

Economics in Two Lessons

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Introductory

Preface

Moral: To understand economics you need to know not only fundamentals but also its *nuances*. Darwin is in the nuances. When someone preaches “Economics in one lesson,” I advise: Go back for the second lesson.

Paul Samuelson “An Enjoyable Life Puzzling Over Modern Finance Theory”, *Annu. Rev. Financ. Econ.* 2009. 1:19–35

As the name implies, this book is, or at least began as, a response to Henry Hazlitt’s *Economics in One Lesson*, a defense of free-market economics first published in 1946. But why respond to a 70-year old book when new books on economics are published every day? Why two lessons instead of one? And where does opportunity cost fit into all this?

The first question was one that naturally occurred to me when Seth Ditchik, my publisher at Princeton University Press suggested this project. It turns out that *Economics in One Lesson* has been in print continuously since its first publication and has now sold more than a million copies. As with many other bestsellers with similarly appealing titles, readers have embraced the message that all problems have a simple answer, and one that matches their own preconceptions.

Hazlitt, as he makes clear, was simply reworking the classic defense of free markets by the French writer Frédéric Bastiat, whose 1850 pamphlets ‘The Law’ and ‘What is Seen and What is Unseen’ form the basis of much of *Economics in One Lesson*. However, Hazlitt extends Bastiat by including a critique of the Keynesian economic model developed in response to the Great Depression of the 1930s.

Both where he was right, and where he was wrong, Hazlitt’s arguments remain relevant today, and have not been substantially improved on by today’s advocates of the free

market. Indeed, precisely because he was writing at a time when support for free markets was at a particularly low ebb, Hazlitt gave a simpler and sharper presentation of the case than many of his successors.

Hazlitt presented the core of the free-market case in simple terms that have not been improved upon by any subsequent writer. And despite impressive advances in mathematical sophistication and the advent of powerful computer models, the basic questions in economics have not changed much since Hazlitt wrote, nor have the key debates been resolved. So, he may be read just if he were writing today.

The simplicity of Hazlitt's argument is his great strength. By tying many complex issues to a single principle, Hazlitt is able to ignore secondary details and go straight to the heart of the free market case against government action. His answer in every case flows from his 'One Lesson'.

Hazlitt's claim to teach *Economics in One Lesson* is similar in its appeal to other bestsellers like *The Secret* and *The Rules*, in providing a simple answer to problems that have puzzled humanity since the dawn of civilization. As with these other bestsellers, Hazlitt is offering a delusion of certainty. His One Lesson contains important truths about the power of markets, but he ignores equally important truths about the limitations of the market. So, we need *Economics in Two Lessons*.

Two lessons are harder than one. And thinking in terms of two lessons comes at a cost: we can sustain neither the dogmatic certainty of Hazlitt's free-market policies nor the reflexive assumption that any economic problem can be solved by government action. In many cases, the right answer will remain elusive, involving a complex mixture of market forces and government policy. Nevertheless, the two lessons presented here provide a framework within which almost any problem in economic policy can usefully be considered.

Introduction

Some of the key questions of economics are:

- * Will Keynesian fiscal policies secure full employment?
- * Should the government invest more in infrastructure ?
- * Do minimum wages benefit workers?
- * Can price controls stop inflation ?

Hazlitt answers 'No' to all these questions. His *One Lesson* is:

The art of economics consists in looking not merely at the immediate but at the longer effects of any act or policy; it consists in tracing the consequences of that policy not merely for one group but for all groups.

As Hazlitt develops the argument, his meaning becomes clear. The direct benefits of more jobs and public works, higher wages and lower prices are obvious. But these benefits do not come without costs, often borne by groups far removed from the beneficiaries. The true measure of cost is not a money value, but the alternative use to which resources could have been put. In Hazlitt's words:

Everything ... is produced at the expense of foregoing something else.

Economists call this foregone value 'opportunity cost'. The centerpiece of this way of thinking is the concept of opportunity cost. This key idea comes up in the first few weeks of any Economics 101 course, and the definition is easy enough to memorize and restate. Learning to think in terms of opportunity cost takes a lot longer, and many students (including some who go on to become professional economists) never do so.

But how does Hazlitt get from the idea of opportunity cost, accepted by nearly all economists, to the conclusion that government intervention in the economy is hardly ever justified? To begin with, Hazlitt assumes that the opportunity cost of any good or

service is its market price. Therefore, he infers, any government interference with markets, such as the provision of 'free' services, must involve hidden costs that outweigh the immediate benefits.

We can restate Hazlitt's Lesson as:

Assuming that market prices are equal to opportunity costs, government interventions that change the market allocation must have opportunity costs that exceed their benefits.

Hazlitt never spells out the relationship between prices and opportunity costs. As a result, he implicitly assumes that there is a unique market allocation, in which prices equal opportunity costs, and that the two can only differ as a result of government interference. This assumption is not, in general, true.

Decades before Hazlitt, economists such as Alfred Marshall and AC Pigou had developed the concept of 'externalities' that is situations in which market prices don't fully reflect social opportunity costs. The classic example is that of air or water pollution generated by a factory. In the absence of specific government policies, the costs of pollution aren't borne by the owner of the factory, or reflected in the prices of the goods the factory produces.

Externalities are just one example of a large class of problems referred to by economists as 'market failures'. In all these cases, prices differ from social opportunity costs. In some cases, but not all, the problems may be remedied by appropriately designed government policies. A typical intermediate course on microeconomic policy begins with a catalog of market failures (ref Bator), and goes on to examine arguments about the desirability or otherwise of possible policy responses.

When I began writing this book, I envisaged it as a non-technical guide to microeconomic policy, based on the concepts of opportunity costs and market failure.

As I worked on the book, though, I felt dissatisfied. Externalities and related market failures are a big issue; the problem of climate change has been aptly described by Sir Nicholas Stern as 'the biggest market failure in history'. But at a time of chronic

economic recession or depression in much of the developed world, and of rapidly growing economic inequality, a book on market failure alone could scarcely justify the title *Economics in Two Lessons*.

I started to think more about the problem of unemployment and how it is treated in Hazlitt's work. Much of *Economics in One Lesson* can be read as an attack on the work of John Maynard Keynes the great English economist, whose *General Theory of Employment, Interest and Money* was published in 1936 and gave rise to the entire field of macroeconomics (the study of disturbances affecting aggregate levels of employment, interest rates and prices).

Experience shows that the economy frequently remains in a depression or recession state for years on end. Keynes was the first economist to present a convincing account of how a market economy could operate for long periods at high levels of unemployment. By contrast, despite the then-recent experience of the Great Depression, Hazlitt implicitly assumed that the economy is always at full employment, or would be if not for government and trade union interference.

As I worked on the problem, I reached the conclusion that the central problem could be stated in terms of opportunity cost. In a recession or depression, markets, and particularly labor markets, don't properly match supply and demand. This means that prices, and particularly wages, do not, in general, determine opportunity costs.

That insight doesn't tell us what, if anything, governments can do to restore and maintain full employment. But it does lead us to a crucial observation, ignored not only by Hazlitt but by the majority of mainstream economists today. It is normally assumed that, in the absence of obvious market failures in some particular part of the economy, Hazlitt's *One Lesson* is applicable. But a recession or depression affects the economy as a whole, and means that opportunity costs will not, in general, be equal to market prices in any sector of the economy.

The other crucial issue of the day is the distribution of income and wealth, which is becoming steadily more unequal. Although he does not say so explicitly, Hazlitt implies that the existing market distribution of income (or rather, the one that would emerge after the policies he dislikes are scrapped) is the only one that is consistent with his One Lesson.

The market outcome depends on the system of property rights from which it is derived. In fact (as we will see later) when markets work in the way Hazlitt assumes, any distribution of goods and resources where prices equal opportunity costs can be derived from some system of property rights. So Hazlitt's Lesson tells us nothing useful about the distribution of income or about government policies that may change that distribution.

While markets are exceptionally powerful social institutions, they cannot work unless governments establish the necessary framework in which they can operate. The core of the economic framework in a market economy, and a central role of government, is the allocation and legal enforcement of property rights.

The choices that determine property rights are subject to the logic of opportunity costs just as much as the choices made within a market setting by firms and households.

Between them, microeconomics, macroeconomics and income distribution cover all the critical issues in economic policy. To master any one of these fields requires years of study. In microeconomics, for example, it is necessary to deal with the theory of supply and demand, first by manipulating the graphical representations given in a typical Economics 101 course, and then with more complex algebraic and numerical techniques.

But this level of analysis is required only for specialists who need, for example, to answer questions like 'How much will a change in taxation of new automobiles affect employment in the steel industry?'. Most of the questions of principle involved in public policy can be illuminated by a careful application of the idea of opportunity cost,

and its relationship to market prices. For this purpose, as I argued above, we need two lessons.

The first lesson, implicit in Hazlitt's is:

Lesson 1: Market prices reflect and determine opportunity costs faced by consumers and producers.

The second lesson is the product of more than two centuries of study of the way markets work, and the reasons that they often fail to work as they should:

Lesson 2: Market prices don't reflect all the opportunity costs we face as a society.

The problem of how markets work and why they fail is at the core of most of the economic policy issues that drive political and social debate. I hope this book, and the two lessons it contains will help to clarify these issues.

The book is in four parts:

Part I is a discussion of Lesson 1, showing how a market economy functions under conditions that ensure prices are equal to the opportunity costs faced by producers and consumers.

Part II is a series of applications of Lesson 1. First, we will see how the price mechanism works, using the example of the market for oil. Next we will consider how policies based on the concepts of prices and opportunity costs can be used to achieve the goals of public policy.

Part III presents Lesson 2, showing that market prices do not reflect the opportunity costs faced by society as a whole. In fact, any market equilibrium is the product of social choices about the allocation of property rights. Market prices tell us nothing about the opportunity costs associated with those choices.

Equally importantly, not all opportunity costs associated with consumer and producer choices are reflected in the opportunity costs they face. There are many different ways in which market prices can fail to reflect opportunity costs. These 'market failure' problems

include unemployment, monopoly, environmental pollution and inadequate provision of public goods. Lesson 2 will help to show how these disparate problems can all be understood in terms of opportunity costs.

Part IV contains applications of Lesson 2 to a wide range of policy problems. First, we will consider the problem of income distribution. We will show that, more often than not, the best way to help poor people, at home and abroad, is to give them money to spend as they see fit, rather than tying assistance to particular goods and services. That is, it is better to fix the inequitable allocation of property rights in the first place than to fix the resulting market outcome.

Next we will consider how macroeconomic problems, the most important of which is mass unemployment, may be addressed using fiscal and monetary policy.

Finally, we will examine a range of public policies more conventionally associated with the idea of market failure.

Lesson 1, Part I: The Lesson

1. Market prices and opportunity costs

Most introductory economics textbooks start with a discussion of opportunity cost. Having been discussed in a couple of pages, though, the concept of opportunity cost typically disappears, to be replaced by a diagrammatic exposition of the way in which prices are determined by supply and demand. This exposition can be further elaborated using the idea of elasticity (a measure of price responsiveness) to show how prices respond to changes in the conditions that determine supply and demand.

All of this is useful and necessary, as the starting point in the training of professional economists, although many of them would benefit from a more thorough grounding in the idea of opportunity cost.¹ But, to understand the economic questions commonly raised in public discussion, the technical apparatus of supply and demand analysis is largely unnecessary, and may even get in the way.

By contrast, an understanding of opportunity cost is crucial. In this chapter, we will begin with a careful exposition of the core idea. Next we will consider the relationship between opportunity cost and more familiar measures of the cost of production. Finally, we will examine opportunity cost in relation to the choices we face, as consumers, workers and households.

¹ A well known, and inevitably controversial, study reported that only 22 per cent of 200 economists attending the 2005 annual meetings of the American Economic Association gave the correct answer to a simple question on opportunity cost measures. <http://epp.gsu.edu/pferraro/docs/FerraroTaylorDismalPerformance.pdf>

1.1 What is opportunity cost?

Remember that Time is Money. He that can earn Ten Shillings a Day by his Labour, and goes abroad, or sits idle one half of that Day, tho' he spends but Sixpence during his Diversion or Idleness, ought not to reckon That the only Expence; he has really spent or rather thrown away Five Shillings besides.

Benjamin Franklin, From his *Advice to a Young Tradesman from an Old One*" (1746)

Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

Robert Frost, *The Road Not Taken*, 1921

Economists are famous for disagreeing among themselves. Keynesians argue with monetarists about fiscal policy. Members of the Chicago School, including a string of Nobel Memorial² Prizewinners, advocates unfettered free markets, while the case for government intervention in the economy is championed by economists such as Paul Krugman, Amartya Sen and Joseph Stiglitz, all of whom have also been awarded the Prize. As George Bernard Shaw is supposed to have observed, 'If all the economists in the world were laid end to end, they still wouldn't reach a conclusion.'

And yet, there is an economic way of thinking that separates any serious economist, regardless of their views on policy, from just about anyone who has not studied economics. Some people, such as Benjamin Franklin get the idea without any formal training. Franklin's observation, cited above, that 'time is money' has become such a truism that it is often taken to be a traditional proverb rather than the acute observation it was when he made it. Franklin's

² The Economics Prize is not one of the original Nobel Prizes, and its full name is The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel. Philip Mirowski has some interesting remarks on how the prize came into existence <http://ineteconomics.org/video/30-ways-be-economist/philip-mirowski-why-there-nobel-memorial-prize-economics>

explanation points to a far broader point, which forms the basis of the central idea in economics: opportunity cost.

The idea of opportunity cost is inseparably bound up with choice. When we make a choice between alternatives choosing one implies forgoing the other. To paraphrase Robert Frost, the opportunity cost of walking down one road is whatever would have been found on the road not taken. It is this road not travelled, and not any monetary measure, that is most properly regarded as the cost of our choice.

To sum up:

The opportunity cost of anything of value is what you must give up to get it.

This is an idea that seems simple enough when it is first presented, but turns out to be unexpectedly subtle. The lesson of opportunity cost is easy to state, but hard to learn. A large part of any good course in introductory economics consists of attempts to lead students to an understanding of the idea.

Let's consider some examples, starting with some simple (in fact, simplistic) textbook cases. For people who are largely self-sufficient producers, or who trade mainly through barter, opportunity cost can be described in simple terms. This is why introductory economics courses spend so much time worrying about Robinson Crusoe, alone on his island, or engaged in barter transactions with Friday.³

If Crusoe spends a day fishing, when the best alternative was to pick coconuts, the opportunity cost of the fish he eats for dinner is the coconut he might have enjoyed if he had spent the day foraging on land instead.

Alternatively, perhaps, Crusoe might have traded his fish to Friday in return for, say, some roast goat. If the trade goes ahead, then Crusoe's opportunity cost for his goat dinner is the fish he traded. For Friday, the reverse is true. He gets fish for dinner, and the opportunity cost is the goat.

The benefit of the trade to Crusoe is the opportunity cost of obtaining the goat some other way. If this cost is greater than the opportunity cost of fishing, then the trade is a good one from Crusoe's viewpoint. The same is true for Friday and the fish.

³ In Defoe's novel, Crusoe's relationship with Friday was that of master and servant rather than, as in economic textbooks, trading partner. We will discuss this more in Section ...

These examples are oversimplified, and conceal a range of complexities. A couple are worth mentioning straight away. First, Crusoe can't know for sure what will happen if he goes foraging for coconuts instead of fishing. The problem of uncertainty is inescapable and, often, intractable. Second, in discussing barter, we haven't said how Crusoe comes to have the fish, and Friday the goat. We'll look at both of these issues, and the complexities they raise, later on.

Introducing money complicates the problem even more, and provides plenty of opportunities for fallacious reasoning. The lesson of opportunity cost is that, contrary to the popular view, economics is not 'all about money'. In fact, the lesson of opportunity cost is harder to learn, the more accustomed you are to thinking about costs and benefits in monetary terms. The principle of opportunity cost is relevant to decisions of all kinds, whether or not there is any monetary cost associated with those decisions.

Sometimes, as we will see, the money price of a good or service is a good measure of its opportunity cost. But very often, as Franklin points out, it is not. The sixpence spent on idle diversion is only part of the opportunity cost of a day off. And even adding the foregone earnings of five shillings may not capture the entire cost. Perhaps the hard working tradesman might have built up goodwill, leading to future demand for his services; this is also part of the opportunity cost.

Opportunity cost is equally relevant to public policy. This is obvious in relation to decisions to provide some particular good or service to the public. In making such a decision, governments forgo opportunities, including alternative expenditure items, cuts in taxation or reductions in public debt (allowing for higher spending in the future). The opportunity cost of a particular item of public expenditure is the value of the best available alternative.

Sometimes, the way in which choices are presented makes it appear that an attractive good can be obtained at no cost. However, a careful consideration of the alternatives usually shows that there is an opportunity cost involved. As we go on, we will see numerous examples of this.

1.2 Production cost and opportunity cost

How does opportunity cost relate to ideas about costs with which we are more familiar, such as the cost of production? And how does this relate to prices?

The cost of production is the value, at market prices, of the resources the producer uses in producing a good or service, including raw materials, the labor of employees, the capital employed in production, and the time and effort of managers.

To illustrate, think about a small business, such as a garment maker, specializing, say, in making jackets. For any particular jacket, some of the costs (materials, cutting, sewing and so on) are specific to that item, while others are ‘overhead’ or fixed costs, needed to keep the business running however many jackets are produced.

The prices paid for these inputs reflect the opportunity costs faced by their owners when they supply them. For the landlord, this is the rent they could get from another tenant. For the suppliers it is the price they could get from another buyer. For workers and the owner-manager it is their best alternative, whether this is another paid job, work at home or leisure.

It’s easy enough to see that, for purchased inputs like cloth and other materials, this opportunity cost is just the market price. The price charged for cloth by a textile manufacturer will be the same for any buyer of medium-sized quantities, whether it is used for jackets, skirts, drapery or sold in a retail haberdashery store. So, this price is the amount the manufacturer forgoes by selling to one buyer rather than another, and is the same whoever buys the cloth.

The same is true, in most cases, as regards rent on shop space. Provided the rent is paid, and the building maintained, landlords do not care whether they rent to a garment maker or to some other tenant, say, a shoe repair business. Similarly, the garment maker has a choice of locations, and will be unwilling to pay a premium price. So, the rent will reflect the opportunity cost of the space.

The logic of opportunity cost is clear enough for items such as materials and rent. However, because labor is the most important input to production in any economy, the cost of producing any good or service is determined, to a substantial extent, by the wage cost of the labor time required. Does the analysis of opportunity cost apply to work and wages?

At one level, the answer is “Yes”.

The workers who produce a given good or service could have spent their time on another job (assuming other jobs are available), or at home, working around the house or enjoying leisure. In the first case, the opportunity cost of labor time is the wage workers could have received if they took their ‘outside option’, that is, the best available alternative job. The ‘wage’ consists

not merely of the hourly rate, but of employer-provided benefits and working conditions, including those that affect the enjoyability, safety and security of the job.

Under conditions of full employment, it is easy enough for workers with generic skills to move from one job to another. And, in competitive labor markets, wages and working conditions are typically much the same for jobs with similar requirements and responsibilities.

An employer who offers wages below the opportunity cost of workers' time, will not lose all their workers immediately. But their most mobile workers (usually including the best ones) will start looking for new jobs, and will be hard to replace when they leave.

In the long run, therefore, an employer in a competitive labor market must pay the market wage. Under these circumstances, the market wage is, in general a good measure of the opportunity cost for buyers and sellers. In a competitive labor market, where jobs are plentiful and workers can choose between employers, wages will, therefore tend to reflect the opportunity costs faced by workers.

To sum up:

When markets are competitive, with many buyers and sellers, the cost of production reflects the opportunity cost of the inputs used, as perceived by input suppliers.

Labor markets raise more complex issues, which we will discuss when we come to Lesson 2. When unemployment is high, workers are not free to move from one job to another. Even in situations of full employment, workers with specialized skills may have only a limited choice of employers. And, with labor market institutions such as employer-funded health insurance, switching jobs may be costly.

Nevertheless, the costs of production are determined, to a large extent, by the opportunity cost of the inputs used. So, both Lesson 1 and Lesson 2 must be used to understand them.

1.2.1 Fixed cost, variable cost marginal cost and sunk cost

To understand opportunity cost more fully, it's useful to look at the cost of production in more detail. One way of breaking down the cost of production is to classify costs as either 'fixed'⁴ or 'variable'. The fixed costs are those that arise from a decision to undertake production in the first place; for example, rent on premises, the cost of necessary capital equipment and so on.

⁴ In business parlance, fixed costs are often called 'overheads'.

Variable costs are those that depend on the amount produced, such as the cost of input materials and the wages of production workers.

This distinction isn't hard and fast, and depends on the length of time over which choices are made. On any given day, staff who have turned up for work have to be paid, so the only variable costs are those of the raw materials actually used that day. Over a period of years, it's possible to invest (or not) in additional machinery, move to new premises and so on, so that nearly all costs are variable. Nonetheless, the distinction is a useful one.

Having drawn the distinction between fixed and variable costs we can deepen our understanding of the opportunity costs of production. First, let's consider the increase (or reduction) in variable cost that arises when more (or less) of some good or service is produced. This is called the marginal cost of production.

Assuming that the firm is concerned only about profits, it will choose to produce more only if the market price is at least as high as the marginal cost of production for one extra unit. This is an example of Lesson 1, with marginal cost as the relevant form of opportunity cost.

While producers must adjust their production up or down in response to market prices on a regular (say, daily) basis, they must also pay attention to their business as a whole, and consider whether it is better to continue in business or to close down. A decision to shut down altogether saves all the variable costs of production, and potentially some of the fixed costs, such as the need to pay rent on premises.

The crucial distinction here is between those fixed costs that can be avoided by shutting down and those that cannot. Only avoidable costs represent part of the opportunity cost of continuing production. Costs that cannot be avoided or recouped, whatever choice is made, are called 'sunk costs'. One of the crucial insights of opportunity cost reasoning (echoed in the folk wisdom 'don't throw good money after bad') is that sunk costs should not influence our decisions, since there is nothing we can do to change them.

The relevance of sunk costs goes far beyond business decisions. In all kinds of long-term projects, from university studies to personal relationships, we face the decision on whether to persist or not. The problem of sunk costs arises mostly when, in retrospect, we regret our decision to begin the project. Sunk costs can lead us astray in two different ways.

