Principles of Strategic Management Accounting

PRINCIPLES OF STRATEGIC MANAGEMENT ACCOUNTING

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Part III. Cost Accounting

INTRODUCTION

This textbook is an alternative introduction to strategic management accounting tools such as budgets, activity based costing, balanced scorecards and the use of performance measures to penalise and reward employees. The book is aimed at students who have an introductory knowledge of these management accounting tools but it does not require an in depth knowledge of how they work. I use the chapters in this book as the core material for two classes in management accounting with students who have had a one semester introduction to management accounting. In one class, students apply the framework in this book to empirical academic papers in management accounting and in the other class, they apply the framework to business case studies.

The two classes show the general intent of this textbook. The goal is to present an analytic framework rooted in academic research that can be used to understand and analyse real businesses. In the first part of the book I build up a coherent framework based on different theoretical perspectives in the academic literature. The core principles of the theories are explained through stripped-down stories of intentionally unrealistic business transactions. This narrative approach is a deliberate choice. I do not expect that the reader of this book is familiar with the academic literature or its terminology. The style of this book is closer to the more personal style of online newsletters and blogs than traditional academic writing or textbooks. At the same time, I want to do justice to the variety of insights that have been generated in the academic literature. The stories allow me to explain the core principle

of a theory in a short self-contained narrative that is easy to remember. This is why I also recommend the first part of this book to my doctoral students when they start out with their research project.

The first part of the book builds up the framework and it is the major departing point from traditional management accounting textbooks. I first explain the difference how organisations can create a competitive advantage through a combination of difficult to imitate investments which defines the strategy of the organisation. The core idea of this textbook is that management accounting tools contribute to managing the core investments in the organisation and this is exactly what makes them strategic. That means that whether a certain management accounting tool is strategic depends on its function and not necessarily whether it is a new and revolutionary tool. In my book, the much maligned budget is the quintessential strategic management accounting tool because it is the main tool by which organisations decide where their priorities are. My approach emphasises the role [1] of management accounting tools in the organisation first and focuses on the details of how they work later.

A second version of this book will contain a second part in which I will delve more deeply in budgets, activity based costing, and the balanced scorecard.

1. That role can be the explicitly intended by the people implementing the tool or the role can organically emerge over time. I do not take a position on whether all benefits and costs of the implementation are explicitly intended or not.

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ACKNOWLEDGEMENT OF COUNTRY

The University of Western Australia acknowledges that its campus is situated on Noongar land, and that Noongar people remain the spiritual and cultural custodians of their land, and continue to practise their values, languages, beliefs and knowledge.

ABOUT THE AUTHOR

Dr Stijn Masschelein, Senior Lecturer at the UWA Business School, has 12 years of experience teaching two advanced management accounting units at the University of Western Australia. He developed the curriculum for those units and wrote his own lecture notes for those classes which are available on his website or on the Social Science Research Network. One of the lectures notes, for Strategic Management Accounting, has been cited in two doctoral theses already and the author has received encouraging emails from colleagues from other institutions on how the notes helped them in their teaching. These lecture notes were the starting point for the textbook.

The author has developed a variety of online resources on programming and statistical analysis for research students at the UWA Accounting and Finance department. The lecture notes and resources rely on the author's extensive knowledge of the academic literature which has also resulted in multiple publications, of which two are in the top journals in the field of Accounting (Masschelein et al., 2012; Masschelein & Moers, 2020). A full list of the author's publications can be viewed on his UWA profile.

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PART I
THE PRINCIPLES

In the first section of the book I will introduce different perspectives from economic and sociological theories to understand why organisations measure the performance of their employees and departments. The economic theories are often based on sophisticated mathematical models which scares off undergraduate students and textbook writers alike. I believe that I can explain the essence of these theories with stories. I call them stories because just like the models from the academic literature they are not literal descriptions of how the real world works. Still, they do reveal underlying principles that help us understand the real world. None of these stories will tell the whole story [1]. To present a fuller picture I need more than one principle and that is why the first story will introduce three economic theories at once. These three theories form the core around which the remainder of the book is structured.

I will then build on these stories and show how they can be used to explain the role of management accounting tools to support, implement, and change an organisation's strategy. The other theories round out this core story and show how management accounting tools play a role in management activities that are hard to measure, and how organisations figure out what the appropriate management accounting tools are for their situation. The complete picture allows us to tackle

1. Pun very much intended

the different management accounting tools and their value to support an organisation's strategy.

1.

THE STORY OF THE MINERS AND THE LANDOWNER

Stijn Masschelein

Imagine a landowner with the property rights to do whatever they want with their land. One day they discover that their land might be rich in iron ore. They quickly realise that they should mine their property for the precious metal. However, they are not quite sure how to do this. Fortunately enough, a number of experienced miners live in the same town as the landowner. All the miners have a wealth of experience in mining for different resources. They know the best techniques for drilling into different surfaces, testing for the quality of the ore, and the exploitation of different types of mines.

The economic problem is that the people who know how to run the mine do not own the land. In other words, in the current situation without any economic transaction the land is not used in the most optimal way. There are broadly speaking two possible solutions to address this problem. First, one of the miners can buy the land. Second, the landowner can buy or hire the expertise of (one of) the miners.

The two solutions

Let me start with making the *first solution* more concrete. Imagine that the owner knows that if they run and exploit the mine, they will earn a total profit of 120 gold coins until the mine is exhausted. The most efficient miner on the other hand could earn 200 gold coins, the second most efficient miner would make 180 gold coins, and the least efficient miner could generate 160 gold coins worth of iron ore. In the ideal scenario, the owner can auction the mine to the three miners who each can bid for the mine. Interestingly, none of the parties involved needs to know the value that the others have attached to the mine. As long as the bid price is below 160 gold coins, all miners will be interested, however only two miners will be willing to bid more than 160 gold coins for the mine. Eventually, the most efficient miner will be the only one left, they will bid 181 gold coins and the owners will accept the bid. The owner makes 61 gold coins more than what they would have made if they would have run the mine themselves. The most efficient miner pays 181 gold coins to the landowner, but they will earn a total of 200 gold coins from exploiting the iron ore. We have arrived at the best possible situation for this four person economy; the most efficient miner is running the mine and creating the highest possible value.

The limitations to this story are clear. For instance, in reality the miners and the landowner will not exactly know how they should value the mine. They might be uncertain about the price of iron ore in the future, they might not know how much iron ore can be mined from the land, or they might be unsure how much work it is to run this specific mine. Another problem is that the miners might not be able to pay the

amount they want to bid. They might need financing [1]. It is entirely possible that none of the miners are willing to bid more than the 120 gold coins. In that case, the landowner might decide that it is profitable for them to employ one of the miners to do the mining for them. Thus, the *second solution* to the economic problem is that the owner hires the most capable miner and the owner knows that the miners have more knowledge and experience.

Contracting problems for the landowner

Which one of the two solutions will play out depends on the costs of contracting for both solutions. The cost of buying land involves a number of costs for the buying miner. They will spend a long time and need special instruments to establish the value of the iron ore in the land. One cost for the landowner is that they do not know what the value is of the iron ore and so they might get a low price if the miners have conspired against them. However if the cost of buying and selling the land is not too high, the economic problem is solved. The miner has the land (ownership rights), the miner knows and can decide what to do with the land (decision rights) and the miner is motivated to exploit the mine as good

1. I have been asked to present what studying finance is to high school students multiple times. If I say so myself, this story has been a successful way to make students interested. I usually first play out the auction with groups of students in the role of miners and landowners. The ensuing discussion about what could go wrong in the real world provides an excellent opportunity to introduce the importance of valuation models, risk, currency fluctuations, and regulation.

as possible because they can sell the iron ore and reap the profit in gold coins.

On the other hand if the landowner hires a miner for their knowledge, there is still a problem. The landowner holds all the rights to do what they want with the land (decision rights) and they get all the profits of the mine exploitation (ownership rights). However, the miner is more capable in mining and has the right experience to actually do the work. This problem can partly be solved by assigning some decision rights to the miner. For instance, if the miner has sufficient knowledge on mining, they need the decision authority to make the calls on the investment in machines or which drilling techniques to employ.

Granting decision rights to the miner only partly addresses the economic problem. Even though the miner can make the right decisions, they are not necessarily motivated to do so. If they take the right decisions, they will earn a fixed salary. If they take the wrong decisions, they will also earn a fixed salary. These wrong decision might be ones that make the miner's life a little easier. For instance, the miner might choose to buy expensive machines that do all the work.

The landowner can address this issue by measuring the performance of the miner and rewarding them for good performance. One possible option is that the landowner gives a percentage of the profits from the sales of the iron ore to the miner. The miner is now motivated to increase their earnings by taking the best decisions for the mining operation. We are now again in the best possible outcome for the four person economy. The miner with the best knowledge of how to mine for the iron ore can make decisions on how to operate the mine and they will be motivated to take the right decisions.

Theories and topics

In the story of the mine, the landowner needs to take three crucial decisions.

1. The landowner needs to decide whether they will *sell* the mine or keep it.
2. If the landowner keeps the mine, they need to decide how much autonomy or *decision rights* to give to the miner they hire.
3. If the landowner gives decision rights to the miner, they need to decide which *performance measures and rewards* they will use.

In this simple story, the value of measurement and evaluation, the topic of this book, depends on how much authority the landowner wants to give the miner when they hire a miner. The value of good performance measures thus depends on how easy it is to sell the mine and how much more experienced and knowledgeable the miner is. The main difference between the three different economic theories at the start of this book is which decision they emphasise.

Transaction cost economists argue that the most important determinant of economic organisation is the cost of either buying and selling the land versus the costs of hiring the miner to work as an employee (Williamson, 1979, 1991, 2002). In the next chapter, I will go into the details of where these costs are coming from and how it relates to an organisation's decision to keep control over their own production process or outsource it to a supplier.

Others argue that the people with the right knowledge should get the decision rights. If the owners of the rights cannot hire the knowledgeable people in the economy they

might be better off selling their rights. Specifically, some knowledge can be easily transferred but other types of knowledge, *specific knowledge*, is specific to people with the right experience or education. These theorists argue that the distribution of specific knowledge ultimately determines how economic transactions will be structured (Jensen & Meckling, 1995).

Agency theorists have argued that what really determines the organisation of firms and economic transactions is whether there are *good performance measures* available. In one of the following chapters, I will explain how economists define good measures. The agency theoretical explanation argues that if these measures can be used to write an enforceable contract, landowners can reliably grant decision rights to their knowledgeable miners and they do not need to sell their ownership rights (Holmstrom & Milgrom, 1994).

These three theories are not mutually exclusive. They do focus on different decisions and emphasise different choices on how firms should organise themselves. Together, the theories give a good indication of the role of performance measurement in the organisation of a firm. In this book, I take the view that a good understanding of these three perspectives provides a structure to understand how performance measurement and rewards choices affect the organisation as a whole. Similarly, the combination of these theories also helps to understand how other organisational choices increase or decrease the importance of performance measurement. The chapters dealing with these theories and their applications form the core of the book.

Nevertheless, not all the aspects of the structure of organisations has been covered. Other economists have focused on *internal labour markets* to motivate and select employees. The internal labour market is the result of competition in the organisation for promotions. We will see

that promotion decision are not only based on objective but also on subjective performance measures that cannot be used in formal contracts but are still a valuable tool to evaluate and motivate employees (Baker et al., 1994). This part of the book can be fully understood from the perspective of the three core theories but its application is so important for most employees that it deserves its own section.

Next, I branch out to another non-economic perspective. Some researchers argue that not all organisations maximise the economic value of the activities they are undertaking. Specifically, when it is unclear what the best action is, organisations rely on institutions to determine the course of action (Dimaggio & Powell 1983). They might be influenced by pressure of powerful groups, professional organisations, or social customs and norms. Other organisations imitate the decisions of more successful organisations even if that is not necessarily optimal. These *institutional influences* are explored and we will see how an understanding of institutional forces and power helps us to better understand how organisations make changes to their existing performance measurement systems and how they implement new ones.

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2.

TRANSACTION COST ECONOMICS

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This chapter explains the Transaction Cost Theory developed by Oliver Williamson (1979, 1991, 2002). This theory argues that there are three important governance structures that are the blueprints for how to organise business activities: (1) Markets, (2) Long-term Contracts, and (3) Hierarchical Organisations. I will deal with these three blueprints in turn and explain the role of transaction costs in deciding which blueprint is optimal for different circumstances. Similar to the story of the mine, these three blueprints are a useful simplification of real world phenomena and not all real world examples will be easy to categorise. However, that does not mean that transaction cost economics has no practical applications because in the chapter I will use the theory to explain the role of strategic management accounting.

Blueprints of Governance

In this section, I explain the three blueprints [1] for governing economic transactions in the Transaction Cost Economics framework: Markets, Long-Term Contracts, and Hierarchical Organisations. We will see that these blueprints are idealised and simplified versions of real world phenomena. Just like the story in the first chapter, they help us to focus on what is important by simplifying reality.

Markets

The role of markets

The *market* is a meeting place for buyers and suppliers where buyers exchange money for a product or service from the supplier. In this market, suppliers sell at a given unit price and the buyers pay this unit price. For each buyer, the identity of the supplier is not important. They are merely interested in the product and the price they have to pay. This is the ideal market from any introduction to economics course and it has a number of interesting characteristics.

