insurers provide economics means for this in developed nations.
- One of the larger issues in accessibility is nations without the infrastructure required to support health care industries. Developing nations often do not have access to the skills or suppliers required.

### **Key Terms**

Medicaid

U.S. government system for providing medical assistance to persons unable to afford medical treatments.

Medicare

The system of government subsidies for health care for the elderly and disabled.

## Beneficiary

One who benefits or receives an advantage.

Healthcare has many inputs and a wide variety of interested parties profiteering. Understanding what drives the need for health care (and what prevents it), what is included in the cost, and the overall accessibility of this essential service is critical to understanding economics issues in healthcare. A dollar spent on health care can find its way to insurance providers, medical service providers, pharmaceutical companies, governments, administrative bodies (managing these businesses), and laboratories. Understanding what individuals pay for and why, alongside what is available, is important data for navigating this market.

## Where the Money Goes

While a percentage breakdown of who procures the largest capital gains from health care is difficult to ascertain across such a complex system, it is safe to say that quite a few players contribute to the constantly rising price of even simple procedures and doctor's visits. A breakdown of the critical players illuminates this further:

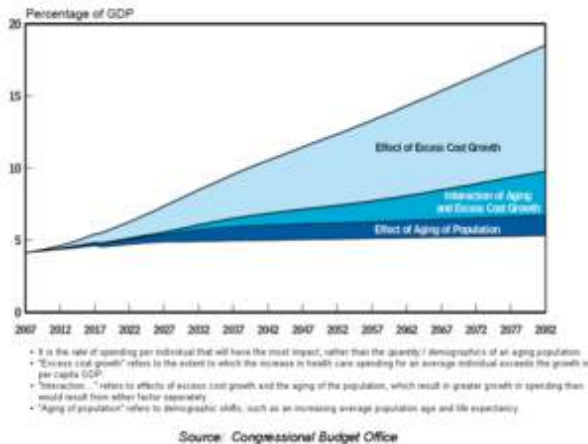
- **Health Care Providers:** On the surface, this is who a beneficiary feels like they are paying. This is their doctors, nurses, psychologists, dietitians, technologists, chiropractors, surgeons, and a wide range of other hands on and customer facing roles. These individuals are further differentiated by the fact that they often act as references as opposed to direct suppliers, making them both a direct to consumer provider and a third party provider.
- **Pharmaceutical Companies:** Drugs are playing an increasingly large role in health care, and likely will continue to do so in the future. The constant development of new drugs, alongside the distribution of established medications, is an enormous part of the market.
- **Insurance Providers:** There is a divider between most medical service consumers and their providers, and this is the insurance company. For those who are covered by their full-time jobs (or dependents of these individuals), this is largely a matter of who their business purchases

from. For others not covered, insurance issues are a complex and highly expensive issue, and getting coverage is quite difficult (this is being addressed in the U.S. by new legislation, and is not an issue in most other developed nations). The insurance companies command a huge profit and represent a substantial part of the medical price tag.

- **Government:** The role of government in health care is fiercely debated in the United States, but in most of the developed world the government is essentially the provider of health care plans (using social services models to consolidate tax revenues to be allocated for this service). In the U.S., this is only done for medicaid and medicare. The government also takes tax revenues from involved parties in this industry, driving prices up further.
- **Administration:** This is the hospital itself, or the doctors office, where the management team attempts to run a largely profitable business in the medical industry. Administration pays the health care providers and the government, taking income from direct consumers, the government, and the insurance companies to cover the cost of business (and often turn substantial profits).

With these group of incumbents in mind, it becomes quite clear why the costs are rising exponentially and are so unsustainable. The constant struggle between these large and powerful players coupled with an essentially infinite demand has left the consumer as an extremely weak player in the market. Indeed, with this in mind, the graph displays the trajectory of health care spending due to excess costs in the long term .

## Projected Federal Spending on Medicare and Medicaid (% GDP)



## Health Care Costs

This graph illustrates the danger of continuing down path of using the excessively high cost-structure U.S. health care incumbents have dictated in the context of spending as a % of GDP.

## Accessibility

One of the most discussed topics in health care is accessibility. Due to the fact that health care represents the ability for an individual to maintain a healthy and happy life, it seems intuitive that accessibility must as unlimited as possible. Of course, in a capitalistic system, this will not be the case. Economics dictates that price points will be determined based on supply and demand, and the demand in this industry is often essentially infinite. As a result, accessibility and profitability do not always align from an economic perspective. The U.S. employs medicaid and medicare to provide for low-income and elderly citizens that would otherwise be excluded from the market, while other countries have healthcare systems with more government intervention to address market failure.

One of the larger issues in accessibility is nations without the infrastructure required to support health care industries. Developing nations often do not have access to the skills or suppliers required to run modern hospitals and doctors offices, nor the ability to act preventatively (i.e. eating healthy, getting exercise, check ups, etc.). This creates enormous inefficiency in the

system and reduces the economic viability of operating in these countries for insurance providers. Addressing this concern is one of the central issues for the United Nations (UN) and other nongovernmental organizations.

### **35.1.3: Different Health Care Systems Around the World**

Health care systems differ from nation to nation depending upon the level of economic development and the political system in place.

#### **Learning Objective**

Identify different types of healthcare systems

#### **Key Points**

- A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities.
- The World Health Organization has been actively measuring a variety of performance indicators to determine an overall ranking system for health care on a global scale.
- The countries which perform the highest on these metrics are primarily located in Europe, where social systems are well designed at a governmental level to ensure prices remain accessible and care remain available.
- The U.S. has consistently ranked poorly and continues to perform substantially below European counterparts deemed developed at similar economic levels.
- Developing nations struggle to compete and compare apples to apples to developed nations, primarily due to the required infrastructure and capital requirements.

#### **Key Terms**

## Universal healthcare

A system where every citizen is guaranteed access to a certain basic level of health services.

## World Health Organization

The World Health Organization (WHO) is a specialized agency of the United Nations (UN) that is concerned with international public health.

## Determinants

A determining factor; an element that determines the nature of something

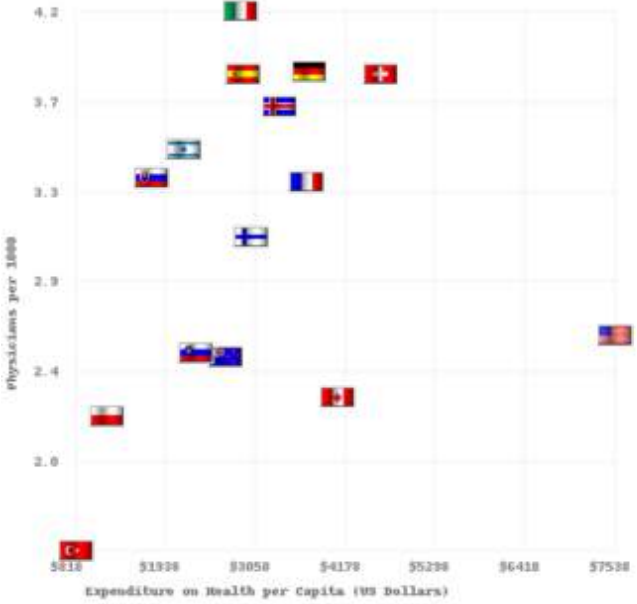
Health care differs from nation to nation, sometimes substantially depending upon the level of economic development and the political system in place. Health care systems, on the global scale, is best defined via the World Health Organization's definition: "A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is therefore more than the pyramid of publicly owned facilities that deliver personal health services. " This definition is important when observing international health care systems, as it captures both developed and developing nations within this context.

## **Comparisons: Developed Nations**

The World Health Organization has been actively measuring a variety of performance indicators to determine an overall ranking system for health care on a global scale. While this has seen some objections, primarily due to the selection of attributes which weigh into this ranking, it is designed to measure critical success factors which are easily comparably across borders (apples to apples). These measured attributes include health of the population, fair financial contributions, responsiveness of the system, preventable deaths, affordability and a range of other considerations.

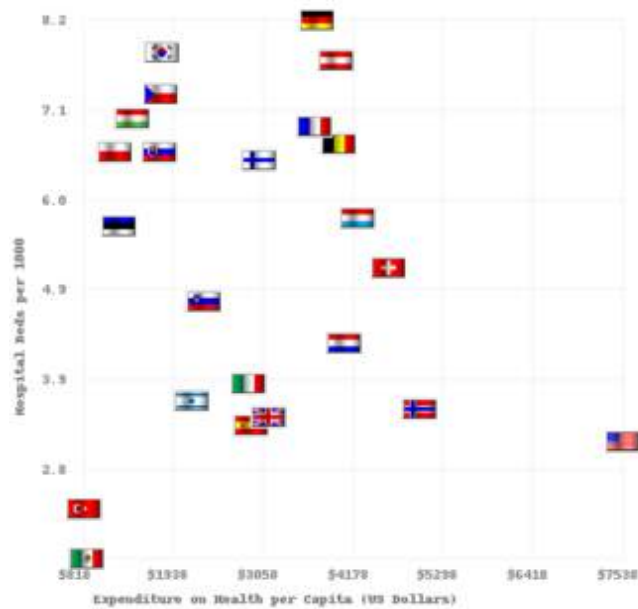


The countries which perform the highest on these metrics are primarily located in Europe (generally northern Europe, see ), where social systems are well designed at a governmental level to ensure prices remain accessible and care remain available. Interestingly, the U.S. has consistently ranked poorly and continues to perform substantially below European counterparts deemed developed at similar economic levels. Two good examples are provided in the media relative to the overall capital costs and the subsequent returns on these costs, on being costs to hospital beds per capita and the other costs to physicians per capita . By these measures, European nations capture more value and efficiency within their systems. The most notable difference between these systems is that the US is that, of these countries, the US is the only country without universal healthcare.