On the one hand, we may think that, having invested heavily in a project, we should see it through, regardless of future costs and benefits, rather than waste all our effort. On the other

hand, we may conclude that, no matter what happens in the future, the project as a whole is bound to have had more costs than benefits and that we should therefore abandon it immediately. Both forms of reasoning are rejected by the logic of opportunity cost. What matters to a choice are the alternatives available now, not the costs that have been incurred in the past.

1.3 Households, prices and opportunity costs

We've just seen how the logic of opportunity cost applies to producers. What about consumers? When we make our own daily decisions about what and how much to buy, market prices usually determine the opportunity costs we face.

Consider the age-old problem of balancing the family budget. Despite the good advice we receive, few of us do this in the systematic manner prescribed by manuals of home economics. Rather, most of us pay the bills that have to be paid, buy what we see as necessities and then see what is left over.

Sometimes, there's enough that we can pick and choose among optional expenditures. In this case, the logic of opportunity cost is clear enough. We can afford a nice new jacket, made by the garment shop in the previous section, or a pleasant restaurant meal but not both.

If we choose the jacket, its opportunity cost is the meal or meals we might have enjoyed with the same expenditure. The market price of the jacket tells us how much, in the way of eating out or other optional expenditures, we must give up in order to get it.

At other times, the choices may be more difficult. There may not be enough money to pay for the necessities, let alone the luxuries. In these circumstances, the choices are either to go without (effectively redefining 'necessities') or to go into debt, for example by running up the balance on the credit card.

If the decision is to go into debt, the opportunity cost of resolving the immediate problem of paying the bills is the increased difficulty of the choice that will have to be made in a month's time, when the credit card debt, plus interest, will be added to the regular bill. One way or another, the logic of opportunity cost is always relevant.

On the other side of the ledger, we must earn the money to pay our bills. For most households, this money comes primarily from wage employment. Depending on the nature of the job, we may be able to work more (or less) hours, gaining (or giving up) extra income from overtime. In

the longer term, a couple household must choose whether both members will seek full-time work, or whether one will spend more time at home.

Time at home can be allocated to household work, childcare or leisure. The wage that could otherwise be earned in the market is the opportunity cost of this time.

So, these everyday choices illustrate Lesson 1

Market prices (including wages) tell us about the opportunity costs we face as consumers and workers

But market prices are only one side of the equation that determines our possible choices. On the other side of the equation is income: the more we have, the wider the range of choices open to us. Incomes in turn are determined by the allocation of property rights including financial wealth, access to education, obligations to pay debts including taxation, and rights to receive income from others, or from government programs like Social Security.

Hazlitt, like other advocates of the free market, assumes the allocation of private property rights to be preordained and natural, while treating government programs as an arbitrary intervention. In fact, all property rights are constructions of government and law.

In some cases these constructions are obvious and immediately visible: in others they are decades or centuries old. Either way, the set of property rights is logically prior to the determination of property rights.

A huge amount of intellectual effort has gone into determining the prices that will emerge from a given set of property rights, production technologies and consumer preferences. In the next section, we will examine the outcomes of this effort in the light of Lesson 1.

2 Markets, opportunity cost and equilibrium

When we make a market choice, between one item and another, the opportunity cost of one item is determined by its price relative to that of the alternatives. The same is true for a firm deciding what, and how much, to produce. These observations raise a number of questions>

- * How are prices themselves determined?
- * How can the same price reflect opportunity costs for both producers and consumers?
- * Do exchanges at market prices benefit everyone, or does one party (say, the seller) always benefit at the expense of the other?

We will examine the last of these questions first. In section 2.1 we will show that, contrary to many perceptions, economic interactions can provide everyone with a ‘free lunch’. In section 2.2 we will discuss market exchanges and show how both parties to such an exchange must benefit. In section 2.3 we will look at the special case of international trade, and introduce the concept of comparative advantage. Finally, in section 2.4, we will look at the determination of competitive equilibrium prices. Under some stringent conditions⁵ a competitive equilibrium illustrates a strong form of Lesson 1:

In an ideal competitive equilibrium, market prices will equal opportunity costs, leaving no free lunches on the table.

2.1 TISATAAFL

The acronymic adage TANSTAAFL (There Ain’t No Such Thing As A Free Lunch) was popularized, particularly in market libertarian circles, by Milton Friedman’s book of that name and, a little earlier, by Robert Heinlein’s science fiction classic, *The Moon is A Harsh Mistress*.⁶

The acronym is derived from a marketing ploy used by 19th century saloons, which offered a ‘free’ lunch to customers, on the assumption that they would wash it down with beer or other drinks. Naturally, the cost of the lunch was incorporated in the price of the drinks. And

⁵ Hazlitt, and other writers in the same vein, typically assume that these conditions hold, without bothering to spell them out.

⁶ As with many such phrases, its origin is lost to time. Wikipedia traces the phrase back to a 1938 article in the *El Paso Herald-Post* where it is the punchline of a joke. This implies that readers already understood the point of the adage, which had presumably circulated in oral form for some time https://en.wikipedia.org/wiki/There_ain%27t_no_such_thing_as_a_free_lunch

presumably, as with the peanuts and pretzels offered in bars today, the meals had plenty of salt, to encourage drinking.

The key idea may therefore be restated in terms of the broader point that it is opportunity cost, rather than just monetary cost, that matters when making economic decisions. Although there is no explicit charge for the lunch, patrons can only consume it at the opportunity cost of forgoing cheaper beer to go with the lunch.

Libertarians commonly use the TANSTAAFL adage to point out that services provided ‘free’ by governments will, in general, have an opportunity cost. ‘Free’ provision of some service must be funded either by higher taxes or by reductions in other areas of public expenditure. The more general point, that it’s necessary to look at the full opportunity cost of any good or service, and not just the immediate price, is yet another version of Lesson 1.

But there is a contradiction here. Most economists think that improved economic policy could yield better outcomes for everyone, even though they may disagree about which policies would yield this result. Libertarians, who extol the benefits that might be realized by rolling back the state and giving markets free rein, are no exception to this rule.

A free lunch is ‘something for nothing’, that is a benefit obtained with no opportunity cost. Conversely, TANSTAAFL holds if and only if there are no free lunches left on the table, which in turn will only happen if the economic system is functioning perfectly. So, if economic outcomes can be improved for everyone, the correct statement is TISATAAFL (There Is Such A Thing As A Free Lunch).

The TANSTAAFL adage embodies an important truth applicable to many apparent ‘free lunches’, in which the true opportunity cost is carefully hidden. If TANSTAAFL were literally true, however, humanity could never have risen above subsistence.

The more important truth, central to economics ever since Adam Smith wrote *The Wealth of Nations* in the 18th century, is TISATAAFL. Even the poorest person in a modern developed economy enjoys a range of goods and services that were unavailable to our ancestors, with less effort and toil. The improvements in living standards generated by a modern economy are, for us, a free lunch. In fact, economics tells us about two kinds of free lunch, technological innovations and improved allocation of resources.

Technological innovations are the most obvious kind of free lunch. Technological innovations that allow us to produce a given output with less of every kind of input, including labor, provide us with the classic example of free lunch. Adopting the new technology allows us to increase output without using any additional resources. So, the opportunity cost of the additional output is zero. To put this point the other way around, additional production entails opportunity costs only if it is technically efficient.

The second kind of free lunch, the core concern of economics, arises from improved allocation of resources. Lesson 1 leads us to think about improvements that can be generated by allowing markets to work⁷.

Exchange through trade and markets can generate benefits for everyone, compared to a situation where everyone relies on themselves. When Crusoe trades fish for Friday's goat, each obtains a meal that would have had a higher opportunity cost in the absence of trade. The improvement is a (partly) free lunch, or maybe a free dinner.

By contrast, the saloon story underlying TANSTAAFL, in which an apparent bargain turns out to be nothing of the kind, stands in stark opposition to the economic idea of exchange as a bargain in which both parties benefit. It is in line with the pre-modern view of trade as a zero-sum game, in which any gain to one part is a loss for the other.

With a correct economic analysis, the saloon story illustrates TISATAAFL. Suppose that the customer would be willing to pay the saloon's price for the beer alone. Then, compared to the situation in the absence of exchange, the lunch really is free. For the lunch not to be free, the price of beer in the saloon must be more than the opportunity cost of obtaining the beer some other way, for example, at another saloon or through home brewing.

However, assuming the saloon is not operating at a loss, its price must cover the saloon's opportunity cost of providing both the beer and the lunch. If this cost is the same as that facing businesses where the beer and the lunch are priced separately, then the price of the lunch is fully included in the price of the beer and there will be no free lunch.

Under ideal conditions, the market outcome will ensure that there are no free lunches left on the table. These are the conditions of perfect competitive equilibrium, which we will consider in Section 2.4. But first, we will look in more detail at the idea of gains from exchange.

⁷ In Lesson 2 we will see that public policy can yield improved resource allocation when markets fail to match prices and social opportunity costs.

2.2 Gains from exchange

Understanding opportunity costs leads us to a central idea of economics. This is the idea of gains from exchange, or, more precisely, the idea that a voluntary exchange of goods and services can, and ordinarily will, leave both parties better off.

At first sight, this idea seems paradoxical, and throughout history, many people have seen any kind of trade as a zero-sum game. That is, whatever one party gains must be at the expense of the other.

The reasoning underlying this apparently plausible view is simple, particularly where goods are traded for money. An item has a 'true value' or 'just price'. If the item is sold for more than its true value, the seller gains at the expense of the buyer, and vice versa.

Opportunity cost reasoning shows why this plausible idea does not hold water. Suppose that Hayek offers a copy of his classic free-market polemic *The Road to Serfdom* to Keynes, in return for a copy of Keynes' *The General Theory of Employment, Interest and Money*. The opportunity cost to Hayek of the copy of Keynes' book is a copy of his own book and vice versa.

Since each of these famous authors has presumably read their own book, and has more copies on hand, the opportunity cost associated with giving up one copy of their own book is small. It might, perhaps be the opportunity of giving the book as a present to a family member.

On the other hand, since it is important to understand one's intellectual adversaries⁸, both Keynes and Hayek would naturally want to read what the other had written. So, the value of the book received in exchange would be greater than the opportunity cost of the book given away, even though both authors would presumably regard their own arguments as more convincing.

Of course, it might be that one or both of the authors doesn't value the opportunity to read the others' work as highly as the opportunity cost of giving up a copy of their own. In this case, trade would indeed be harmful to at least one party. Under these circumstances, however, the trade won't take place. So, the fact that trade takes place is sufficient to conclude that both parties are better off, relative to the alternative of not trading.

⁸ In reality, the idea of Keynes and Hayek as rivals is historically inaccurate. Keynes gave fairly friendly comments on *The Road to Serfdom* and Hayek was not particularly notable among the critics of the *General Theory*. The supposed Keynes-Hayek contest really reflects Hayek's latter-day reputation as the prophet of market liberalism and the 'Austrian school' of economics

The argument doesn't change at all if, instead of bartering goods, the transaction involves money. For the buyer, the opportunity cost of the purchase price of an item is the goods or services the money could have been used for otherwise, and the purchase will go ahead only if the value of the item exceeds this opportunity cost. For the seller, the value of the sale is the value of the goods that can be bought with the proceeds, while the opportunity cost is the item (or, taking the analysis a step further) the resources (labor, capital and so on) used to produce it.

Once again, trade will take place only if the value gained for both parties exceeds the opportunity cost, so that both parties are better off⁹ than they would be without the trade. In fact, trade using money allows us to put things more simply. A sale will take place only if the price is less than the value of the item to the buyer and more than the value of the item to the seller.

The fact that both parties gain from voluntary exchange does not mean that the outcome of such exchanges is fair to both. Before exchange can take place, property rights must be defined and enforced. If property rights are unequally and unfairly allocated in the first place, they will remain unequal and unfair after voluntary exchanges have taken place.

2.3 Trade and comparative advantage

International trade is a special kind of exchange, and one that has always been more complex and controversial than ordinary market purchases and sales between residents of the same country, using the same currency. The language in which international trade is commonly discussed, centered on terms like 'competitiveness', 'surplus' and 'deficit' tends to reinforce the view that exchange, at least between different countries, must be a zero sum game.

Economists have long rejected this view. Their key arguments are based on the concept of comparative advantage, first developed by the great classical economist David Ricardo.

The idea of comparative advantage is subtle, powerful and surprising. An understanding of comparative advantage, and the resulting theory of gains from trade, is one of the things that separates economists from just about everybody else. Not surprisingly, economists are very fond of the idea; sometimes too fond.

⁹ We'll see later on that, in a world with more than two people, and with inequalities of power and wealth, things are not so simple. Even though the argument about gains from trade holds for any trade considered in isolation, unrestricted trade need not make everyone better off.

Ricardo use the example of trade between Portugal (then and now a producer and exporter of wine) and England (then, but not now, a producer and exporter of cloth). I'll try to bring things up to date, by looking instead, at the United States and Australia. In keeping with the general idea of this book, focusing on ideas rather than graphs and calculations, I'll also forgo the presentation of a numerical example - you can find one in any introductory text.

On a superficial look at the two economies, it might seem that Australian producers can't compete with the United States in any important industry. The United States is more technologically advanced, though this gap has narrowed over time. Not only that, but US farmland is far richer and more fertile than Australia's. Australia produces lots of coal and iron ore, but the United States also produces more of these commodities than it needs for domestic use.

Unsurprisingly, the United States exports a lot of manufactured goods, such as boats, to Australia. On the other hand, Australia exports a wide variety of agricultural products to the United States, notably including beef, and would sell more if not for a variety of restrictions on market access, imposed with the aim of protecting United States farmers.

To see why, let's apply Lesson One, and think about the opportunity cost of producing beef in Australia and in the United States. To keep things simple, suppose that the alternative is to produce boats.

Suppose Australia were to produce more boats, and replace imports from the United States. That might be done by converting beef growing land to timber, from which to make boats, and re-employing Australian farmworkers as boatbuilders. Unfortunately, the land on which beef cattle is mostly raised in Australia is low in fertility and doesn't get reliable rainfall. That makes it less productive as cattle country, but it's even less well suited for producing timber. The opportunity cost of using land for beef is the value of the timber that might otherwise be grown, and that value is very low.

The same point applies to labor. In our example, the opportunity cost of farmworkers' labor used in beef production is the extra boats the same workers could produce if they retrained as boatbuilders. For a variety of reasons, output per hour in most Australian manufacturing industries is very low, so the number of extra boats produced for each ton of beef foregone would be small, well below the number that could be produced by transferring US workers from

agriculture (beef) to manufacturing (boats). That is, in the US case the opportunity cost of beef is higher, and the opportunity cost of boats is correspondingly higher.

Putting these points together, we can see that to produce more boats, Australia would have to give up a lot of beef production. By contrast, the opportunity cost of boats and other manufactured goods in the United States is much lower. So, in a simple system of barter, it would make sense for Australians to trade their beef for American manufactures, exactly as happens in reality.¹⁰

2.4 Competitive equilibrium

Let's restate Lesson 1:

Market prices reflect and determine the opportunity costs faced by consumers and producers.

We've seen how market prices determine the opportunity costs we face in making economic decisions as consumers, workers and producers of goods and services. We can't as individuals, change the market prices we face for goods and services in general, so we must take them as given in looking at the opportunity cost of different choices.

But Lesson 1 says something more, namely that market prices also *reflect* opportunity costs. That is, just as the opportunity costs of our choices are determined by market prices, those market prices are determined by our choices. Under ideal conditions, those choices, aggregated over all the members of a society, will reflect the opportunity costs for that society as a whole.

There is a large branch of economic theory devoted to proving results of this kind using formal mathematics. But the core of the idea may be approached using the idea of 'no free lunches' or, more precisely, 'no benefits without *equal* opportunity costs', discussed in the previous section.

As we saw then, this condition requires that all production be technologically efficient. If not, there is always a free lunch to be had by making production more efficient, thereby producing more with the same inputs.

¹⁰ It's true, by the way that the United States sells more good and services to Australia than it buys; that is, the United States has a surplus in its bilateral balance of trade with Australia. But this doesn't reflect an absolute US advantage. After all, China is less advanced than either the United States or Australia, but runs a huge surplus in its trade with the United States and a large deficit in its trade with Australia. This pattern of 'triangular trade' is found quite commonly. It makes sense when trade is determined by comparative advantage.

The second 'no free lunch' requirement is that there should be no gains from mutually beneficial exchange remaining to be realized. It's easy to see that this requirement is closely related to market prices.

Example 1: Suppose that you own a new jacket that you would be willing to trade for tickets to tonight's baseball game, while I have tickets and would be willing to trade them for your jacket.

Now let's look at market prices. If the market price of the jacket is greater than the price of the tickets, there is no need for you to trade with me. You can sell the jacket at the market price, use the proceeds to buy the tickets and have money left over. Since you make the best possible choices that's what you will do. If I want to complete the trade, by selling my tickets and buying the jacket, I will have to make up the price difference.

On the other hand, if the market price of the jacket is less than that of the tickets, the fact that this price prevails indicates that there must be someone else willing to sell jackets, and buy tickets at those prices. So, I can sell my tickets and use the proceeds to buy a jacket, making an exchange that benefits both me and the other parties involved. You, on the other hand, are out of luck. At the prevailing prices, no one is willing to trade tickets for a jacket, and there are no remaining exchanges to be made.

This simple examples give a flavor of the argument that leads to Lesson 1. Intuitively, it suggests the conclusion that trade at market prices will capture all the potential gains from mutually beneficial exchanges, so that no free lunches will be left on the table. In other words, in market equilibrium, TANSTAAFL holds.

This is where casual presentations of Lesson 1 commonly stop. But the simple story above embodies a lot of assumptions about the way markets work:

The most important are:

(A) Everyone faces the same market-determined prices for all goods and services, including labor of any given quality, and everyone can buy or sell as much as they want to at the prevailing prices

(B) Everyone is fully aware of the prices they face for all goods and services, including how uncertain events might affect those prices

(C) No one can influence the prices they face

(D) Everyone makes the best possible choices given their preferences and the technology available to them

(E) Sellers bear the full opportunity cost of producing the good, and buyers receive the full benefit of consuming it, no more and no less. That is, no one can shift costs associated with production or consumption to anyone else without compensation (for example, by dumping waste products into the environment) and no one else receives benefits for which they do not pay.

We can go back to the example to see where each of these conditions fits in.

If the market price of the jacket is greater than the price of the tickets, there is no need for you to trade with me. You can (assumption A) sell the jacket at the market price (which is unaffected by assumption C), use the proceeds to buy the tickets and have money left over. Since you make the best possible choices (assumption D) that's what you will do. If I want to complete the trade, by selling my tickets and buying the jacket, I will have to make up the price difference. By assumption (E), no one else is affected.

This more complicated version of the story can be formulated in mathematical terms to show that, under the stated conditions (and some additional technical requirements), a competitive equilibrium will arise in which there are no free lunches; that is, any potential benefit entails an opportunity cost that is at least as great.

In this 'perfectly competitive equilibrium, the price of any particular good is equal, for everyone who consumes that good, to the opportunity cost of a change in consumption, expressed in terms of the best alternative use they could make of the money paid for the good. Similarly, firms can maximize profits only if the prices of the goods they produce are equal to the opportunity cost of the resources that could be saved by producing less of those goods.

This point is the core of Lesson 1. In a perfect competitive equilibrium prices exactly match opportunity cost. There are no 'free lunches' left. More precisely, any additional benefit that can be generated for anyone in the economy must be matched by an equal or greater opportunity cost, where opportunity cost is measured by the goods and services foregone, valued at the equilibrium prices. This opportunity cost may be borne by those who benefit from the change or by others.

Hazlitt, and many subsequent writers, implicitly assume something much stronger: that if prices reflect opportunity costs, there is no room for improvement in public policy. In particular, he assumes that any policy that benefits one group at the expense of others is undesirable. To put it more strongly, the distribution of income associated with the competitive market equilibrium we might observe if all government intervention were removed is assumed to be optimal.

This idea is false: as we will see there are a vast number (in the usual mathematical formulation, infinitely many) possible outcomes in which there are no free lunches, each corresponding to a different allocation of rights and a different market equilibrium.

3 Time, information and uncertainty

The discussion of Lesson 1 in the previous chapter, like most introductory discussions of economics deal with a timeless world of perfect certainty. Goods are exchanged once and for all. Everyone knows what they are giving up, what they are getting and the price at which the exchange can take place.

Is Lesson 1 still relevant when we think about a more realistic representation of the world, where choices are made over time, and with limited information about the future? If so, what are the market prices in question and how much can they tell us about opportunity costs?

In this Chapter, we will show that the answer to the first question is 'Yes'. Interest rates, insurance premiums and the market values of financial assets are all special kinds of prices. When financial markets function smoothly, they tell us about the opportunity cost of choices between the present and the future and between different possible future contingencies. So, to fully understand the economics of time and uncertainty, we need both Lesson 1 and Lesson 2.

3.1 *Interest and the opportunity cost of (not) waiting*

Interest rates are prices that express the cost of current expenditure, financed by borrowing, in terms of the future repayment that must be made. Interest rates can be expressed in many different ways, but the most common and useful is the Annual Percentage Rate (APR). If the APR is equal to r per cent, \$100 borrowed today converts to a repayment of $\$100 + \r in a year's time. Longer terms may be calculated using the standard formulas for compound interest.

What does this mean in terms of opportunity cost? A useful device is the 'rule of 70' which states that a sum invested with compound interest at a percentage rate of interest r doubles its value in approximately $70/r$ years.¹¹ So, for example, a dollar invested now at 2 per cent will be worth two dollars in 35 years time. That is, the opportunity cost of spending a dollar today is the two dollars of spending that would be available 35 years from now.

A rate of 2 per cent may seem low, but in fact it is the correct starting point for thinking about the opportunity costs involved in choices between the present and the future. Where repayment in full is taken as certain (as was the case until very recently for US government bonds), and where inflation is not a major problem, interest rates are normally around this level. Over the

¹¹ For the mathematically inclined, the basis for the rule is the fact that the natural log of 2 is approximately 0.7, while the natural log of the return on investment, $1+r$, is approximately equal to r for small values of r .

past two centuries, the 'risk-free' rate of interest, after adjusting for inflation, has averaged about 2 per cent. At the time of writing it is below 1 per cent.

How are interest rates determined? As with every price, it is necessary to look at the issue from the perspective of consumers and of producers.