First, a market is adaptive to disturbances or changes in the economic environment. If the consumer demand for the goods of the buyers goes up and they need more materials from their suppliers, those materials becomes more valuable. Buyers will (have to) pay a higher unit price to their suppliers. Thus,

1. I use blueprint here in the sense of a design or plan for how a real organisation or a real market looks. A blueprint gives the general structure and the main features but it has to leave the details out.

the unit price that buyers pay and suppliers receive, responds to changes in the consumers' preferences. In general, all relevant information about the economic environment will be captured in the price of the product. As a result an ideal market can be seen as an *information* generating machine. The market price gathers all the demand and supply related information. That also means that buyers and suppliers do not need to invest in information technology such as performance measurement. They can just follow the price to know all the relevant information that is in the market.

Second, an ideal market also provides *incentives* to the buyer and suppliers. The market is unforgiving in the sense that if a supplier wants to ask a higher price no buyer will be willing to pay that price. If buyers want to pay a lower price, no supplier will be willing to sell. That means that both buyers and suppliers have an incentive to be efficient. If they are inefficient, they are not able to generate a profit at the market price. Again, this means that the buyers do not have to worry about monitoring the suppliers and there is no role for performance measurement. Buyers will only buy a product or service that they need and they only care about the price they are paying.

Transaction Costs in Markets

We see in practice that firms use extensive contracts with their suppliers and with their employees. They set standards, have rule books, try to measure the quality of the work delivered, and the efficiency of work practices. This is because real markets are not perfect markets and these imperfections give rise to *transaction costs*, which are the costs of ensuring that the market functions.

The story of the mine already reveals some transaction costs in imperfect markets. Not every potential miner has the time

to investigate the new land. Some miners might not have the necessary information to value the mine. The landowner might not know how to reach all miners who are interested in exploiting the mine. These types of *information and search costs* are common transaction costs in markets and they give rise to the need for formal contracts with clauses that reward good performance and penalise delays and bad performance.

Another potential problem in the story of the mine is that the landowner and the miner might need to make initial investments together before they can decide whether they want to respectively buy or sell the mine. For instance, the miner will want to independently investigate how valuable the iron ore and they will hire geologists to assess the mine. The landowner will have to invest in background checks on all potential bidders to make sure that they can actually pay for the mine. The problem is that both parties need to coordinate on these initial investments. If the landowner does not do background checks, the miners will not feel confident that the landowner actually wants to sell the land and they do not want to face the costs of hiring a geologist. If the miners do not invest in a geologist, the landowner does not feel confident that the miners actually want to buy the land and they do not want to invest in background checks. The transaction costs associated with solving these coordination problems are unimaginatively called *coordination costs*.

A typical solution in markets is that there is third party who is trusted by both parties who will assure that both parties are genuinely interested in the transaction: the buyers can be trusted to pay and the sellers can be trusted to deliver the goods. Exchanges and banks play this role in financial markets and traders pay the exchange or the bank fees for their services. These are transaction costs to solve the coordination problem. In business-to-business markets, companies rely a lot on reputation concerns. An organisation that wants to survive

long term cannot be known in the industry for not paying their suppliers or for not delivering goods and services to their customers. The transaction cost is that sometimes you will not get paid as a supplier or you will not get your goods as a customers because the counter party does not care about their reputation because they plan on disappearing with all your money to a subtropical island.

Long-Term Contracts

The Role of Long-Term Contracts

The second blueprint is a long-term contract where two or more different economic parties decide to work together for an extended period of time. In practice, these long-term contracts can take the form of joint ventures, alliances, purchasing agreements, strategic partnerships and many more. The crucial part for our purpose is that both parties remain independent organisations and they plan to interact with each other for an extended period of time.

The critical part of a contract is that it specifies rewards for when the parties completely adhere to their responsibilities and it contains penalties for when the parties do not fulfil their duties. A supply contract typically contains penalties for late delivery and the buyer will need to pay interest on any late payments.

The ability of contracts to specify the parties' responsibilities creates the opportunity to *solve the coordination problems* that emerge in markets. The contract can specify which initial actions a buyer and supplier need to take. For instance a supplier of industrial machines will have to invest in a new production technology to produce the customised machines that a new customer wants. Their

customer will need to share information about their production process so that the supplier knows what the customer needs. The advantage of the long-term contract is that the buyer and supplier can rely on the contract to be sure that the other party will fulfil their part of the deal. They can write the contract in such a way that the supplier is incentivised to invest in the new technology and the buyer is incentivised to share the information. After signing the contract, either party can be assured that the other will do their part. Specifically, the supplier does not have to fear that they will invest in a costly technology and that the customer will not share the necessary information to do the job. Furthermore, the long-term contract also covers multiple transactions for an extended period of time. This also gives the suppliers more assurance that the customer will reward them for the initial investment in new production technology.

Another type of clause in long-term contracts are stipulations on how the parties will address conflicts when they inevitably arrive. In a long-term contract the parties interact with each other for an extended period and they cannot predict all possible problems that will arise. If both parties agree on how to deal with problems, there is no problem. However, if both parties disagree, they need a mechanism to resolve this conflict. The contract will specify when they can resort to mediation by a third party, renegotiation of the contract, or to the legal system. *Conflict resolution* in a long-term contract makes sure that the buyer and supplier can adapt the working relationship if the environment or requirements of the task change.

Transaction Costs in Long-Term Contracts and the Role of Performance Measures

The transaction costs of long-term contracts consists of two

categories. The first costs are the costs associated with the contract itself and the second ones are the costs of a breakdown in the relation. The first category are obvious *contract costs* such as lawyers involved in negotiating the contract, the opportunity cost of the time it takes to negotiate the contract, and the information and measures that are needed to determine whether the parties should be rewarded or penalised.

The last example is our first encounter with *performance measurement*. In the transaction cost view, performance measurement is important because it allows the parties to write a contract that solves the coordination problem. In this view, performance measurement is subject to a cost-benefit analysis. The costs are the time, money, and effort involved in collecting the measures. The benefits are that the measures allow the parties to work together while being assured that the other parties will make the necessary and agreed upon investments in the joint project. This allows the parties to organise economic transactions that would not be possible in the ideal market because of coordination problems.

The second category of transaction costs in the long-term contract are the costs of *conflict resolution*. In the ideal market, there are no costs of conflict because the only transaction that happens in the ideal market is that the buyer and seller exchange money for goods or services and this is where the relation ends. In the long-term contract, the buyers and supplier keep interacting with each other. They have been able to overcome the coordination problem together and therefore cannot just go to a different partner. They are to some extent dependent on each other. This creates the risk that when the economic environment, such as customer demands or the cost of energy, changes the benefits of working together might change. For instance, the supplier of industrial machines might have to adapt the machine they delivered to new specification

by their customer, so that the customer can respond to changing demands from their customers. In some cases, the contract will specify which party is responsible for upgrading the machines and at what cost to the supplier. It is also possible that the changes in the environment were not predicted at the time the contract was signed and the parties need to renegotiate parts of the contract with all the costs that entails. In the most extreme case, the parties will disagree who is responsible for making adjustments or how to continue the relation. They might end up in a legal battle with all the legal costs involved.

The role of performance measurement and collecting information from the environment is to lower the possibility that the changes in the environment are not foreseen in the contract or at least that they do not come as a surprise to the parties. So, another advantage of a good performance measurement and information system is that they help the parties in the long-term contract predict changes that can lead to a conflict in the relation. It gives the parties time to adapt to changes in the environment. Nevertheless, certain economic activities are too unpredictable and require too much coordination and cannot be dealt with efficiently in a long-term contract. For these type of transactions, we need the third blueprint, organisations.

Organisations

The Role of Hierarchical Organisations

Hierarchical organisations are formed to react quickly to changes in the environment when mutual investments are needed and need to be coordinated. In an organisation the buyer and supplier are no longer two different entities. They

become one organisation which can take many legal forms but most of the time we will think of them as for-profit corporations. In fact, in an organisation there will often be more than two parties, not just a buyer and a supplier. An organisation has multiple divisions or departments who all need to work together. If a manufacturing firm needs to produce different products in response to changing customer demands, the marketing division needs to collect information on what customers want, the production division needs to adjust the manufacturing process, the purchasing department need to search for new suppliers, and the HR team needs to hire new specialists. The advantage that organisations have is that these actions are coordinated.

The organisation will set-up formal responsibilities and duties to make sure that all necessary actions are taken. Typically, a small group of people, top management, is responsible to ensure that everyone in the organisation fulfils their responsibility. Top management can unilaterally decide to assign duties to different employees, to invest in new technology, or to focus on new customers. They do no need to rewrite a long-term contract to change the course of the organisation. This gives the organisation the flexibility to quickly *adapt to changes* in the environment.

Organisations have a second function to deal with changes in the environment. Top management can easily *resolve conflicts* at will in the organisation. If two divisions do not agree on how the organisation should react to changes in the environment, top management can simply tell them what to do. There is no need for time wasting negotiations between the divisions or expensive court cases.

Unfortunately, this flexibility in organisations comes at a cost. All divisions in the organisation know that they are stuck with each other. Together they are creating value by being able to act together in response to changes. That means that no

division can be easily replaced and as a result they need to be forgiving of each other when one of them makes a mistake. While markets are unforgiving because every supplier or buyer can easily be replaced, organisations are forgiving. Thus, incentives to perform well are lower in organisations because a division is more likely to not be punished because the other divisions of the organisation need it. To make sure that the divisions work in the best interest of the firm, top management will have to design incentive systems. In transaction cost economics, the role of incentives in organisations is to take over one of the role of prices in markets: motivating the parties involved in the transaction.

Transaction Costs in Hierarchical Organisations

The transaction costs in organisations are the most directly observable costs that we have dealt with so far. The first category of costs are the costs of setting up a bureaucratic system of role descriptions, duties, and budget allocation. These are the costs involved in making sure that top management's decisions are carried out all throughout the firm. In this category, we will also find a role for cost accounting and measurement of key performance indicators or balanced scorecards. All these tools provide information to top management and allow them to make better decisions. The specific costs can be the cost of collecting data, managing databases, or the cost of the Human Resources department.

The second category of costs are the costs involved in designing rewards and penalty schemes to motivate the divisions and not let them rely on being forgiven for mistakes. The costs involved in these incentive schemes are the same costs of information collection but also the cost that employees will want to be compensated for the risk that their

compensation depends on factors beyond their control. I will discuss these last costs further in the chapter on incentives.

The fundamental insight of transaction cost economics is that there is a *cost-benefit trade-off for strategic management accounting* tools. There is a cost in setting up accounting systems which needs to be weight against the benefits of coordinating different divisions. If the costs are too high to manage the different divisions, the different divisions in the organisation might be better off splitting up and operating as separate entities.

Overview and How To Apply Transaction Cost Economics

The important insight of transaction cost theory is that market, contracts and hierarchical bureaucracies are efficient for different economic transactions. Hierarchical organisations are better at coordinating activities and investments that benefit the organisation as a whole and resolving conflicts within the organisation. The disadvantage of organisations is that they cannot rely solely on market prices to provide information and incentives. Organisations need performance measurement and accounting systems to replace the information and incentives of prices. These systems have their own costs which have to be weighted against the costs of better coordination and better conflict resolution.

As we will see going forward, the role of performance measurement and evaluation systems is to provide information on the environment, the performance of different divisions, and provide incentives, just like ideal markets do. Firms will often outsource some activities to suppliers because they believe that the market is better at evaluating and incentivizing the supplier or they believe it is better to outsource certain

activities with a long-term contract. Nevertheless, firms also keep a lot of activities within the firm and strategic management accounting plays an role in coordinating those activities and motivating the divisions.

As we will see further on, transaction cost economics does not capture all important factors to understand the role of strategic management accounting tools. Just like the story of land owner and the mine, transaction cost economics provides a useful, simplified model to help us think about the role of management accounting tools in organisations. I deliberately used blueprints to refer to the different ways of managing economic transactions in transaction cost economics because they should be seen as incomplete representations of real world markets, contracts, and organisations. Real relations between businesses, between employees and employers, or between divisions within a firm might show some elements of each blueprint but often one blueprint will dominate. What will be important for us is that we should be able to realise the *transaction costs* of managing the relation and that we can compare the benefits of blueprints to their potential costs.

In order to better understand those costs and benefits, in the next section, I turn my attention to two factors that drive the cost-benefit trade-off that favours one blueprint over an other.

The Drivers of Costs and Benefits

Asset Specificity

As I explained above, both markets and organisations [2] can

2. Long-term contracts sit in the middle between markets and organisations. For

adapt quickly to changes in the environment. You might ask yourself what the difference is between the blueprints if they essentially do the same thing well. The difference between markets and organisations is in how they need to respond to changes.

Organisations rely on *asset-specific investments* which are investments that are only valuable for a specific transaction. For instance a supplier can invest in a technology to improve the quality of the products they produce. If all their current and potential customers are willing to pay more for the improved quality, the technology is general and not specific. The market will reward suppliers who invest in this technology. However, if the improved quality of the products is only relevant for one or two customers, the investment is *specific to the relation* that supplier has with those customers. There are two reasons why the supplier might not be willing to invest in the technology. The first one is that the supplier needs to invest in the technology before they reap the benefits from higher sales. If the higher sales do not materialise, they are just left with additional costs. The second and related issue is that the customers can not always assess the quality of the product before they use it. If this is the case, they will not be prepared to pay a higher price for the product and thus, the supplier will not want to invest in the technology.