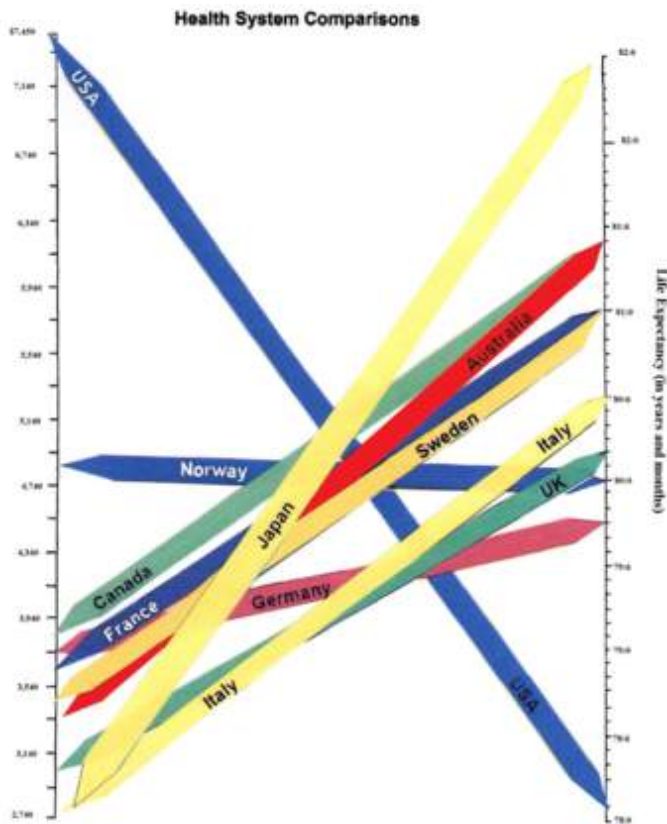
## Capital Costs and Physicians

Similar to the graph representing costs vs. beds, this chart illustrates the number of physicians available (relative to the population) in the context of capital expenditures. Once again the United States is a clear outlier, where the number of physicians is low and the cost quite high.



## Capital Costs and Hospital Beds

This graph demonstrates the apparent correlation between beds (per 1000 people) and the costs involved in healthcare overall. This demonstrates that, on a per capita basis, the U.S. is spending a great deal without capturing much in return relative to available space for patients.



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## Economic Efficiency of Global Health Care Systems

Healthcare spending per capita is on the left y-axis and life expectancy is on the right. Country differences are apparent, especially when comparing the US to others.

Let us explore further through an example of health care in German (though not all European countries are the same). Germany has consistently demonstrated reductions in cost of health care per capita relative to GDP growth. German health care is regulated by the Federal Joint Commission, a public health organization which leverages governmental health reform bills to generate new regulations. This system also includes a total of 85% of the population on the government offered standardized health care plan, which covers a variety of health care needs across the board. The remaining 15% of

the population has opted for private health insurance options, which provide unique niche benefits for specific groups. This system has been highly effective and affordable in providing health care to German citizens.

## **Developing Nations**

With fewer resources, developing nations struggle to compete provide the same access to health care as do developed nations.

China is an interesting case study. China has a great deal of variance in quality and accessibility, with hospital wait times for the poor (depending on severity) taking many hours (sometimes days) compared to the rich, who are admitted immediately. Transitioning towards a system that provides care to the rich and the poor alike is the primary challenge in these developing regions.

### **35.1.4: Externalities in the Health Care Market**

Health care can impact people beyond the person receiving and the person providing the care, causing positive and negative externalities.

#### **Learning Objective**

Describe externalities in the healthcare market

#### **Key Points**

- An externality is any impact, be it positive or negative, on individuals or groups not involved in a given economic transaction.
- Negative externalities include tax costs, infectious disease, anti-biotic resistance and environmental degradation. The negative components impact others despite their participation in the system.
- Positive externalities include increases in wealth due to increased health, vaccinations to limit disease exposures and increases in technology and knowledge.

- Positive externalities include increases in wealth due to increased health, vaccinations to limit disease exposures and increases in technology and knowledge.

## Key Terms

externality

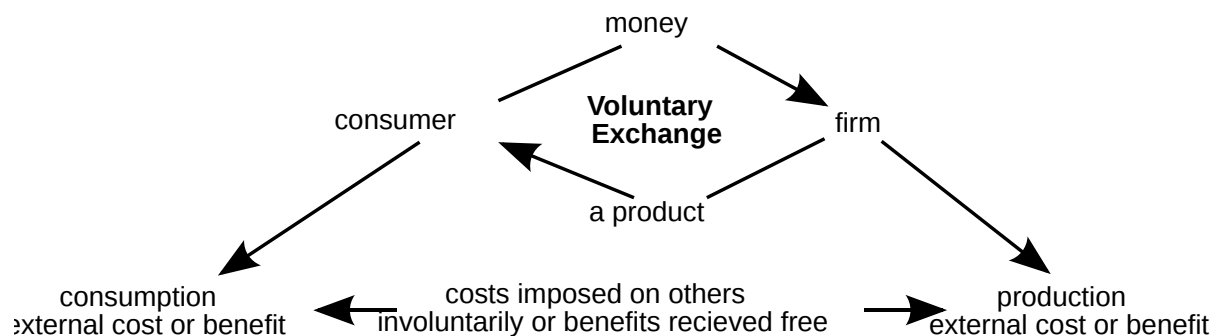
An impact, positive or negative, on any party not involved in a given economic transaction or act.

Vaccinations

Inoculation with a vaccine in order to protect a particular disease or strain of disease

## Defining Externalities

An externality is any impact, be it positive or negative, on individuals or groups not involved in a given economic transaction . That is to say, an externality is something that affects other people outside of the particular parties involved in an exchange.



## Externalities

The basic premise of an externality is captured in this diagram, where external factors affect the internal economic system for a product or service.

A classic example of externalities is the automobile. Cars consistently produce air pollution whenever they are driven, slowly eroding the health of our ecosystem. This cost is shouldered not only by the driver of the vehicle, but also by every living thing on the planet. This is an example of parties not involved in the transaction (selling or buying the vehicle) being impacted, in this case negatively.

## **Health Care Externalities**

In health care, the critical externality in most systems is the care provided to others. You benefit from others being healthy because it reduces the likelihood of you catching their illness (assuming it's contagious). You benefit from a positive externality of others receiving health care.

Your health care costs are also affected by others choosing to purchase health care. The healthy pay more to the insurance company than they receive in treatment, while the opposite is true for the sick. Insurance fundamentally operates by taking the money from healthy people to pay for the procedures required by sick people.

Taxpayers should also be concerned with the state of the healthcare system not only because they pay for Medicare and Medicaid, but also because healthcare is a huge part of the US economy. In 2011, the US spent 17.2% of GDP on healthcare, more than any other country. Reducing the cost of health care can clearly increase the amount that the US can consume or invest.

Other negative externalities include:

- **Infectious Disease:** One of the largest reasons why health care is so critical is the fact that disease are infectious. Untreated disease will result higher population vulnerability to that disease due to increased exposure.
- **Environmental Degradation:**Health care produces a great deal of chemical waste, requires a great deal of emissions (ambulances, etc.) and alters the natural ecological environment of bacteria.
- **Antibiotic Resistance:** An interesting byproduct of the newer solutions to medical dilemmas is the slowly growing resistance of antibiotics in

bacteria. Due to the way in which the health care industry has been operating, bacteria are dramatically altering to resist our solutions.

Positive externalities include:

- **Health Affects Wealth:** Healthy workers are absent from work less and are more productive workers. A health care market that effectively helps workers can lead to positive economic gains.
- **Technology and Information:** The study of health care, and the research involved in generating new solutions, has dramatically increased the knowledge and technological capacity of society in general. This has affected other industries, as research and development in health care affects the technological efficacy in other markets.
- **Vaccinations:** An interesting new development in health care is the advent of vaccines. Vaccination results in herd immunity, or essentially the fact that many individuals will become immune and thus reduce the likelihood that everyone in the population will contract certain diseases.

### **35.1.5: Current Issues in Health Care**

Current issues in the U.S. health care system largely revolve around the significant policy changes resulting from the Affordable Care Act.

#### **Learning Objective**

Explain the main parts of the Affordable Care Act and the current American healthcare system

#### **Key Points**

- U.S. citizens pay substantially more per capita for health care than do residents of other countries, and many people lack access to affordable health care.
- Patients have procedures performed by doctors, by the actual exchange of money occurs between the patient's insurance provider and the doctor's employer.

- The Affordable Care Act addresses issues like pre-existing conditions, anti-trust, unfair rates based on gender, universal standards and a range of other considerations.
- Many individuals believe that this new legislation will increase costs for small businesses, and will motivate 'freeloaders', or individuals who take government handouts.

## **Key Terms**

### Affordable Care Act

The ACA was enacted with the goals of increasing the quality and affordability of health insurance.

### Pre-existing Conditions

A pre-existing condition is a risk with extant causes that is not readily compensated by standard, affordable insurance premiums.

Current issues in the U.S. health care system largely revolve around the significant policy changes imposed by the Affordable Care Act (ACA, or Obamacare), which attempts to provide health insurance coverage for all citizens. This legislation was designed to respond to many flaws in the current U.S. system of healthcare. It is also important to understand the criticisms of this change, as many voters in the U.S. disagree with proposed changes to the system.