3.1.1 The production side

On the production side, the nature of technology is that an investment made now can return its value, and more, in the future. The earliest (and still an important) illustration of this came with the discovery of agriculture in the Neolithic era. Before agriculture, humans gathered goods in much the same way as other animals, though with the use of tools and enhanced cooperation. They collected grains and other plant products to eat and killed wild animals for their meat.

Provided population pressure was low enough the opportunity cost of hunting and gathering was very low. The animals and plants consumed in one season were replaced by the ordinary processes of reproduction.

If population pressure was too great, a food animal or plant could be driven to extinction, or reduced in population to a level where the opportunity cost of collecting food one day was to have less available the next. Successful hunter-gather societies evolved institutions, such as tribal boundaries and taboos which took this opportunity cost into account. Such institutions were essentially stationary in nature, maintaining populations at a stable sustainable level.

The key discovery behind agriculture was that by saving some grain and sowing it where the new plants could be protected, the initial seed would be returned many-fold. Similarly, by keeping some animals alive, and under control, each female would bear many young. Against this benefit must be set the added costs of managing crops and livestock. However, as long as there is sufficient land, there is still a net surplus.

Under suitable conditions, such as those prevailing in the Fertile Crescent of Western Asia and in the river valleys of Egypt, India and China, the discovery of agriculture enabled a massive increase in the amount of food that could be produced in a given area, and therefore in the human population it could support. Expanding agricultural populations, seeking more land, rapidly drove hunter-gatherer societies out of areas suitable for cropping and grazing, and into more marginal hill and forest country.

In an agricultural society, the opportunity cost of consuming an extra meal of grain, say wheat, today is the amount of food that could be produced the following season if the grain was saved for seed (similarly, a steak dinner today comes at the cost of the amount of meat that could be produced next year if the animal were saved for breeding or fattening).

Under normal conditions, the quantity used as seed is less than the amount harvested in the future. However, this need not be the case. In a year of particular abundance, and in conditions where storage is difficult or impossible, there may be so much grain left over that makes sense to sow it on marginal ground, where the yield may be less than the original investment of seed.

John Maynard Keynes expressed these ideas in terms of the 'wheat rate of interest'. If, for example, 100 bushels of wheat used as seed grain today would produce 110 bushels next harvest, the wheat rate of interest is 10 per cent. As Keynes observed, while the wheat rate of interest is normally positive, it may, in some circumstances, be negative.¹²

In a society with productive opportunities that yield a positive net return, interest may be seen as the opportunity cost of consuming now, rather than investing and consuming more in the future. More succinctly, interest is the opportunity cost of not waiting.

The abstract economic reality of opportunity cost was soon translated into the concrete social institutions of money and debt. Agricultural societies produced a food surplus, which could be used to sustain specialist trade workers of all kinds. Rather less usefully the surplus could be extracted by military rulers in the form of taxes and compulsory gifts.

The obligations of subjects to rulers, and of the poor to the rich gave rise to the institution of debt. The logic of opportunity cost then ensured that the settlement of debts required the repayment not only of the amount originally owed (principal) but of the additional opportunity cost (interest). Resentment over this exaction, and the power imbalance with which it has typically been associated, has been a constant theme in political, social and religious conflict between creditors and debtors ever since.

While the conceptual idea of an 'own-rate of interest' for commodities such as wheat is useful, debts and interest are most naturally expressed in terms of money. For kings and specialist lenders alike, money provides a common unit of account and store of value. That is, money

¹² In his anti-Keynesian polemic, 'The Failure of the "new Economics": An Analysis of the Keynesian Fallacies' Hazlitt misses the point completely, claiming that 'a negative rate of interest is a foolish and self-contradictory conception'. In reality, a negative rate of interest will arise naturally in an agricultural society in any period where food is unusually abundant but not storable.

arose from debt, and only later came into use as a medium of exchange.¹³ This idea overturns the standard (but entirely ahistorical) economists' story in which money arose as a way of overcoming the inconveniences of barter, and more complex financial instruments such as debts were derived from it.

Modern manufacturing technology faces the same logic of opportunity cost as agriculture. An investment of resources not consumed today can produce a larger amount in the future. In addition, the rapid technological progress that characterizes modern society has generated a new source of opportunity cost. The resources required to produce a given quantity and quality of final output are declining steadily. This process may be slow and gradual, as in the case of improvements in agricultural productivity. Alternatively, the process may be rapid, as in the case of information and communications technology, where Moore's Law predicts that the number of transistors in a dense integrated circuit will double approximately every two years. In some cases, the rate of technological progress may be essentially zero, as in the case of services such as haircuts, where there is hardly any change in productivity.¹⁴

Overall, though the annual rate of growth in productivity is around 2 per cent, which is approximately equal to the risk-free interest rate. As will be discussed in the following subsection, this equality is about what would be expected on the basis of sensible judgements about the opportunity cost trade-off between present and future consumption.

* 3.1.2 The consumer side

Every market transaction involves a buyer and seller, and market equilibrium involves opportunity costs for both producers and consumers. It is necessary to consider how interest rates affect the opportunity costs facing consumers and, conversely, how choices between present and future consumption help to determine market interest rates.

¹³ In his recent book, *Debt: The First Five Thousand Years*, David Graeber made this point, and derived a range of interesting and controversial conclusions. In the course of my research, I discovered that the same observation had been made, much earlier, by my namesake, Alison Hingston Quiggin, in her classic work *A Survey Of Primitive Money*

¹⁴ One implication is that the own-rate of interest will be higher for goods subject to rapid technological change, such as computers, than to manufactured goods in general, and lower in the case of services. This might seem to create a problem, given that the producers and consumers of all these goods and services face the same rate of interest on money. The problem is resolved by changes in prices over time. The price of services like haircuts has risen by more than the rate of inflation, while the price of computers has fallen, even as their computing capacity has risen dramatically.

The existence of a positive interest rate implies that the opportunity cost of a given amount of consumption expenditure now is a larger amount in the future. Conversely, the opportunity cost of a given amount of consumption expenditure in the future is a smaller amount in the present.

The crucial factor is that in a growing economy, most people expect to consume more in the future than at present. Conversely, we expect our unmet needs and desires for consumption expenditure to be more pressing now than in the future. For the opportunity cost trade-off to be balanced, consumption forgone in the present must be matched by a larger increase in the future.¹⁵

How big must the increase in future consumption be to outweigh the opportunity cost, namely the foregone opportunity to increase current consumption? One answer, which seems close to the views typically elicited when people are asked questions of this kind, is to treat equal proportional increases in consumption as being equally desirable. That is, an increase from \$10 000 to \$11 000 is just as desirable as an increase from \$20 000 to \$22 000. Conversely, if the opportunity cost of the \$10 000 benefit to the high income earner is a loss to the low income earner of more than \$1000, the cost exceeds the benefit.

As this example shows, when total future consumption doubles so does the additional future consumption required to justify the opportunity cost of a given amount of consumption forgone today. As we can see from the rule of 70, this balance will arise if the rate of interest is equal to the rate of growth of consumption. For example, if consumption is growing at 2 per cent per year, it will double in 35 years. And, if the rate of interest is 2 per cent, any given amount saved and invested today, will double, with compound interest, over the same period of 35 years. More generally, the interest rate is the same as the rate of growth of consumption.

¹⁵ An alternative, or sometimes complementary, explanation is that people are inherently impatient, and will always prefer present to future consumption. In particular, it is often suggested that members of the current generation (or at least, those in a position to make economic decisions) place more value on their own wellbeing than on that of later-born generations. There is not much evidence to support this view. On the contrary, the more prevalent pattern is one of parents sacrificing their own welfare to improve the lives of their children. At least in well-functioning political systems, the same pattern can be observed in our collective decisions: governments routinely make long-term investments, both in physical infrastructure and in education, that will mostly benefit future voters rather than current ones.

3.1.3 Which rate of interest?

In the discussion above, we have looked at an idealized concept of the rate of interest, which is the same for all borrowers and lenders. This idealized concept corresponds to the risk-free interest rate, typically about 2 per cent.

In actual market settings, a wide variety of interest rates may be observed, from very low to very high. Explaining the differences between low and high interest rates is a complex exercise, beyond the scope of this book. But the crucial factor is risk; more precisely the ‘default risk’ that a debt will not be repaid. Debt subject to default risk, or with returns that are inherently risky (as in the case of stockmarket equity) is subject to rates of interest (or expected rates of return) substantially higher than the risk free rate.

The rate on lower grade ‘junk’ bonds is substantially higher, even after making an allowance for the average loss associated with default.

<https://research.stlouisfed.org/fred2/series/BAMLH0A3HYC>

The average rate of real return on equity, after allowing for the risk of corporate failure has historically been around 8 per cent. The difference between the rate of return on equity and the rate of interest on bonds is referred to as the ‘equity premium’ and is substantially larger than can be explained by economic models based on Lesson 1. We will look more at the ‘equity premium puzzle’ in the following section, and afterwards.

There are much larger differences in the interest rates faced by individual borrowers. The rates charged by ‘payday lenders’ to borrowers with poor credit history and little collateral can be as high as 400 per cent. This difference could not exist if it were not for default risk, which makes lenders like banks unwilling to make loans to borrowers with bad credit. But once excluded from the regular credit market, borrowers are vulnerable to all kinds of predatory practices which force them to pay far more than is justified by default risk.

3.2 Information

It is a cliché that we are living in an ‘information economy’. The ubiquity of computers, mobile phones and other digital devices makes it obvious that the great majority of us are engaged, to a greater or lesser extent, in dealing with information. In reality, though, information has always been central to economic activity of all kinds.

Human beings differ from other animals in two crucial respects: our capacity to make and use tools, and our ability to communicate with each other. Both are crucially connected with information and with our ability to reason.

The information embodied in technology and our capacity to communicate it have enabled humans to develop large and complex societies. This development solves many problems, but creates new ones: the information needed for a complex human society to operate is far more than any one person can acquire or process.

These problems are particularly severe in relation to economic activity. In any modern society, we depend on others for the great majority of our needs and wants, while our own labor is part of a complex production process no single person can fully understand. How do disparate parts of this system fit together to produce and distribute the goods and services we consume?

As Hayek and others have pointed out, markets provide one solution to this problem. It is worth quoting Hayek's classic article 'The Use of Knowledge in Society' at length on this point

Fundamentally, in a system where the knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions of different people in the same way as subjective values help the individual to coordinate the parts of his plan. It is worth contemplating for a moment a very simple and commonplace instance of the action of the price system to see what precisely it accomplishes. Assume that some where in the world a new opportunity for the use of some raw material, say tin, has arisen, or that one of the sources of supply of tin has been eliminated

All that the users of tin need to know is that some of the tin they use to consume is now more profitably employed elsewhere, and that in consequence they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the people who are aware of the new gap thus created in turn fill it from still other sources, the effect will rapidly spread throughout the whole economic system and influence not only all the uses

of tin but also those of its substitutes and the substitutes of these substitutes, the supply of all the things made of tin, and their substitutes, and so on; and all this without the great majority of those instrumental in bringing about these substitutions knowing anything at all about the original cause of these changes. The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all. The mere fact that there is one price for any commodity — or rather that local prices are connected in a manner determined by the cost of transport, etc. — brings about the solution which (it is just conceptually possible) might have been arrived at by one single mind possessing all the information which is in fact dispersed among all the people involved in the process.

The marvel is that in a case like that of a scarcity of one raw material, without an order being issued, without more than perhaps a handful of people knowing the cause, tens of thousands of people whose identity could not be ascertained by months of investigation, are made to use the material or its products more sparingly; i.e., they move in the right direction.

This is an excellent statement of Lesson 1, showing how market prices signal opportunity costs. But Hayek stops his analysis there. Although he says ‘The price system is just one of those formations which man has learned to use after he had stumbled upon it without understanding it’, Hayek shows little interest in exploring alternative ways in which human societies manage the problems and opportunities associated with information. We will examine this point further in ...

3.2.1 Information economics and Robinson Crusoe

Robinson Crusoe is, as we have seen, a stock character in economics textbooks, engaged first in the production of food and clothing for his own use and then in trade with Friday. But the textbooks rarely ask how Crusoe manages the problem of production. The simple answer, and the one that will occur first to an economist who bothers to read the original story by Daniel

Defoe, is that Crusoe has the necessary inputs: labor (his own), land (the natural resources of the island) and capital (tools and raw materials that he salvages from the shipwreck).

Reading on, it becomes apparent that Crusoe has something far more important: information. He knows, to begin with, how to build a raft and a simple house and how to light a fire. Although he begins by relying on food retrieved from the ship and hunting wild game, he soon commences agriculture.

Crusoe has the technological knowledge that might be expected of a 17th century European sailor. He knows the basics of sowing and harvesting crops and of domesticating animals such as dogs and goats. He does not know how to mill grain, bake bread, make pottery or metal tools. However, he knows these things are possible and sets himself, successfully, to work out how they are done. As a result, his standard of living is soon higher than that of the indigenous inhabitants of the region, who lack this knowledge.¹⁶

Defoe's Crusoe does not trade with Friday, but rather provides him with information so that they can work together. As would be expected by the readers of the day, the relationship between the two is that of master and servant, a status justified by the fact that Crusoe has rescued Friday from enemies who were about to kill and eat him. He teaches Friday about agriculture,¹⁷ and thereby increases Friday's productivity. In Defoe's version story, information is at least as important as trade in generating free lunches for Crusoe and Friday.

3.3 Uncertainty

Uncertainty is, in a sense, the flip side of information. In a situation of uncertainty, we face a number of possibilities, and we have insufficient information to determine which one will be realised. The logic of opportunity cost applies here, as it does in choices over time. To take a simple example, suppose I decide to go out for a walk, and think about the possibility of a rainstorm. I can take an umbrella, and stay dry. The opportunity cost of this choice, compared to risking getting wet, is the more enjoyable walk I would have, in the event of sunny weather, without the encumbrance of the umbrella.

Insurance markets provide a way to manage risk. If I insure my house against fire, I gain the benefit of a net payout in the event that the house burns, at the opportunity cost of a premium paid in advance. The premium (a particular kind of market price) charged in a competitive

¹⁶ Defoe's account is based on the real-life experience of Alexander Selkirk

¹⁷ as well as imparting the elements of Christianity

insurance market will depend on the risk of the insured event happening. Commonly, the premium will vary depending on the structure of the house and the protection measures (such as alarms and sprinkler systems) that are in place. Insurance premiums are another illustration of Lesson 1. The premium gives me information about the opportunity costs associated with the various possible outcomes of different choices regarding the risk of fire.

At least in the idealized form found in most textbooks, financial markets provide the same kinds of opportunities for trading between different possible future events. For example, speculative stocks will yield a high payoff in boom conditions, but may become worthless in recessions. ‘Countercyclical’ stocks, such as those of companies offering cheap entertainment, are highly valued by risk-averse investors because they perform well during recessions, providing income when it is most needed. Government bonds provide a fixed payoff regardless of economic conditions. There is a whole branch of financial economics devoted to calculating the appropriate price of such assets, and to inferring the opportunity costs of the contingent payments the assets will yield.

In principle, then, Lesson 1 applies to choices involving uncertainty, as it does to choices over time. In practice, as we will see in Part ..., things are much more complex. The failure of financial markets to perform the role allotted to them by economic theory is one of the most important reasons why economics needs Lesson 2 as well as Lesson 1.

Lesson 1, Part II: Applications

The economic analysis showing how market equilibrium prices reflect the opportunity costs facing producers and consumers is elegant and, for a certain kind of mind, convincing.

For most of us, however, it's more useful to see how the logic of prices and opportunity costs works in particular cases, sometimes in ways that conflict with strongly held intuitions. This will also give us more insight into the ways in which prices can fail to reflect opportunity costs for society as a whole, some of which we will examine in Lesson 2.

4 Lesson 1: Applications

4.1 Tricks and traps

One way to sharpen up thinking about opportunity costs is to try out some examples. Here's one that allegedly fooled a lot of professional economists.

You won a free ticket (which has no resale value) to see an Eric Clapton concert. Bob Dylan is performing on the same night and is your next-best alternative activity. Tickets to see Dylan cost \$40. On any given day, you would be willing to pay up to \$50 to see Dylan. Assume there are no other costs of seeing either performer. Based on this information, what is the opportunity cost of seeing Eric Clapton? (a) \$0, (b) \$10, (c) \$40, or (d) \$50.

Recall the definition of opportunity cost,

The opportunity cost of anything of value is what you must give up to get it.

In this example, the opportunity cost of seeing Clapton is the best available alternative, namely going to see Dylan. What is the value of this alternative? Based on the information presented in the question, a ticket to the Dylan concert sells for \$40 but is worth \$50 to you. So, by attending the Dylan concert you would obtain a net benefit of \$10. This is the opportunity cost of going to see Clapton. So, the correct answer is (b).

When 200 professional economists were asked this question during the annual conference of the American Economics Association, their answers were virtually random, with the correct answer scoring only 22 per cent of the total, the worst of the lot. Some defenders of the profession have come up with convoluted defenses of their colleagues, amounting to arbitrary redefinitions of

the concept of opportunity cost.¹⁸ It seems far more likely, however, that the conditions under which the question was asked were stressful and conducive to error.¹⁹

Among the incorrect answers to the question above, the most intuitively appealing is probably (a). Since the Clapton ticket is stated to be free, it might reasonably be concluded that the cost of going to see the concert is zero. This, in turn, would suggest that, unless you positively dislike Clapton, you should go. But the logic of opportunity cost shows that this reasoning is incorrect. If, for example, the value to you of the Clapton ticket is \$5, you are better off throwing it away and going to see Dylan.

What if you had paid \$5 for a (non-refundable) ticket to see Clapton when the opportunity to attend the Dylan concert came up? This is an example of ‘sunk costs’ discussed in Section ... The money spent on the Clapton ticket is gone, whichever choice you make. So, the opportunity cost of going to the Clapton concert is, \$10 just as if the ticket was originally free.

4.2 *TANSTAAFL: What about “free” TV, radio and Internet content? j*

We saw in ... that the ‘free lunch’ provided by saloons wasn’t really free in terms of opportunity cost. Rather, consuming the lunch involves forgoing the opportunity of buying cheaper beer at a saloon where lunch is charged for separately.

The same point applies to ‘free’ services provided by governments and financed by taxation revenue. The opportunity cost is the private expenditure forgone to pay taxes. This is the point being made by drivers with TANSTAAFL bumper stickers, even if many of them might be unhappy about paying to use ‘free’ public roads.

There are, however, lots of other examples of services provided free of charge by for-profit corporations. These include radio and TV broadcasts, Internet services like Google, Facebook and Twitter and sponsorship for sporting and cultural events. Obviously, TV and radio stations, like Google and Facebook, are funded mainly by the sale of advertising. Corporate sponsorship

¹⁸ On reflection, it seems far less embarrassing to admit that economists sometimes make mistakes than to claim, not only that the concept of opportunity cost can be defined any way you like, but that no one has noticed this until now.

¹⁹ One subject recalls ‘I was on the job market and had gone to the 4th floor of the hotel to check on where my interviews were going to be. As you might imagine, I was incredibly stressed out and distracted. I was then approached by somebody who wanted me to fill out this form.http://marginalrevolution.com/marginalrevolution/2005/09/opportunity_cos.html

is based on the perception that it will create a favourable impression of the company concerned, which is a kind of advertising. How does our analysis apply to advertising?

In thinking about advertising in TV and similar media, we can easily dispense with the claim sometimes put forward by industry advocates, that such advertising provides consumers with useful information. If this were true, firms would not need to pay TV networks or Internet companies to broadcast the ads.

As is shown by the sales of specialist magazines of all kinds, consumers are willing to pay for useful information about consumer products. But no one will willingly consume ordinary ads unless they are packaged with a program they want to watch, or a webpage they want to view.

In fact, the original free lunch provides a much better analogy. Eating a meal or snack, particularly a salty one, increases the desirability of a cold drink, and the bar is there to provide it. Similarly, advertisements work because watching an ad increases the desirability of buying the associated product. This may be because the ad attaches desirable qualities (such as sophistication or sex appeal) to the product or because it engenders dissatisfaction with the alternatives we are currently consuming.

In terms of opportunity cost, it does not matter whether an ad works positively or negatively. Either way, the opportunity cost of alternative products is increased relative to the value of the product being advertised. In the standard terminology of economics, a successful ad is complementary (in consumption) with the product being advertised.

In terms of our happiness, though, there's a big difference. The net effect of advertising is almost certainly to reduce our satisfaction with the things we buy, because most of the ads we see are designed to make us switch to something else. And of course, the things that are not advertised, such as quiet leisure time with family and friends, where no goods and services are required and no money is spent, are downgraded even further.

Market prices tell us about the opportunity costs we face, although the cost, like that of the original free lunch, is hidden. We can choose not to watch the ads (and the programs with which they are bundled), and buy the advertised 'brand name' products. Alternatively, we can avoid the ads and buy cheaper alternatives, which don't include the cost of advertising.

The third possibility is that of watching the ads, but buying the cheaper products anyway. If ads work as they are supposed to, this should induce a similar feeling similar to that of eating salty bar snacks but not buying a drink to go with them. That is, we should feel less satisfied with our

choice than if we had not viewed the ads for the brand name product, perhaps so much so that we change our minds and buy the advertised product instead.

Many readers will (like the author) probably judge that they are too strong-minded to be swayed by advertising, particularly the uninformative puffery that we get from mass media. But the continued market dominance of advertised name brands suggests that this is an illusion, similar to the one that leads around 80 per cent of us to believe we are better than average drivers.

Opportunity cost is as relevant to advertisers as it is to consumers. In particular, opportunity cost explains why some kinds of goods and services are commonly bundled with advertising, while others are not. The opportunity cost of producing a TV show or an attractive website can be substantial. But once a given program or website has been produced, the opportunity cost of allowing access to it is small (often less than the cost of restricting access).

In these circumstances, bundling the program with advertising may be the only way to cover the fixed costs of production. If so, the availability of the package as a whole makes us better off compared to the alternative, at least on the (strong) assumption that we carefully consider the hidden cost of the 'free lunch' we are being offered.

The problem is more complicated when there are alternatives, such as public funding for broadcasting, which might be financed (as it was for a long time in the United Kingdom and Australia) by a license fee for television sets. Choice is maximized when both methods of funding are available, but as a matter of political practice, advertising-funded commercial broadcasters will lobby to have publicly funded alternatives shut down or forced to take ads. The Internet has shown the power, and the limitations, of a third alternative, that of voluntary provision by individuals (as with blogs) or by large co-operative groups (as with Wikipedia). We'll discuss this more in Lesson 2.