I can make this more concrete with another simple story which we will build on in the following chapters. Imagine that one supplier can make shiny white computers and one buyer can build shops that make shiny white computers look

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simplicity, I will ignore them in this discussion. You can think of them as somewhere between the two extremes of the ideal market and the strictly hierarchical organisation

more attractive to consumers [3]. If the suppliers sells their white computers to another buyer with another shop, their investment in the production technology for white computers is useless. If the buyer purchases regular grey computers, their investments in lighting for white computer are useless. Based on the price in the competitive market the supplier has no incentive to make the investment in the production technology for white computers. Therefore the buyer has no incentive to invest in lighting for white computer. As I have explained before, it will be beneficial for the supplier and the buyer to write a contract that makes sure that they both invest or they can form a single organisation where top management directs both parties to make the investment.

Uncertainty

The role of uncertainty and unpredictable changes in customer demands or technology has permeated the discussion of transaction cost economics in this chapter. At the end of the chapter, I will clarify some of the more subtle differences I have glossed over. The most obvious place where uncertainty has popped up is that I have defined the benefits of the blueprints in terms of how quickly they can *respond to changes* in the environment. If the environment never changes and is not expected to change, there is no uncertainty at all.

Uncertainty also showed up as a *measurement problem*. Top management in an organisation is uncertain about its

3. It's not difficult to see that this is a simplified version of what Apple is doing. Apple requires shops like JB Hifi to present Apple products in a very specific way. As a customer, you can recognise the Apple style presentation tables wherever you go in the world. I will talk more about this application in the next chapter.

environment and needs to collect information to decide what the best combination of actions and investments is for the divisions of the firm. Buyers are uncertain about the quality of products delivered and suppliers are uncertain whether a buyer will pay a higher price. In a lot of these cases, we can transform the problem to a *risk-benefit trade-off*. For instance, the buyer might not be sure about the quality of the product but they can decide that it might still be worth the risk to buy a product. Top management might not be sure that customers want a new product but they can decide it is worth the risk to launch a new product because of the potential sales. One important feature of this type of risk is that it can be minimised by having better measurement systems. Thus, there is a role for performance measurement and information systems to minimise the risk.

The last type of uncertainty is *fundamental unpredictability*. Some events cannot be predicted and therefor cannot be put as a condition in a long-term contract. In an organisation, unpredictable events lead to conflicts and mistakes. In a fundamentally unpredictable environment, the value of conflict resolution and integration of different perspectives in decision making will be crucial. On the other hand, unpredictability can also break markets if buyers are no longer be assured that suppliers will deliver the goods and services and sellers are not longer sure that buyers will pay. All blueprints can deal with a moderate level of unpredictability but the common view is that organisations at least have the processes in place to deal with completely unexpected events in the form of a group of top managers that can take decisions in the best interest of the firm as a whole.

Summary of the Drivers

The drivers are the factors that determine which of the blueprints is best at adapting to changing environments. Since the focus on this book is on strategic management accounting tools, we are primarily concerned with organisations. This blueprint is best at coordinating a bundle of specific investments that are only valuable within the organisation in an unpredictable environment. In transaction economics, organisations are somewhat of a paradox in that they on the one hand are resilient to change because their value comes from this bundle of investments where all investments are necessary. On the other hand, when necessary they can change quickly because only a handful of top managers need to agree to make the change happen. From a transaction cost economics point of view, the key role of strategic management accounting is to coordinate the bundle of investments and to provide top managers with information on how to adapt to a changing environment.

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3.

THE ROLE OF STRATEGY IN TRANSACTION COST ECONOMICS

Stijn Masschelein

At this point, it would be reasonable to ask the question why a book on strategic management accounting should start with a simple model of what the difference is between an organisation and a market. The reason is that I will use the insights from transaction costs to explain the benefits of a strategy for a organisation and how management accounting plays a role in reaping the benefits of a strategy. The fundamental insight of transaction cost economics is that organisations exist because they are more efficient at coordinating certain asset-specific investments than independent organisations transacting in markets. The argument in this chapter is that an *organisation's strategy* can be defined by which investments they coordinate and that different management accounting tools help to coordinate these investments. To make that proposition more concrete I will use the examples of the Apple and the Android ecosystem in the smartphone industry.

Strategy and Transaction Costs

The categorisation of organisation strategies is a source of a lot of debate. A company's strategy explicates how organisations exploit opportunities in the market place that lie within their capabilities (Horngren et al., 2012) or their strategies specify the direction a company tends to take over the long term to achieve its mission and meet its objectives. Most management accounting textbooks focus on the distinction between cost leaders and differentiators (p.5 in Horngren et al., 2012; p.14-15 in Langfield-Smith et al, 2008). Cost leaders provide products and services at prices that competitors cannot match. Examples of cost leaders are Amazon, JetStar, and Red Rooster. Typically, cost management will be an important tool for companies with a cost leadership strategy. Other organisations try to differentiate their products and services from competitors. Apple is a prime example of a company that has been able to differentiate its iPhones and MacBooks to the extent that some customers almost see them as a different product category, separate from other smartphones and laptops. A subtler example is Subway that has successfully built an image of being a healthy fast-food alternative.

Although this distinction is useful and can be further refined [1], I look slightly differently at an organisation's strategy. The established view of strategy in management accounting textbooks assumes that the strategy is decided upon at the top of the company and top management tries to implement that strategy with the help of management accounting tools such as budgets, cost accounting systems, incentive systems, and other

1. Some people identify an intermediate, flexible strategy where organisations try to adapt quickly to customer demands by frequently updating their products.

performance measurement systems. While this assumption might be realistic in organisations that are tightly controlled by a powerful CEO such as Steve Jobs (Apple), Jeff Bezos (Amazon, Blue Origin), or Elon Musk (Tesla, Solar City, SpaceX), it does not have to be true.

The approach in this textbook is different in that it does not assume that the strategy of the organisation is a deliberate choice of top management. For the purpose of this text, the strategy of the organisation is determined by the investment decisions that give the organisation a *difficult to imitate competitive advantage*. The assumption is that organisations that have no sustainable competitive advantage will be copied, or taken over by competitors, and disappear from the market place as they are being replaced by more efficient copy-cats.

One way how organisations can create a difficult to imitate competitive advantage is by coordinating a lot of asset-specific investments. Remember that these are investments that are only valuable within the organisation and if they are combined with other asset-specific investments. One example is a vertically integrated organisation like Apple. Apple tightly controls the hardware design, the engineering of the computer chip, the operating system, the marketing and the retail experience for their iPhone smartphones.

Markets

In order for a organisation's strategy to provide a competitive advantage, it is not enough that no other single organisation can copy the strategy. The organisation also wants to avoid that a collection of organisations together outperform the organisation's strategy. This is especially important for vertically integrated organisations like Apple. For the production of the iPhone, Apple tightly controls the hardware

design, the engineering of the computer chip, the operating system, the marketing and the retail experience. For the typical Android smartphone many more companies are involved such as Google, Samsung, Telstra, JB Hifi and they all have direct control over some of these activities.

The Android market approach has a number of attractive features. As each organisation is a for-profit entity, they all have a strong incentive to be efficient. An inefficient organisation will either be quickly put aside by their customers because their prices are too high or they will incur losses and run out of funding. The incentives in the market are in general much stronger than those for individual departments in an integrated organisation as we have seen in the previous chapter.

The second feature of markets is that the price of the different products and services is a coordination mechanism between the individual companies. When customers are buying more Samsung phones, the retailers, such as JB Hifi, are willing to pay a higher price for Samsung phones and carriers, such as Telstra, are willing to subsidize the purchase of a Samsung phone with a phone plan. This is a signal to Samsung that their phones are popular and they should produce more of the phones that are in high demand. Although, Samsung is not in direct contact with the consumers, they still receive feedback on the popularity of their products [2]. What holds for the final product, also goes for all the intermediate components that make up the phone. Every supplier in the whole production process will get price signals that determine whether they should make more or less

2. Yes, of course this example is simplified. In reality, Samsung will also directly interact with customers who buy their phones. As always, the simplified story is meant to help highlight the differences. This is not meant to be a full analysis of the smartphone market.

of a product or product category. This is the famous invisible hand of Adam Smith at work.

Incentives and Information in Organisations

Integrated organisations will need to replace the incentive and price signal of markets internally. This is one of the major functions of the strategic management accounting tools that we are going to discuss in the second section of the book. The goal of budgets, balanced scorecards, cost accounting, and bonus systems is some combination of gathering information from inside and outside the organisation, disseminating that information through the organisation, and motivating the different departments in the firm to work in the best interest of the organisation.

As an example, organisations can set up a *transfer pricing* system which is the most direct reflection of a market mechanism. A transfer price is a price paid by one department of the company to another for a product or service. For instance in a proto-typical manufacturing company, the production department assembles the product and the sales department sells to the final customer. The transfer price is a revenue for the production department and a cost for the sales department which allows the headquarters to assess each department's contribution to the organisation's profit (See further in this textbook for more on transfer pricing and chapter 22 in Horngren et al. (2012) or chapter 12 in Langfield-Smith et al. (2008)). Alternatively, organisations can allocate a budget to each department and assess whether the department used the budget efficiently. The allocation of budgets can also be used as a way to coordinate both

departments. If headquarters want to increase the number of products manufactured, they can allocate a larger budget to the production department (see further in this textbook for more on budgets, or chapter 6 in Horngren et al. (2012) and chapter 9 in Langfield-Smith et al. (2008)). As a last example, organisations also collect non-financial measures to evaluate and motivate employees instead of relying on market incentives and financial measures only. Financial measures and non-financial measures are used together in a balanced scorecard and they help organisations to keep track of the overall performance of the organisation and to coordinate the different departments. The balanced scorecard allows the organisation to break up the overall strategy into departmental strategies that are measured in separate, departmental balanced scorecards so that each department knows how they can contribute to the overall goal of the organisation (see further in this textbook for more on the balanced scorecard, or chapter 13 in Horngren et al. (2012), and chapter 14 in Langfield-Smith et al. (2008)).

Integrated Organisations and Transaction Costs

Because performance measures and evaluation systems are rarely perfect, they often contain less information than the price in a perfectly functioning market and the incentives in organisations are often less strong than in a competitive market. Organisations can not as easily fire employees as they can change their suppliers. When markets seem to be better at summarising information and providing incentives, the question remains why vertically integrated organisations exist. In other words, why has the market of software and hardware

manufacturers not driven Apple out of the smartphone market?

The advantage of an integrated organisation is that it can combine and coordinate all the functions at once and create synergies. Apple for instance has created its own system on a chip (SoC) which optimises energy use and performance for its software on its hardware. To get the best of this combination Apple needs to invest and coordinate the investments in the design of the chip, the software, and the hardware at the same time. The coordination of all these benefits is a delicate balancing act but if the benefits of this integration outweigh the costs of abandoning the market's price mechanism, an integrated organisation has a sustainable, difficult to copy strategy. For our purpose the key insight is that the success of the integration will depend crucially on using the right management accounting systems to assign the necessary budget to all projects, hold divisions accountable for their contribution to the overall strategy, and communicate the overarching strategy to the different divisions [3].

In the smartphone industry, other players such as Google, Microsoft, and Samsung, have with varying success moved towards more vertical integration. In general, all organisations are combining and coordinating multiple investments. That is, all organisations are integrated to a certain extent. I have used the comparison between Apple and the Android ecosystem as another simplified story to illustrate the value of integrating

3. Apple is notoriously tight-lipped on how they manage the organisation and it is difficult to use Apple as a case study. Nevertheless, there are some educated guesses we can make. For instance, when Apple launched the first iPad tablet they deliberately compromised on features to keep the overall price for customers under 499 USD for the base model while maintaining a healthy profit margin. This is consistent with a management accounting practice called target costing.

multiple functions and coordinating them well. The simplified story shows that while management accounting tools might not be as effective as the market price in an efficient market, this does not necessarily diminish the value of these tools if they allow firms to combine and coordinate multiple functions and create synergies. This cost-benefit analysis between the transaction costs of setting up management accounting tools and the benefits of synergies is how we should evaluate the value of strategic management accounting tools [4]. As a result, not all organisations are necessarily trying to get more vertically integrated. Some organisations choose a strategy that tries to remove transaction costs. The success of companies such as Uber and Amazon shows that some organisations do not shy away from creating markets, and using a pricing system as the core of their strategy. Uber, for instance, manages demand and supply for driving services through a dynamic pricing system.

These transaction costs of management accounting tools can take numerous forms: from the cost of hiring consultants to help design the system, over the cost of IT systems to manage and collect the data, to the reaction of employees to being monitored or have their salary depend on imperfect measures. It is equally important to know what transaction costs are not. They are not the costs of goods, services, and human resources that are necessary for the production process of the organisation [5]. I believe that one of the key differences of

4. Most management accounting textbooks touch upon integrated organisations when talking about the outsourcing and make-or-buy decisions (e.g. Chapter 11 in Horngren et al. (2012) or p860 in Langfield-Smith et al. (2008). However, I believe the focus in those chapters understates the importance of the integration and coordination in organisations.