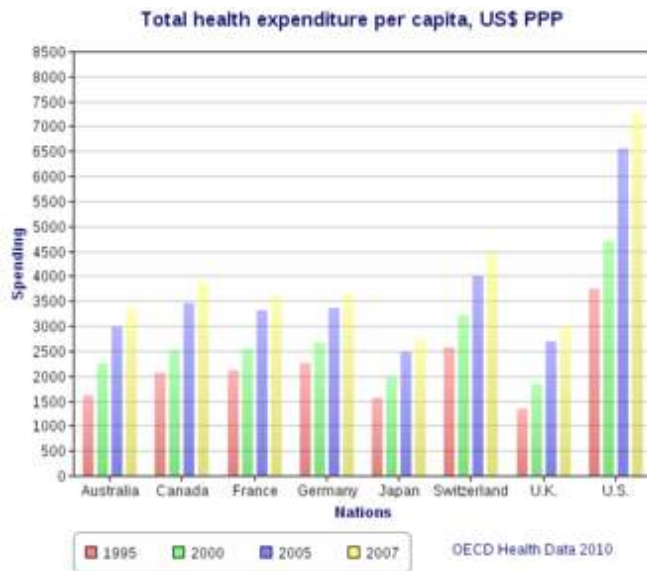


## **U.S. House Votes for the Affordable Health Care Act**

This map outlines the voting distribution in 2009 when the Affordable Health Care Act was brought to the floor.

## **U.S. Health Care Currently**

The U.S., despite having some of the greatest technological advances and medical professionals, has consistently struggled to provide affordable, effective health care to everyone. The costs alone, on a per capita basis, underline the way in which the U.S. system has struggled to meet international standards in providing affordable care. illustrates the costs incurred by each individual in the system based on a country to country comparison. As it illustrates, consumers in the U.S. are faced with much higher (and growing) costs than international counterparts.



## Health Costs Per Capita

This chart illustrates the costs incurred by each individual in the system based on a country to country comparison. As is demonstrated, consumers in the U.S. are faced with much higher costs (and consistently growing higher) than international counterparts.

Most Americans with private health insurance have it provided by their employers. There are also social welfare programs such as Medicaid and Medicare. The insurers negotiate rates with hospitals for different procedures. Patients then go into the hospital and get procedures recommended by doctors. The doctors are then paid by hospitals. This is a classic case of moral hazard: the two parties deciding for the transaction to occur- patients and doctors- are not the same two exchanging money.

Healthcare has a demand curve that fluctuates wildly based upon the extent of the issue - consumers who are facing serious health problems will likely demand healthcare at almost any price, allowing medical providers to take advantage of the inelastic demand. Further issues include the fact that doctors represent a third party (recommending drugs and procedures) and that insurance companies have the power to deny coverage to individuals who need it most.

# The Affordable Health Care Act

In December of 2009, the Senate passing a bill called Patient Protection and Affordable Care Act. The Affordable Care Act is a complex piece of legislation, but a number of bullets from the bill are highly useful to understand:

- **Pre-existing Conditions:** Individuals with pre-existing conditions are much more likely to be expensive clients, and thus are not profitable to insure. This results in insurers refusing to insure these patients. The Affordable Care Act addresses this through legislation, saying providers cannot refuse coverage.
- **Changing Insurance Rates:** As a complement to the analysis above, insurance agencies also cannot alter rates based on pre-existing conditions or gender. This levels the playing field for the consumer, who historically had limited buyer power.
- **Antitrust:** Previously, insurance companies were immune to antitrust laws. This means they could generate monopolies geographically and exploit consumers. This immunity has been repealed.
- **Standards:** Obamacare also closes loopholes regarding to quality standards, ensuring that insurance providers do not reduce what is provided to clients in an effort to cut costs.
- **Healthcare.gov:** This is a way to enable consumers in finding health care insurers in a way that promotes capitalistic competition between providers. Previously, discussing pricing and plans with insurers was highly complex for many individuals (designed for businesses, not individual consumers).
- **Medicaid and Medicare:** Overall, medicare has been reduced while medicaid has been expanded. Medicare spending has been increasing dramatically. This has been cut by \$400 billion, which is a source of discontent for many individuals. Medicaid has been expanded to 133% of the poverty level, covering more people.

## Criticisms

The ACA will only work if both healthy and sick people alike buy insurance: if the healthy choose to pay the fine for not having insurance and

only the sick buy insurance, then costs will increase. There is also a political critique of the ACA. Some feel that the government should not mandate that private citizens purchase insurance in the first place. They feel that the government is overstepping its bounds.

Many individuals also believe that this new legislation will increase costs for small businesses that are now required to buy insurance for their employees, and will motivate 'freeloaders', or individuals who take government handouts. Overall, while the goal is to enable more people to health care more affordably, many people believe this new approach will do not accomplish that.

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# **36: Natural Resource Economics**

# 36.1: Introduction to Natural Resource Economics

## 36.1.1: Types of Natural Resources

Natural resource economics focuses on the supply, demand, and allocation of the Earth's natural resources.

### Learning Objective

Analyze natural resource economics and explain the types of natural resources that exist.

### Key Points

- Natural resource economics focuses on the supply, demand, and allocation of the Earth's natural resources.
- Every man-made product in an economy is composed of natural resources to some degree.
- Natural resources can be classified as potential, actual, reserve, or stock resources based on their stage of development.
- Natural resources are either renewable or non-renewable depending on whether or not they replenish naturally.
- Natural resource utilization is regulated through the use of taxes and permits. The government and individual states determine how resources must be used and they monitor the availability and status of the resources.

### Key Terms

Renewable

Sustainable; able to be regrown or renewed; having an ongoing or continuous source of supply; not finite.

natural resource

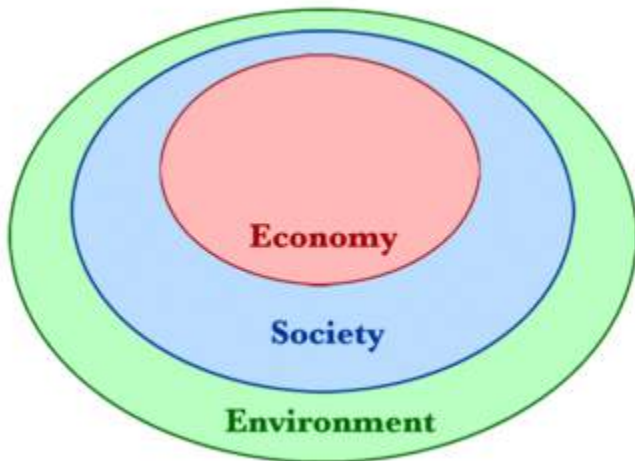
Any source of wealth that occurs naturally, especially minerals, fossil fuels, timber, etc.

depletion

The consumption of a resource faster than it can be replenished.

## **Natural Resource Economics**

Natural resource economics focuses on the supply, demand, and allocation of the Earth's natural resources. Its goal is to gain a better understanding of the role of natural resources in the economy. Learning about the role of natural resources allows for the development of more sustainable methods to manage resources and make sure that they are maintained for future generations. The goal of natural resource economics is to develop an efficient economy that is sustainable in the long-run .



## **Importance of the Environment**

This diagram illustrates how society and the economy are subsets of the environment. It is not possible for societal and economic systems to exist independently from the environment. For this reason, natural resource economics focuses on understanding the role of natural resources in the economy in order to develop a sufficient and sustainable economy that protects natural resources.

## **Types of Natural Resources**

Natural resources are derived from the environment. Some of the resources are essential to survival, while others merely satisfy societal wants. Every man-made product in an economy is composed of natural resources to some degree.

There are numerous ways to classify the types of natural resources, they include the source of origin, the state of development, and the renewability of the resources.

In terms of the source of origin, natural resources can be divided into the following types:

- Biotic: these resources come from living and organic material, such as forests and animals, and include the materials that can be obtained from them. Biotic natural resources also include fossil fuels such as coal and petroleum which are formed from organic matter that has decayed.
- Abiotic: these resources come from non-living and non-organic material. Examples of these resources include land, fresh water, air, and heavy metals (gold, iron, copper, silver, etc.).

Natural resources can also be categorized based on their stage of development including:

- Potential resources: these are resources that exist in a region and may be used in the future. For example, if a country has petroleum in sedimentary rocks, it is a potential resource until it is actually drilled out of the rock and put to use.
- Actual resources: these are resources that have been surveyed, their quantity and quality has been determined, and they are currently being used. The development of actual resources is dependent on technology.
- Reserve resources: this is the part of an actual resource that can be developed profitably in the future.
- Stock resources: these are resources that have been surveyed, but cannot be used due to a lack of technology. An example of a stock resource is hydrogen.

Natural resources are also classified based on their renewability:

- Renewable natural resources: these are resources that can be replenished. Examples of renewable resources include sunlight, air, and wind. They are available continuously and their quantity is not noticeably affected by human consumption. However, renewable resources do not have a rapid recovery rate and are susceptible to depletion if they are overused.
- Non-renewable natural resources: these resources form extremely slowly and do not naturally form in the environment. A resource is considered to be non-renewable when their rate of consumption exceeds the rate of recovery. Examples of non-renewable natural resources are minerals and fossil fuels.

There is constant worldwide debate regarding the allocation of natural resources. The discussions are centered around the issues of increased scarcity (resource depletion) and the exportation of natural resources as a basis for many economies (especially developed nations). The vast majority of natural resources are exhaustible which means they are available in a limited quantity and can be used up if they are not managed correctly. Natural resource economics aims to study resources in order to prevent depletion.

Natural resource utilization is regulated through the use of taxes and permits. The government and individual states determine how resources must be used and they monitor the availability and status of the resources. An example of natural resource protection is the Clean Air Act. The act was designed in 1963 to control air pollution on a national level. Regulations were established to protect the public from airborne contaminants that are hazardous to human health. The act has been revised over the years to continue to protect the quality of the air and health of the public in the United States.



## **Wind**

Wind is an example of a renewable natural resource. It occurs naturally in the environment and has the ability to replenish itself. It has also been used as a form of energy development through wind turbines.

### **36.1.2: Basic Economics of Natural Resources**

Natural resource economics focuses on the supply, demand, and allocation of the Earth's natural resources to create a more efficient economy.