Finally, it's worth considering the case when we are forced to consume the advertising whether we want to or not, and without receiving any benefit. The most obvious example is that of highway billboard advertising, as distinct from informative signs regarding the services available at a given exit.

The case where the right to put up a billboard is controlled by (for example) a highway authority, and advertisers have to pay is essentially the same as that of 'free' TV and radio. Road users pay part of the cost of providing the highway by consuming ads.

By contrast, in the case where neighboring property owners can display billboards, neither the road users nor the providers get any benefit. In effect, the owner of the billboard is imposing a cost without any intervening market transaction. In the technical jargon of economics, this is a ‘negative externality’ (we’ll look more at this in Section ...).

4.3 The cost of (not) going to college

The rising cost of university tuition is a big problem in the United States and many other countries. Even after allowing for grant aid and tax benefits, the average cost of in-state tuition at a public four-year university has risen by nearly 60 per cent, in real terms, since 1990.

[Trends in College Pricing - Trends in Higher Education - The College Board](#)

Moreover, in-state college places have become increasingly inaccessible, as colleges have sought to improve their financial position by enrolling interstate and international students, who pay more tuition and receive less aid. In California, long a trendsetter in such matters, the University of California system announced a cap on the number of in-state students in 2015. This decision cemented a long-term trend in which the increase in enrolment over the past twenty years has consisted entirely of interstate and international students

<http://www.news10.net/story/news/education/2015/03/04/university-of-california-capping-enrollment-for-in-state-students/24404031/>

http://www.mercurynews.com/education/ci_25669089/uc-admission-harder-than-ever-californians

Meanwhile, the rewards of a college education are not what they once were. The median salary for a new college graduate has fallen since the economic crisis of 2008, and is now lower, in inflation-adjusted terms, than it was in 1970.

<http://www.epi.org/publication/ib327-young-workers-wages/>

On the other hand, the struggle to get into ‘good’ colleges and universities has never been sharper. Harvard University, with standard tuition and boarding fees in excess of \$60 000 a year <https://college.harvard.edu/financial-aid/how-aid-works/cost-attendance> had nearly 20

applicants for every place in 2013. At least 100 US universities had three or more applicants for every place

<http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/lowest-acceptance-rate/page+4>

So we have what looks like a paradox. Young people are keener than ever to pay more and more for an education that rewards them less and less. This seeming paradox can be explained by thinking in terms of opportunity cost.

The opportunity forgone by attending college is that of entering the work force with a high school diploma. And, while the labor market for college graduates is not as attractive as it once was, the alternative of taking a job straight after high school has become less and less attractive over the years. Real wages for male high school graduates in the United States have been falling ever since the 1970s, with only a brief recovery in the 1990s. For women, wages have risen only marginally, from levels that were very low to begin with.

<http://www.epi.org/publication/ib327-young-workers-wages/>

And that's assuming you can get a job. Workers without college degrees have substantially lower employment rates than those with degrees, and this gap widens in periods of high unemployment. So, even though the monetary cost of a college degree has risen sharply, the opportunity cost has not increased nearly as much. This helps to explain why the demand for college places has been largely unaffected by increasing tuition fees.

That isn't true for all kinds of college degrees. The most striking case is that of law schools, which enjoyed a decades-long boom beginning in the 1970s. By 2010, enrolments had risen to more than 145 000, more than twice the level in 1970. But the demand for practising lawyers had not risen nearly as fast. Only 68.4 percent of 2010 graduates were able to find a job requiring bar passage, the lowest percentage since the legal career professionals group NALP began collecting statistics.

http://www.abajournal.com/news/article/a_record_low_for_2010_law_grads_only_68_have_jobs_requiring_bar_passage

Of course, not everyone obtaining a law degree wants to be a lawyer. However, for those graduates who did not become lawyers, the opportunity cost of their law degree was rising fast. Tuition fees for law degrees rose even faster than for college degrees in general. Moreover, it is

arguable that the cost of delaying entry to the labor market is even greater when conditions are chronically slack, as they have been since the 2008 crisis. A graduate who enters the labor market straight out of college has three more years of work experience than one who goes on to law school.

In response to the declining benefits, and increasing opportunity costs, of going to law school, applications have plummeted, dropping by 24 per cent between 2010 and 2013. Law schools have responded by cutting or freezing tuition fees, and by offering more scholarships to students with high incoming grades, who can be expected to boost the schools' reputation in future.

<http://dealbook.nytimes.com/2014/12/01/law-school-becomes-buyers-market-as-competition-for-best-students-increases/>

However, the process of adjustment is very slow. For those who have already embarked on a law degree, much of the cost is 'sunk'. So they stay on to complete their degrees, with the result that the entering class of 2010-11, the largest on record, is now joining the depressed job market. Unsurprisingly, employment outcomes have worsened even further, with only 57 per cent of 2013 graduates finding jobs as lawyers.

So, the number of new applicants will continue to fall until the benefits of attending law school come back into balance with the opportunity cost. That will require a combination of better employment outcomes, lower tuition charges, and, perhaps, a decline in the alternative employment opportunities for recent graduates.

5 Lesson 1 and economic policy

5.1 Why price control doesn't (usually) work

When the price of some important commodity or service rises rapidly, governments face pressure to do something about it. A variety of options are commonly considered.

Governments can, and often do, subsidize the supply of goods seen as vital, commonly including food and fuel. Such policies are popular, often cost relatively little at first, and are politically hard to remove. But who benefits and what are the opportunity costs?

Particularly in developing countries, such subsidies commonly benefit urban dwellers, and particularly the middle class, who tend to have more political influence than the rural poor. Subsistence farmers do not benefit from food subsidies. If subsidized food is imported, with the result that the domestic price falls, farmers are also likely losers. Fuel subsidies generally benefit those on higher incomes, who use more energy of all kinds. Again, this effect is particularly marked in developing countries where the rural poor may rely on collecting wood or dung for fuel, and on oxen, or their own effort, for energy inputs to food production.

The opportunity costs of food and fuel subsidies are not hard to find. Government revenue allocated to subsidies cannot be spent on services like health and education, or on income support for the poor. Even where funding for subsidies is notionally derived from cutting wasteful or unproductive expenditure, the true opportunity cost is the best use to which the funds released in this way could have been put.

Where governments lack the resources to subsidize prices, the simplest, and seemingly least costly, response to rising prices, is to legislate to fix the price at a 'fair' level, or to control the rate at which prices increase. Such policies have been tried many times, and can be reasonably effective in preventing price increases resulting from temporary shortages ('gouging'). But attempts to maintain price controls over longer periods have mostly failed.

A classic example, discussed by many economists, is that of rent control in New York City. Controls were introduced during World War II, and have been maintained with various changes ever since. The experience of New York City has shown that comprehensive rent controls can't be sustained for long without producing severe housing shortages. Once comprehensive controls

are in place, construction of new rental housing grinds to a halt, and landlords try to spend as little as possible on maintenance.

Once shortages become acute, the typical solution is what is often called ‘grandfathering’. Rent control is enforced over existing housing units, but builders of new units are allowed to charge whatever the market will bear. Since rent-controlled units are effectively off the market, this rent will be higher than would be the case in the absence of rent control.

The result is to create two classes of tenants. Sitting tenants in rent-controlled units continue to benefit, but those entering the market pay more than the pre-control rent (which, we should recall, was regarded as being so unaffordable as to constitute an emergency). Eventually, as is happening in New York City now, the rent-controlled tenants die or move away, and the system breaks down altogether.

The problem with price controls is simple when we think in terms of opportunity cost. If prices are fixed by law, they cannot tell us anything about the true opportunity cost of goods and services. Nevertheless, the logic of opportunity costs still applies to firms and consumers.

Firms will supply a good if the price they receive is more than the opportunity cost. If the price is fixed at a low level, then firms will supply only small amounts, or none at all. Similarly consumers will be willing to buy more of a good if the opportunity cost is less than its value to them. The opportunity cost consists of the price, along with any other costs involved in obtaining the good. If the price is fixed at a low level, and the good is freely available, they will choose to consume a lot.

But there is a contradiction here. If the price is fixed at a low level, consumers will demand a lot, and firms will offer very little. So, the good will not be freely available. One possible outcome is that consumers will spend time searching for supplies, or standing in line. The opportunity cost of the time they spend will make up the difference between the fixed price and the value of the good to the consumers concerned.

Another possibility is that formal or informal systems of rationing will be developed. For example, the government may estimate the needs of the average person (with some allowance for children), and issue each household with a corresponding number of ration coupons, allowing them to purchase goods at the legal fixed price. Inevitably, once such a system has been in place for a while, a black market (or quasi-legal ‘grey market’) will develop, as in the systems of ticket scalping for sporting and music events. So, for a household, the opportunity

cost of a good bought within the official system will be the legal price, plus whatever they could have obtained, in cash or favors, for passing the ration coupon to someone else. For someone buying black market ration coupons, the cost of the good again includes the legal price and the cost of the coupon, as well as the risk and difficulty associated with a black market transaction.

It's easy to show that, if price controls are effective, and ration coupons are freely traded, the opportunity cost for consumers (the sum of the official price and the coupon price) must be higher than the price that would have emerged in the absence of control. That's because producers will supply less of the good than in the absence of controls. The logic of marginal cost and benefit implies that the opportunity cost of the marginal item for consumers must therefore be higher under price control.

Price control with rationing produces both winners and losers. The main winners are those consumers and households who would not have consumed any more than the rationed allowance at the market price. They get the same amount of the good, at a lower price, and perhaps get some extra benefit from selling surplus coupons.

The most obvious losers from price controls are the suppliers of the goods and services subject to controls. In the case of food, this group includes farmers, farm workers, those engaged in food processing (flour millers, butchers and so on) as well as a wide variety of people (sometimes described as 'middlemen') engaged in transport, wholesale and retail trade and so on.

Another group of losers are consumers who would have willingly paid more, at the market price, for a higher quantity than they end up consuming under rationing. They must either do without goods they would willingly pay for, or pay both the fixed price and the cost of illegally acquiring extra coupons.

Sometimes, the gainers from price controls are, or are seen as, more deserving than the losers. From a social point of view, however, it is usually better to redistribute income directly than to attempt to stop price increases through controls or to offset them using subsidies. As we will argue in the next section, if you want to help poor people, give them money.

This way of posing the problem raises the question: what about minimum wages? On the one hand, as Hazlitt stresses, minimum wages are a kind of price control. On the other hand, since they raise the incomes of the poorest group of workers, increasing their ability to purchase all

kinds of goods and services, minimum wages will almost always be a superior alternative to price controls. We will develop this point further in the next section.

5.2 *To help poor people, give them money*

The problem of poverty is huge, in rich and poor countries alike. Around the world, nearly a billion people live in extreme poverty, living on less than \$US1.50 a day. Even in the United States, on many measures the wealthiest country in the world, the Department of Agriculture estimates that 14.5 per cent of the population experience food insecurity, defined as being ‘uncertain of having, or unable to acquire, enough food to meet the needs of all their members because they had insufficient money or other resources for food.’

Faced with images of the hunger and suffering caused by famines and extreme poverty, a natural and intuitive reaction is to send food. This reaction is often politically appealing in countries that happen to have large stockpiles of food, either because of unforeseen declines in market demand, or because of government policies such as price supports for farmers.

On the other hand, many advocates of development aid dismiss food aid as a short-term ‘band-aid’, and argue that the aim of aid should be to provide the ‘right’ kind of assistance, as measured by subsequent economic growth. Advocates of aid initially focused on economic infrastructure and industrial development, and have more recently turned their attention to health and education.

Similar debates have played out in the United States. The Supplemental Nutrition Assistance Program (SNAP), better known as food stamps, has played a central role in US programs to assist low-income households since it was introduced in 1964. With cuts in other welfare programs, its importance has increased over time. On the other hand, as with international food aid, the SNAP program is regularly derided as a bandaid approach. Liberals frequently point to education as the way to provide real opportunities for the poor.

Which of these approaches is right? Much of the time, neither. While support for health and education has a better track record than food aid, there is a growing body of evidence to say that, in both poor countries and rich ones, the best way to help people is to give them money.

To see why this should be so, ask: What would a desperately poor family do with some extra money? They might use it to stave off immediate disaster, buying urgently needed food or medical attention for sick children. On the other hand, they could put the money towards

school fees for the children, or save up for a piece of capital like a sewing machine or mobile phone that would increase the family's earning power.

The poor family is faced with the reality of opportunity cost. Improved living standards in the future come at the cost of present suffering, perhaps even starvation and death. Whether or not their judgements are the same as we would make, they are in the best possible position to make them.

This is a straightforward application of Lesson 1.

Market prices reflect (and determine) the opportunity costs faced by consumers and producers.

Exactly the same points apply in rich countries. Giving poor people assistance in kind, such as food stamps and subsidized housing, has a lot of political appeal. Not only does it meet an apparent need, but it appears to reduce the chance that the recipients will waste their extra income on luxuries, or on alcohol and tobacco. In addition, as in the case of the US food stamps program, it may also be possible to form a political coalition with producer interests, represented by the farm lobby.

Thinking in terms of opportunity cost, however, we can see that aid in kind almost inevitably results in waste. The opportunity cost of subsidized housing is the low rent paid for the house, while the opportunity cost of moving usually includes going to the back of the line. Having secured subsidized housing, people will stay there even if the house no longer suits their needs, because it is too big, too small, or too far away from a new job.

The same kinds of problems come up with food stamps. Families poor enough to get food stamps face all kinds of problems. They might, for example, need urgent medical or dental care, or be faced with eviction if they don't make a rent payment.

Much of the time food stamps cover only part of a family's food budget, so they are really just like cash. Families can meet some of their food bills with stamps, then use the money they save to meet other needs. The opportunity cost of spending more on food is the alternative that can't be afforded.

But it's precisely when people need money most, to the point where they are prepared to live on a restricted diet, that the limits of food stamps start to bite. If poor families were given money, they could choose to pay the rent bill even if it meant living on rice and beans. That's a hard choice, but it might be the best one available.

Unsurprisingly, then, poor people often try to change some of their food stamps for money. This is denounced as ‘fraud’ and used as a reason for cutting food stamps even further.

It is market prices that determine the opportunity costs of goods and services for individuals and families. When people choose how to spend additional money, the opportunity cost of one choice is the alternative that could be bought for the same amount.

The idea that poor people don’t understand this is patronizing and wrong. The tighter are the constraints on your budget, the more important it is to pay attention to them. Poor people often have less access to markets of all kinds, including supermarkets and basic financial markets such as bank accounts. They face complex and variable prices as a result. Nevertheless, many of them manage to find highly creative ways of stretching a limited budget to meet their needs. Additional constraints, in the form of payments that can only be spent in particular places and on particular goods, are the last thing they need.

These arguments have been going on for many years, but resolving them has proved difficult, since there are usually many different factors that determine good or bad outcomes for poor families. In recent years, however, a combination of improved statistical techniques and careful studies of experimental program pilots have allowed an assessment of the evidence to emerge. Overwhelmingly, it supports the view that giving people money is more effective than most, if not all, forms of tied assistance in improving wellbeing and life outcomes.

<http://www.thebaffler.com/blog/blaming-parents/>

http://www.nytimes.com/2013/08/18/magazine/is-it-nuts-to-give-to-the-poor-without-strings-attached.html?_r=0

If the best way to help the poor is to give them money, what is the best way of doing that? In a market economy there are two possible answers. The one that has been discussed most is redistribution; that is, using the taxation and welfare systems to transfer some market income from the rich to the poor. More difficult, but arguably more effective is to change the structure of markets and property rights to produce a less unequal distribution of market income — this is sometimes called ‘predistribution’.

5.3 *Road pricing*

For much of the 20th century, the road was a symbol of freedom, at the centre of cultural productions as diverse as Jack Kerouac’s *On the Road* and *The Happy Journey to Trenton and*

Camden. But roads are not free. The costs of road construction and maintenance represent a major share of the budget at all levels of government (local, state and national), and attract a fair amount of attention. Even larger, but more rarely considered are the opportunity costs of the road network.

The capital tied up in roads represents a large share of the stock of investments owned by governments. This capital investment comes at the expense of alternatives like schools, hospitals and, most notably, public transport systems. The opportunity cost of land dedicated to roads is larger still .

Turning from roads to vehicles, road users impose costs on each other in the form of traffic congestion and crash risks, as well as the general annoyance that has given rise to the term ‘road rage’. These costs aren’t symmetrical; big vehicles and fast drivers contribute more to crash risks, while slow vehicles may cause more congestion. A whole book could be written (and probably/inevitably has been) on the conflicts between motorists and cyclists.

Finally, road users impose costs on others through noise, air pollution and the crash risk faced by pedestrians and other non-motorists. To keep the discussion manageable, we’ll ignore these ‘external costs’ for the moment (They are discussed in Part 3.)

We pay for roads in many different ways: gas taxes, tolls, vehicle registration charges and through general government revenue. Typically, these systems have evolved through historical processes driven by the exigencies of funding, with little or no underlying rationale. As a result, a road built during a period of relatively flush public funding may be a freeway, while another nearby may be subject to tolling. Some jurisdictions tax gasoline, while others levy charges on vehicles.

These prices usually bear little or no relationship to opportunity costs, a fact that helps to explain why driving is so often a source of frustration and socio-political dispute. There is probably no way of bringing the prices paid by road users completely into line with the opportunity costs they generate. Increased use of road pricing, based on congestion and externality cost rather than historical cost accounting, would certainly help.

5.4 Fish and tradeable quota

Fisheries provide another example of the importance of opportunity costs, and what prices and markets can tell us about them.

The proverbial advice 'there's plenty more fish in the sea' reflected what seemed, until modern times, to be an inexhaustible abundance. The vastness of the oceans, the proverbial difficulty of catching fish and the reproductive capacity of most fish species made it seem that, no matter how many fish might be caught in one season, there would be just as many to catch in the next.

The industrialization of fishing in the late 19th century changed all that. Steam powered vessels could travel further, and were independent of wind and currents. The development of factory ships allowed catches to be processed on board, so that voyages could be longer. These were followed in the 20th century by new trawling techniques, longline fishing, electronic navigation, radar and sonar systems. Catch rates soared and then, predictably, crashed.

With the slow reproduction rates typical of mammals, and the misfortune of being valuable sources of lighting oil, whales were among the first species to be hunted to the edge of extinction. The right whale (supposedly so-called because it was the 'right' whale to catch) was almost extinct by the 1930s, with the result that hunting right whales was banned worldwide in 1937. Even so, nearly 70 years later both the North Atlantic and North Pacific right whales are critically endangered, with populations still in the hundreds.

Fish species soon followed. The decline of the Atlantic northwest cod fishery was typical. Catches rose steadily over the first half of the 20th century, reaching a peak in the 1960s. Then came a sharp decline, as stocks crashed. This decline did not, at least initially, produce a decline in fishing effort. Rather, efforts were intensified in an attempt to maintain declining incomes.

By 1992, catches had fallen almost to zero, and it was estimated that only 1 per cent of the original stock remained. The Canadian government imposed a moratorium, originally intended to be temporary. As with the right whales however, the damage was too severe to be remedied by a temporary respite. More than twenty years later the moratorium is still in place. There are some limited signs of recovery in fish populations, but the resumption of commercial fishing is still a long way off. The same story has been repeated in fisheries all around the world with minor variations.

Thinking in terms of opportunity cost makes the reason clear. If a landowner fells a tree and sells the timber, the opportunity cost includes the return that might have been gained by letting the tree grow for another year. But catching a fish has no such opportunity cost for the fisher. Left in the sea, it might have grown and reproduced, increasing future catches. But for any

individual fisher, thinking about whether to cast the net one more time, fish that are not caught now are gone forever.

Some other fisher might catch them in the future, but that is not part of the individual's opportunity cost. So, the opportunity cost for an individual fisher includes the time and effort spent fishing, the cost of boats, fuel, nets and so forth, but not the impact on the fishing stock.

In these circumstances, once technology advances far enough to permit it, overfishing is virtually inevitable. A wide range of responses have been tried in an attempt to prevent overfishing: the number of boats in a fishery has been limited, the gear they can use has been restricted, and allowable fishing seasons have been shortened.

These measures have almost invariably proved ineffective. If the number of boats is limited, fishers buy bigger boats. If gear restrictions are imposed, new types of gear are developed to evade them.

If the open season is limited, effort is increased, and boats put to sea in good weather or bad, with the result that overfishing continues. The response is commonly to shorten the season still further. As White²⁰ observes:

these input limitations -- especially the limits on the number of calendar days for fishing -- have led to "fishing derbies" or "races for the fish", in which fishermen try feverishly to maximize the amount of fish harvesting that they can accomplish within the limited time period available to them.

The contraction of the Alaska halibut season is a "poster child" for this process. From an open season of over 150 days in the early 1970s, the season length shrank to only 47 days by 1977 and then collapsed to an average of only 2-3 days per year between 1980 and 1994 pp. 71-72, 304-307).²¹ Similarly, the collapse of the surf clam fishery in the Mid-Atlantic region caused a progressive shortening of allowable fishing time until, in 1990, a surf clam vessel was permitted to fish only 6 hours every other week.

To sum up, any attempt to control overfishing by limiting effort has ultimately collapsed into absurdity. The only measure that has consistently been shown to work is the creation of property rights. Three main systems of property rights have been employed.

²⁰ <http://archive.nyu.edu/bitstream/2451/26080/3/6-18.pdf.txt>

²¹ Gates (2005), and Leal (2006)

First, there is privatization, where entire fishery may be handed over to a single private owner, typically a corporation. The owner has control over the number of boats that are used, the number of fish that are caught and so on, bears the costs of managing the fishery and receives all the net return from fishing. This is the solution seen as 'ideal' by some free-market advocates (notably H. Scott Gordon, widely regarded as the founder of fisheries economics, and Garret Hardin, the ecologist who popularized the phrase 'tragedy of the commons', which will be discussed in more detail in the next section.)

The second option, and the most common in practice, is a system of individual catch quotas. These are limits on the number of fish that an individual fisher can catch, combined with exclusion from the fishery of anyone who does not hold a quota. Typically, the total allowable catch is determined, then divided up in the form of individual transferable quotas (ITQs). Each of the fishers receives a quota they can catch. If they want to catch more fish, or if a new boat wants to enter, they must buy the quota from someone willing to sell.