5. That is, operational costs are not transaction costs.

my approach to strategic management accounting compared to traditional textbook approach is the focus on transaction costs. I fundamentally start from the premise that all management accounting tools have transaction costs associated with them. Thus, they will only be useful to an organisation if the benefit of having the management accounting tool are larger than the transaction costs of developing and implementing it.

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4.

SPECIFIC KNOWLEDGE

Stijn Masschelein

We started the discussion of economic theories with transaction cost economics in the previous chapters. The emphasis of transaction cost economics is on the value that organizations create by coordinating different functions in different departments. Transaction cost economics of hierarchical organisations has a top down flavour that focuses on the coordination role of top management. In this chapter, I introduce the notion of specific knowledge because it will help us think about when top management should not take the decisions. That is, I will answer the question when decisions should be decentralised to the departments in the organisation. Decentralisation leads to new measurement and control problems which can be solved or at least alleviated by strategic management accounting tools. In one of the following chapters, I will expand the notion of specific knowledge to the broader category of human capital where investments in human capital are an alternative mechanism for organisations to create a difficult to imitate competitive advantage.

General and Specific Knowledge

This chapter focuses on the problem of assuring that the person or department with appropriate knowledge decides

how to implement a strategy, which projects to fund, or how to execute them. I make a distinction between two types of knowledge: general knowledge and specific knowledge. The distinguishing feature of *specific knowledge* is that it is difficult to communicate (Jensen & Meckling 1995). If a person has specific knowledge that means that they cannot just explain their insight to other people. For instance, the design sensibilities of Jonathan Ive or Steve Jobs at Apple and the experience and negotiation skills of Warren Buffett are more difficult to transfer to other employees. Production workers, such as the manufacturing employees at Toyota, gain unique insights in their job just by doing it. It is costly and often very difficult to impart this knowledge to new employees. They will only learn through their own experience.

In contrast, the market price for a product or service is the quintessential example of *general knowledge*. If sellers' cost of production goes up, the market price will increase. If the final customers value the buyers' products more, the intermediate market price will increase. In a well functioning market, the market price contains all the information that buyers and sellers need about the product. If there is more demand for the product (by the buyer), the price will go up. If there is more supply of the product (by the sellers), the price will go down. The market price is known to everyone in the market and can be understood by everyone in the market and is therefore general knowledge.

There are multiple reasons why information is difficult to communicate. I will focus on two. The first reason is that we humans have *cognitive limitations*. We cannot digest and remember an infinite amount of information. That means that in all but the smallest organisations, it is unlikely that one person will have all the knowledge necessary for the organisation to be run perfectly. In addition, when we learn new knowledge, it takes time. Just reading this textbook is

not enough for you to have the same knowledge that I have [1]. When we learn a new skill or new knowledge, we need to practice which takes time. That means that we are learning new knowledge that is difficult to communicate.

The second reason why specific knowledge exists is that a lot of knowledge is *specific to an environment* and the people who work in that environment know best what is important. For instance, sales people interact a lot with the firm's customers and as a consequence they know a lot about the preferences of the customers. Similarly, the production team knows the production process the best. They will be able to identify possible improvements in the production process. If a department needs to transfer this information to the headquarters some of the knowledge will get lost in translation. Every report or presentation by the production managers will necessarily leave out some details which might be important for the decision about the production process. The fact that the production managers have to write a report or must have multiple long meetings with headquarters is also a sign that it is costly to transfer their knowledge.

Markets and Specific Knowledge

As we have seen before in the story of the mine, there are two possible solutions to assure that the people with knowledge take the decisions. The first solution works in the well functioning market. A market operates best when the rights to assets are in private ownership and these rights can be bought

1. Setting aside the obvious questions whether that would be something that you would want.

and sold. This means that the owners of the rights transfer the rights to somebody else and the new owners reap the profits of using the machine. If you have the *ownership rights* to a machine, you can sell this machine and you get the sales price when you sell. You can also use the machine to produce goods and sell the products to consumers. In such a case, market forces will assure that the owners of the rights will sell them to the most knowledgeable people in the market. These people know what to do best with the rights and can use the machine most efficiently. The machine is more valuable for knowledgeable people and they are willing to pay the highest price for the rights to the machine. Because that price will be higher than what the current owners can earn from the machine, the owners will be happy to sell.

Organisations and Specific Knowledge

The market solution does not work in organisations and it is obvious why. The sales department can not sell the goods to consumers and keep the money. The price that consumers pay for the companies products belongs to the company. Similarly, the production department can use the organisation's machines but it is rare that they are allowed to sell the machines. And even if they are allowed to sell the machine, the proceeds from those sales do not belong to the production department but to the organisation. In these examples, the sales person and the production manager do not directly benefit from the decisions that they take and this sets up a potential conflict of interest.

Numerical Example of an Organisation

We can use a simple numerical example to illustrate the problem. Let us assume that there is a manufacturer of computers with two departments: a production department and a sales department. The production department can invest in a technology to produce shiny white computers which can be sold at a higher price to consumers than regular grey computers. The production department is evaluated as a profit centre with a fixed transfer price for each computer that it manufactures and transfers to the sales department. As a result, the production department does not profit from an investment in the production technology for white computers. Whether they deliver a white computer or a grey computer does not matter for the transfer price in our example. The sales department can invest in more attractive lighting in the stores which will increase customer traffic and thus customer demand. The investment is so substantial that the sales department alone will not profit enough to invest [2].

To make this example more tangible, I will put some numbers on these investments. We have four possible options: the production department can either invest or not in white computer technology and the sales department can either invest or not in better lighting in the stores. In Table 4.1, you can find the profit of the production department for each of the four options. The key insight is that the production

2. The similarity with an existing company is not entirely coincidental because it provides further continuity with some of the examples I used in the chapters on transaction costs. Nevertheless, the investment in this example are deliberately trivial to emphasize this is just a story to illustrate the problem with specific knowledge. This is not an actual case study of Apple computers.

department would rather not invest independent of what the sales department does. If the sales department invests and the production department does not invest, the production department has a profit of 450 while investing gives a profit of 350. Similarly , when the sales department does not invest and the production department does not invest, it has a profit of 300 while investing gives a profit of 200.

Table 4.1: Production Department Profit

	Sales Investment	**Sales No Investment**
Production Investment	350	200
Production No Investment	450	300

Table 4.2 shows the profit for the sales department with the same four options. The sales department is in a very similar situation. No matter whether the production department invests or not, the sales department is better off not investing in the lighting for the stores. The profit of not investing is always higher than the profit of investing.

Table 4.2: Sales Department Profit

	Sales Investment	**Sales No Investment**
Production Investment	380	420
Production No Investment	200	300

In our simple story, we can just add up the profit of the

production department and the sales department to get the profit of the firm. Table 4.3 shows that the firm has the highest profit when the production department and the sales department both make the investment.

Table 4.3: Firm Profit

Firm Profit	Sales Investment	Sales No Investment
Production Investment	730	620
Production No Investment	650	600

This situation is the problem of asset specific investments in transaction cost economics. The sales and production department are better off not to invest but the firm as whole would benefit from the investments [3]. This is a good place to think about what the solution is to this problem. You can even go back to the chapter on transaction cost economics because coordinating asset specific investments is exactly the problem that transaction cost economics identifies as the key problem in economic governance.

The solution is simple because the story is simple. The best option for the firm is for top management to take the

3. Remark that in our example the firm benefits from the sales investment or the production investment independent of whether the other investment is undertaken. From the firm's point of view, both investments should obviously be undertaken. I deliberately choose the numbers in this example to illustrate that the problem is the different perspective between the departments and the firm as a whole. There is nothing inherently complicated to the decision process whether to invest or not.

investment decisions and let the departments execute the strategy that is implied by these decisions. This is why transaction cost economics explains the benefits of the hierarchical organisation where top management coordinates the investments.

Extension with Uncertainty and Specific Knowledge

In the simple story above, I assumed that top management exactly knows the benefits and costs of both investments. This assumption is not always useful. It is not hard to imagine a situation where the production department has specific knowledge about the true cost of a new production technology and the sales department has a better understanding of customer demand and how customers will react to changes to the stores. For simplicity, I will assume that the true costs and benefits are given in Table 4.1, Table 4.2, and Table 4.3. The specific knowledge of the production and sales department means that they know respectively that Table 4.1 and Table 4.2 are true and therefore together they know that Table 4.3 is true. However, because the tables are based on specific knowledge they cannot be communicated to top management.

Let us further assume that because top management has less understanding of the investment decision, they believe that Table 4.3 is a possible outcome but they are not sure that they can avoid the worst case scenario in Table 4.4 where the shiny white computer production technology is more expensive than expected and the demand is lower than expected with the introduction of better lighting in the stores. Under the worst case scenario, the firm would be better off not to invest in either technology.

Table 4.4: Firm Profit in the Worst Case Scenario

	Sales Investment	Sales No Investment
Production Investment	390	520
Production No Investment	550	600

This minor change to the original story complicates how the firm should make investment decisions considerably. It is no longer guaranteed that top management will take the decision that benefits the firm as a whole because the necessary knowledge to make the decision is in the departments. Again, this is a good place to think about how top management can solve this problem.

There are two broad categories of solutions. The first one is a top-down approach. Top management can try to make the knowledge in the departments readily available to them by requiring the departments to *quantify* their *specific knowledge*. For instance, the production department can use a cost accounting system to quantify the cost of producing the white computers and the grey computers. Similarly, the sales department can use a customer profitability analysis to understand the willingness to pay for grey and white computers in different customer segments. Quantifying specific knowledge is one of the key contributions that strategic management accounting has to better strategic decision making.

The second solution is a bottom-up approach. Top management can *decentralise the decision making process* to the departments which immediately introduces a new problem. The departments will not take the best decision for the firm as a whole, even in our most simple story, and thus, top management will have to design incentives to make sure that

departments make investments that are in the best interest of the firm as a whole. Importantly, *top management does not know what the optimal decision is a priori*. If they did, they would just take the decision themselves and they would not need to bother with decentralising decision making.

In our story, a straight forward solution is to tie the compensation of the departments to the firm's profit. There are potential problems with this approach because factors beyond the control of the departments could affect the profit. For instance, the production department needs to trust that the sales department will make the right investments and vice versa. The production department also need to trust that customer demand will not be affected by macro economic factors or decisions by competitors.

The problem of designing incentives that allow the firm to decentralise the investment decision to the departments is the subject of a future chapter on agency theory. In this chapter, I will explain the properties of good performance measures to motivate the departments to make decisions that increase total firm profit. Here, I want to highlight that management accounting tools play an important role in defining the scope of decentralisation and the incentives for the departments. If the department has a budget to invest in new technologies, the firm has granted them some decision rights. If a department is evaluated at the end of the year on how much money they spend of the budget, they will be incentivised not to overspend. Budgets are at the heart of many investment decision rights in hierarchical organisations and therefore they will be the first strategic management accounting tool I will discuss in the second part of this textbook. However, the other management accounting tools such as cost accounting and balanced scorecards play an important role in measuring the performance of departments and investments and thus, they are also used to design better incentives for decentralisation.

Summary

In this chapter, I introduced the notion of specific knowledge as knowledge that a person or a group of people has and that they cannot easily or quickly communicate to others. In combination with transaction cost economics, it gives us a powerful framework to understand hierarchical organisations and the need for management accounting tools. The transaction cost framework emphasises the role of top-down process because of the role of top management to coordinate the different investments in the organisation. Specific knowledge emphasises the limitations to the top-down process because top management will not have all the necessary specific knowledge. As a result, top management needs to use management accounting tools to translate, collect, and communicate specific knowledge to top management or they need to design a more bottom-up structure where decisions are decentralised. The latter solution also requires management accounting tools to measure and evaluate the performance of the decision makers. All these management accounting tools have transaction costs associated with them. The role of top management is to find the balance between good decision making and transaction costs.

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5.

HUMAN CAPITAL

Stijn Masschelein

In the previous chapter I introduced the notion of specific knowledge and mainly focused on how it complicates the transaction cost blueprint for the hierarchical notion. Because top management needs to rely on specific knowledge in the departments, they need to use management accounting tools and incur additional transaction costs. That part of the story focuses on the costs of specific knowledge. In contrast, this chapter focuses on the benefits of specific knowledge. Because specific knowledge is difficult to communicate, it is also difficult to imitate and thus specific knowledge is a valuable source of a difficult to imitate competitive advantage. In this chapter, I will extend this argument to *human capital* such as capabilities, specific knowledge, reputation and trust of employees and suppliers.

Human Capital as a Source of Competitive Advantage

An organisation's strategy in this textbook refers to the crucial investments that give a company a difficult to imitate competitive advantage. In this section, I discuss a minimum requirement for a strategy to be difficult to imitate. A

sustained competitive advantage requires that no other organisation can apply the same strategy and improve upon it. I argue that solely investing in technology or physical assets can always be imitated by other companies if these competitors can buy the same assets and technology. In contrast, human capital is more difficult to imitate because human capital takes time to develop and therefor can not be just bought. In other words, developing trust with employees or suppliers takes time. Over that time, the company has to maintain its impeccable reputation and not betray the trust. If the employees of the firm have specific knowledge, a competitor can pay the employees a higher compensation to lure them away, but it will take time for them to establish the same working relationship with these employees. In other words, it is the working relationship that gives a company competitive advantage.