## **Learning Objective**

Explain basic natural resource economics

## **Key Points**

- As a field of academic research, natural resource economics addresses the connections and interdependence between human economies and natural ecosystems.
- By studying natural resources, economists learn how to develop more sustainable methods of managing resources to ensure that they are maintained for future generations.
- Natural resource economics is studied on an academic level, and the findings are used to shape and direct policy-making for environmental issues. These issues include resource extraction, depletion, protection, and management.
- Natural resource economics findings impact policies for environmental work including issues such as extraction, depletion, protection, and management.

## **Key Terms**

natural resource

Any source of wealth that occurs naturally, especially minerals, fossil fuels, timber, etc.

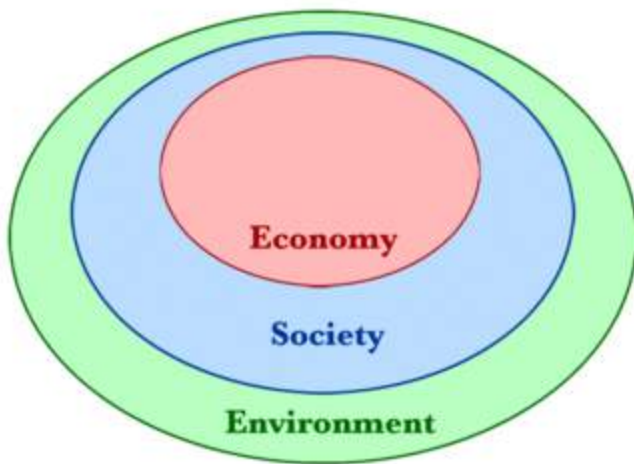
sustainable

Able to be sustained for an indefinite period without damaging the environment, or without depleting a resource.

## **Natural Resource Economics**

Natural resource economics focuses on the supply, demand, and allocation of the Earth's natural resources. The main objective of natural resource economics is to gain a better understanding of the role of natural resources in the economy. By studying natural resources, economists learn how to develop more sustainable methods of managing resources to ensure that they are maintained for future generations. Economists study how economic and natural systems interact in order to develop an efficient economy.

As a field of academic research, natural resource economics addresses the connections and interdependence between human economies and natural ecosystems. The focus is how to operate an economy within the ecological constraints of the earth's natural resources .



## **Natural Resource Economics**

This diagram illustrates that society and the economy are subsets of the environment. It is not possible for social and economic systems to exist independently from the environment. Natural resource economics focuses on the demand, supply, and allocation of natural resources to increase sustainability.

## **Areas of Study**



Economists study the commercial and recreational use and exploitation of resources. Traditionally, natural resource economics focused on fishery, forestry, and mineral models. However, in recent years many more topics have become increasingly important, including air, water, and the global climate. Natural resource economics is studied on an academic level, and the findings are used to shape and direct policy-making for environmental issues.

Examples of areas of study in natural resource economics include:

- welfare theory
- pollution control
- resource exhaustibility
- environmental management
- resource extraction
- non-market valuation
- environmental policy

Additionally, research topics of natural resource economists can include topics such as the environmental impacts of agriculture, transportation and urbanization, land use in poor and industrialized countries, international trade and the environment, and climate change.

## **Impact of Natural Resource Economics**

The findings of natural resource economists are used by governments and organizations to better understand how to efficiently use and sustain natural resources. The findings are used to gain insight into the following environmental areas:

- **Extraction:** the process of withdrawing resources from nature. Extractive industries are a basis for the primary sector of the economy. The extraction of natural resources substantially increases a country's wealth. Economists study extraction rates to make sure that resources are not depleted. Also, if resources are extracted too quickly, the sudden inflow of money can cause inflation. Economists seek to maintain a sense of balance within extraction industries.

- Depletion: the using up of natural resources, which is considered to be a global sustainable development issue. Many governments and organizations have become increasingly involved in preserving natural resources. Economists provide data to determine how to balance the needs of societies now and preserve resources for the future.
- Protection: the preservation of natural resources for the future. The findings of economists help governments and organization develop measures of protection to sustain natural resources. Protection policies state the necessary actions internationally, nationally, and individually that must take place to control natural resource depletion that is a result of human activity.
- Management: the use of natural resources taking into account economic, environmental, and social concerns. This process deals with managing natural resources such as land, water, soil, plants, and animals. Particular focus is placed on how the preservation of natural resources impacts the quality of life now and for future generations.

### **36.1.3: Externalities and Impacts on Resource Allocation**

Production and use of resources can have a positive or negative effect on the allocation of the natural resources.

#### **Learning Objective**

Examine externalities and how they the impact resource allocation of natural resources.

#### **Key Points**

- An externality is a cost or benefit that affects a party who did not choose to incur the cost or benefit.
- A negative externality, also called the external cost, imposes a negative effect on a third party.
- When external costs are present, the market equilibrium use of natural resources is inefficient because the social benefit is less than the social

cost. In other words, society would have been better off if fewer natural resources had been used.

- Positive externalities, also referred to as external benefits, imposes a positive effect on a third party.
- Assuming that natural resources are used and also sustained, the external benefits of goods produced by natural resources impacts the majority of the public in a positive way.

## **Key Term**

externality

An impact, positive or negative, on any party not involved in a given economic transaction or act.

## **Resource Allocation**

Resource allocation is division of goods for the use of production within the economy. The needs and wants of society as well as industries impact what is produced. Suppliers focus on producing the varieties of goods and services that will yield the greatest satisfaction to consumers. In the long run, externalities directly impact resource allocation. It must be determined whether the production, as well as the process of production, creates more benefits that costs for the producers, consumers, and society as a whole.

## **Externalities**

An externality is a cost or benefit that affects a party who did not choose to incur the cost or benefit. In regards to natural resources, production and use of resources can have a positive or negative effect on the allocation of the resources.

## **External Costs**

A negative externality, also called the external cost, imposes a negative effect on a third party to an economic transaction. Many negative

externalities impact natural resources negatively because of the environmental consequences of production and use. For example, air pollution from factories and vehicles can cause damage to crops . Likewise, water pollution has a negative impact of plants and animals.



## **Negative externality**

Air pollution from vehicles is an example of a negative externality. It affects other than those who drive the vehicle and those who sell the gas.

In the case of negative externalities, the marginal private cost of consuming a good is less than the marginal social or public cost. The marginal social benefit should equal the marginal social cost (i.e. production should only be increased when the marginal social benefit exceeds the marginal social cost). When external costs are present, the use of natural resources is inefficient because the social benefit is less than the social cost. In other

words, society and the natural resources involved would have been better off if the natural resources had not been used at all.

Developed countries use more natural resources and must enact sustainable development plan for the use of resources. Human needs must be met, but the environment and natural resources must be preserved. Examples of resource depletion include mining, petroleum extraction, fishing, forestry, and agriculture.

## External Benefits

Positive externalities, also referred to as external benefits, impose a positive effect on a third party. An example of a positive externality is when crops are pollinated by bees from a neighboring bee farm. In order to achieve the socially optimal equilibrium, the marginal social benefit should equal the marginal social cost (i.e. production should be increased as long as the marginal social benefit exceeds the marginal social cost). Assuming that natural resources are used and also sustained, the external benefits of goods produced by natural resources impacts the majority of the public in a positive way.

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# **37: Agriculture Economics**



# 37.1: Introduction to the Agriculture Economics

## 37.1.1: The Agricultural Market Landscape

The agricultural market landscape is the economic system that produces, distributes, and consumes agricultural products and services.

### Learning Objective

Outline the evolution of the agriculture market over time

### Key Points

- The history of agriculture is complex, spanning back thousands of years across a wide variety of different geographic regions, climates, cultures, and technological approaches.
- The roots of agriculture are derived over 10,000 years ago, with tribes executing forest gardening alongside the domestication of animals in the Fertile Crescent region.
- As population expanded dramatically over time (see, so did the efficiency of agriculture economics. This began with agricultural improvements such as the hoe and is represented today with genetic engineering, robotics, irrigation, etc.
- This rapid expansion coupled with the essential role of food in our society has generated a field of economics solely dedicated to observing and predicting trends within the agriculture market landscape.
- Interesting trends in the agricultural market pertain to the decrease in cost for the actual farming aspects and an increase in costs for the distribution and sales system (particularly in the U.S.). This is largely a result of technological progress.

## **Key Term**

### Agricultural Economics

The study of the production, distribution, and consumption of goods and services related to food.

Agriculture, in many ways, has been the fundamental economic industry throughout history. The production and exchange of food laid the groundwork for all bartering, making it likely to be the oldest market in history. The production of food in modern times in developed nations is oddly taken for granted, as surpluses tend to define the market in pursuit of providing options.