Finally, where the industry is organized in a co-operative fashion, an aggregate quota may be determined for the season, and allocated among a group of fishers in the industry by mutual agreement. Again, those outside the group are excluded. In this way, the group members acquire common property rights over the fishery in question.²²

Whether individual or collective, the choice of the quota for a season forces fishers to confront the problem of opportunity cost. A higher catch in the current season means a smaller stock, which will make fishing more costly in future seasons. If the catch exceeds the maximum sustainable yield, then future catches must decline, regardless of effort.

The appropriate point²³ at which to set the aggregate catch quota is that at which the value of any further increase in the catch is equal to the cost of catching the fish plus the opportunity cost (incurred in the future) of reduced stocks.

The determination of an aggregate quota leaves open the question of how fishers, boats and fishing time will be organized to catch the allowable number of fish. In this respect, the different

²² Unfortunately, some free market advocates treat common property as a synonym for 'no property'. The most notable example is Garret Hardin, whose persuasive, but historically inaccurate, article *The tragedy of the Commons* was highly influential from the 1970s onwards.

²³ The exact determination of the optimal quota is a complex problem involving a mixture of biology, economics and advanced mathematics. But once the principle of opportunity cost is understood, this is a matter of detail that can be left to fishers and fishery experts to work out.

systems of property rights vary in the role played by markets and prices in determining the opportunity costs.

The role of markets and prices is largest and most evident in a system of ITQs. Here, the decision of an individual fisher to catch their quota has an obvious opportunity cost: the value they could realize by selling the quota and using their labor and capital somewhere else.

By contrast, in a fully privatized fishery, individual fishers are employees or contract workers for the owner of the fishery. Decisions about who will fish, and when and where they will fish, are made by managers rather than individual fishers. Under common property systems, mutual agreement takes the place of market transactions. These examples show that, while market prices tell us about opportunity cost, they are not always and everywhere the best way of transmitting this information.

5.4.1 The creation of property rights

The effect of introducing quotas is to create new property rights. The introduction of transferable quotas, with appropriate institutional arrangements, may result in the emergence of market where none existed before.

However, the creation of property rights, including the creation of property rights over fisheries, is a politically fraught and philosophically controversial process. Formal property rights, by their nature, supersede expectations and social judgements about who has the right to use a socially valuable asset like a fishery and how they can use it.

When an asset previously open to all is made the subject of property rights, rights of access that were previously taken for granted are withdrawn or strictly circumscribed. Those who are expropriated in this process may or may not receive some compensation. But even where compensation is paid, it is commonly insufficient to offset a feeling of injustice.

The conflict is even greater when, as is often the case with local fisheries, an informal system of common property management has emerged. Property rights systems established by national or state governments, which are typically neutral as between citizens of the entire jurisdiction, commonly conflict with established social norms among existing fishers. These norms, which typically stress local ownership and controls, are strongly held, but may be challenged by 'outsiders', excluded from access.

In the case of fisheries regulation, the inherent conflict is sharpened by the fact that formal property rights are typically not introduced until well after the actual catch rate has reached unsustainably high levels and begun to decline.

Fishers have built their way of life, and invested large amounts of capital, on the basis of the assumption that large catches could be maintained indefinitely. The process of reducing catches to a sustainable level involves sharp and often painful adjustments, such as a reduction in the number of boats and fishers in a given fishery. This adjustment, taking place in combination with changes in property rights, frequently gives rise to conflict.

The process of creating new property rights and markets raises a variety of philosophical concerns. As the discussion above indicates²⁴, the creation of new formal property rights has an opportunity cost, namely, the loss of old, informal rights. Particularly in the case of full privatization, the redistribution that takes place commonly benefits the rich and politically powerful at the expense of everyone else.

Unsurprisingly then, critics of markets and property rights are hostile to proposals for their extension. The difficulties are least in the case where existing common property institutions are formalized, but even here the issue of opportunity cost cannot be avoided: common property for some means exclusion for others.

Philosophical difficulties with the creation of new property rights are not confined to critics of the market system. The fact that formal property rights and the markets in which they are traded are creations of government and the legal system is one that many advocates of markets, including propertarians²⁵ like Hazlitt, are unwilling to confront directly.

The result is a great deal of inconsistency, depending in part on which groups in the community benefit and lose from a given change in property rights. For example, the propertarian Cato

²⁴ We will discuss this more in Lesson 2.

²⁵ Hazlitt's admirers would mostly describe themselves as 'libertarian'. I'm using the term 'propertarian' for two reasons.

First, ownership of the term 'libertarian' is strongly contested by leftwing libertarians, who regard the enforcement of property rights by government as an assault on freedom.

Second, an emphasis on the desirability of protecting markets and property rights from government intervention need not be associated with any concern about liberty in general. For example, Hayek supported the Pinochet dictatorship in Chile because of its free market policies. He supported Margaret Thatcher, but apparently felt that the 'Iron Lady' was not authoritarian enough when it came to suppressing protests by trade unionists and other opponents of the government.

Institute has enthusiastically backed transferable quotas in fisheries, but has opposed the conceptually identical policy of tradeable permits for greenhouse gas emissions.

Consideration of both Lesson 1 and Lesson 2 suggests that any suggestion for expanding the role of property rights needs to be subject to careful scrutiny. But, at least in the case of fisheries, some form of property, which may be individual, common or corporate, seems to be essential.

6 The opportunity cost of destruction

Careful consideration of Lesson 1 enables us to refute an idea that is popular among both admirers and critics of markets, namely that waste and destruction, such as that caused by war, are economically beneficial. Hazlitt's critique of this idea is one of the strongest parts of his book.

After describing his lesson in general terms, Hazlitt begins the main part of his book with a parable, taken from Bastiat, about a broken window that requires repair, and the tempting idea that random destruction may, by 'creating work' be beneficial. As Bastiat observes, this idea fails to take account of the opportunity cost of the resources used in the repair work.

Hazlitt extends this simple parable to a real-life policy issue, of vital importance at the time he was writing (1946). This is the question of whether the need to repair the destruction caused by war, and to meet the demand for consumer goods and services that was suppressed under wartime conditions, will stimulate economic activity and ensure prosperity. Hazlitt argues that it will not.

In this chapter, I'll develop Hazlitt's key points a little further, spelling out the role of opportunity cost in the analysis, and extending the argument to cover natural disasters. I'll show that Hazlitt and Bastiat are essentially correct: in most cases, natural and man-made disasters, including war, are also economic disasters. On the other hand, spelling out the argument also draws attention to its limits, limits that will be discussed in more detail when we come to Lesson 2.

6.1 *The glazier's fallacy*

A classic example (originally from Bastiat) will convey the general flavor of Hazlitt's use of Lesson 1

A young hoodlum, say, heaves a brick through the window of a baker's shop. The shopkeeper runs out furious, but the boy is gone. A crowd gathers, and begins to stare with quiet satisfaction at the gaping hole in the window and the shattered glass over the bread and pies. After a while the crowd feels the need for philosophic reflection. And several of its members are almost certain to remind each other or the baker that, after

all, the misfortune has its bright side. It will make business for some glazier. As they begin to think of this they elaborate upon it. How much does a new plate glass window cost? Fifty dollars? That will be quite a sum. After all, if windows were never broken, what would happen to the glass business? Then, of course, the thing is endless. The glazier will have \$50 more to spend with other merchants, and these in turn will have \$50 more to spend with still other merchants, and so ad infinitum. The smashed window will go on providing money and employment in ever-widening circles. The logical conclusion from all this would be, if the crowd drew it, that the little hoodlum who threw the brick, far from being a public menace, was a public benefactor.

Now let us take another look. The crowd is at least right in its first conclusion. This little act of vandalism will in the first instance mean more business for some glazier. The glazier will be no more unhappy to learn of the incident than an undertaker to learn of a death. But the shopkeeper will be out \$50 that he was planning to spend for a new suit. Because he has had to replace a window, he will have to go without the suit (or some equivalent need or luxury). Instead of having a window and \$50 he now has merely a window. Or, as he was planning to buy the suit that very afternoon, instead of having both a window and a suit he must be content with the window and no suit. If we think of him as a part of the community, the community has lost a new suit that might otherwise have come into being, and is just that much poorer.

The glazier's gain of business, in short, is merely the tailor's loss of business. No new "employment" has been added. The people in the crowd were thinking only of two parties to the transaction, the baker and the glazier. They had forgotten the potential third party involved, the tailor. They forgot him precisely because he will not now enter the scene. They will see the new window in the next day or two. They will never see the extra suit, precisely because it will never be made. They see only what is immediately visible to the eye.

Hazlitt does not spell out all the steps in his argument, so we will do it for him. The argument depends implicitly on the assumption that the economy is in a state of competitive equilibrium. In such a state, an increase in the production of one good, such as windows, can only come at an equal or greater opportunity cost, in this case a reduction in the production of suits. So, there is no net gain to set against the destruction of the window with which the story began.

Let's remind ourselves of the conditions of competitive equilibrium we discussed in Section ... The critical assumption in Hazlitt's version is (A) , 'Everyone faces the same market-determined prices for all goods and services, including labor of any given quality, and everyone can buy or sell as much as they want to at the prevailing prices'.

Since, by assumption (A), both glaziers and tailors already have as much work as they want at the prevailing wages, an increase in one line of work, say that of glazing, can only happen if glaziers are induced to work harder than they would like at current wages or if workers switch from other activities like tailoring, and take up glazing instead. Either way, there is no net gain.

Even if the competitive market assumption doesn't hold, there's no particular reason to think that randomly smashing windows will improve the allocation of resources. We'll look at this point next, in the more realistic context of natural disasters.

6.2 *The economics of natural disasters*

Natural disasters like floods, earthquakes and hurricanes come seemingly out of nowhere, wreak intense havoc in a short period, and move on, leaving vast, and largely random, destruction in their wake. Productive economic activity is halted or disrupted, often for weeks or months after the initial impact has passed.

Reports of such events commonly provide estimates of the associated damage bill and the cost of lost production. The cost is partially covered by insurance claims and government disaster assistance, but inevitably much of it falls on the residents of the area hit by the disaster.

It is only natural for people, faced with such disasters, to seek to find some consolatory 'silver lining', and one such consolation is the idea that natural disasters will create work, and thereby stimulate the economy. Disasters certainly create work for emergency services of all kinds when they occur and for the many kinds of workers needed to rebuild damaged houses and infrastructure.

The wages earned by these workers might be seen as an offset against the damage from the disaster. That would be true if they had nothing else to do. But, most of the time, such workers are not to be found sitting idle and waiting for a disaster to happen.

Government budgets are chronically tight, so emergency services are routinely overstretched. Providing additional services to respond to a disaster comes with an opportunity cost, that of the more routine services that would ordinarily be provided.

Similarly, unless the disaster happens to coincide with a slump in the construction industry, rebuilding damaged houses comes at the expense of the new houses that would otherwise have been built. Natural disasters strike at random, and most of the time do not coincide with any requirement to create jobs in the construction sector. Moreover, there are many more useful ways of creating jobs. Expecting economic benefits from a natural disaster is like hoping that a car smash will fix your wheel alignment.

To sum up, in economic terms, disasters are, in most cases, just as bad as they appear at first sight. As with the example of the broken window the economic activity generated by disaster repairs comes at the opportunity cost of productive activities that may be overlooked because they are never undertaken.

6.3 The opportunity cost of war

What is true of natural disasters is even more true of the disasters we inflict on ourselves and others. Of these human-made calamities, the greatest is war.

Dwight Eisenhower, Supreme Commander of the Allied Forces in Europe during World War II was arguably America's greatest military commander, and served as President of the United States at the height of the Cold War with the Soviet Union. It is striking, then, that more than any US political leader before or since, Eisenhower showed an acute understanding of the limitations of military power and of the economic costs of military expenditure. He is, perhaps, best remembered for warning of the dangers of the 'military-industrial complex' as a standing lobby for armaments spending.

Even more penetrating was his observation that

Every gun that is made, every warship launched, every rocket fired, signifies in the final sense a theft from those who hunger and are not fed, those who are cold and are not clothed'.

The logic of opportunity cost has rarely been put more simply or sharply, particularly as it applies to military expenditure. Nearly 50 years after Eisenhower's death, the lesson he stated so simply and forcefully has not been learned. Every crisis in the world brings forward a call for military intervention, often from people who regard 'foreign aid' as a proven failure.

The failure rate for these interventions is far higher than for ordinary foreign aid projects. Of the major US military interventions in the past 20 years (Kosovo, Somalia, Gulf War I, Afghanistan, Gulf War II, Libya and Iraq/Syria) only Kosovo²⁶ could be regarded as a clear success, and even there the outcome is a weak state bitterly divided between two hostile communities, kept apart by armed peacekeepers..

But even when military action works as planned, it is hard to justify in terms of opportunity cost. The total figures are staggering. The Afghan and Iraq wars between them are estimated to have cost the United States between \$4 trillion and \$6 trillion dollars in wartime expenditures and future medical bills for veterans (Bilmes). That's ten times the total amount of aid received by the whole of Africa since 1945, an amount regularly cited to show the futility of foreign aid.

Rather than attempt to apply opportunity cost calculations to such stupendous numbers, let's look at the opportunity cost of maintaining a single additional soldier in Afghanistan. The direct cost has been estimated at \$2.1 million per soldier per year,

<http://news.yahoo.com/it-costs--2-1-million-per-year-for-each-soldier-deployed-in-afghanistan--report-133150602.html>

though support costs and the need to provide for future medical care would almost certainly double this.

We could look at the opportunity cost in terms of alternative ways of providing aid to Afghanistan. The US development agency USAid provides around \$70 million a year in educational and social services aid to Afghanistan,

<http://results.usaid.gov/afghanistan#fy2013>

a sum which is claimed to enable one million additional children to enrol in education

<http://www.usaid.gov/afghanistan/education>

²⁶ Gulf War I succeeded in the terms originally set out, but, beginning with the incitement of the failed Shi'ite uprising, set in train the disastrous process that ultimately produced Gulf War II, and, another decade later, the War against ISIS.

Obviously there is plenty of room for more expenditure of this kind, in Afghanistan or elsewhere. A simple calculation shows that the opportunity cost of keeping 35 soldiers in the field is school education for a million young people.

Most advocates of the war, faced with this kind of calculation would say that the object of the war is not (primarily) to promote the welfare of Afghans but to protect Americans from the threat of terrorist attack. It might seem to be impossible to place a monetary value on such protection. However, it is at least possible to identify the opportunity cost, and, as we have seen, the US government does so explicitly.

As we will see later, US government interventions aimed at protecting Americans from threats to their life and safety are typically approved only if the cost per life saved is less than the ‘Value of Statistical Life’ for the agency concerned.

In particular, this procedure applies to policies aimed at protecting Americans from terror attacks within the United States. In assessing a September 2007 Department of Homeland Security proposal to expand air travel security, the U.S. Customs and Border Patrol estimated life-saving benefits using two separate life values: \$3 million and \$6 million.

<http://www.foreffectivegov.org/node/3205>

No such analysis is applied to overseas military action. Nevertheless, the logic of opportunity cost applies, whether or not it is taken into account by planners. Each additional soldier deployed in Afghanistan comes at the cost of the alternative use that could be made of the required funding. Using the \$6 million estimate cited above, the opportunity cost of the \$6.3 million spent to deploy three additional soldiers is the funding of a domestic security program that would save one American life per year.

If the casualty rate for soldiers in the field were anything like one in three, the war would have ended long ago. Yet the same cost in lives, in the form of foregone opportunities to protect Americans at home, has been accepted with bipartisan support, because it is invisible, unless viewed through the lens of opportunity cost.

Bastiat’s contrast between “that which is seen” and “that which is not seen” has never been more apposite.

6.4 *Economic benefits of war ?*

Despite, or perhaps because of, the obvious waste and destruction of war, it's often claimed that war has economic benefits, and even that it's necessary to the successful functioning of the economy. One version of this argument, based on the idea of 'military Keynesianism' will be discussed later.

In this section, we'll look at another popular argument, namely, that war is a spur to research and development (R & D), and therefore to peacetime prosperity. This idea, mostly based on the experience of World War II, has some superficial appeal.

As in many other instances, World War II was exceptional. World War I produced some notable advances in the technology of death and destruction (poison gas, tanks and submarine warfare to name a few), but little of any value beyond that. Other 20th century wars, with the exception of the Cold War, discussed below, have been too small in their scale to have much impact on the technological development of the world as a whole.

World War II was different, at least on the face of it. Penicillin, nuclear energy, computers and jet aircraft are examples of technologies that were developed, or advanced rapidly, during World War II, and played a major role in postwar prosperity.

In all of these cases, the underlying research had been commenced in the 1920s and 1930s. Following the fortuitous discovery of the antimicrobial properties of penicillin by Alexander Fleming in 1928, Howard Florey and Ernst Chain began work in 1939 to understand its therapeutic action and chemical composition. Frank Whittle patented the turbojet in 1930 and built the first prototype in 1937. Turing's fundamental work on computability was also undertaken in the 1930s. Atomic fission was first demonstrated in 1938, the culmination of decades of research. In August 1939, a group of physicists including Albert Einstein wrote to President Roosevelt warning that this discovery raised the possibility of an atomic bomb.

The outbreak of war led to a massive push to apply these and other research discoveries on an industrial scale, producing millions of doses of penicillin, hundreds of thousands of airplanes, including the first jet fighters, and of course the atomic bomb. ENIAC, the first electronic general-purpose computer was commissioned to compute artillery tables, but did not appear until 1946, when it was used in computations to produce the first hydrogen bomb.

Opportunity cost reasoning leads us to ask what was foregone to release the resources. In large part, the answer is ‘research of the kind that made these developments possible’. War gives great urgency to the ‘D’ part of R&D, at the expense of ‘R’. This can produce some impressive short run payoffs, such as those described above.

On the other hand, the need for immediate results can lead to losses in the long run. This is evident, for example, in the case of computing. Overall, it seems likely that World War II delayed the development of modern digital computers. The urgent demand for computational power to be delivered as soon as possible meant that designs remained close to those of older analog computing devices.

Much harder to measure, but almost certainly more significant, is the loss arising when scientists are shifted from fundamental research to activities more directly relevant to the war effort, much of it with very little value beyond the immediate needs of the military. Then there are the vast numbers of young scientists whose careers were interrupted because of military service.

For quite a few scientists, war service has been more than a career interruption. Harry Moseley, widely regarded as the greatest experimental physicist of the twentieth century, was killed at Gallipoli in 1915²⁷. The great theoretical physicist Karl Schwarzschild died the following year. Other losses include the mathematicians Jean Cavailles, shot by the Gestapo, and Wolfgang Doblin, who killed himself when faced with capture by the Germans. Another tragic and heroic story from World War II is that of the scientists of the Pavlovsk Experimental Station near Leningrad (now St Petersburg), twelve of whom starved to death while protecting the station’s seed bank during the siege of the city in 1941.

Many more died before having any chance to contribute. One can think of the 50 per cent fatality rate suffered by the class of 1914 at the École Normale Supérieure https://books.google.com/books?id=EjZHLXRKjtEC&pg=PA329&lpg=PA329&dq=ecole+nationale+superieure+casualties+world+war+i&source=bl&ots=asLFDx9V5p&sig=gr415-65JgNhXGRaCHkEz39xzmk&hl=en&sa=X&redir_esc=y#v=onepage&q=ecole%20nationale%20superieure%20casualties%20world%20war%20i&f=false.

²⁷ Niels Bohr is supposed to have said that even if no one else had died, the death of Harry Moseley alone was enough to make the First World War an unbearable tragedy.]

<http://prospect.rsc.org/blogs/cw/2013/08/12/henry-moseley-single-most-costly-death-war/>

As the example of the Pavlovsk Experimental Station shows, scientific projects themselves were not immune from the destruction. The first programmable computer to be built was not ENIAC, but the Z1, designed by German Konrad Zuse. This computer and its successors, the Z2 and Z3 were destroyed by Allied bombing raids, and Zuse's work was not resumed for years.

Yet again, the idea of opportunity cost as 'that which is not seen' provides a corrective against any attempt to minimize the costs of destruction.

Lesson 2 Part I: Social opportunity costs

In Lesson 1, we saw how prices in competitive markets reflect the opportunity costs faced by producers and consumers. For many writers on economics, including Hazlitt, this is the beginning and end of the story. The conclusion they draw is that government action that takes society away from the market allocation can only be for the worse.

In reality, however, markets don't work in the idealized fashion assumed in simple tracts like *Economics in One Lesson*. As a result, many opportunity costs arising in the process of production and consumption aren't reflected, or aren't fully reflected, in market prices.

To begin with, there is nothing special about the particular market equilibrium we observe at any given time. There is an infinite range of possible allocations of property rights, each corresponding to different social choices, and each associated with a different competitive equilibrium.

Second, the actual outcome in a market economy differs greatly from the ideal competitive equilibrium. Markets for vital services like health and education work poorly or don't exist at all. Social and economic problems including unemployment, pollution and monopoly are further examples where markets don't work in the way that Hazlitt assumes. This large class of problems is collectively known as 'market failure'. Although market failures are many and varied, all involve the failure of market prices to reflect opportunity costs.

One type of market failure, the cycle of boom and bust that gives rise to mass unemployment, is so severe and so pervasive that it has become the subject of a special branch of economics, called macroeconomics. The name, which refers to the study of the economy at an aggregate level, is distinguished from microeconomics, the study of individual prices and markets and the way that they interact in equilibrium.

The evidence from macroeconomics is that, for the economy as a whole, resources are not always allocated on the basis of opportunity cost. Rather, there are long periods of recession and depression where productive resources sit idle, so that their opportunity cost, in effect, is zero.

The inability of markets to resolve questions of distribution, and the various forms of market failure form the basis of Lesson Two

Lesson 2: Market prices don't reflect all the opportunity costs we face as a society.

We will begin by looking at Lesson 2 in detail. We first examine how the logic of opportunity cost applies to the distribution of income and wealth. Next we will look at a variety of forms of market failure, drawing on the classic work of Francis Bator (1958). Finally, we will consider how to interpret the classic macroeconomic problems of recession, unemployment and inflation in terms of opportunity cost.

7 Property rights and income distribution

The competitive equilibrium we talked about in Lesson 1 is not the unique product of spontaneous social processes. Rather it depends on the allocation of property rights on which trade is based. Before we can trade in markets, we must determine who owns what. This determination is subject to the logic of opportunity cost, but can't be reduced to market transactions.

Presented with this problem in the abstract, most people would prefer an egalitarian initial allocation, leading to outcomes where everyone is better off than they were before entering into trade, and no one is much better off than anyone else. In reality, though, there is no starting point at which we get to make a once-for-all choice.