The distinction between physical capital and human capital is not always easy but for accountants a good rule of thumb is that physical capital is much more likely to be found on the balance sheet while that is not the case for human capital [1]. *Physical capital* is assets such as stores, factories, and machines. In this category, I also include technology because most technological solutions need a physical representation. *Human capital* are assets tied to specific people such as capabilities, culture, reputation, specific knowledge, trust of employees and stakeholders.

Although there are some obvious exceptions such as the

1. One of my many, equal part frustrations and enjoyments in life is to see the recurring cycle of financial accounting colleagues struggling with designing general accounting rules on how to value the type of human capital that is in fashion at the time. In the chapter on the balanced scorecard, I will explain why I think that is impossible and why that is not a problem. Firms have developed robust management accounting solutions to deal with this problem.

adage "location, location, location" for the tourism industry, there are striking examples of the importance of human capital over physical capital. One particular example is the rise of Japanese car manufacturers in the U.S. market. Recent studies have investigated why for decades General Motors was not able to copy the strategies of Toyota despite having closely worked together in an alliance. Several researchers have highlighted that General Motors made considerable investments in automation during the time they learned the best practices from Toyota but it still took them two decades to catch up. One team of researchers concludes that the difficulty for General Motors was to copy the relations that Toyota had with its suppliers and employees which allowed Toyota to fully exploit the improved technology (Helper & Henderson, 2014). For instance, Toyota involved suppliers in the design process of new models and employees in continuous improvement of the manufacturing process. General Motors tried to create the same efficiency gains through heavy handed monitoring and incentive contract. However, these formal practices prevented the development of cooperative relations between General Motors, its suppliers and its employees. As it turns out, it was the willingness to cooperate and communicate mistakes that made it possible for Toyota to become more efficient.

This example also has direct relevance for management accounting practice. One of the accounting practices that got popularised by Japanese manufacturers is Kaizen costing (see p. 203 in Horngren et al. 2014). With Kaizen costing, the budgeting process assumes that costs of production will steadily decrease over time because of continuous small improvements to the production process. In Toyota, the actual decrease in costs is driven by incremental improvements in the production process discovered by manufacturing employees. Despite the lack of explicit incentives for the employees, they

trusted that management would reward them for all suggestions to the production process. In General Motors, employees lacked the trust in management and incentive systems were difficult to devise which inhibited the effective introduction of Kaizen costing and continuous improvement programs (Helper & Henderson, 2014). This example highlights that the successful introduction of new management accounting systems depends on other factors such as the culture of the firm. The case of Toyota reflects the importance of human capital in general. The next section discusses why human capital is difficult to imitate.

Strategy as Human Capital

So far, when talking about the strategy of the organisation I have implicitly assumed that top management knows and can explain the strategy of the organisation at least when they are able to collect all the necessary information to make strategic decisions. However understanding of what makes an organisation successful requires experience and deep knowledge of the industry in which the organisation is operating. It should not come as a surprise that we can think of strategic insight as a form of specific knowledge or human capital.

Strategy as Specific Knowledge

Top management often has difficulty to explain or quantify their own strategy in for instance a balanced scorecard. It is not that they do not know what they are doing. They have difficulty to communicate it to other employees or to the outside world. Management skills are difficult to transfer from

one manager to another. Research has shown that one of the best predictors of bad management is whether the firm is led by a second generation owner-manager (Bloom et al., 2010). In other words, while the founder of a company might be an excellent manager, they will often not be able to pass that skill on to their offspring.

One role of management accounting is to transform this informal and subjective knowledge into general knowledge that can be communicated to everyone in the firm or be stored over time. For instance, a founder's intuitive knowledge of who should be doing which work can be replaced by a formal hierarchy with clear job descriptions. The earlier mentioned role of balanced scorecards in communicating the firm's strategy is another example. Cost price calculations based on value chain analysis can formalise implicit engineering knowledge. The engineers might have an intuitive idea of which products are difficult to produce and which ones are not. However, other divisions might not be aware of these insights or understand where that knowledge comes from. If the production difficulties are captured in the cost of producing a simple versus a complex product, the sales people can use that information in setting the price and the finance people can incorporate that information in decisions to scrap product lines (Wouters & Wilderom, 2008; Wouters et al. 2009). In other words, the formalisation of intuitive, subjective, specific knowledge in numbers can help to transfer that information across the firm.

Specific, subjective knowledge can yield a difficult to imitate competitive advantage for a firm because other firms cannot immediately build up the same knowledge. It is by definition difficult for firms to store and communicate that information throughout the whole firm. If specific knowledge is not formalised, firms risk to loose the knowledge when the employees leave the company. Management accounting

systems such as performance measures are an attempt to make the subjective information more objective and general. Formal management accounting systems can serve as a memory for deliberate, top-down strategies. For instance, balanced scorecards are used to map a strategy and develop a system of measures to track the success of a strategy. When the executives who developed the strategy leave the company, the balanced scorecard can help their successors to implement the same strategy. In other words, formal system can help to communicate the strategy not only across divisions but also across time.

A Bottom-up Strategy

The introduction of specific knowledge and human capital in our framework puts the emphasis on bottom-up decision making. Departments and people in those departments have skills, relations, capabilities, and knowledge that cannot be replicated by top management. So far, I implicitly have followed the transaction cost economics view where top management decides the overall strategy of the organisation, that is which combination of investments can give it a difficult to imitate competitive advantage. I did acknowledge that sometimes top management will have to rely on the departments to make decisions on which investments are beneficial but we can go one step further. The definition I use for a strategy does not require it to be determined by top management.

It is possible that top management only has a vague idea of which direction the company should take but top management is excellent at nurturing and motivating people

to come up with new ideas [2]. In this case, the strategy is more bottom up than top down because the rank-and-file employees effectively set the direction of the firm. In addition, we will see that top management often has difficulties in clearly formulating what the firm's strategy actually is. The implementation of strategic management accounting tools are often hampered by that lack of knowledge but at the same time the process of implementing a management tool sometimes helps top management realise what their strengths and weakness are.

This emerging bottom-up strategy also benefits from management accounting tools. If nobody in the firm has an obvious grasp of the strategy, you might ask how the strategy can be implemented. A firm can use management accounting tools such as incentive contracts and targets to align the interest of employees with the interest of shareholders, i.e. creating long-term value. The joint effort of employees are now responsible for the emerging strategy. Budgets help to coordinate the needs of different divisions and allocate the limited funds of the company even when the firm does not know exactly how to execute the strategy. In other words, companies benefit from strategic management accounting tools even in the absence of a clearly formulated strategy because management accounting tools focus the attention of the employees and coordinate their efforts.

2. I think Alphabet (formerly Google) is an example of this type of bottom-up strategy.

Summary

This chapter on human capital introduces another key component in my view on strategic management accounting. The human capital view emphasises the importance of the people in the organisation and their skills, capabilities, and knowledge. I have explained that these people can be a fundamental part of making an organisation's strategy difficult to imitate exactly because the human capital is difficult to quantify. In contrast to what some might expect, this does not imply that there is no role for management accounting. Indeed, sometimes organisations will use strategic management accounting tools to formalise and quantify some of the unstructured knowledge of its people. Other organisations will use management accounting tools to coordinate and motivate the employees to work in the best interest of the organisation. Which brings us to the next chapter.

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6.

AGENCY THEORY

Stijn Masschelein

The chapters on specific knowledge and human capital showed that top management needs to decentralise decisions to departments because the people in those departments have skills, knowledge, and capabilities that top management does not have. This creates a potential conflict of interest where the departments can use those decisions rights to take decisions that are in their best interest and no longer in the interest of the firm. Because the departments know better which decision is in the best interest of the firm, top management cannot judge whether the departments have taken the right decision directly. They have to rely on necessarily imperfect measures. The central trade-off of decentralisation is between better decision making by the departments and the contracting costs as the result of imperfect performance measures (Prendergast, 2002).

In contrast to market transactions, organisations do not transfer the ownership rights to their employees; they only grant them some decision rights. Sales staff in a car dealership do not have the right to do what they want with the car. There are a limited number of decisions they can take over what will happen with that car. The decisions they can and cannot take will be described in their (official) job description. Their level of autonomy will depend on whether or not they have to get permission from a supervisor to give price reductions,

give away extras at reduced prices, or pay for the customer's old car. To make sure that the sales people make decisions in the interest of the dealership, they will be paid a commission for each sale. The remainder of this chapter deals with the problem of designing these incentives so that the balance between decision making and contracting costs is right.

The Agency Theory of Incentive Contracts

The elements of incentive contracts

One of the tools to align the interests of the employees with the interests of the firm are incentive contracts. For our purpose *contracts* are broadly defined; they can be both written and implicit agreements. *Incentives* are similarly supposed to capture a broad range of possible rewards for employees: from monetary bonuses, to business trips and awards, or a promotion. The other crucial element in an incentive contract are *the performance measures* that determine whether the employees get a reward or that determine the size of the reward. The measure can be financial measures, non-financial measures, or even the subjective judgment by a superior.

In summary, the theory of incentive contracts can apply to a broad range of settings. In the remainder of this chapter, the focus will be on explicit bonuses for managers of a department but keep in mind that the theory is broader than this example

[1]. I start by making goal of incentive contracts explicit in more detail which will help us to understand better why firms are using incentive contracts over just monitoring their employees. In the sections that follow, I will explain the characteristics of good performance measures and how the combination of multiple performance measures can improve incentive contracts. Lastly, I look at the problems that arise when the performance measures motivate employees only on a subset of all the actions that are the best interest of the firm.

The goal of incentive contracts

The main goal of incentive contracts is to encourage and direct the effort and attention of employees. The first goal that springs to mind is that bonus contracts make employees work harder because they will be rewarded for their additional effort. This is not the only function of incentive contracts and is the least interesting one for our perspective because it does not focus on the problem that departments with specific knowledge make decentralised decisions. Incentive contracts also direct the effort and attention of employees to the right task. For instance, fashion designers might spend most of their time on innovative and artful designs while their employer might be more interested in more mainstream designs. To make sure that the designer spends enough time on mainstream designs, the organisation can reward the designer for mainstream designs but not for avant-garde designs. With or without the incentive contract the designer will work equally hard but with the incentive contract, their effort will be

1. For instance, the chapter on internal labour markets will explicitly explain how subjective, non-verifiable judgements and promotions work as incentive contracts.

more in the commercial interest of the organisation. Thus, the organisation can give the fashion designers the right to decide on which tasks to focus if they can design an appropriate incentive contract. Another related but slightly different role for incentives is to make sure employees invest in projects that are profitable for the firm and not in projects that only increase the prestige and status of the employee. CEOs are often accused of empire building which means that they are investing in big and popular projects to raise their own status but those projects are not necessarily in the best interest of shareholders. One way to solve this problem is to reward CEOs with stock rewards. Of course, coordinating the incentives of the organisation is the key task of top management according to transaction cost economics.

These incentive contracts are studied in sophisticated mathematical models in a field of study that is sometimes called agency theory or principal-agent theory (Holmstrom & Milgrom, 1994; Lambert 2001). To explain the main intuition, I rely on a simple story of top management (the principal) and one employee (the agent). The timeline of the labour relationship under an incentive contract is as follows. First, the principal and the agent agree on a basic salary and on a bonus for the employee depending on the outcome of a performance measure. Next, the employee works and takes decisions. The assumption is that the agent will try to maximise their total compensation taking into account the costs of maximising total compensation. Examples of these costs are extra hours of work, or doing tasks that do not help their future career, status or prestige. Another important cost stems from the risk that the measure might not capture the agent's performance completely and that despite the agent's best effort they do not get their reward. Finally, in the last step in an incentive contract, the outcome for the performance measure is established and the employee receives their salary and bonus.

Something that is often counterintuitive is that in this baseline story, the behaviour of the agent does not change based on whether they get the bonus. The behaviour of the agent is already fixed at the time when the bonus is being paid. Or in other words, *the behaviour of the agent determines the bonus and not other way around*.

To better understand the role of incentive contracts, we can contrast incentive contracts with giving directions to employees and correct them when they do not adhere to the directions. One of the reasons why giving directions might not work is that employees know better how to do their job than top management. They have the experience of doing the job day in day out or they have the specific education. In short, employees have specific knowledge. In addition, communicating top management's directions through the different hierarchical levels is costly or takes a long time. Lastly, the employer still needs a costly monitoring system to know whether employees have adhered to the directions they were given. The employer can not follow around all employees to check whether they are following up on the employer's directions or not. To avoid all these problems and transaction costs, firms can rely on incentive contracts to align the interest of the employees. The next section will deal with costs that are associated with these incentive contracts in the simplified story.