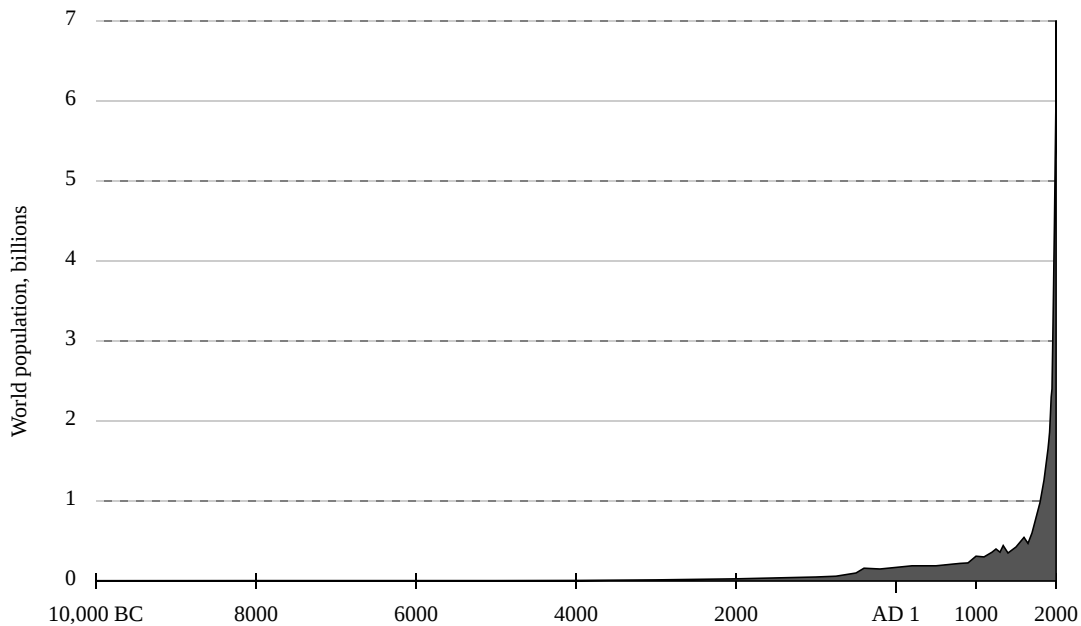
Developing nations view agriculture quite differently, where famines and low yield years can dramatically affect the overall food supply in a given region. Due to the critical importance of food production, the agricultural market landscape is one of the most studied and evolved economic segments.

## **The History of Agriculture**

The history of agriculture is complex, spanning back thousands of years across a wide variety of different geographic regions, climates, cultures, and technological approaches. Over 10,000 years ago, tribes began executing forest gardening. This evolved in the Fertile Crescent region into the domestication of animals (i.e. cattle, sheep, goats, pigs), growing of wheat and barley in Jordan Valley and the growth of cereal in Syria (all still about 10,000 years ago).

As population expanded dramatically over time (see ), so did the efficiency of agriculture economics. This began with agricultural improvements such as the hoe and the plow (2500 B.C.), irrigation via canals, and biological pest control as early as the bronze and iron ages. This evolved further in the middle ages with the advent of fertilizers, three field techniques, draft horses, and improved international exchange. Indeed, until the Industrial Revolution (18th and 19th centuries) the vast majority of the human

population labored long hard days to generate enough food to feed the masses.



## Human Population Growth

This chart illustrates the way in which human population growth evolved over time, underlining the difficulty in maintaining supplies to fill the needs of such a large population.

The modern era of farming is increasingly defined by selective breeding, crop rotation, economies of scale, electronic machinery, genetic modification, pesticides, and a host of other solutions that have rapidly expanded the overall potential capacity in farming.

## Agricultural Economics

This rapid expansion coupled with the essential role of food in our society has generated a field of economics solely dedicated to observing and predicting trends within the agriculture market landscape. Basic macro and micro-economic principles apply to farming, as do the existence of externalities such as climate change and nutritional health. Agricultural

economics is defined as the economic system that produces, distributes, and consumes agricultural products and services. This represents a large interconnected supply chain on a global scale.

Interesting trends in the agricultural market pertain to the decrease in cost for the actual farming aspects and an increase in costs for the distribution and sales system (particularly in the U.S.). This is largely a result of technological progress greatly reducing the need for human labor in the production of agricultural goods, weighting the costs more heavily on the human resources side of the equation.

The politics and economics of agriculture are also relevant issues on the global scale. US agricultural subsidies have had a large impact on international trade flows. The subsidies make US agricultural products artificially cheap, too cheap for developing nations to compete with. Developing nations, which may rely more heavily on agriculture in their economy than developed nations, argue that the US should reduce its agriculture subsidies. This tension is perhaps the biggest cause of the failure of the Doha Round, a World Trade Organization push for more open global trade, to make any progress since its initiation in 2001.

## **37.1.2: Subsidies and Income Supports**

An agricultural subsidy is a government grant paid to incumbents in the industry to reduce costs and influence the supply of commodities.

### **Learning Objective**

Analyze the positive and negative affects of subsidies on agricultural economics.

### **Key Points**

- Subsidized goods generally include wheat, corn, barley, oats, sorghum, milk, rice, peanuts, tobacco, soybean, cotton, lamb, beef, chicken and pork.

- Another, less direct, form of subsidy is in the taxing system for consumers. Consumers are not charged tax on food goods and clothes, which are considered necessities and thus should be provided at the lowest costs possible.
- In the context of international trade, government assistance in industry provides an unfair competitive advantage for those companies receiving the support.
- Overall, while subsidies are largely a good thing and enable individuals to buy the necessities, there are clear cut downsides to subsidies as well.
- Overall, while subsidies are largely a good thing and enable individuals to buy the necessities, there are clear cut downsides to subsidies as well. Politics must find a way to mitigate the negative externalities.

## **Key Terms**

externalities

Impacts, positive or negative, on any party not involved in a given economic transaction or act.

subsidy

Government assistance to a business or economic sector.

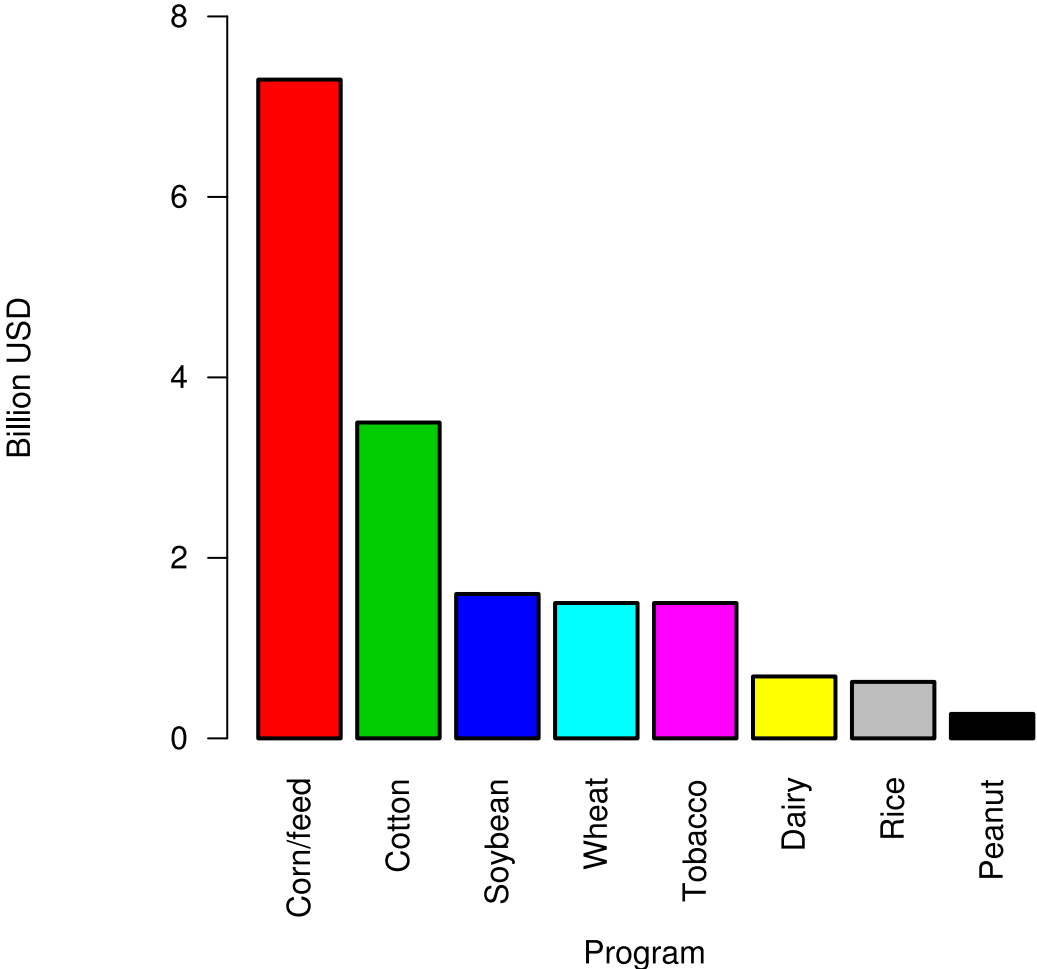
When governments want to ensure their citizens have access to healthy foods at reasonable prices, a variety of governmental supports are provided to the industry to ensure it maintains low costs of production and high output. This is generally in the form of subsidy and income supports, which alleviate some competitive dynamics and operating expenses to maintain reasonable price points in the market economically.

## **Subsidies**

An agricultural subsidy is defined as a government grant paid to farmers to supplement income and influence the overall cost and supply of certain

commodities. In this industry, subsidized goods generally include wheat, corn, barley, oats, sorghum, milk, rice, peanuts, tobacco, soybean, cotton, lamb, beef, chicken and pork. illustrates the governmental priorities, based upon subsidies provided, for specific agricultural goods in the United States. These subsidies play a large role in enabling higher supply at lower price points, supporting the domestic agricultural industry.

**United States farm subsidies in 2005**



Source: Congressional Budget Office (via the Associated Press)

## **Agriculture Subsidies in the U.S. (2005)**

This chart illustrates the governmental priorities, based upon subsidies provided, for specific agriculture goods in the United States.

Another, less direct, form of subsidy is in the taxing system for consumers. Consumers are not charged tax on food goods and clothes, which are considered necessities and thus should be provided at the lowest costs possible. These consumer-based subsidies are another governmental attempt to enable citizens in the country to purchase basic food stuffs required to survive. Food stamps are a similar concept, used to empower low income individuals and ensure they have access to these basic foods as well (food stamps are often limited to milk, eggs, bread and other core foods).