People enter the world with endowments of all kinds that are determined, in greater or lesser measure, by those of their parents. They have innate or acquired characteristics that may prove valuable, or harmful, to their chances of doing well in a given society. In some societies, for example, strength and a propensity for physical violence may lead to positions of power, in others to imprisonment and poverty. This process continues from birth to death. People experience good and bad luck over the course of their lives, as well as incurring the consequences of life choices that may or not be wise.

Social decisions about property rights influence the allocation of opportunities between people in a given generation, and between generations. Again, there is no point at which a 'once for all' fair allocation can be settled, leaving everything to market exchange from then on. Every

day, some people are born, helplessly dependent on their parents, and others die, leaving assets of various kinds behind them. Decisions made today supersede the wishes of the departed and constrain the opportunities of the young and of those yet to be born.

Yet such decisions must be made all the time, implicitly and explicitly, and the logic of opportunity cost applies to them. Rights allocated to one person or group cannot be allocated to another. The way in which this allocation takes place is the central topic of this chapter.

7.1 What Lesson 2 tells us about property rights and income distribution

In any market economy, the outcome of interactions between individuals, families, businesses and governments depends on the initial allocation of property rights and resources that determines the starting point for trade and employment. Those property rights include not only ownership of houses, factories and so on, but the set of rights and obligations created by taxation and welfare systems, and the legal framework within which economic activity takes place.

The range of possible initial allocations and institutions is vast, and so is the range of possible market outcomes they can generate. In fact, according to economic theory, any final outcome that is consistent with the technological possibilities available to society, and that takes full advantage of the possibilities for trade, can arise as the market outcome, given the right initial allocation.

What this means is that the choice of any particular starting point, and the resulting market outcome, entails an opportunity cost, namely, forgoing all the alternative possibilities. Increasing the allocation of rights to one person or group will, in general, reduce what is available for everyone else, and this will be reflected in the market outcome.

7.2 The starting point

If we are going to consider changes in the distribution of income and wealth, what should we take as our starting point? There are various possibilities, many of which are of theoretical interest, but not of much practical use.

Hazlitt doesn't spell out the starting point for his analysis. However, his analysis is based on the implicit claim (spelt out in more detail by Bastiat) that there is a natural distribution of private property rights, that exists prior to any government activity such as taxation and the payment of welfare benefits. This is nonsense. It is impossible to disentangle some subset of property rights

and entitlements from the social and economic framework in which they are created and enforced.

The ordinary meaning of ‘property’ refers to a specific kind of control over resources, most completely realized in freehold ownership of land. In the idealized model which forms the basis of much thinking about property, all property is of this kind.

Most of the time, we take the existing allocation of property rights for granted. This is, however, an example of exactly the fallacy pointed out by Bastiat, that of focusing on what is seen and ignoring the unseen alternatives. All property rights began with a decision by governments to create and enforce someone’s right to use a particular good, asset or idea, and to regulate the way in which that right might, or might not, be transferred to others.

In some of the cases discussed in Section 2, such as those of telecommunications spectrum and fishing quotas, the rights were created relatively recently, and the process by which they were created is well documented. In somewhat older cases, such as that of the 19th century innovations which created limited liability corporations, the history has been forgotten by all but a few specialists. Going even further back, property rights in land and in ordinary goods (chattels, in legal parlance) are mostly taken for granted, even though they are all derived, in the final analysis, from a state-created legal framework.

In any society, people have views about what property rights are legitimate and, in particular, what they themselves are entitled to. These views may or may not match the property rights that actually prevail in that society. For example, workers commonly regard of their job as belonging to them, in some sense. In some places, this perception is supported by laws prohibiting unfair dismissal. In the United States, by contrast, the doctrine of ‘employment at will’ means that the job is the property of the employer.

Propertarians like Hazlitt want to pare back government to the minimum necessary to protect the property rights of which they approve. These include rights over land and houses, private sector financial assets and personal possessions.

There are two main difficulties with this. First, propertarians disagree among themselves as to which government functions should be retained, and which property rights should be maintained. For example, some support core government functions like police and fire services while others want these to be provided, on a market basis, to those willing to pay for them.

Similarly, some proprietarians, support the idea that the creators of ideas should have unlimited ‘intellectual property’ in those ideas, while others believe that ‘information ought to be free’.

Moreover, while proprietarians almost invariably oppose ‘welfare’ benefits paid out of tax revenue, such as social security, there is no clear dividing line between these benefits and contractually obligatory payments such as pensions for public and private workers.

The fine distinctions between Austrians, minarchists, objectivists, and anarcho-capitalists are too complex and tedious to be detailed here. The point is that any attempt to define, on the basis of logical first principles, a ‘natural’ set of property rights, independent of government, runs rapidly into quicksand.

The second problem is that any attempt to strip all rights and entitlements back to a minimal set corresponding to a naive notion of ‘private property’ would not produce anything like the existing distribution of private property rights. Some kinds of private property would become much more valuable, and others much less so. An example can be seen in the mass privatisations that followed the end of Communism in Russia and other countries in the former Soviet bloc., These processes greatly enriched a handful of oligarchs and greatly impoverished everyone else, leading, for most people to the loss of the limited property rights they had.

It is impossible to describe a proposed starting point based on such a radical change with any accuracy. So, we can’t really say what the opportunity cost of shifting property rights from one person to another might be in such a situation. It makes sense, therefore, to start thinking about the initial allocation with reference to our actual position rather than to some theoretical ideal or another.

In most modern societies, governments collect a substantial proportion of national income in taxation revenue. Some of this revenue is spent on the provision of public services, and some on ‘transfer payments’ such as social security, unemployment and disability insurance, and assistance to poor families.

The starting point therefore includes both the existing set of property rights of workers, the employment position of workers and the rights and obligations of members of the community to receive government services and benefits and to pay the taxes necessary to finance those services and benefits.

7.3 *The opportunity costs of redistribution*

There are many policy changes that will improve the starting position for some members of the community. Examples include

- (A) Reducing marginal rates of income tax above some income level, which will benefit those with taxable incomes above that level;
- (B) Increasing the duration of intellectual property rights such as copyrights and patents, which will benefit the owners of those rights;
- (C) Increasing the number of publicly funded places in colleges and universities, which will benefit the young people who are able to attend;
- (D) Increasing social security payments and unemployment insurance, which will benefit those who are unable to work because of age or inability to find a job; and
- (E) Increasing the minimum wage.

Over the past 40 years, we have seen substantial changes of types (A) and (B) in the United States and elsewhere around the world. The top marginal rate of income tax has been reduced from 70 per cent to 39.6 per cent . The maximum term of copyright protection has been extended from 56 years in 1975 to the duration of the authors life plus 70 years. This measure does nothing for authors, but greatly enriches corporate owners of copyrights such as the Disney Corporation²⁸. Other measures, such as the use of ISDS provisions in trade agreements, have created a variety of new and expanded property rights for corporations.

By contrast, there have been few changes of types (C), (D) and (E). On the contrary, public funding of universities has been reduced, eligibility for social security has been tightened and the real value of the minimum wage has been reduced.

This outcome reflects the logic of opportunity cost. To finance increased expenditure on some goal or to reduce the taxes paid by one group, the government must find offsetting cuts in expenditure or increased taxes elsewhere, or else accept a larger deficit, incurring a debt that will have to be serviced in the future. The least unattractive of these options, as evidenced by the choices of policymakers, will constitute the opportunity cost of providing the benefit.

²⁸ Disney's most valuable corporate assets Mickey Mouse and Winnie the Pooh date back to the 1920s. Mickey was, at least, a Disney creation, but Winnie was bought from the estate of English author AA Milne, who died in 1956. Doubtless, the expiry of Winnie's copyright term due in 2026, will be forestalled by a further extension.

Creating new property rights or extending old ones provides the owner with control over resources, including ideas, that were previously accessible to all. Users other than the owner will either be excluded from the resource or will have to negotiate terms with the owner; the associated costs represent the opportunity cost.

7.4 Opportunity cost of redistribution: example

Any change in the allocation of rights and obligations will create benefits for some people and costs for others. Consider a simple example: a reduction of 0.1 per cent in the top marginal rate of income tax, currently 39.6 per cent, providing roughly \$1 billion in additional net income to those with pre-tax incomes over \$400 000.

The opportunity cost of such a policy is the offsetting measure needed to finance it. Possibilities include a reduction in public expenditure, an increase in other forms of taxation or the issuance of debt that must be repaid in the future. For concreteness, let's suppose that the tax cut is financed by a reduction in unemployment insurance payments. How large a reduction is needed? Both collecting taxes and operating unemployment insurance schemes involve administrative costs. Collecting taxes is costly, as is administering unemployment insurance.

The opportunity cost of this policy is less than the \$1 billion transferred from the unemployed to high income earners. The opportunity cost of a transfer payment includes the value of resources spent in administration, as well as the amount transferred. If the transfer is reduced, these administration costs will also be reduced. As advocates of the free market will be quick to point out, that's not all. Reducing tax rates on high income earners will lead to changes in the opportunity costs that they face. In particular, the opportunity cost of taking additional leisure time, namely the additional expenditure that could be enjoyed with a higher post-tax income, increases as tax rates fall.

This change in opportunity costs, often referred to as an 'incentive effect' means that high income earners will tend to allocate more time to work, and less to leisure, when tax rates are reduced. Some of the resulting extra income will flow back to the government in the form of tax revenue, partly offsetting the initial cost of the tax cut.

More importantly perhaps, the lower are tax rates, the less effort high income earners, and their lawyers and accountants, may be expected to put into schemes to avoid or reduce tax liabilities.

From the viewpoint of someone paying a tax rate of 40 per cent, and not concerned with the ethics of tax avoidance, a scheme that turns a dollar of taxable income into 70 tax-free cents is well worth while. The benefit of 70 cents exceeds the opportunity cost of 60 cents of disposable income. So, we can expect lower marginal tax rates to be associated with some reduction in the resources devoted to tax avoidance.

On the other side of the transfer, it is often argued that more generous unemployment benefits reduce the opportunity cost of remaining unemployed, namely the income foregone, and therefore make the unemployed less keen to seek work. The evidence on this point is mixed in the US context, but there is probably at least some effect.

Taking all these points into account, the opportunity cost of a \$1 billion reduction in the tax paid by top income earners will be a reduction of less than \$1 billion in the net benefits that can be paid to the unemployed. For those concerned solely with 'efficiency' or maximizing the market value of GDP, that's sufficient to resolve the issue. Cutting taxes on the rich, and impoverishing the poor even further, will generally increase GDP. But GDP is an arbitrary aggregate, which tells us nothing about the social opportunity costs and benefits of different allocations of rights and obligations. To assess the desirability of a redistribution of rights, such as a reduction in marginal tax rates we need to answer two questions

First, what is the opportunity cost? In this case, how much do we have to reduce net payments through unemployment insurance in order to finance a cut in marginal tax rates?

Second, how should we weigh the benefits to some (in this case, the wealthy) against the opportunity costs borne by others (in this case, the unemployed)?

We will address these questions in the next two sections.

7.5 *TANSTAAFL and the Laffer hypothesis*

Scratch someone with a TANSTAAFL bumper sticker and you're pretty sure to find a believer in the so-called so-called 'Laffer curve'. The idea associated with that phrase represents the ultimate 'free lunch': the claim that by cutting income tax rates for high income earners, it is possible to generate more tax revenue, which can then be used to make everyone better off.

Everyone knows the story of how Laffer drew a graph on a napkin, illustrating the point that tax rates of 100 per cent would result in a cessation of economic activity and therefore yield zero revenue. Since a tax rate of zero will also yield zero revenue, there must exist some rate of

taxation that yields a maximum level of revenue. Increases in tax beyond that point will harm economic activity so much that they reduce revenue.

Wanniski christened this graph the ‘Laffer curve’, but as Laffer himself was happy to concede, there was nothing original about it. It can be traced back to the 14th century Arabic writer Ibn Khaldun. Laffer credited his own version to the nemesis of supply-side economics, John Maynard Keynes. And while few economists had made much of the point, that was mainly because it seemed too obvious to bother spelling out.

What was novel in Laffer’s presentation was what might be called the ‘Laffer hypothesis’, namely that the United States in the early 1980s was on the descending part of the curve, where higher tax rates produced less revenue. Unfortunately, as the old saying has it, Laffer’s analysis contained a mixture of correctness and originality. The Laffer curve was correct but unoriginal. The Laffer hypothesis was original but incorrect.

For the Laffer hypothesis to be supported, tax cuts would have to increase revenue more rapidly than would be expected as a result of inflation and normal income growth. In fact, as Richard Kogan of the Center on Budget and Policy Priorities reported, income tax receipts grew noticeably more slowly than usual in the 1980s, after the large cuts in individual and corporate income tax rates in 1981.

To the extent that there was an economic response to the Reagan tax cuts, and to those of George W. Bush twenty years later, it seems largely to have been a Keynesian demand-side response, to be expected when governments provide households with additional net income in the context of a depressed economy (See section ...).

There have been attempts to make the fantasy economics of the Laffer hypothesis more respectable, using an idea called ‘dynamic scoring’. Studies using this idea have not supported the extreme claims made by Laffer, but they have suggested that a large proportion of any cut in taxes, particularly taxes on capital income, will be recouped in the form of additional revenue.

Dealing with this issue in detail is beyond the scope of this book. However, my earlier book *Zombie Economics* explains some of the problems with the dynamic scoring approach, which have led to its being abandoned by serious economists.

Moving on from the fantasy world of the Laffer hypothesis, a large number of economic studies have attempted to estimate the relationship between tax rates, economic activity and revenue. The most common finding is that the incentive effects of a dollar in tax cuts generate around

twenty cents of additional economic activity. Given a top marginal tax rate of 40 cents, around eight cents will flow back to the government in the form of tax revenue.

The incentive effects of transfer payments like unemployment insurance are less well understood, but it seems reasonable to use a similar estimate here: that a reduction in unemployment insurance would yield some additional job search and work effort, resulting in around 20 cents of additional economic activity for each dollar in reduced assistance.

In addition, we might estimate 10 cents in the dollar for the administrative costs of the tax and welfare systems, including the resource costs of tax avoidance.

Putting all of these effects together, a plausible estimate is that increasing the incomes of the wealthy by one dollar, through lower tax rates, implies an opportunity cost of 50 cents, in reduced transfers to the poor and unemployed.

Does such a change make society as a whole better or worse off? Answering this question inevitably involves a value judgement. But that doesn't mean economics has nothing to say about the question. We can use opportunity cost reasoning to clarify our thinking about issues of income distribution.

7.6 Weighing opportunity costs and benefits

Changes in the regulation of labor and capital markets and in taxation and expenditure policy have greatly enhanced the income and wealth of the best-off members of society (the so-called 1 per cent), and have yielded more modest, but still substantial, improvements in the position of those in the top 20 per cent of the income distribution (broadly speaking, professionals and business owners and managers).

On the other hand, incomes for the rest of the community have grown more slowly than might have been expected based on the experience of the decades from 1945 to 1975. The substantial technological advances of recent decades have had little impact on the (inflation-adjusted) income of the median US household. For many below the median, incomes have actually fallen as a result of declining real wages and welfare reform.

In the absence of the tax cuts of the 1980s, and the associated cuts in public expenditure and financial and industrial relations policies that benefitted business, the incomes of the wealthy would not have increased as much as they have done. Those on median and lower incomes would have done substantially better. But how should we compare those gains and losses?

Economists and philosophers have been looking at this question for a long time and in many different ways. The answers most consistent with opportunity cost reasoning can be described by the following ‘thought’ experiment, developed explicitly by John Harsanyi and John Rawls in the mid-20th century, but implicit in the reasoning of earlier writers like Jeremy Bentham, John Stuart Mill and Friedrich von Wieser.

First consider yourself in the position of both the high income beneficiary and the low income loser from such a change. Next, imagine that you are setting rules for a society, of which you will be a member, without knowing which of these positions you might be in. One way to think of this is to imagine life as a lottery in which your life chances are determined by the ticket you draw.

Now consider a choice between increasing the income of the better off and the worse off person. Presumably, if the dollar increase were the same in both cases, you would prefer to receive it in the case where you are poor rather than in the case when you are rich.

The reasons for this preference are obvious enough. For a very poor person, an additional hundred dollars could mean the difference between eating and not eating. For someone slightly better off, it may mean the difference between paying the rent and being evicted. For a middle class family, it might allow an unexpected luxury purchase. For someone on a million dollars a year, it would barely be noticed.

Economists typically present this point in terms of the concept of marginal utility, a technical term for the benefits that are gained from additional income or consumption. As argued above, the marginal utility of additional income decreases as income rises. It follows that a policy that increases the income of the rich and decreases that of the poor by an equal amount will reduce the utility of the poor more than it increases the utility of the rich.

Few mainstream economists would reject this analysis outright. However, many prefer to duck the issue, relying on a distinction between ‘positive’ economics, concerned with factual predictions of the outcomes of particular economic policies and ‘normative’ economics, concerned with ‘value judgements’ like the one discussed above. The debate over the justifiability or otherwise of this distinction has been going on for decades and is unlikely to be resolved any time soon.

More importantly, constructs derived from economics are often used, implicitly or explicitly, in ways that imply that an additional dollar of income should be regarded as equally valuable, no matter to whom it accrues.

The most important of these constructs is GDP, the aggregate value of all production in the economy. GDP per person is the ordinary average (or arithmetic mean) income of the community. GDP per person treats additive changes in income equally no matter who receives them.

Used correctly, as a measure of economic activity, GDP can be a useful guide to the short-term management of the economy. In the short run, weak GDP growth is commonly an indicator of a recession, suggesting the need for expansionary monetary and fiscal policies.

Unfortunately, measures of GDP and GDP per person are commonly misused, as an indicator of living standards and economic welfare more generally. There are many reasons why this is inappropriate, but the failure to take account of the distribution of income is most important.

It is easy enough to see that, if the opportunity cost of a given increase the income of a better off person is an equal increase in the income of a worse off person, then the change is for the worse.

What about the case when the choice is between a given increase for the worse off person and a larger increase for the better off person? How big does the benefit to the better-off person need to be before it outweighs the opportunity cost (the foregone opportunity to improve the position of the worse off person) ? This question, raising once again the thought experiment mentioned above, can be answered in many different ways.

One answer is to use the same kind of reasoning as we do when comparing choices between the present and the future. As was discussed in Section 3.1.2, the most common rule is to treat equal proportional increases in income as being equally desirable. That is, an increase of \$1000 in the income of a person on \$10 000 a year is seen as yielding a benefit comparable to that of an increase of \$10 000 in the income of a person earning \$100 000 a year. Conversely, if the opportunity cost of the \$10 000 benefit to the high income earner is a loss to the low income earner of more than \$1000, the cost exceeds the benefit.

It's surprisingly easy to turn this way of looking at things into a measure of average living standards. If, we want a measure that treats proportional changes equally, all that is needed is to replace arithmetic average measures such as GDP per person with the geometric average (mean) that we all learned about in high school (and most of us promptly forgot).

The geometric mean has the property that, if all incomes increase by the same proportion, so does the geometric mean. For this reason, it's a better measure of the growth rate of incomes across the community than the usual arithmetic mean. It can also be justified mathematically, in terms of the theory of expected utility. For those interested, the details are spelt out in an optional section on logarithmic utility.

The geometric mean is equal to the arithmetic mean when incomes are distributed exactly unequally. But the more unequal is the income distribution, the greater the gap between the arithmetic and geometric means. For this reason, the ratio of the arithmetic to the geometric mean is often used as a measure of income inequality.

We can look at the changes in these measures using data from the US Census Office, and some simple computations (details available on request). From 1967 to 2013, arithmetic mean income per household (in 2013 dollars) rose from \$66 500 to \$104 000, an increase of 56 per cent. But the geometric mean rose by only 34 per cent, from \$50 000 to \$67,500. The ratio between the two rose from 1.32 to 1.54, indicating a substantial increase in inequality.

The idea that equal proportional increases are equally valuable, and therefore that the geometric mean is a good measure of economic welfare or wellbeing is not the only answer to the question posed above. Another possible answer is always to prefer the increase to the worse off person. In this case, welfare is measured by the minimum income. There's no way of reaching a final resolution on questions like this but it's worth observing that a policy aimed at maximising the geometric mean of income would be substantially more egalitarian than anything that has ever been seen in a market economy.

For example, calculations by Peter Diamond and Emmanuel Saez, using a method equivalent to the geometric mean approach, suggest that the top marginal tax rate, after taking account of disincentive effects should be between 70 and 80 per cent. These rates are far above those found in any country today. And while the top marginal rate was at or above this level in the 1950s, generous exemptions and other loopholes meant that the effective rate was much lower.

It's not surprising that political outcomes are less egalitarian than an opportunity cost estimate would suggest. The thought experiment leading to the geometric mean gives everyone equal weight, as in an ideal democracy. In practice, however, the well off have more weight in democratic systems than do the poor; and of course the disparity is even greater in undemocratic and partly democratic systems. So, while there are good arguments for more strongly egalitarian

approaches, policies aimed at maximizing geometric mean income will inevitably be found well to the left of centre in any feasible political system.

7.7 Optional: Log utility and the geometric mean

8 Unemployment

In this chapter, we will first look at the business cycle of boom and recession. As we will see the economy is in recession almost as often as it is operating at full capacity. This is contrary to the view implicit in most textbooks, where full employment is the norm, and recessions are represented as temporary aberrations, and it has important implications for the way we think about opportunity cost.

We will then consider in more detail how Lesson 2 applies to unemployment.

Pulling all this together, we'll see that the microeconomic analysis of Lesson 1 only makes sense if full employment can be sustained. This doesn't happen automatically in market economies. It requires government action, through monetary and fiscal policy, to smooth out the business cycle.

With this in mind, we will reconsider Hazlitt's discussion of Bastiat's 'glazier's fallacy'. We will show that the story told by Bastiat only makes sense in an environment of high unemployment. In this context, the apparent fallacy needs more careful consideration.

8.1 Macroeconomics and microeconomics

Economists commonly distinguish 'macroeconomic' issues like unemployment which affect the economy as a whole from 'microeconomic' issues arising in particular markets. Microeconomics leads us, with some important qualifications to Lesson 1. Microeconomic analysis shows us how prices signal, and respond to, opportunity costs. By contrast, the core concern of macroeconomics is the periodic failure of markets to function properly, resulting in recessions and depressions. Macroeconomic analysis is, therefore, part of Lesson 2.