Risk, sensitivity, and precision

The benefit of incentive contracts for top management is that contracts make employees spend their time at the right tasks and spend more effort for the firm. The benefit for some employees is that they enjoy the responsibility and decision rights instead of following directions. However, because top

management can only imperfectly measure and reward the employees, there is a risk that despite spending more effort on an unattractive task, employees do not receive a reward. If the performance measure is affected by other factors such as the economy, competitors, or other employees than the employee might not receive the expected bonus despite their best effort. Most people are risk averse and prefer to avoid such risks. Employees will only accept a risky incentive contract if they are compensated for this additional risk of incomplete measurement (Holmstrom, 1979). The additional compensation to make-up for the risk [2] is a transaction cost or a contracting cost for the employer. The organisation will have to weigh this extra cost against the benefit of aligning the employee's interest with those of the firm.

A good measure from both the organisation's and the employee's point of view is a measure that picks up only what the employee has done and nothing else. Remember that the main goal of a performance measure in an incentive contract is to direct the decisions and effort of the agent. Such a *precise* measure limits the risk of employees not getting their reward while they deserve it. The advantage for the firm is that they do not have to pay a higher compensation for the additional risk. A good measure will also be *sensitive* to what the employee has done. This means that when employees change their behaviour, the performance measure will change as well. If a measure is sensitive to their behaviour, it is easier for the employee to move the measure in the right direction and gain a reward. Because it is easy for the employee to influence the measure, firms do not need to hand out large rewards to motivate the employee and they can set more demanding

2. You can think of it as a risk premium in financial transactions.

targets without offering egregious large rewards (Banker & Datar, 1989; Holmstrom, 1979).

Precision and sensitivity of a measure are not the same characteristic. Measures can be affected by little outside influences and be precise but at the same time not respond to the behaviour of the employee and be insensitive. Similarly, a measure can be affected by the behaviour of the employee but also affected by a number of other factors. For such measures, the organisations need to trade-off whether the improvement in precision is worth the decrease in sensitivity.

In the simplest agency theory story, the risk premium is the main transaction cost of a bad performance measure. If it is difficult for the employee to improve on the performance measure and the measure can be affected by a number of outside factors, they will not want to work under an incentive contract but prefer a fixed salary. To persuade risk averse employees to sign an incentive contract with such a bad measure, organisations will have to pay high salaries and bonuses.

Multiple measures

One way to improve the incentive contract is to make the reward dependent on more than one measure. The idea is that at two measures that are very insensitive or very noisy can together be informative about the behaviour of an employee. A specific application of this idea is to include measures in a contract that are uncontrollable by employees but decrease the noise in the contract. For instance, organisations regularly use benchmarks that make rewards dependent on the performance of peers or competitors. If there is a lot of economic uncertainty and the peers or competitors are also subject to that uncertainty, including performance of peers as a

benchmark in the contract makes the total compensation less risky.

For instance, a car dealership might want to reward the sales staff based on their individual sales. However, car sales depend on the general economic sentiment which is out of control of the sales staff. Furthermore, it is hard to actually measure the effect of economic sentiment on car sales. The sales staff will want to avoid that their bonus depends on weak economic demand. One possibility for the car retailer is to compare the sales from each staff member to the average and give them a bonus if they are above average. Because all sales staff are affected by economic demand, the average of the peers' sales will capture the impact of changes in demand and make the bonus less noisy. Including an insensitive measure (i.e. average peer sales), increases the precision of the overall measurement (i.e employee sales minus average peer sales) because it filters out the common economic effects. This is the basic idea behind benchmarking explained within the agency theory framework [3]

3. This is a good place to illustrate why I take the approach of building up the theory of why organisations need performance measures over different story. At this point, you can trace back when benchmarking will be useful. It helps when an organisation (1) decentralises decision making to knowledgeable employees, (2) needs to incentivise the decentralised decision makers, (3) those decision makers are risk averse, and (4) benchmark helps to remove unwanted noise from the decision makers performance measure. I find it useful to be able to identify those assumptions because it helps me to decide whether benchmarking should be a priority in improving an organisation's performance measurement system.

Multiple actions and incongruence

So far we did not explicitly take into account that a measure can be affected by two different actions from the employee. Another way of looking at the issue is that managers and employees take a lot of different independent decisions that can all affect the performance measures. A lot of actual real-life performance measures are compiled out of information and reports gathered by the employees. This means that employees can influence the measure without improving task performance by changing the reports. In this example, the employee can take two actions that will influence the performance measure, i.e. they can manipulate the measure or they can improve performance. If a measure is more sensitive to measurement manipulation than to performance improvement (i.e. it is easier to fudge the number undetected than to actually do the work), incorporating the measure in the contract will motivate the employees to manipulate the measure (Holmstrom, 1979; Lambert, 2001). If employees can influence a measure in two different ways and one of them is not valuable for the firm, the measure is called incongruent with the firm's interest.

The opposite is also possible. Sometimes a performance measure does not capture every aspect of the job. For instance, a lot of the criticism of accounting based measures (e.g. accounting profit) is that they only measure a decision's effect on short-run profit of the firm but not necessarily the effect on long-term firm value. The firm can complement the accounting based measures with non-financial measures such as customer satisfaction, product quality or leadership to capture those long-term effects.

These two examples show that the principal needs to consider two aspects when thinking about the effect of the actions on the performance measures. (1) Are there any actions

that can improve a measure but are not in the best interest of the organisation? (2) Are there measures that do not capture the results of the agent's actions? A *congruent measure* is a measure that captures all the actions of an employee that are in the best interest of the firm and no other actions. Very few measures are at the same time precise, sensitive to desired actions and not sensitive to undesired actions. Thus, incongruent measures will have to be rectified by adding additional measures to the bonus contract (Holmstrom & Milgrom, 1991). This is the motivation behind the Balanced Scorecard which I will discuss in a future chapter.

However sometimes, the organisation will have to trade-off the different characteristics of the measures. For instance, the profit of a department is arguably more sensitive to the decisions by the department's managers than firm profit. Departmental profit is also less noisy than firm profit. In contrast, firm profit is more congruent because it will capture the effect that the manager's decisions have on the other departments. In the chapter on Specific Knowledge, we worked through a story of a production department and a sales department of a computer firm where both department were strongly interdependent. The trade-off might be difficult [4]. Let us assume that the head of the department can invest in two projects: both projects improve departmental profit but only one improves firm profit. One setting where that could occur is when the department receives the revenues of the project

4. The story that follows is not something I necessarily expect you to come up with on your own. However, it again illustrates that combining the different stories and mechanisms that I have presented so far can lead to advanced insights in real cases. The problem is that the actual outcomes will depend on the actual costs and benefits which will differ from case to case. It becomes impossible to give general explanations that will always be true.

while another department bears the costs. This is a variation on the story in the chapter on specific knowledge. Rewarding the head of the department only based on departmental profit will increase the effort in the project that is in the best interest of the firm but also in the project that is not in the best interest of the firm. Depending on the circumstances it can be best for the firm to:

1. use both firm and department profit to evaluate the department. In that case, the firm will combine the congruence of firm profit with the relatively stronger sensitivity and precision of the department profit.
2. use only department profit. If the project that is in the best interest of the firm is also more profitable than the other one for the department, department profit is not too incongruent. It will still motivate the department to focus on the project that is in the best interest of the firm.
3. use only firm profit. If firm profit is not too noisy, the cost of the risk premium will be smaller than the benefits of more congruence with the interest of the firm.

These issues are at the forefront in discussion on the reorganisation(s) at Microsoft. Whereas until around 2010, Microsoft had strong internal competition between divisions (such as the hardware, the Office software, or the Windows software division), they have reconsidered their structure. Because of the strong focus on division profit, each division refused to cooperate with other divisions and invested in projects that caused headaches for other divisions.

One of the main sources of competition between the divisions is for the limited budget to develop new projects. The divisions have to convince headquarters that they deserve investments in their projects. However, that competition can

turn ugly when different divisions do not want to accommodate their projects to benefit others. For instance, the Office division was for a long time not willing to adapt their software for a touch and stylus interface.

Costs and Benefits of Decentralisation

The strategy of the firm will have a big impact on how a firm structures its different divisions. Some firms will split up the firm according to geographical locations, others choose to have divisions for different product lines, and others have different divisions for different business functions such as sales, production, and purchasing. Big international firms will often have an organisational structure over multiple dimensions in a so-called matrix structure. In this concluding section, I want to emphasise again how the decentralisation decision fits into the broader framework I have presented so far.

There are multiple reasons why headquarters decide to decentralise decisions to divisions. Geographically decentralised divisions often have better specific knowledge about the preferences of customers, the capabilities of suppliers, and employees, or the local political environment. As a result, a decentralised division will be more responsive to its environment than headquarters. Because a decentralised division does not have to wait for directions from headquarters it will not only detect changes in the local environment quicker but also react quicker to changes in customer preferences or supplier capabilities.

In addition to improving decision making, decentralisation improves the motivation of managers in the division. Because managers feel more empowered when they can make their

decisions, managers with more responsibility are more likely to take initiative and work harder in the interest of the firm. For instance, lower level managers with more autonomy are more likely to develop management skills than managers who can take fewer decisions. This does not mean that the incentives we talked about in the previous section do not matter. When the managers can earn a bonus or a promotion, they will be more likely to put those improved skills in action.

In the section above I already highlighted one potential risk of decentralisation. It can lead to competition between departments and the organisation no longer has the benefit that it can coordinate multiple investment decisions. Another disadvantage of decentralisation is that some activities and functions of the firm might be duplicated. That is why firms often centralise some supporting functions such as HR administration, accounting, or purchasing. Centralisation of these functions is an example of how firms can economise on the transaction costs of running a business.

The main insight of agency theory for this textbook is that decentralisation of decisions depends on how well the organisation can measure the actions of the decentralised employees. If the measures as a whole are sufficiently sensitive, precise, and congruent, the organisation can design a performance evaluation system that motivates the employees to act in the interest of the organisation. In agency theory, the only transaction cost of such a performance evaluation system is the risk premium the organisation has to pay as the result of insensitive and imprecise measures and the cost of misaligned incentives when measures are incongruent. In practice, another considerable transaction cost will be the cost of collecting, refining, and storing the measures that the organisation is using to evaluate the employees.

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7.

PROMOTIONS AND SUBJECTIVE PERFORMANCE EVALUATION

Stijn Masschelein

Besides direct incentives from a bonus contract, employees are also motivated by the opportunity to get a promotion. The role of promotions has not received the same level of attention as incentive contracts but we can glean some general insights within the framework that we have built up so far. This chapter will have a different flavour compared to the previous chapters. Initially, I will use the concepts from transaction cost economics, specific knowledge, and properties of performance measures to give insights in the function of promotion incentives within organisations. The second half of the chapter introduces a new story to help us understand the role of subjectivity in performance measurement and incentives. Promotion decisions are often partly based on the subjective judgment of higher-level managers and I will use this story to explain the fundamental problem with these type of evaluations. This will give us a good jumping off point to talk about subjectivity in performance evaluation in general. For a lot of non-managerial incentives, the bonus is not fully

determined by objective performance which is assumed in the previous chapter but the bonus will depend on the subjective judgment of one or multiple superiors.

The Role of Promotions

In this section, we leave the territory of the simple stories from earlier chapters and we are applying the insights from those stories to look at the role of promotions in organisations. As we will see with a number of strategic management accounting tools in the second part of the book, real-life practices often have multiple functions. One role of promotions is that it is part of a career path for the employee within the organisation. Because employees who are promoted have been working in the organisation for a while, the organisation has more knowledge about their skills and abilities. Similarly, those employees will also have more knowledge about how the organisation works through experience compared to outsiders. This is straight forward application of transaction cost economics and specific knowledge. Because the employee and organisation work together for a period of time, they develop specific knowledge and become mutually dependent. The time invested together becomes an asset specific, irreversible investment [1]. The second role of promotions is that they can be used as a reward for employees who perform well. A promotion is often desirable and employees will be motivated

1. This is the first time that we explicitly acknowledge that economic investments do not necessarily have to involve a monetary costs. This will remain true for the remainder of this textbook.

to get the prize of a promotion, i.e. the promotion is the reward in an implicit incentive contract.

Mutually Beneficial Learning

One advantage of promotions is that it gives the organisation the chance to observe the employees and get experience in how they work. Internal promotions allow organisations to find out which employees have the ability and the skills to work at a higher level in the hierarchy. Upon hiring and despite the interview process, firms are still uncertain on the capabilities of their employees. While employees are working for the organisation, supervisors learn more about the employees in day-to-day interactions on the job. In other words, supervisors and co-workers gain specific knowledge about their subordinates and colleagues. They might have a better judgement about whether certain employees are able to work in a different function. The firm for which an employee is working obtains specific knowledge on their employees that is not available to other firms. Similarly, the employees learn through experience how the organisation's processes work, and what the firm culture is. They get to know customers and suppliers of the firm. That is, the employees gains specific knowledge that is valuable for the organisation [2].

Baker et al. (1994) provide evidence for this idea by looking at the differences between internally promoted employees and external hires in one specific firm. They show that external hires have more experience and have a higher educational degree than promoted employees. Some of these externally hired employees rise faster in the company than the average

2. This is just reiterating the importance of specific knowledge and human capital.

current employee but overall more of the external hires stay at the same level or exit in the first years. These differences indicate that the career path of external hires is more uncertain than the career path of incumbents. Some of the newly hired employees are superstars who rise quickly but the majority is moving slower in the hierarchy than the incumbents. This is likely because the firm understands the capabilities of current employees better than the skill set of new hires.