## Impacts of Subsidies

While these subsidies above are designed to have a positive effect on consumers looking to purchase foods, there are externalities to this process that can have a damaging affect on other groups:

- **Global Effects:** While domestic subsidies are good for driving up production domestically, it suppresses competition in the context of international trade. Government assistance in an industry is argued to provide an unfair competitive advantage for those companies, artificially lowering their costs of production, sometimes below the feasible level for countries (especially developing nations) not receiving these supports.
- **Developing Nations:** A complement to the above discussion is the effect on poverty and developing nations without the infrastructure to provide subsidies for their own farmers. The International Food Policy Research Institute has estimated a total loss of economic growth in developing nations at \$24 billion in 2003, all of which translate to lost income for individuals who desperately need it.
- **Nutrition:** Another interesting side effect of subsidies and the artificially reduced price of food is obesity and overeating. Some argue that these low prices provide the incentive to buy more food than is necessary, and this over consumption has resulted in a highly unhealthy culture (particularly in the U.S.).
- **Environmental Implications:** As food prices reduce distribution increases, thus driving an environmental externality which already existed even further. The cost, environmentally, of transporting a high

quantity of agricultural goods across the globe has resulted in high degrees of pollution and waste.

Overall, while subsidies are largely a good thing and enable individuals to buy the necessities, there are clear cut downsides to subsidies as well. Politics must find a way to mitigate the negative consequences while increasing the positive effects, allowing for balanced and healthy consumption across all demographics.

### **37.1.3: Price Supports**

Price supports are subsidies or price controls used by the government to artificially increase or decrease prices in the agriculture market.

#### **Learning Objective**

Assess the way in which price controls affect supply, demand, and equilibrium pricing in agricultural economics.

#### **Key Points**

- Governments enact a variety of price controls on the agriculture business, both in the U.S. and abroad, to ensure desired supply and prices for specific necessities.
- Price supports are defined as subsidies or price controls that are leveraged by the government to artificially increase or decrease prices, and alter the supply consumed/quantity demanded by individuals within the system.
- The government may artificially increase prices through purchasing a portion of the consumer surplus or artificially increase quantity through offering subsidies to producers. This allows the government control over the established equilibrium in agriculture.
- The United States currently pays out around \$20 billion annually to farmers and producers in agriculture in the form of subsidies via farm bills in order to artificially reduce prices and shift the supply curve.



- The subsidies provide a price floor (or a minimum price in which farmers can be reimbursed for certain products). This is a significant economic policy of price control to ensure farmers have proper incentive and revenues to continue to produce.

## **Key Terms**

### Price support

A subsidy or a price control with the intended effect of keeping the market price of a good higher or the quantity consumer higher within a market.

### Subsidies

Financial support or assistance, such as a grant.

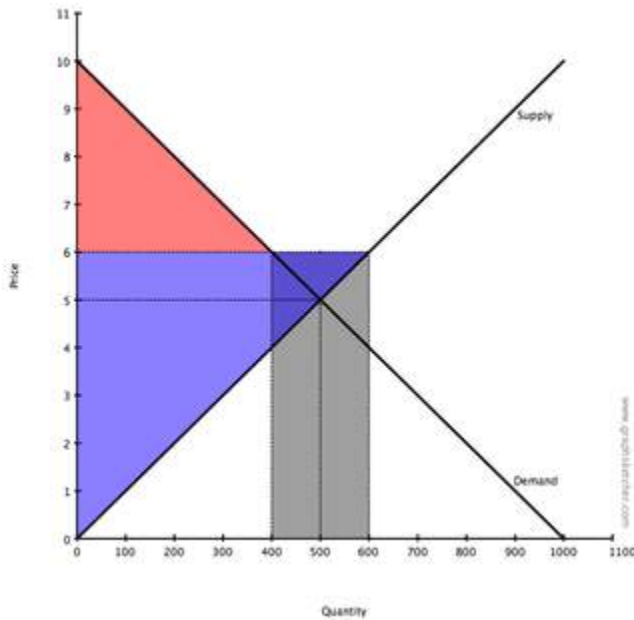
The agriculture industry is a critical component of any national economy because it represents both a substantial portion of gross domestic product and it is a core necessity for citizens within the system. Due to the fact that these goods are necessities, it is also important to keep in mind the way in which supply and demand would operate if there was a limited supply (required for survival, and thus potential demand upsides could be boundless). Due to these factors, governments enact a variety of price controls on the agriculture business, both in the U.S. and abroad.

## **Defining Price Supports**

Price supports are defined as subsidies or price controls that are leveraged by the government to artificially increase or decrease prices, and thus alter the supply consumed/quantity demanded by individuals within the system. Understanding the effects of subsidies and price controls is critical in industries with a high degree of government involvement, and agriculture is one of the most affected industries.

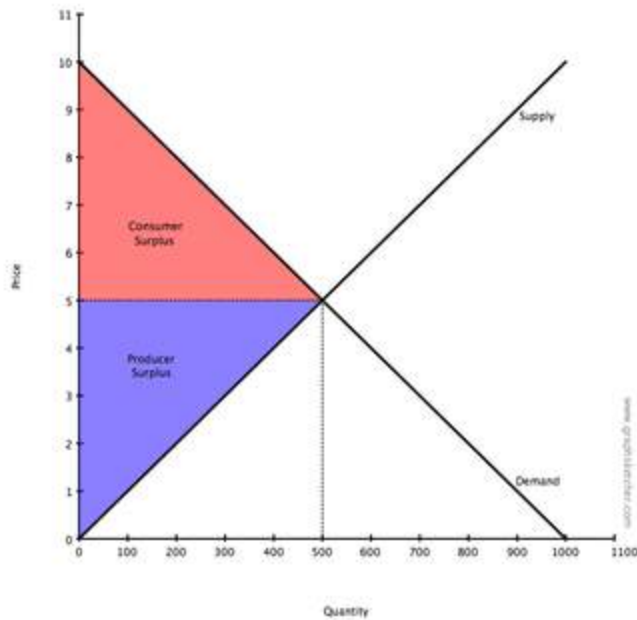
is simply a supply and demand curve that demonstrates the consumer surplus and producer surplus opportunities in basic supply and demand

chart. In this scenario, without external governmental intervention, the price equilibrium will remain in the center of the graph. However, the government may implement price supports that artificially consume some of the consumer surplus (in , this is 200 units). This drives the price upwards to \$6 per unit despite the fact that the consumer is not gaining additional quantity (it is artificial quantity, as purchased by the government).



## Consumer Surplus with Price Support

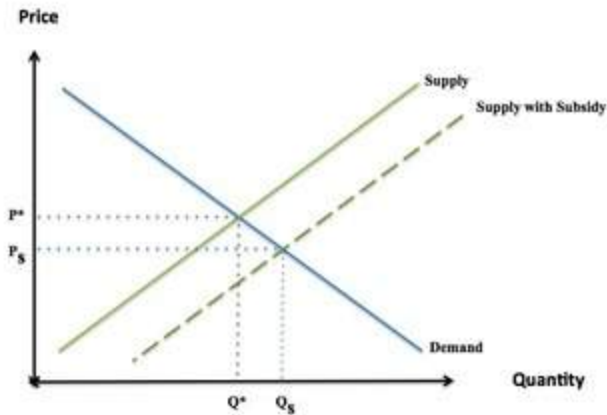
This graph is a complement to the first graph. It demonstrates the effect of implementing a price support on a basic supply and demand chart. The overall consumption will decrease as the government buys up consumer surplus. This demonstrates a price control on behalf of the government.



## Consumer Surplus

This chart, in conjunction with the one below, illustrates the way in which price supports can alter supply and overall consumption. It demonstrates the consumer surplus and producer surplus opportunities on a basic supply and demand chart.

This can happen in reverse as well in the form of subsidies. Subsidies are the reduction of costs for producers, generally in the form of governmental grants provided to suppliers. In this scenario, prices are artificially reduced, allowing for an outward shift of the supply curve along the demand line, which creates a higher amount of consumption by consumers as a result of the reduced price. This is illustrated in , where the governmental subsidy allows for increased consumption power on behalf of the consumers in that market.



## Subsidies and Supply

This chart shows how subsidies and price controls affect supply and demand. A subsidy, as illustrated here, will reduce the price and extend the overall supply demanded and consumed by individuals within the system. This is the most relevant chart to agricultural economics specifically.

## Applying Price Supports to Agricultural Economics

The United States currently pays out around \$20 billion annually to farmers and producers in agriculture in the form of subsidies via farm bills in order to artificially reduce prices and shift the supply curve outward to ensure the overall supply in the market is high enough to satisfy all prospective consumers. It is important to note how dramatically the recipients of farming subsidies have changed over time in the United States. In 1925, there were around 6,000,000 small farms of which 25% of the nation resided. By 1997, 72% of farm sales come from 157,000 large farms and only 2% of the U.S. population resides there. This is an interesting economic factor in farm subsidies, as these subsidies are largely going to corporations of substantial size, as opposed to small farmers.

The subsidies provide a price floor (or a minimum price in which farmers can be reimbursed for certain products). This is a significant economic policy of price control to ensure farmers have proper incentive and revenues

to continue to produce at the level of goods desired by the U.S. government. Agricultural economics is a highly complicated market as a result of these price supports and controls, particularly from the perspective of subsidization and price control.

### **37.1.4: Supply Reduction**

Agricultural aggregate supply can be reduced through external capacity potential or governmental interventions.

#### **Learning Objective**

Identify factors resulting in global reductions in agricultural supply levels.

#### **Key Points**

- Government policy has a large impact on the agriculture market, usually in the form of subsidies and price ceilings, by controlling the overall supply and demand equilibrium points in the market.
- Governments may reduce supply through utilizing quotas (limiting imports) or providing foreign aid (actively reducing domestic demand).
- Environmental concerns have also been widely cited as a reductive influence on the agriculture market. Global warming (increased average temperatures) has demonstrated a negative effect on overall plant yield for certain products.
- Other concerns reducing supply revolve around dramatic soil damage due to short-term yield increasing strategies, growing immunity to pesticides, loss of rural space for farming (due to urbanization), and availability of clean water for irrigation.