The macro-micro distinction goes back to John Maynard Keynes, the great British economist who produced the first serious analysis of why market economies can experience prolonged periods of depression, including high unemployment and widespread business failure. The core idea in Keynes' analysis is that of a failure of co-ordination, in which people may be willing to trade at the prices prevailing in the market, but are unable to do so.

In standard economics courses, analysis of opportunity cost and market failure is typically confined to courses on microeconomics. This is a mistake. Lesson 2 tells us that market prices don't reflect all the opportunity costs we face as a society. There can be no clearer case of this than that of an unemployed worker, willing to work for the prevailing market wage, but unable

to find a job. Workers trade their labor for the goods they buy with their wages. Under conditions of high unemployment, workers would like to make this trade at current wages and prices, but are unable to do so. Yet when the economy recovers, the same workers regain employment and are sufficiently productive that employers can pay their wages and earn a profit margin. This is possible precisely because of the additional demand for goods and services of all kinds that arises when the labor force is fully employed.

Mass unemployment, then, is a clear illustration of Lesson 2. The prevailing wage does not reflect the opportunity cost faced by unemployed workers, who would willingly work at this wage and could, under full employment conditions, produce enough to justify their employment.

Wages represent most, or at least a large part, of the cost of every one of the goods and services produced in the economy. For the majority of households, wages are the primary source of income. When wages do not properly reflect the social opportunity cost of labor, no price in the economy reflects the true social opportunity cost of the goods and services concerned.

To put it simply, Lesson 1, important as it is, holds true only in an economy that is working at full employment. The standard results of microeconomics are valid only when the macroeconomy is working properly. This fact is why Keynes saw his macroeconomic theory as a means of saving market capitalism, not from its socialist critics, but from its own potentially fatal flaws.

8.2 *The business cycle*

In the United States, recessions are officially measured by the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER). NBER defines 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, and wholesale-retail sales’

Over the past century, the US economy has been in recession, as defined by the NBER, or in a sustained slump like the Great Depression, almost as often as it has experienced ‘normal’ conditions of steady economic growth and full employment. (We will discuss this further in Section 8.4).

When the NBER was founded in 1920, its primary task was to document and analyze business cycles, of which recessions and depressions are the most distinctive features. To this day, it is the announcement and definition of recessions for which the NBER is best known to the general public. To understand recessions, and the way they are measured, therefore, it is useful to take a brief look at the idea of the business cycle.

Almost as soon as global capitalism emerged around the beginning of the 19th century, it became evident that capitalist economies were subject to fluctuations arising, not from external causes like wars and crop failures, but from the operation of markets themselves. More or less regularly, the economy would fall into recession, frequently as the result of a panic in financial or commodity markets. At other times, the gloom of recession was replaced by the feverish optimism of booms.

The idea that these alternating periods of boom, recession and ‘normal’ economic expansion reflected an underlying cyclical pattern was immediately appealing. A variety of cyclical theories were proposed in the 19th century of which the most influential have been those of Clement Juglar and Nikolai Kondratiev. Kondratiev proposed the idea of ‘long waves’ of expansion and contraction, with each phase lasting up to 30 years. Juglar proposed a cycle of 7 to 11 years encompassing phases of expansion, crisis, recession and recovery. This roughly corresponds to the business cycle concepts in use today by the NBER.

The NBER approach is based on identifying ‘peaks’ and ‘troughs’ in economic activity. A recession is then defined as the period between a peak and trough, while an expansion is the period between a trough and a peak.

The typical view of the US business cycle is one in which recessions are relatively short, and involve a steep decline in economic activity, followed by a similarly rapid recovery, which gives rise to the notion of a ‘V-shaped’ recession. The recovery phase is followed by a more durable period of steady expansion, which is ended either by an economic crisis or by a sharp tightening of monetary policy designed to reduce the risk of inflation. The phases of a cycle including a V-shaped recession correspond fairly closely to the classic Juglar cycle.

However, the biggest macroeconomic events, namely, major depressions such as the Great Depression of the 1930s and the Lesser Depression that began in 2008, do not fit into this pattern. These episodes will be examined in the next section.

8.3 *The experience of the Great and Lesser Depressions*

Most of the time, booms and recessions fit be described by ‘typical’ business cycle pattern first described by Juglar. Recessions are relatively short, occur in different countries at different times, and are followed by a fairly rapid return to the long term trend path of economic growth.

In the last 100 years, however, the developed world has experienced two prolonged periods of Depression that do not fit the typical pattern: the Great Depression of the 1930s and the Lesser Depression²⁹ that began with the Global Financial Crisis of 2008.

The experience of depressions is very different from that of the standard cyclical downturn. Depressions typically follow a period of sustained growth and financial excess, culminating in a crisis and financial panic. The immediate contraction is rapid and deep. Worse still, in most cases, any recovery is choked off by mistaken policy decisions, commonly labelled as ‘austerity’.

The Great Depression followed this pattern, beginning with a crash in the US stock market in October 1929. The US stock market lost 25 per cent of its value in two days, and continued falling for three years. At its lowest point, in July 1932, the market had lost 89 per cent of its pre-crisis value.

Consumer spending fell sharply as a result of stock market losses and a general decline in confidence. Companies responded to the lack of demand by cutting investment, and laying off workers. The result was a downward spiral which cut US industrial production in half between 1929 and 1932.

The decline in the US economy had a direct impact on European exporters. But the biggest impact was financial. A series of banking crises in the wake of the US crash led to the collapse, in 1931, of the Austrian Credit-Anstalt bank, which had been forced to rescue weaker competitors. This turned the general European slowdown into a full-blown crisis.

The US economy did not begin to recover until the inauguration of Franklin D Roosevelt in 1933. Roosevelt did not have a coherent policy program, but he was willing to take action to bring about an economic recovery, regardless of the constraints of market orthodoxy.

²⁹ The terms Great and Lesser Depression are appropriate to the United States, where the recent period of depression has been far milder than that of the 1930s. But in many European countries (examples ...), the current period is actually worse.

Over time, Roosevelt's New Deal program became broadly Keynesian in its orientation, and provided a substantial stimulus

Elsewhere, the general response to the Depression was the adoption of a set of contractionary policies commonly described as 'austerity', with consequences that ranged from bad to disastrous.

The biggest disasters came to pass in Germany and Japan. In his book, *Austerity: The History of a Dangerous Idea*, Mark Blyth describes the way the austerity policies of the conservative Brüning administration in Germany paved the way for the rise of Hitler. Similar policies in Japan led to the replacement of limited democracy by an expansionist military dictatorship.

The Global Financial Crisis that began in September 2008 led to a broadly similar set of economic outcomes, though so far with less disastrous social consequences. After a sharp drop in both employment and production, the US economy returned to slow economic growth in 2010. However, the lost output and jobs were never regained.

Even though official unemployment rates have fallen to low levels, this outcome has arisen entirely because people have given up looking for work. The employment-population ratio (the proportion of the adult population in employment) fell sharply in 2009 and has never recovered.

This experience is common to other long lasting recessions and depressions, particularly those that have followed financial crises. Potentially productive workers can remain unemployed for years at a time. In these circumstances, Lesson 1 does not apply, even approximately. Attempts to pretend that it does, through misguided austerity policies, will only make matters worse.

More needed here?

8.4 Are recessions abnormal?

As was mentioned above, much economic discussion is based on the implicit assumption that the 'normal' state of the economic or business cycle is one of full employment, and that mass unemployment is a rare exception to this state. On this view of the world, recessions are temporary interruptions to a pattern of stable growth.

The pattern of economic activity associated with a 'typical' recession is 'V-shaped', with two or three quarters of sharp contraction followed by an equally rapid expansion which restores the economy to something close to full employment. The widely-used informal definition of a recession as 'two quarters of negative growth' reflects this view.

There have, however, been lengthy periods when the economy has behaved quite differently. In deep depressions such as those following the Wall Street Crash of 1929 and the Global Financial Crisis of 2008, the contraction is sharper and the recovery, when it comes, is slow and fragile. Even after years of 'recovery' employment remains far below normal levels.

During the Great Depression the ratio of employment to population in the United States fell from 55 per cent in 1929 to 42 per cent at the depths of the slump in 1933. Despite the expansionary effects of the New Deal, employment remained weak throughout the 1930s, with the ratio only reaching 47 per cent in 1940.

<http://www.u-s-history.com/pages/h1528.html>

The same is true of the 'Lesser Depression', which began with the Global Financial Crisis at the end of 2008 and has continued ever since. The ratio of employment to population in the United States fell from 63 per cent to 58.5 per cent at the onset of the crisis. Despite years of 'recovery', the ratio has remained at or near that level ever since.

There have also been lengthy periods when recessions were consistently mild, so mild that many observers believed the business cycle to have ceased to operate. The longest such period began with the outbreak of World War II in 1939, and came to an end in the 1970s. This 'long boom' began when wartime economic planning mobilized all available economic resources.

Most economists expected the economy to decline when the war ended, as had happened after World War I. However, under the influence of Keynesian economics, governments in the decades after World War II were committed to maintaining full employment and did so with substantial success. Internationally, this commitment was embodied in the Bretton Woods system of fixed exchange rates, and the associated institutions, the International Monetary Fund and the World Bank. The Keynesian system of economic policies ran into difficulties at the end of the 1960s, leading to the breakdown of the Bretton Woods system in 1971. The 1970s was a chaotic period of high inflation and periodic high unemployment.

In the mid-1980s, the economy began to recover, as the Federal Reserve developed new tools for economic management. Recessions continued to occur, as in 1990 and 2000, but they were relatively brief and mild. By the early 2000s, economists discerned a period of relative stability which was quickly christened 'The Great Moderation'.

However, the Great Moderation turned out to be an illusion. Whereas the Keynesian long boom had lasted for decades, the Great Moderation was already over by the time it was 'discovered'.

The bursting of the Internet bubble in 2000 marked the end of strong employment growth in much of the developed world. The Global Financial Crisis turned slow growth into sharp decline, followed by stagnation.

Taking these disparate periods into account, can we regard full employment as the normal state of the economy, subject to temporary interruptions associated with downturns in the business cycle? The evidence suggests that we can not.

Before looking at the business cycle, it's important to observe that, even under the conditions normally described as representing full employment, around 5 per cent of the labor force is unemployed and actively looking for work at any given time. In addition, substantial numbers of workers would like to work longer hours while others would enter the labor force and seek work if they thought such a search would be successful.

In treating such a state as one of full employment, the underlying assumption is that, under these conditions, unemployment arises from difficulties in matching workers with jobs, rather than from a shortage of jobs in aggregate. (This will be addressed later).

Turning to the cyclical data, the United States was the first country where systematic study of the business cycle was undertaken, and therefore yields a long series of data based on consistent criteria. The National Bureau of Economic Research was set up in the 1920s and has long been the source of official estimates of the start and end dates for recessions in the United States. According to NBER estimates, over the 100-year period since 1914, around 25 years have been spent in recession.

However, this classification is, in critical respects, an underestimate. The NBER treats recessions as beginning when the economy starts contracting, and ending when economic growth resumes. This treatment works reasonably well for 'typical' 'V-shaped' recessions where the recovery phase restores full employment within a few quarters.

In deep Depressions, however, economic weakness persists long after the end of the contraction phase. At least from the perspective of labor markets it would make more sense to treat the recession as continuing until the economy returns to its pre-crisis growth path. In particular, as long as the employment-population ratio is far below its pre-crisis level, implying the existence of large numbers of unemployed or discouraged workers, wages do not properly represent opportunity costs.

To see the implications of this, consider the NBER data separately for the periods before and after 1929. Before 1929, contractions and expansions were about equally long, so that the economy was in recession a little under half the time.

Now, in addition to the NBER data, treat the whole of the Great Depression 1929-39 and the years since the Global Financial Crisis as recessions. On that basis, the US economy has been in recession for about a third of the period since 1929, only a modest improvement on the period 1854-1929.

But this is still an underestimate. The post-1929 average is pulled up by World War II when the government actively worked to ensure that everyone capable of working towards the war effort did so, and by the period of Keynesian macroeconomic management from 1945 to 1970. If these periods are excluded, the proportion of time spent in recession is around 40 per cent.

To sum up, except when governments are actively working to maintain full employment, the economy is in recession almost as often as not. The idea of full employment as the natural state of a market economy is an illusion.

8.5 *Unemployment and opportunity cost*

In the immediate aftermath of an economic crisis, such as the Global Financial Crisis of 2008, markets of all kinds are paralyzed. Unsold goods pile up in warehouses and on wharfs, crops rot in fields because it is not worthwhile to harvest them and half-built houses are abandoned. As a slump continues, firms reduce their production, laying off workers and idling factories. The visible surpluses of unsold goods are gradually wound down, but the surplus of unused productive capacity continues to grow.

The most obvious feature of a recession is mass unemployment, sustained for a long period. Workers of all kinds find it impossible to get jobs, even though they would be willing to work at prevailing wages. As we observed in Section ... mass unemployment is an example, and arguably the most important example, of Lesson 2. The prevailing wage does not reflect the opportunity cost faced by unemployed workers, who would willingly work at this wage and could, under full employment conditions, produce enough to justify their employment.

Workers are not the only ones affected by recessions. A less obvious, but equally important feature of recessions is that capital, as well as labor is unemployed or underemployed.³⁰

Under recession conditions, market prices do not work as accurate signals of opportunity costs for the economy as a whole.

Rather, the opportunity cost of any additional provision of goods and services depends on whether the workers who produce those goods and services were previously employed.

Flow needs fixing here

If an increase in production is achieved by hiring previously unemployed workers, then the true opportunity cost is not the wages they receive but the value of whatever they were doing while unemployed. This value is usually low, for example, doing odd jobs for cash or around the home. It may even be negative, if idle workers sit at home while their skills become obsolete and their work habits are eroded.

If a recession persists long enough, market pressures force wages and prices down to a level where consumers are willing to spend rather than save, and where domestically produced goods and services are more affordable than imports. The process is slow and painful, especially because the immediate impact of lower wages is to reduce the purchasing power of wages and therefore the demand for the ‘wage goods’ typically consumed by workers. Only when prices also fall to a level where they reflect opportunity costs does Lesson 1 become applicable again. In the long run, with lower wages and prices, the recession ends and full employment is restored.

But, as Keynes observed in a much-misquoted statement³¹, this is no reason not to worry about unemployment.

³⁰ At this point, it's worth mentioning the theory of the business cycle put forward by members of the Austrian School, most notably Hayek. According to this theory, business cycle slumps are the result of excessive and unsound investment during a boom phase. The slump continues until the excess capital stock is liquidated through depreciation and scrapping. While this theory represented an advance on the classical view, in which recessions were impossible, it fails to explain why recessions and depressions lead to unemployment among workers. Given an excess of capital, the demand for workers should be greater than usual, not less.

³¹ Keynes is not saying that we should ignore the long run. Rather his point is that we can't afford to ignore the 'short run', which may involve years of recession and depression, on the basis that the economy will eventually return to long run equilibrium.

The long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is past the ocean is flat again.

8.6 *The macro foundations of micro*

In the heyday of Keynesian economics, the majority of attention was focused on macroeconomic issues: unemployment, inflation, economic growth and the balance of international payments. These were the big issues that determined whether the economy was performing well or badly. Microeconomic issues like the determination of prices in individual markets received plenty of attention, but were definitely seen as a less pressing concern.

As Keynes himself observed, only if governments could maintain full employment and economic growth could markets be expected to work properly. In the Keynesian period, the typical economics course began with a description of the economy as a whole, and the basic macroeconomics of the business cycle. Only after presenting this background did the course move on to supply and demand, under implicitly assumed conditions of full employment. In the terms of this book, Lesson 2 was taught before Lesson 1.

When Keynesian economics fell from favor in the 1970s, the crucial objection was that it lacked foundations in microeconomics. The hope was that a single consistent body of economic analysis could be developed to overcome the inconsistencies between macroeconomics and microeconomics. This project has proved to be a disastrous failure. Micro-based macroeconomics proved unable to predict the Global Financial Crisis or to provide any useful guidance on how to respond. Logically, this failure should have cast doubt on the microeconomic foundations of the model as well as the macroeconomic implications derived from it.

However, the majority response among microeconomists has been to treat this as ‘somebody else’s problem’.³² Even if macroeconomic problems appear insoluble, micro-economists assume that the validity of their own analysis is unaffected. The implication is that, even if macro is

³² In the radio series *Hitchhiker’s Guide to the Galaxy* first broadcast in the late 1970s, the character Ford Prefect describes an invisibility device based on the ‘Somebody Else’s Problem Field’ as follows “An SEP is something we can't see, or don't see, or our brain doesn't let us see, because we think that it's somebody else's problem...” https://en.wikipedia.org/wiki/Somebody_else's_problem

totally wrong, only a minority of economists do it, and microeconomists are in the clear. This defense doesn't work, at least not in general.

The problem is that standard neoclassical microeconomics is itself a macroeconomic theory in the sense that it's derived from a general equilibrium (GE) model of the economy as a whole. The standard GE model takes full employment (in an appropriate technical sense) as given, and derives a whole series of fundamental results from this. Conversely, if the economy can exhibit sustained high unemployment, there must be something badly wrong with standard neoclassical microeconomics.

Most notably, in a competitive GE with full information, no externalities and so on, prices of goods reflect the social opportunity cost of producing them. This means, that, other than redistributing the initial endowments of property rights, governments can't do anything to improve on the competitive market allocation of resources.

Once you have involuntary unemployment, all of this fails. Keynes' famous thought experiment of burying pound notes in coal mines made the point that an intervention that would be totally absurd in terms of standard microeconomic reasoning might nonetheless help to alleviate a recession and therefore make society better off.

The point can be made in more detail with respect to labor economics, finance theory, public economics and industrial organization. None of the standard conclusions of these fields of microeconomics can be assumed to be valid under conditions of sustained high unemployment.

9 Market failure

The idea of market failure comes directly from the theory of general equilibrium described in Lesson 1. Under the ideal conditions of competitive general equilibrium market prices for all those goods and services would reflect their opportunity cost for society as a whole.

We have already seen that market processes may fail to reach the general equilibrium outcome for macroeconomic reasons. During periods of crisis and recession, goods go unsold, workers are unemployed and financial assets become unsaleable. Moreover, the desirability of any particular market equilibrium depends on the allocation of property rights from which it is generated. The choice of property rights systems and allocations determines opportunity costs in markets, but this choice is itself subject to the logic of social opportunity cost.

But even in a full employment general equilibrium, and taking the allocation of property rights as given, markets may fail to generate prices that reflect social opportunity cost. When economists discuss market failure, they typically take full employment and the allocation of property rights for granted, and focus on microeconomic problems. What micro-economists usually have in mind when they talk about market failure is the possibility that the full employment equilibrium prices observed in particular markets may not reflect the opportunity costs for society as a whole.

This can happen in many different ways, a fact that has resulted in the development of various typologies of market failure, that is, attempts to classify the main possible problems with market outcomes.³³ There have also been attempts to reduce all the many kinds of market failure to a single underlying cause, such as the absence of a market, or an inadequate definition of property rights. While elegant at first sight, the attempt to fit a range of disparate phenomena into a single analytical box usually ends up reminiscent of a Procrustean bed.³⁴

The framing of the problem in terms of market prices and social opportunity costs suggests two broad classes of market failure. First, market prices may not reflect the opportunity costs facing buyers and sellers. Second, the opportunity costs of a given transaction may be borne, wholly or in part, by people other than the buyer and seller who are directly involved.

The first category of market failures arise when markets are not perfectly competitive. The classic example is monopoly, where a single firm is the sole supplier of a good. Such a firm can set prices higher than opportunity costs and thereby reap additional profits. Monopoly is the extreme case of a large class of what are commonly called ‘market imperfections’.

The second category of market failures is most commonly associated with the term ‘externalities’. Historically, this term referred to economies of scale arising as industries expanded. However, it has been broadened to encompass all kinds of production and consumption activities may have effects that aren’t mediated by markets. Among the most notable are air pollution generated by factories that harm nearby residents or, in cases like acid

³³ One of the first such typologies, and one of the most useful was developed by Francis Bator in the 1950s.

³⁴ Procrustes was a character in Greek mythology, who forced overnight guests to sleep in an iron bed. If they were too short for the bed he stretched them to fit; if too long, he amputated the excess length. The myth was most recently used by Nassim Taleb as the title of a collection of critical aphorisms about mistaken ways of thinking.

rain and CO₂ emissions, people far removed from the point at which pollution is generated. Extending the idea in a different direction leads to the idea of public goods. These are goods such as broadcast television where the technology of production and distribution means that the good must be supplied, in the same quantity, to the entire population.

All of these are inter-related. For example, monopolies arise most frequently where the technology displays economies of scale, and the public good of air quality is affected by pollution externalities. By treating them separately we can see how all kinds of market failure arise from a divergence between prices and opportunity costs.

9.1 Scale economies and externalities

The idea that the opportunity cost of production declines as the scale of production increases goes back to the starting point of modern economics, Adam Smith's *Wealth of Nations*. Smith focused on the idea that, by dividing production processes up into small parts, the amount produced by a given groups of workers, each specializing in one operation, could be greatly increased. His classic example was that of a pin factory, in which the relatively simple process of making a pin was divided into eighteen distinct operations. Using this division of labor, ten workers could produce 48 000 pins a day between them. Working separately, Smith estimated, the same ten workers could produce no more than 200 pins.

Other economies of large scale operation arise from the physical characteristics of technology. For example, the cost of a boiler, the centre point of steam technology depends on its surface area, while the capacity depends on its volume. Roughly speaking, doubling the volume requires a 60 per cent increase in surface area. This physical fact (the square-cube law) forms the basis of a rule of thumb that engineers have found applicable to estimating scale economies in many different contexts. The 'point six power rule' states that changing the size of a piece of equipment will change the capital cost by the 0.6 power of the capacity ratio.

Smith's great successor, Alfred Marshall, who systematized economics in the late 19th century, examined the issue of economies of scale in more detail. He sought to reconcile the pervasive evidence of scale economies, and declining costs in the long run, with the existence of multiple firms in a given industry, each of which seemed to operate at a limited scale.

Marshall observed that the economies described above, available to a single firm as it increased the scale of its operations were not the only, or even the most important, sources of lower production costs. There are other benefits that arise when a number of firms in a given industry

are located in close proximity. These firms can share technical knowledge, either by agreement, or as skilled workers move between firms. The more firms are concentrated in a given location, the more suppliers and skilled workers seek out opportunities in that location, thereby benefiting the whole industry. Transport networks and supply chains similarly benefit all firms in an industry.