This shows that there is a mutual dependence between the organisation and their employees. The organisation knows the employee better than any other potential employer and the employee has knowledge and capabilities that are specifically valuable within the organisation. Thus the organisation will be willing to pay a higher compensation to those employees or will be more ready to promote them. Baker et al. (1994) argue that in the firm they study, the internally promoted employees make up for their lack of general industry experience and education by firm specific experience.

The mutually dependent relationship between firms and employees is similar to the mutual dependence of a manufacturer making white computers and the retailers with the luxurious shops in the chapter on specific knowledge. The employee has invested time and effort in learning about the company and the company has invested time and effort in learning about the employee. Some of these investments are specific to the employee and the company, i.e. the company and the employee cannot use the knowledge respectively to another employee or in a another company.

Tournament Incentives

The second role of promotions is to provide incentives. Employees are motived to perform better if they know that

their work will be rewarded with a promotion. One story to understand these incentives is to compare promotions to a tournament in sports where one competitor wins the highest price. All the employees are ranked and only one gets the promotion. The advantage of promotion based incentives is that the ranking is not affected by noise that is affecting all employees such as economic shocks or weather conditions. This is similar to the use of benchmarks as we discussed in the chapter on agency theory. Because promotions are based on the relative performance of an employee, they implicitly use peer performance as a performance measure. As a result, the tournament creates an incentive system that is less noisy than a pure bonus based incentive system.

One of the predictions of tournament theory is that the prize for winning the tournament should increase with more competitors. With more employees competing for one promotion, every employee has a lower chance that they will get the promotion. Therefore, they will need to be compensated with a higher reward for this uncertainty, i.e there is a risk premium. This is the sensitivity effect of tournament incentives. As a consequence, you would expect a higher compensation for functions in a hierarchy that are limited to a few people (e.g. the CEO) because a lot of employees are competing for a limited number of positions. Baker et al. (1994) show indeed that the compensation level increases more for promotions higher in the hierarchy.

The literature also reports a number of drawbacks from tournaments. When employees feel they can not get the promotion they will be demotivated and they will not be motivated to work harder. In agency theory terminology, the employees belief that their promotion chances are not sensitive to their effort. Other employees might take risky decisions to catch up with co-workers that are ahead of them in the ranking. Tournaments do not provide reasons to cooperate

with co-workers and it might even be beneficial for an employee to sabotage co-workers if they are in a better position for the promotion. In the last two examples, the rank is an incongruent measure because it motivates the employees to take actions that are not in the best interest of the organisation. In the tournament story, promotions are an incentive contract with a performance measure, the rank of the employee, that has less noise than the employee's performance but is also potentially less sensitive and less congruent. As we have seen so many times before, in this story promotions require a cost-benefit trade-off.

Promotions and the Hierarchical Organisation

While some elements of promotions in the tournament story are reminiscent of the blueprint of the perfect market as we encountered in the chapter on transaction cost economics, it is actually instructive to think about promotion incentives as being part of a hierarchical organisation (Baker et al., 1994). Promotions do instigate a market like competition between employees but typically that competition is limited. For instance, the organisation will limit who can apply for new position and often exclude anyone who is not already in the organisation. In the blueprint of an ideal market, there are no restrictions on who can compete. Another restriction is that the organisation typically has a stable hierarchy and the promotions follow a well known procedure and timing.

One of the reasons why promotions work in stable, hierarchical organisations is the mutual dependence that I have explained above. Organisations are the preferred blueprint when the transaction requires mutual asset specific investments. The stable structure also provides benefits from

a tournament theory point of view. Employees know which opportunities are available to them further in their career and they can see how other employees have climbed the ladder. The stability makes it easier to understand what the reward is and it decreases the risk that employees might not get a reward despite working hard. Similarly, restrictions on who can apply for a promotion increase the chances of a promotion and increase the sensitivity of getting a promotion to the employee's effort.

Finally, most promotion decisions are at least partly based on the subjective judgment of superiors. These judgments are often more informative than current performance to decide whether an employee will be successful in the higher position because the new position will require different skills and capabilities than in the employee's previous job. Nevertheless, from the employee's point of view subjective judgments are more noisy than an objective measure. Hierarchical organisations use formal procedures where they specify the criteria the superiors have to address so that the employee has more certainty and bears less risk.

There is a second problem with subjective performance evaluation. The superior might have incentives to not be honest in their evaluation of the employee. This is the problem I will explain in the next section of this chapter.

Subjective Performance Evaluation

Subjective evaluations by superiors are an important measure in most bonus contracts, not only for promotions. If superiors have experience in the department or the job they are evaluating, they have developed specific knowledge to

determine what good performance means. Knowledgeable superiors can also take into account and adjust for unexpected events during the year. An extreme example is the impact of the pandemic in 2020 on almost every part of the economy which could not be predicted at the start of the year. Remember from the time line of the incentive contract, that these adjustments are not possible in the traditional incentive contract. The reward and the measure are set at the start of the period and are not changed [3]. Another advantage of subjective evaluation is that the superior can take into account factors that are harder to quantify such as the employee's attitude or how well they collaborate with their colleagues. In other words, the benefits of subjective performance evaluation is that when it is done well the performance evaluation by an experienced superior is more congruent than any combination of objective measures such as profitability or customer satisfaction.

The Incentive Problem of Subjective Performance Evaluation

The incentive problem of subjective evaluations is that the supervisor can manipulate subjective measures of performance. If the supervisor is not willing to grant a bonus or promote the employee, they can always understate the performance of the employee. The supervisor might even have

3. If the measure or the reward can be changed during the period, we are in effect in a situation with subjective evaluation even if it is not called that way. We will see examples in this section that are typically not associated with subjective performance evaluation but they show strong similarities with the subjective evaluation story and suffer from similar issues.

an incentive to understate the performance of the employee, if the bonus or the higher salary is paid from the supervisor's budget. Economists consider this the fundamental difference between objective and subjective performance measures. Objective measures are performance measures that are specified at the start of the working period and the principal and agent agree on what the value of the performance measure is at the end of the period. *Subjective measures* are performance measures that are under control of the principal. The most straightforward example is if the measure is the opinion of the principal.

To see the problem of subjective measures imagine the following story between a principal and an agent. The principal delegates some job to the agent where the agent has to make a decision between 1 and 5. The higher the agent's choice, the higher the cost to the agent and the higher the profit to the principal. This part of the story introduces a conflict of interest between the principal and the agent. The principal wants a high choice and the agent prefers a low choice. After the agent has made their decision, the principal will judge the outcome of the decision and decide on the compensation for the agent. The key difference with the incentive contract story is that there is no contract that guarantees the agent a bonus for a certain outcome of the performance measure [4]. Table 7.1 puts some numerical values on this story.

4. Obviously, this is an extreme story. It is interesting to us because it captures the main dynamic we are interested in. The principal can ultimately decide the agent's compensation because it depends on whether the principal is happy or not and there is no way for the agent to check whether the principal is really not happy with the outcome or just pretending.

Table 7.1: Subjective Performance Evaluation

Agent Decision	1	2	3	4	5
Cost Agent	0.5	2	4.5	8	12.5
Profit Principal	10	20	30	40	50

You can imagine for instance that the agent chooses 4, and the principal pays the agent 15 in compensation. In this case, the agent earns 7 = 15 – 8 and the principal earns 25 = 40 – 15. However, nothing is stopping the principal to pay a lower compensation. For instance, they could pay 8.5, which leaves the agent with 0.5. The principal does not even have to stop there. If the agent and the principal make this decision only once, the principal is best off when they just do not pay any compensation to the agent. If the agent realises that the principal can do that, they will decide that the best they can do is to choose 1 or just find a different job. The principal does not want that because their profit will go down as well.

In contrast, in the long run, when this story plays out repeatedly, the principal is motivated to establish a reputation for being a fair assessor and reward their agents with a high enough compensation. If they establish such a reputation, their employees are motivated to choose 4 or 5 because they know if they perform well they will be rewarded. On the other hand, if the principal does not have such a reputation, employees have no incentive to work hard because their performance will not affect the likelihood of earning a reward (Prendergast, 1999).

To overcome the incentive problem, the organisation needs to establish a norm or a culture where it is *credible* and *clear* that agents will do their job well and that they will be rewarded for their effort (Gibbons & Henderson, 2012). Credibility

means that it is in the best interest of the agent and the principal to not defect from the established norm. Clarity means that the norm and thus the expectations of what it means to perform well in a job. In Table 7.1, the agent's actions and the principal's profit have numerical value and are thus easy to communicate. However, remember that this story is meant to illustrate the problem with subjective performance evaluation where the superior makes a judgment about the agent's performance and the superior uses specific knowledge which is by definition difficult to communicate. As I will explain in the next section, the role of management accounting is to establish credibility and clarity of what the expectations are.

The Role of Management Accounting

In the first section of the chapter, we saw that promotions motivate the employees to develop specific knowledge for working in the organisation. The stable structure of the typical hierarchical organisation with a limited number of job types helps clarify what the rewards are when you get promoted and how you can get a promotion. The stable organisational structure also provides credibility. If employees see that their predecessors got fairly evaluated and received a promotion, they are more likely be motivated and work hard to receive a promotion. Especially larger organisations will have a policy with formal rules on how promotion decisions should be made. These formal rules will help supervisors to establish a reputation.

Management accounting plays an important role in setting up these formal structures and rules that support promotions. Especially budgets help define responsibilities of departments and their managers. Management accounting tools are equally

an important part of subjective performance evaluation for promotions and rewards. So far, I have presented subjective performance evaluation as the extreme version where no objective measures are used by the superior. In reality, performance evaluation is a combination of objective measures such as profit, sales, customer satisfaction, and productivity measures and the subjective judgment of the superior. The superior can use their judgment to decide how important the different measures are or to exclude measures that were affected by unexpected events beyond the control of the employee. In the best case scenario, the superior can use the objective measures to set clear targets and *create clarity* about what their expectations are for good performance. At the same time, they can use their judgment to filter out noise from events that could not be foreseen at the start of the period [5]. In addition, the use of objective performance measures makes it easier for the superior to defend their decisions to top management. Top management can hold the superiors responsible when they use their discretion unfairly. If employees know that their

5. I once again want to emphasise how the role of accounting can be important to the strategy of the firm as defined in this textbook. Remember that one way for organisations to create a difficult to imitate advantage is to develop the human capital of the firm. By offering employees a career path in the organisation, the employees are motivated to develop skills and knowledge that is especially relevant to working within the organisation. The career path critically depends on promotions within the organisation. One contribution of accounting measures is that they help clarify the expectations the organisation have while at the same time make it credible that good performance will lead to a promotion within the organisation while allowing superiors discretion in identifying talented employees. In short, the development of performance measures to evaluate employees for promotions helps the firm in its strategy to develop its human capital.

superiors are held accountable for their evaluations, the superiors' subjective judgment is seen as more credible.

In the chapter on specific knowledge, we saw that accounting tools like cost accounting, budgets, and balanced scorecards can help organisations to capture specific knowledge and make it easier to communicate within the firm. These same tools provide financial and non-financial performance measures to similarly help the organisation to communicate their expectations about what good performance means. The similarity in both situations is the role of accounting to quantify the specific knowledge and experience so that it is easier to communicate.

Examples of Problems with Subjective Performance Evaluation

This story of subjective measures is not only applicable to soft measures, subjective judgments, or a subjective combination of objective measures. It can also apply directly to measures of profitability. This might be somewhat counterintuitive because profit measures are often seen as the most objective measure of performance. Remember that the defining feature of the subjective performance evaluation is that the principal can decide what the value of the measure is. If the principal can change the profit measure and the agent cannot stop them, we are in the story of subjective performance evaluation.

Hollywood accounting is a an example where profit can be seen as a subjective measure of performance. If the bonus of a movie star would be dependent on the profitability of the movie, the actor or actress has to trust the profit figures that the accountants from the production company come up with. The production company has an incentive to underestimate the profitability of the movie so they can pay a lower bonus.

This might backfire in negotiation with other actors for new movies because they will not trust that they will get their bonus even if the movie is a success. For an example of some creative accounting in Hollywood: Even Harry Potter Movie Makes Loss

As a result, big movie stars usually do not trust the studios' profit calculations and they will only except incentive contracts based on gross revenues. The revenues can be verified by comparing them to independent measures of box office sales. While profit is a more congruent measure from the studios' point of view, they cannot fully use it in contracts because actors fear that the studios will not calculate the profit fairly.

Another potential problem with subjective measures is that the employees can influence the judgement of a supervisor without improving their performance. They might sabotage others or try to present their work more favourably without doing any productive work for the company. In other words sometimes there is an incentive for employees to spend less time being productive and more time trying to influence the evaluation by a supervisor. These latter activities are sometimes called rent seeking activities and it means that the performance measure is not congruent with the interests of the firm [6]. Employees can influence their supervisor's judgement without actually improving their performance.