#### **Key Terms**

Dumping

Selling goods at less than their normal price, especially in the export market as a means of securing a monopoly.

## Quotas

A restriction on the import of a good to a specific quantity.

Agricultural economics is largely bound by concepts of climate and overall world food producing capacity (i.e. farmlands and infrastructure), while simultaneously being enabled by government policy, technological advances, and the continued growth of developing nations. Understanding the reductions in aggregate supply in this industry, as a result of governmental policy or economic limits, is a critical component in understanding agricultural economics. We will look at both the governmental components and the climatic/aggregate demand components contributing to overall supply in this industry.

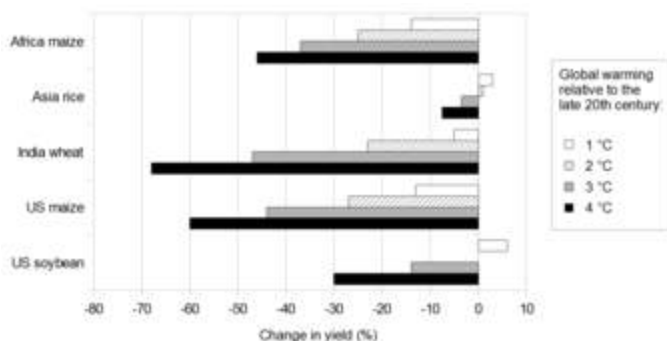
## Governmental Policy

Government policy has a large impact on the agriculture market. Both subsidies and price ceilings are common and affect the overall supply and demand equilibrium points in the market. Governmental policy to reduce supply also exists and is executed often from a global trade perspective. One of the largest risks in this industry, due to the high degree of subsidization, is 'dumping.' Dumping is the process of selling undervalued goods in another market, upsetting price points and equilibrium. In this scenario, government policies may set quotas, or import limits, to reduce supply.

A second reduction in supply that is quite common in developed nations is utilizing surplus for foreign aid. Many developing nations lack the requisites to generate the appropriate supply of agriculture to feed the population. In this scenario, the leveraging of the surplus in one country can benefit the other country via aid, and in turn correct the supply/demand equilibrium in the donating country to the desired level.

## Climate Change

Environmental concerns have also been widely cited as a reductive influence on the agriculture market. Global warming has been slowly increasing temperatures as the ozone layer erodes due to a variety of pollutants, altering the ecosystem averages outside of the evolutionary environment in which many agricultural products historically grew. Climate changes means a different growing environment for plants, which are not used to it. illustrates the reduction in yield as a result of altering climatic environments. Shifts in climate drastically reduce aggregate supply.



## Climate Change Affecting Agriculture

This chart illustrates the reduction in yield as a result of altering climatic environments. Essentially, deviations outside of the normal temperature ranges drastically reduce aggregate supply.

Other concerns revolve around dramatic soil damage due to short-term yield increasing strategies, growing immunity to pesticides, loss of rural space for farming (due to urbanization), and availability of clean water for irrigation. All of these factors may reduce the aggregate supply and thus drive up prices. demonstrates rising food prices, perhaps from a number of the supply reduction factors discussed in this atom (or potentially unidentified factors). Controlling supply is a critical component of ensuring everyone has access to affordable food, and maintaining our ecosystem will clearly play a critical role in the years ahead.



## Food Price Increases Over Time

Food prices over time, particularly in recent years, are demonstrating a trend upwards that may reflect a reduction in overall efficiency of agricultural production or reductions in supply.

### 37.1.5: Evaluating Policies

Agriculture requires a vast support system and a great deal of oversight, addressing industry threats and utilizing policy-based tools.

#### Learning Objective

Evaluate the economics of agriculture policies.

#### Key Points

- The political frame of the agriculture market is complex, with a wide range of critical concerns that need to be addressed both domestically and internationally.
- Concerns to keep in mind revolve around the international markets, bio-security, infrastructure, technology, water, and resource allocation to enable effective agricultural markets.



- Governments can use import quotas, subsidies, price floors, price ceilings, and aid to control their domestic market supply, demand, and equilibrium price point.
- Combining the issues above with tools provided, the agricultural business can change dramatically as a result of the concerns and activities of the respective government in a given economy.

## **Key Terms**

### infrastructure

The basic facilities, services, and installations needed for the functioning of a community or society.

### Biosecurity

The protection of plants and animals against harm from disease or from human exploitation.

The political frame of the agriculture market is hugely complex, with a wide range of critical concerns that need to be addressed both domestically and internationally. Agricultural policy differs from nation to nation, but has a number of key questions and considerations that occur across the board. The purpose of this atom is to outline the various trends in agricultural economic policy, and how these governmental policies can be evaluated for efficacy in their respective markets.

## **Policy Concerns**

Agriculture requires a vast support system and a great deal of oversight, as the consumption of grown foods poses a huge safety threat alongside a critical need for the health and survival of a civilization. Below is a list of core questions to keep in mind when evaluating agricultural policy:

- **Biosecurity:** The ability of a country to consistently provide enough food for its citizens is a major concern. Pests and diseases are a

significant threat to yield rates and must be closely observed and regulated.

- **International Trading Environment:** Global agricultural trade is a complex issue, with quality control, pricing (dumping), and import/export tariffs. The dangers of biosecurity, or lack thereof, in particular are quite stringent.
- **Infrastructure:** Transporting goods, irrigation facilities, land utilization, and a variety of other logistics concerns are required by the government to enable effective economic trade (domestically and internationally).
- **Technology:** This is a critical driving force in increasing yield and lowering costs in the agriculture business. Enabling technological progress is a critical investment and something governments must provide incentives for.
- **Water:** Access to clean, potable water is a basic necessity to which not everyone has access. Effective sewage systems for irrigation and effective water treatment for sanitation are a required input, and must be provided via governmental centralized infrastructure.
- **Resource Access:** Ensuring access to land and biodiversity is another important component to a successful agricultural industry. Protection of environmental land and the overall ecosystem is an important policy consideration.

## **Policy Tools**

With the above concerns in mind, it is also useful to understand some of the tools leveraged by governments to enable this industry:

- **Subsidies:** The government can utilize subsidies to reduce price points and increase the overall supply within a system. The use of subsidies in developed nations has been a major point of international contention, since they may force developing nations out of the global agriculture market.
- **Price Floors/Ceilings:** Price floors provide a minimum price point for a given product while price ceilings create a maximum price point. These are used to ensure appropriate pricing in a given industry (see ), and are often used in agriculture to control price points.

- Import Quotas: Policy makers often implement quotas in agriculture to retain more control over prices and protect domestic incumbents. Quotas, like other forms of trade protection, benefit the local industry.
- Aid: When aggregate supply is too high in a home country or there is a crisis in another, governments can provide their surplus to nations in need of food. This is both a way to provide utilitarian value while reducing aggregate supply.

Combining the issues above with tools provided, the agricultural business can change dramatically as a result of the concerns and activities of the respective government in a given economy. This is useful in controlling food prices, reducing waste, enabling efficiency and avoiding biosecurity issues.

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# **38: Immigration Economics**

# 38.1: Introduction to Immigration Economics

## 38.1.1: Dimensionalizing Immigration: Numbers of Immigrants around the World

Annually, millions of people around the world decide to emigrate to another country, and this rate is expected to increase over time.

### Learning Objective

Describe trends of global immigration

### Key Points

- It is predicted that immigration rates will continue to increase over time. A 2012 Gallup survey determined that nearly 640 million adults would want to immigrate if they had the chance to.
- In 2005, the United Nations reported that there were nearly 191 million international immigrants worldwide; about 3% of the world population. In 2006, Europe, the United States, and Asia were found to host the largest number of immigrants at 70 million, 45 million, and 25 million, respectively.
- Regional factors contribute to immigrants selecting a specific host country. The prospects for employment, wage rate, standard of living, and immigration laws all contribute the immigrants' decision of where to relocate.

### Key Term

immigration



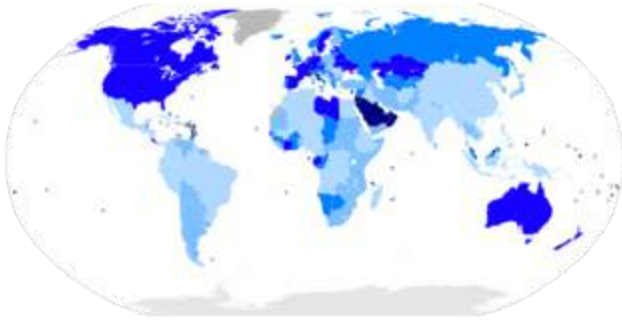
The act of coming into a country for the purpose of permanent residence.

## **Immigration**

Immigration is defined as the movement of people from their home country or region to another country, of which they are not native, to live. There are specific economic factors that contribute to immigration, including the desire to obtain higher wage rates, improve the standard of living, have better job opportunities, and gain an education. Non-economic factors are also significant and include leaving a home country due to persecution, ethnic cleansing, genocide, war, natural disasters, and political control (for example, dictatorship). Throughout history, with improved transportation and technology, immigration has become increasingly common worldwide. Immigration numbers impact both the home country and the host country.

## **Immigration Statistics**

In 2005, the United Nations reported that there were nearly 191 million international immigrants worldwide, which accounted for about 3% of the world population . This represented an increase in the number of immigrants by about 26 million since 1990. It is estimated that 60% of the immigrants moved to developed countries.



## Country Immigrant Populations in 2005

The darker the color, the higher the percent immigrants in the population. The darkest blue indicates more than 50% of the population are immigrants. There is no data for countries in grey.