In this setting, each firm reduces the cost of production for the others. Based on this observation, Marshall drew a distinction between internal economies of scale (those arising when a given firm expands its output) and external economies of scale (those arising from the growth of an industry). Over time, the second class came to be referred to as ‘externalities’.³⁵

It might seem that, since all the firms in an industry both contribute to, and benefit from external economies of scale, the effects cancel out, leaving prices equal to opportunity costs. In fact, however, this is not the case. Each firm treats the benefits generated by others as part of its technology of production, but treats its own contribution to the industry as an opportunity cost for which no benefit is received.³⁶ Because firms take no account of the external scale economies they generate, industries where such economies are important are likely, in a competitive equilibrium, to be smaller than would be required if prices were equal to social opportunity cost.

9.2 Monopoly

If internal economies of scale are sufficiently great, large firms will have lower costs than their smaller competitors and will tend to drive them out of business. If the process goes far enough, a single firm will come to dominate the industry, leading to what is called a ‘natural monopoly’. Monopolies may also arise ‘unnaturally’ as a result of legal restrictions or market strategies. In either case, monopolies provide an important example of Lesson 2.

The term ‘monopoly’ means ‘one seller’ (from Greek). A monopoly arises when there is only a single seller of a given good or service. The term is often used more broadly to cover situations where there are only a few providers (oligopoly) or only a single buyer (monopsony).

³⁵ As we will discuss in Section 9.4 the term ‘externality’ now typically refers to negative external effects such as pollution and congestion. The external economies of scale discussed by Marshall are now more commonly referred to as sources of ‘endogenous growth’.

³⁶ More precisely, if there are n firms in the industry, each firm receives only a $1/n$ share of the benefits from industry-wide economies of scale.

Monopoly prices are an instance of the Second Lesson. Monopolists have the power to set whatever price they choose, though of course lower prices will mean higher sales.

Monopolists, like all producers are subject to the logic of opportunity cost. As with a firm in a competitive market, monopolists who decide to increase their output must pay the opportunity cost of the resources used to produce it, that is, the marginal cost of production.

In a competitive firm, the decision stops there. If the firm wants to maximize its profits, it will produce extra output only if the opportunity cost of doing so is less than the market price.

For a monopolist, the problem is more complicated. To sell the additional output, the monopolist must set a lower price. But this involves an additional opportunity cost: the opportunity of charging the original, higher price to those consumers willing to pay it. A monopolist will produce and sell extra output only if the price received exceeds the sum of the two components of opportunity cost: the marginal cost of production and the profits foregone by lowering prices for everyone. So, the monopolist will set a price higher than that of a firm in a market where prices are set by competition.

Since the monopolist could always choose to charge the competitive market price, it's clear that profits are higher under monopoly. But consumers are worse off, both those who pay the higher price and those who would buy the good or service at the opportunity cost price but are not willing to pay the higher price demanded by the monopolist.

The first kind of loss is a transfer of wealth from consumers to the monopoly supplier, but the second kind of loss benefits no-one. So, in aggregate, the losses to consumers are larger than the benefit to the monopolist.

The loss of profits on existing sales when prices are lowered is an opportunity cost to monopolists when they increase production. However, since this loss is matched by a gain to consumers, it is not an opportunity cost for society as a whole. Monopoly is, then, an instance of Lesson 2: even when market prices represent opportunity costs for producers and consumers they may not reflect opportunity costs for society as a whole.

9.2.1 Unnatural monopoly

'Unnatural' monopolies may arise because one firm acquires or squeezes out all its competitors, perhaps by gaining control of an essential and unique input to the production process. The classic example of monopoly by acquisition was the Standard Oil Trust, dominated by John D.

Rockefeller. Starting in Cleveland, Standard Oil acquired its rivals or drove them out of business by a combination of fair means (lower prices) and foul (blocking the construction of rival pipelines). By the time it was broken up under the *Sherman Anti-Trust Act* in 1909, Standard Oil controlled between 85 and 90 per cent of the US oil markets

Monopolies can also arise because the first firm to enter a market creates barriers that keep out rivals. For example, they can sign exclusive long-term contracts with customers and suppliers. Alternatively, they can threaten any entrant with a price war that would cause them to lose their investment. Last but not least, governments create legal monopoly rights for a variety of good or bad reasons. For example, inventors are granted patents which give them, for a limited period, monopoly rights to sell any product that uses their invention.

Unnatural monopolies don't last forever. If governments don't act to break them up, changes in market conditions will usually do so, in the long run. But Keynes' aphorism that 'we are all dead in the long run' is just as applicable here as in macroeconomics.

The computer market provides an example. A series of firms have risen to market dominance, eventually failing. IBM dominated the market for many decades, successfully making the transition from large mainframe computers to PCs. IBM lost its dominance not to a rival manufacturer, but because the source of monopoly power shifted to the operating system, controlled by Microsoft. The rise of mobile computing shifted the dominant model again. Apple, which supplied both the physical device and the operating system in a more elegant package emerged as the dominant supplier. Meanwhile the Internet, originally created by the not-for-profit university sector, became the basis of a new dominant firm, Google. It turned out that the crucial key to control of this market was the search function, and this market was quickly dominated by Google³⁷.

None of these firms has lasted forever³⁸. In the long run, then, the power of any given monopoly is likely to dissipate. But, as Keynes famously observed, in the long run we are all dead. The fact is that, with brief interruptions, the history of information technology has been on in which markets are dominated by a single firm, with a great deal of power over pricing. There is only a tenuous relationship between prices and opportunity costs.

³⁷ It's arguable that Google's monopoly in search is 'natural'. There are obvious economies in having a single firm search and index the Internet, and no one has been willing to replicate Google's vast engines. But Google has levered its dominant role in search into other areas, such as mapping, where there were already well established services.

³⁸ though there is a view that the current leaders may remain in position for a long time NYTimes??

In particular, the profits of these enterprises depends at least as much on their ability to gain and retain monopoly profits as on the social value of their products. In these circumstances, it is unlikely that capital markets, by increasing the precision with which the profits are valued, are adding anything at all of value to society. As of the first quarter of 2012, the five most valuable companies in the world were Apple, Exxon, Petro China, Microsoft and IBM, all firms depending, to a large extent on monopoly power. The market value of these firms depends more on the question of whether they can maintain that monopoly position than on whether the total return on their investments is greater than the social opportunity cost.

9.3 *Externalities and pollution*

The characteristic product of industrial society is not cotton, cars or computers, but smoke. Cities have always been smoky places: as early as 1272, King Edward I banned the burning of coal in London. But it was only after the Industrial Revolution that human activity became a major influence on the atmosphere and the climate, first locally and then globally.

As factories and mills grew up in the 19th century, the city became ‘the Big Smoke’. London, the great metropolis of the Industrial Revolution was the birthplace of ‘smog’, the meeting osmoke and fog in the infamous ‘pea-souper’, made famous in 19th century novels. The smogs only got worse as time went on. The Great London smog of 1952, which killed more than 10 000 people, was the point at which the problem became too big to ignore.³⁹

Smoke pouring out of a factory chimney is a perfect symbol of one the most important parts of Lesson 2. Factory production requires the disposal and management of the associated waste products. In the absence of special measures, the resulting pollution harms people living nearby, and business activities such as tourist ventures that depend on clean air.

Pollution is part of the social opportunity cost of production. But, under the rules that prevailed until the mid-20th century, this component of opportunity cost was not borne by factory owners. Rather, it was shifted to the public as a whole, through the adverse health effects of pollution and the cost of cleaning it up. So, the market prices for inputs to production do not represent the full opportunity costs.

³⁹ Water pollution was as bad or worse. The Great Stink of 1858 forced the House of Commons to abandon its meetings, and led to a large-scale project to improve sanitation. But even 100 years later the Thames was little better than an open sewer. The same was true of other great rivers like the Rhine and the Hudson. The Cuyahoga river flowing into Lake Erie was so polluted that it regularly caught fire, most famously in 1969 when it made the pages of Time Magazine (though the picture was of an early fire in 1952).

The first economist to examine this issue seriously was AC Pigou. Pigou extended the idea of ‘external economies of scale’ to the more general concept of ‘externalities’. External economies of scale, involve externalities between firms within a given industry. More generally, though externalities may arise between all kinds of production and consumption activities, or between producers, consumers and households who may be affected by problems like pollution.

Some externalities are beneficial (a common example is that of a commercial flower garden, which improves the amenity of neighboring properties). There are, however, good reasons for expecting negative externalities, like pollution to predominate. As Pigou observed, firms have no particular incentive to organize themselves in ways that produce positive externalities. By contrast, a negative externality involves shifting some of the costs of production onto others. In the absence of a policy response, this will increase profit. So, we expect to see more production of goods that generate negative externalities, and less of goods that generate positive externalities, than we would if market prices fully reflected social opportunity costs.

The rise of the automobile provided a new, less tractable and more pervasive source of pollution externalities. The most notable example of automobile-driven pollution was in Los Angeles, where a massively car-dependent transport system combined with temperature inversions to trap large quantities of emissions, most notably carbon monoxide and hydrocarbons. By the 1960s, the air in Los Angeles was dangerous to breathe more days than not.

Not only do cars contribute to a choking atmosphere, they choked each other through traffic jams. With old-style pollution externalities, the generator of the externality and the bearer of the cost were separate. By contrast, with congestion externalities like those associated with motor vehicles, the people who generate the externality also bear the costs.

This might seem to solve the problem. But a careful analysis of opportunity costs shows that the opportunity cost of using the road, for any individual motorist⁴⁰, does not include the congestion they themselves create. So, as with the external economies of scale examined by Marshall, social opportunity costs are not equal to private costs.

9.4 Public goods

The term ‘public good’ is used in various ways, most commonly to refer to goods and services that, for one reason or another, are provided free of charge by governments and public agencies,

⁴⁰ A further complication arises from the fact that, most of the time, motorists aren’t charged for using a road (the exception being toll roads). Rather they pay indirectly through gasoline taxes, vehicle registration fees and general taxation.

rather than by private firms charging market prices. Economists use the term differently, to describe certain characteristics of a good that may make it suitable for public provision.

The economists ideal concept of public goods takes the concepts of scale economies and externalities to a logical extreme. A pure public good is one that:

(a) once provided to one consumer can be provided to everyone at no additional cost (this is often called non-rivalry); and

(b) if made available to one consumer, cannot be withheld from others (this is often called non-excludability).

Non-rivalry means that, once the service has been provided for some users, there is no additional cost in providing it to everyone. The standard example is broadcast TV. Producing the programming for TV, and constructing the system for broadcasting are costly. But once the signal has been sent out, anyone with an appropriate TV set can receive it. The cost is the same whether one viewer or one thousand tunes in. Here the opportunity cost for any individual consumer tuning in is zero, but the opportunity cost for the TV station to produce and broadcast the program is substantial. There is no price that is equal to opportunity cost for both producers and consumers.

Non-excludability means that, if the good is provided at all, it is not possible to restrict access to those willing to pay. In these circumstances, users do not pay the opportunity cost of the goods they consume. If the value of the good to the consumer is less than the opportunity cost to society, then there is a net loss.

For example, if a city council creates a new public park, it may not be practical to construct gates and fences around the park so that those using it can be charged for access. As a result, the park may be overcrowded. Park users with a high value for the amenities of the park will have a less pleasant experience as a result of entry by other users with a low value. In the worst case, it may be that the total value of the park is lower than the cost of provision, so that, if the council anticipates the outcome correctly, the park will not be provided at all.

Public goods are, in some ways, the opposite⁴¹ of negative externalities like pollution. This is most obvious in the case of public health measures that remove hazards (whether natural or human-caused) from the environment. For example, sanitation measures make water supplies

⁴¹ A key distinction is that externalities (positive or negative) arise as a by-product of some production or consumption activity. Public goods are produced for their own sake.

safe to drink, removing hazards that may arise naturally, or be caused by industrial pollution, agricultural runoff or human waste.

Public goods illustrate Lesson 2 in two ways. First, non-rivalry means that when one person or organization pays for the provision of the public good, everyone else gets the benefit of the good. If the price is equal to the benefit received by the provider, it will be below the benefit for society as a whole. Moreover, non-excludability means that no one can be made to pay a price for access to the good, assuming that it is provided. So, Lesson 1 does not apply to non-excludable public goods.

10. Information, uncertainty and financial markets

Information is what we know. The other side of the coin, what we don't know, may be described as ignorance, ambiguity or unawareness, among other terms. The profusion of names for what we don't know reflects the difficulty of coming to grips with this problem. The most commonly used general term in economics is 'uncertainty'.

To a greater or lesser extent, all economic choices involve uncertainty. We don't know for sure what we will get when we make a choice, or what we are forgoing as a result. That's obviously a problem in working out opportunity cost. In this chapter, we'll look at information and uncertainty, how markets sometimes help us in managing uncertainty, and sometimes make matters worse.

In particular, our two Lessons provide a useful way to look at the large body of evidence about the performance of financial markets. To the extent that Lesson 1 is applicable, financial markets will provide information about the likelihood of different possible outcomes for the economy as a whole and for particular businesses and industries. Where financial markets fail, generating inappropriate investment signals and leading to speculative bubbles and busts, Lesson 2 is more relevant.

10.1 Market prices, information and public goods

The price mechanism is a marvellous social device for collecting and combining information about the value and cost of goods and services. In an open market, everyone can see the price at which suppliers are willing to sell goods and services, which ensures that everyone will charge much the same price at any given time. Suppliers will only be willing to accept the market price if it is at least as great as the opportunity cost of the good or service concerned. If buyers

are willing to pay that price, they are showing that the value of the good to them is more than the opportunity cost.

As we saw in ... Hayek makes this point very effectively in his classic article, ‘The Use of Knowledge in Society’ (quoted again for convenience)

Assume that somewhere in the world a new opportunity for the use of some raw material, say tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter for our purpose and it is very significant that it does not matter which of these two causes has made tin more scarce. All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other uses they ought to husband the supply. (Hayek, 1945, p. 526)

But there is a paradox here. In an open market setting, the information conveyed by the price system is a pure public good. The use of price information by one buyer or seller does not reduce its availability to everyone else. Information, once someone knows it, has no opportunity cost. Sharing the information with someone else does not mean that it is no longer available. That is, market information, like all information, is non-rival.

Moreover, unlike many other kinds of information, which can be kept secret, market information is non-excludable. In open markets, everyone can observe the prevailing prices. Everyone who buys or sells in the market automatically contributes information about their willingness to buy or sell, whether or not they wish to reveal this information. Aggregated over all participants, this information is reflected in the price.

Market information is a pure public good. But as we have already seen, pure public goods are generally under-supplied, relative to the socially desirable level. Does this conclusion apply to the information contained in market prices? There’s no easy answer to this question.

In this context, economists commonly distinguish between ‘thick’ and ‘thin’ markets. ‘Thick’ markets are characterized by homogenous products, large numbers of buyers and sellers who regularly engage in repeat transactions, transparent pricing and, ideally, forward markets for purchase or delivery at future dates. ‘Thin’ markets are missing one or more of these

characteristics. Broadly speaking, prices emerging from ‘thick’ markets are regarded as capturing all the information of market participants that is relevant to opportunity costs. By contrast, prices in “thin” markets are relatively uninformative.

One way of telling whether the public good of market price information is undersupplied is to look at the characteristics of the market in question, to see whether it is ‘thick’ or ‘thin’ Another is to look at the volatility of market prices. In a market where available information is widely shared, prices will move only if there is an unanticipated change in the technology of production, such as a new disease that wipes out an agricultural crop, or in consumer preferences, for example because of the emergence of a competing product. Volatility in the absence of news suggests an inadequate supply of information.

A third approach is to look at the willingness of market participants to spend money and resources on information about demand and supply. Getting such information early can yield significant benefits to producers making investment plans, to large-scale consumers and, as we will see in the following section, to speculators. Unlike market price information which anyone can observe, this kind of information is not, in general, a public good. As long as it can be kept secret, it is, in the technical terminology of public goods theory, an excludable good. But it is difficult to make use of information without revealing it to others. So, we have a further paradox, best summed by Stewart Brand

On the one hand information wants to be expensive, because it's so valuable.
The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time. So you have these two fighting against each other.

Returning to the paradox with which we started, the amazing ability of market prices to combine information about opportunity costs from diverse and disparate groups of buyers and sellers is the best illustration imaginable of Lesson 1. But, the fact that market information, like all publicly available information is a pure public good means that Lesson 2 is applicable even here. Economics needs two lessons, not one.

10.2 Speculation

The importance of obtaining more information than is contained in current market prices is most obvious in the case of speculators. Speculators make their living by predicting market price movements in advance, buying if they expect the price to rise and selling if they expect it to fall.

For an ordinary buyer or seller of tin, the price conveys information about opportunity costs. Additional information about, for example, the likely movement of prices can further refine these decisions. For example, a buyer who thinks the price of tin is likely to fall, might rearrange their plans so that they can hold off buying. A seller who thinks the price is going to rise might stockpile their production rather than sell at the current low price. These judgements reflect the role of prices in signalling current and future opportunity costs.

But what about a participant in the market for tin futures? This market allows anyone who can correctly predict movements in the price of tin to make large profits, irrespective of whether they have any need for, or ability to supply the commodity. That in turn means that information is highly valuable, as long as it can be obtained and exploited before it is learned by other market players. Players in the futures market will be willing to pay a substantial amount for early access to information.

In speculative markets, private information about prices will itself have a price. But there is no obvious way that this price corresponds to any kind of social opportunity cost. There is no reason to think that there is much social value of obtaining information about tin prices a day or two earlier than we would otherwise do.

On the other hand, markets such as commodity futures markets provide useful services to producers and users, allowing them to reduce the risk associated with future price movements. And, in many cases, an active group of speculators is needed to provide a “thick” market, in which prices are truly informative.

There is no easy answer to the question of whether speculation is beneficial or harmful. As with many other questions in economics, it is necessary to weigh up whether Lesson One or Lesson Two is more relevant in any particular case.

10.3 Risk and insurance

One of the most important kinds of uncertainty is that relating to large and small disasters, from minor car crashes, to losing a job, to life-threatening illnesses. For some of these disasters, such

as car crashes, it is possible to obtain insurance that largely offset the risk of loss. As we saw in Section 3, insurance against such disasters provides an illustration of Lesson 1.

A striking feature of market societies is that for some risks including job loss, crop failure and health costs, market insurance is typically unavailable. In these cases, insurance is commonly provided by governments either directly or through a combination of mandate and subsidy policies

Why is insurance available for some risks and not for others? Insurance companies operate by offering insurance to many clients on the assumption that only a small proportion will need to make a claim in any given year. The premiums of all the clients, including those who don't claim, can be used to pay out claims, as well as covering the insurers' operating costs and providing a profit margin.

One problem with insurance arises if the insured event affects a large proportion of the insured group at once, as in a natural disaster. The smaller and less diversified the insurance company, the bigger the problem. This is, in essence, a problem of economies of scale, so the analysis of Section ... is relevant.

The bigger problem is the need for insurers to estimate, with reasonable accuracy, the probability that any particular client will make a claim. This depends on both the risk faced by the client in the absence of insurance, and on whether they respond to insurance by taking more risks⁴². In most cases, the client knows more about this than does the insurance company. This problem is referred to in the economic literature as 'asymmetric information'.

Insurers can deal with the problem of asymmetric information in various ways. In some cases public information about potential clients is sufficient to estimate the probability of a claim with reasonable accuracy. For example, a driver aged 25 with a poor driving record is more likely to be involved in a crash and will therefore face higher premiums than a 45 year-old with a clean sheet. Another is to design contracts with features that appeal more to low-risk clients. For example, a contract with low premiums and high deductibles will be more attractive to someone who does not expect to make many claims.

For many important risks in life, however, the problem of asymmetric information cannot be overcome, and markets do not provide insurance. Perhaps the most important is unemployment insurance. Workers often have much better information about the likelihood of losing their job

⁴² In the economics and insurance literature, it's customary to refer to these problems as 'adverse selection' and 'moral hazard'. I don't find these terms particularly helpful, and

than an outside insurer can hope to obtain. So, market insurance against job loss is typically unavailable, or available only on terms that do not reflect the opportunity costs involved for society as a whole..

Lesson 1 explains the potential benefits of insurance. Lesson 2 is relevant whenever problems of asymmetric information prevent the emergence of properly functioning insurance markets.

10.4 Financial markets, bubbles and busts

For all their limitations, insurance markets provide a wide range of benefits to everyone in society. The same cannot be said, with any certainty, about markets in stocks and other financial assets. Financial markets are essential to the functioning of a capitalist economy. Yet they are also a source of disastrous disruption. Both the Great Depression of the 1930s and the Lesser Depression of the recent past had their origin in financial market failures. The same is true of a string of panics and slumps going back to the bursting of the South Sea Bubble in 1720.

Even disregarding spectacular crashes like those of 1929, 2000 and 2008, financial markets are many times more volatile than the economy as a whole. Even in a deep recession, the aggregate output of the economy rarely falls more than 10 per cent below its long run trend values. By contrast, exchange rates and stock market indexes frequently double (or halve) their value over the course of a few years.

The extreme volatility of financial markets is associated with a phenomenon that has perplexed economists for decades: the 'equity premium puzzle'. Equities (shares traded on stockmarkets) commonly generate high returns at times when the economy is strong (booms) and low returns or losses when the economy is weak (recessions and depressions). By contrast, high-quality bonds, such as those issued by the US government, provide a return, in the form of interest, that does not vary with the state of the economy.

Because equities are riskier than bonds, equity investors expect a premium rate of return to compensate them. Historically, the equity premium has been large: around six percentage points in addition to the long-term rate of interest on bonds, which has averaged about two per cent, adjusted for inflation. Reasoning in terms of opportunity cost suggests that the premium is higher than it should be, if Lesson 1 were applicable.

Because equity investments pay off in booms, but not in recessions, they represent one way of increasing income in boom periods with the opportunity cost of reducing income in recessions.

The magnitude of the equity premium is a puzzle because it seems to imply that the opportunity cost of additional income or consumption in periods of booms is very low. An additional dollar of income in a boom period is given the same value, by stockmarkets, as an additional 50 cents of income in a recession. For a variety of reasons, most economists find this implausible.

What this means is that the equity premium puzzle is an illustration of Lesson 2. The prices generated in financial markets do not, in general, give us an accurate measure of the opportunity costs facing society as a whole.

10.5 Bounded rationality

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