In 2006, the International Organization for Migration estimated the number of immigrants to be more than 200 million globally. Europe, the United States, and Asia were found to host the largest number of immigrants at 70 million, 45 million, and 25 million.

Moreover, it is predicted that immigration rates will continue to increase over time. A 2012 survey that was conducted by Gallup determined that nearly 640 million adults would want to immigrate if they had the chance. About one quarter of those surveyed (23%, or 150 million adults) stated that they would choose to immigrate to the United States. Seven percent (45 million adults) stated that they would choose to immigrate to the United Kingdom. Other top countries listed in the survey included Canada, France, Saudi Arabia, Australia, Germany, and Spain.



## Net Immigration Rate

This graph shows the worldwide net immigration rate in 2011. The blue shows positive rates, the orange is negative, green is stable, and gray represents no data available. It is predicted that global immigration rates will continue to increase in the future.

## Regional Factors for Immigration

Regional factors contribute to immigrants' selection of a specific host country. The prospects for employment, wage rate, standard of living, and immigration laws all contribute to relocation decisions. Examples of immigration patterns in certain countries help to illustrate how specific factors influence immigration numbers worldwide.

- Europe: Immigrants helped to rebuild and repopulate Europe after World War II. In 2005 Europe experienced an overall net gain of 1.8 million people from immigration. This accounted for almost 85% of Europe's total population growth that year. In 2010, according to Eurostat, there were 47.3 million immigrants living throughout Europe, which accounted for 9.4% of the total population; Germany, France, the United Kingdom, Spain, Italy, and the Netherlands experienced the highest immigration rates.
- Japan: Japan had strict immigration policies, but in the early 1990's, issues such as low birth rates and an aging work force caused the country to reevaluate its laws. It is estimated that the number of foreign residents living in Japan in 2008 was more than 2.2 million. The largest groups of immigrants were from Korea, China, and Brazil.

- Mexico: Mexico does experience large numbers of immigrants crossing over the Guatemalan border, but many of these individuals enter illegally and get deported. There were an estimated 200,000 undocumented immigrants in Mexico in 2005 alone. Mexico is also the leading country for migrants moving to the United States. The tighter immigration laws have made immigrating to the U.S. from Mexico very challenging. Many Mexican immigrants enter and live in the U.S. illegally.
- United States: Factors that influence immigration to the U.S. include family reunification, employment opportunities, and humanitarian needs. When President Bill Clinton was in office, the U.S. Commission on Immigration Reform sought to limit legal immigration to about 550,000 people a year. Immigration has remained a heavily debated issue since then. U.S. borders have tightened in recent years to help control illegal immigration. It was documented in 2010 that 1 million immigrants obtained legal permanent resident status for that year.

## **38.1.2: Impact of Immigration on the Immigrant**

Immigrants move to another country with the intent to improve their life; however, immigration presents both benefits and challenges for immigrants.

### **Learning Objective**

Assess the impact that immigration has on immigrants

### **Key Points**

- Some reasons immigrants choose to leave their home countries include economic issues, political issues, family reunification, or natural disasters. Economic reasons include seeking higher wages, better employment opportunities, a higher standard of living, and educational opportunities.
- No matter the reasons behind an immigration decision, immigration provides the immigrant with a new start on life and more growth

- opportunities than were previously available.
- One of the initial challenges faced by immigrants is the cost of immigrating. However, the majority of challenges associated with immigration deal with assimilating into life in the host country.
  - One of the initial challenges faced by immigrants is the cost of immigrating. It is not uncommon for immigrants to liquidate their assets, potentially at a substantial loss, to be able to afford to move.
  - The majority of challenges associated with immigration deal with assimilating into life in the host country.

## **Key Term**

immigrant

A person who comes to a country from another country in order to permanently settle in the new country.

## **Immigration**

Immigration involves the movement of people from their home country to a host country or region, to which they are not native, to live. There are many reasons why immigrants choose to leave their home countries, including economic issues, political issues, family reunification, and natural disasters. In general, no matter what the reasoning is, immigrants move to another country to improve their life. Immigration presents both benefits and challenges for immigrants.

## **Benefits of Immigration**

There are many benefits associated with immigration. Primarily, immigrants choose to leave their home country in order to improve their quality of life. Economic reasons for immigrating include seeking higher wage rates, better employment opportunities, a higher standard of living, and educational opportunities. It is also common for immigrants to leave their home country to escape from poverty, religious persecution, oppression, ethnic cleansing, genocide, wars, or a political structure (e.g.

repressive dictatorship). No matter what the reasoning is behind immigration, it provides the immigrant with a new start on life and more growth opportunities than were previously available. Success in a new country is not guaranteed and often requires hard work and sacrifices, but many immigrants are willing to take risks for the possibility of a better future for themselves.



## **Immigration**

This picture shows a group of North African immigrants on a boat near the island of Sicily. When most immigrants choose to leave their home country, the intent is to move in order to obtain a higher quality of life in the host country.

## **Challenges of Immigration**

One of the initial challenges faced by immigrants is the cost of immigrating. Many immigrants are seeking better economic conditions in a new country, so the cost of moving can be substantial for them. It is not uncommon for immigrants to liquidate their assets, potentially at a substantial loss, to be able to afford to move. Also, during immigration many individuals are without work and must find work once they get settled.

The majority of challenges associated with immigration deal with assimilating into life in the host country. Many immigrants take low wage jobs until they can adjust to society, gain housing, and obtain an education. Immigrants must learn a new way of life and become familiar with the language and laws of the host country. While many immigrants leave their home country to escape persecution, it is possible that they could face discrimination or even racism in the host country. The process of immigrating is not easy, but for many individuals staying in their home country does not provide them with a promising future. Most immigrants are willing to take risks and work hard to build a solid future even though the process can be challenging.

### **38.1.3: Impact of Immigration on the Host and Home Country Economies**

Immigration has both positive and negative effects on the host and home countries including population totals, employment, and production.

#### **Learning Objective**

Explain how immigration impacts the host country and the home country of immigrants

#### **Key Points**

- People immigrate for many reasons, some of which include economic or political reasons, family reunification, natural disasters, or the desire to change one's surroundings.
- Immigration can represent an expansion of the supply of labor in the host country.
- Host countries are faced with a variety of challenges due to immigration including population surges, support services, employment, and national security.
- Reasons to immigrate can include the standard of living not being high enough, the value of wages being low, a slow job market, or a lack of educational opportunities.

- In the long run, large amounts of immigration will weaken the home country by decreasing the population, the level of production, and economic spending.

## **Key Terms**

immigration

The act of coming into a country for the purpose of permanent residence.

assimilate

To absorb a group of people into a community.

## **Immigration**

Immigration involves the movement of people from their home country to a host country, of which they are not native, to settle and live. People immigrate for many reasons; some of which include economic or political reasons, family reunification, natural disasters, or the desire to change one's surroundings.

In 2006, the International Organization for Migration estimated the number of foreign migrants worldwide to be more than 200 million. Europe, North America, and Asia host the largest number of immigrants totaling 70 million, 45 million, and 25 million in 2005, respectively .





## Immigration Rates

This map shows the migration rates worldwide in 2011. The blue countries experienced positive rates, orange indicates negative rates, green shows stable rates, and the gray shows where no data was available. Immigration involves individuals moving from their home country to live in a non-native country. In 2005, Europe, the United States, and Asia had the highest levels of immigration worldwide.

## Impacts on the Host Country

A host country experiences both advantages and challenges as a result of immigration. At certain times throughout history, larger migrations have taken place which created huge population surges. The higher population numbers placed strain on the infrastructure and services within the host country. When immigrants move to a new country, they are faced with many unknowns, including finding employment and housing, as well as adjusting to new laws, cultural norms, and possibly a new language. It can be a challenge for a host country to assimilate immigrants into society and provide the necessary support.

Immigration does cause an increase in the labor force. This can impact great quantities of them if the immigrants are generally the same type of worker (e.g. low-skilled) and immigrate in large enough numbers so as to significantly expand the supply of labor.

Immigration is still a heavily debated topic in many host countries. Some believe that immigration brings many advantages to a country both for the economy and society as a whole. Others believe that high immigration

numbers threaten national identity, increase dependence on welfare, and threaten national security (through illegal immigration or terrorism). Another argument is that high immigration rates cheapens labor. Empirically, research has shown this may be partially true. The Brookings Institute found that from 1980 to 2007, immigration only caused a 2.3% depression in the wages of the host country. The Center for Immigration Studies found a 3.7% depression in wages during 1980 to 2000.

## **Impacts on the Home Country**

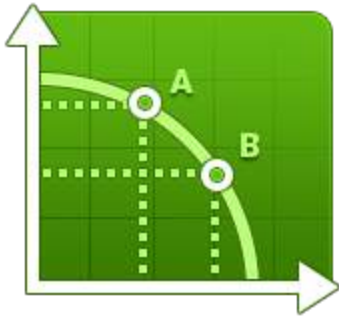
The home country also faces specific challenges in regards to immigration. In many cases, immigrants move to another country to provide positive changes for their future. Reasons to immigrate can include the standard of living not being high enough, the value of wages being too low, a slow job market, or a lack of educational opportunities. A home country must analyze immigration statistics to determine and address why citizens are moving to other countries. In the long-run, large amounts of immigration will weaken the home country by decreasing the population, the level of production, and economic spending. If a country is losing citizens due to economic reasons, the situation will not improve until economic changes are made.

At times, citizens of a country may leave because of non-economic reasons such as religious persecution, ethnic cleansing, genocide, war, or to escape the government (for example, a dictatorship). In these cases, it is not uncommon for the citizens to return to the home country at some point once the threat is no longer present. While a citizen is living in another country, if they receive an education and create a solid life, their individual success can also be beneficial to the home country, if they use their acquired skills to make a difference. Many individuals do not forget their home country and continue to support family members financially through the income from the country they migrate to.

## **Attributions**

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