Subjective measures are also influenced by psychological biases. Superiors sometimes put a higher weight on information that is externally generated, e.g. by customers, than internally generated information, e.g. by their own

6. This is exactly the problem of a measure that can be influence by two actions as discussed in the chapter on agency theory.

employees. Most superiors favour financial information over non-financial information and objective, quantifiable measures over subjective, qualitative judgements and they find it easier to interpret performance when they can compare it to a performance target or a benchmark.

Ittner et al. (2003) investigate these biases based on the case of a financial service provider with a balanced scorecard. The scorecard has six dimensions. The headquarter of this firm has to assess the performance of local bank managers on the six dimensions. They also have to combine all the information in the scorecard to judge the overall performance of the local bank managers. Some of the dimensions are based on financial information and others on non-financial. Some of the dimensions are based on externally generated data but other dimensions are based on internally generated data. Some measures in the scorecard are quantifiable and other information is qualitative. The researchers estimated how much a change in each dimension influences the change in the overall performance score for a local manager. Although the findings are equivocal, the authors report that the psychological biases explain a considerable amount of the variation in the judgements of the supervisors.

Conclusion

This chapter serves as a capstone chapter to the previous chapters in the sense that it brings together the different strands we have touched upon so far. In this chapter, I argue that one of the benefits of a hierarchical organisation is that organisations can develop, identify, and retain human capital through promotions and offering a career path within the organisation for their employees. Because identifying employees who would do better at higher levels in the

organisation requires specific knowledge, the decision on who gets a promotion cannot be specified in a traditional agency theory contract. Especially in larger organisation, promotions are decided by a committee to include different points of view (i.e. specific knowledge) and increase the credibility of promotion decisions. These committees will partly rely on objective performance measures when making these decisions because objective measures also increase the credibility and they clarify the expectations of good performance. The bureaucracy around promotion decisions and collecting performance measures are some of the more obvious transaction costs involved in these promotion decisions. As before, organisations have to decide to trade-off the accumulation of human capital and better employees against the transaction costs of the promotions.

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8.

POWER AND INSTITUTIONAL THEORY

Stijn Masschelein

Economic theory and institutional theory

Institutional theorists start from the observation that a lot of organisations have a very similar hierarchical structure (DiMaggio and Powell, 1983). There is one CEO on top, supported by an executive team. There is division of labor in different business unit based on products or geography. A lot of these similarities are further formalised in bureaucratic systems such as budgets, hiring, compensation and promotion policies, company handbooks, or job guidelines. The similarities are also expressed in norms and expectations in different professional fields. For instance, traditional professional business are more likely to expect their employees and especially their executives to wear formal business attire while business in the technology industry are more likely to accept business casual attire. The argument from institutional theory is that these practices, policies, and expectations are not necessarily the result of organisations being forced to be more efficient but the result of copying what other, similar organisations are doing.

In the previous chapters (transaction cost economics, specific knowledge, agency theory, and promotions and subjective performance evaluation), I have implicitly assumed that organisations either deliberately choose formal systems and develop norms that work best for their specific circumstances or that they are forced to adopt those norms because they feel pressure from capital markets. Banks, shareholders, venture capitalists and other capital providers ask a price (interest, dividend, buy-backs) for their investment. If the capital market believes that the firm is not sufficiently adapted to its competitive environment, they will ask a higher price for investments to cover the risk that the firm decreases in value or goes out of business. The capital market can even decide to withdraw its investments from the firm. If a company does not adapt to its competitive environment it will get a signal from the capital market that something has to change. As a result, firms in the same competitive environment will be similar to each other.

However, institutional theorists argue that this is not enough to explain all the similarities between organisations (DiMaggio and Powell, 1983). In times of uncertainty and unpredictability, humans and organisations have a tendency to look for stability and structure. Stability in this sense simply means that the organisation survives in a similar form as it was before. Thus, the need for stability leads to the introduction of a formal hierarchy with levels of decision making and clear role descriptions for every individual and business unit. This formal hierarchy will only remain stable if making changes to the hierarchy needs to be approved by the hierarchy through bureaucratic rules that determine how the role descriptions and levels of decision making can be changed. These bureaucratic rules will also determine what the appropriate lines of communications are in the organisation so that all decisions receive the correct approval. In this view, accounting

and control systems are the means by which organisations maintain stability and the survival of the organisation. [1]

As a result of this process permanent structures arise which can be organisations (for-profit and not for-profit, financial and product markets), communication channels (consultants and universities), and governance systems (government and private regulation). If these permanent structures become important and stable enough they are sometimes called institutions and as we will see in the next section, they can have the power to shape their environment and other organisations.

Institutions shape the environment

In the economic theories I have discussed before, organisations always respond to their environment. They will adapt to price changes in markets, changes in customer demand, or changes in technology. Institutional theory argues that some institutions do not have to respond to the environment by adaptation but that they can change the environment themselves. A specific example is that some firms do not have

1. The impersonal writing in this paragraph is not a coincidence. The institutional theory explanation is not that these outcomes are the result of deliberate decisions by managers in the organisation but that hierarchical organisations contain a drive to protect the organisation which creates these forces towards more bureaucratisation. It is a more fleshed out argument of the common utterance that large organisations and government organisations tend to resist change.

to accept the market price, but can set the price for their own products [2].

Institutions can become influential in three different ways. Some institutions take *decisions* that influence a large number of other organisations. If Google changes its search algorithm, this has an impact on all organisations and individuals who use their website to generate an income. If Microsoft Windows changes its operating system both hardware and software developers for Windows have to make changes to their product. Similarly, governmental decisions on environmental regulation have an impact on the whole economy of a country. This is not to say that it is either good or bad that one institution has such an influence but it is hardly disputable that in a lot of fields one institution can set the direction for the whole field. If this is the case, the dependent organisations have to conform to the powerful institution. Economic efficiency will only be a secondary consideration because survival primarily depends on the powerful institution.

Another role of institutions is to set the *example* of what the best course of action is. For instance, the Balanced Scorecard is a performance management tool that combines financial and non-financial measures initiated by Harvard scholars (an institution). One factor in the popularity of the balanced scorecard compared to earlier and similar performance measurement tools such as the French Tableau de bord is Harvard's fame. Firms will be more willing to adopt a new strategic performance measurement system if it is backed by a well known institution. Similarly, over the last couple of decades, government agencies have started to see business

2. I will talk about this more when I discuss the role of cost accounting in price setting.

practices as examples on how to run government agencies. This movement towards new public management has many causes which I will not delve into here. What is important for us is that government agencies have felt pressure to adopt tools and organisational structures from for-profit companies. Obviously, this will lead to a greater similarity in the how government agencies and business units in the private sector are managed. In general, by copying examples set by prestigious or influential institutions, organisations will look more similar to each other even without the pressure from the capital market.

The last effect of institutions is that they set the *norm and expectations* of a profession or a player in the field. Professional organisations (e.g. CPA and CA) and educational institutions (e.g. universities) determine who can enter the labour market and who can not enter the market. They determine what the necessary knowledge is for entering the field but also set the expectations and ethical norms are. A potential disadvantage of such a selection mechanism is the influence of these institutions leads to limited diversity between professionals in the field.

Criticism of the institutional view

The lessons from institutional theory is that powerful organisations, groups, and individuals can have a huge impact on their environment. The power of these institutions may or may not stem from economic power but it can also come from the role this institution plays in setting an example or because the institution has a huge impact on the rules that govern economic transactions. This view has come under criticism for ignoring that organisations can make deliberate, smart decisions that are in their best interest (Abernethy and

Chua, 1996). To provide a more complete picture, there is value in combining the economic insights from previous chapters with the institutional view. In my view, institutional theory is more informative when the organisation is going through change or when the environment that the organisation is operating in goes through rapid change. Under those circumstances, all the bureaucratic and social forces that resist change will be more important. The organisation will have to be aware of these operational forces to successfully adapt to the new environment. At the same time, in tumultuous circumstances where the best solutions are not clear, powerful institutions will provide examples on how to deal with change and can provide best practices. Economic theories are generally focused on what optimal management control solutions are but provide little guidance on how to get there. If we want to figure out how to implement or change management accounting systems, the institutional view will be more informative. In the next chapter, I will explain some of the more common implementation problems and solutions.

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9.

IMPLEMENTATION AND CHANGE

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In previous chapters, I have talked about how management accounting tools support organisations to create a competitive advantage by coordinating the different functions within the organisation, managing human capital and specific knowledge, and aligning the interest of the employees and business units with the organisation's goals and strategy. Unfortunately, implementing or dramatically changing budget processes, cost accounting systems, or performance measurement systems takes time and effort and is prone to implementation costs which are a specific example of transaction costs. You can find a nice, practical overview of implementations problems by Deloitte in Deloitte's perspectives series. In this chapter, I will provide my own list of implementation problems and tie them back to the different theoretical perspectives from the previous chapters. Not only will it be useful to think of implementation problems as transaction costs, we will again see that specific knowledge is necessary to successfully implement new accounting tools, that institutional forces can resist or hasten change, and that organisation sometimes need bonuses to convince employees to adopt the new system. The goal of this chapter is not to provide a guide on change management but to show how the core stories I have introduced can help to

diagnose the difficulties when overhauling a management accounting system.

Change resistance

It is not unusual that changes to a company are met with resistance or hesitations. One of the reasons is that people are generally averse to uncertainty and risk. A feeling that is best captured in the saying: "Never change a winning team". A more developed argument is that institutional forces in organisations are focused on the survival and stability of the organisation and not necessarily on economic efficiency. These institutional forces can take the abstract form of the bureaucratic process in the organisation or they can be more concrete like the power of the senior medical staff in a hospital (Abernethy and Chua, 1996). Another related factor is that changes in the organisation can create more risk for the employees. The introduction of a new cost accounting system changes how the profit and thus the performance of business units is measured. In the chapter on agency theory, I explained that employees generally demand a risk premium when they have to bear more risk in their compensation. One way to convince the employees to accept the risk in the new system is to pay higher wages or bonuses which is one example of a transaction cost for the organisation. If at all possible, the organisation would prefer to not pay this cost.

A different reason for employees to resist new management accounting systems is that these systems often try to replace the employees' subjective judgements with objective information. As I explained before in Chapter 5, this can be the explicit purpose of a management accounting tool for the organisation. Often, the employees will argue that the accounting system does not adequately capture all the nuances

or they might feel their influence diminished because their judgement is less important. The difficulty for management of the organisation is to distinguish between legitimate claims of flaws in the new system on the one hand and employees trying to protect their power over the decision or production process on the other hand. If employees have superior knowledge about what works and what does not work in their specific circumstances, they also know best whether a new management accounting system will work but they will not always be motivated to reveal that knowledge [1].

The last reason for resistance is that management accounting systems can clash with established unspoken rules and norms in the organisation. Individual business units will often develop informal norms based on the day-to-day operations that top management is not aware of. New formal systems can disrupt and harm these norms. Sometimes that is the intention of the company because they want to change the culture of the business unit. However, in other situations, the implementation of a formal system can also disrupt an otherwise smooth running business unit because top management does not understand the culture of the business unit [2]. It is often not easy for an organisation to decide whether

1. There is a very clear parallel with the reaction to large language or AI models such as ChatGPT and Bard. To understand the influence of AI on organisations, one useful lens is to think of these systems as formal management tools such as budgets and cost accounting system.
2. A well known example of this phenomenon is documented in a study on day-care centers. Surprisingly, the introduction of a penalty for late parents increased the number of late parents. Before the introduction of the penaly, the parents would feel shame because of a social norm against being late. With the penalty in place, they felt they could just pay for the convenience of showing up late (Gneezy and Rustichini, 2000)

a business unit's resistance to a formal system is motivated by their own interests or by the legitimate fear that the new system will impair the functioning of the business unit.

Fit with the environment

In the previous section, I emphasised that the success of a new cost accounting or budgeting system depends on the existing firm culture and norms and this line of reasoning can be further extended. There exists a large body of academic studies that focus on how the benefits and costs of accounting systems depends on the environment in which the firm operates. In this section, I provide some examples of how the organisation's circumstances influence which accounting system is more appropriate. The message of this section is not that there are rules for which accounting system fits with which environment. The take-away message is that finding the right fit is complicated and can easily go wrong. The correct way to interpret the three subsections is to interpret them as micro case studies. An important consequence of the importance of context specificity is that a one-size-fits-all approach is rarely going to work [3]. A cost accounting system that is successful in one firm is not necessarily the best approach for another firm. Similarly, if a firm's environment changes, the accounting system that was adequate in the old environment might no longer be optimal in the new environment.

The goal of this section is to make you aware of the difficulty

3. Note that the search for best practices implicitly implies that there is a one size that fits a certain group of companies. In my personal opinion, the search for best practices is often misguided. Your mileage might vary.

to adapt the accounting system to the firm's environment. The following examples illustrate that there are not even simple one-to-one relations between the environment and the right management accounting system. That makes it all the more important to investigate the specific circumstances of an organisation that help or hinder the implementation of a new accounting system. Unfortunately, I cannot and will not give you any easy answers in this textbook. The reality is too complex for that. Once we accept this complexity and the difficulty in finding the right system for each organisation, we can focus on tactics to gather information that make it more likely that we come up with a system that works good enough for the organisation. Specifically, when we develop a new accounting system, we will want to take into account the knowledge in the organisation and we will want to learn about what works and what does not work through direct experience and experimentation.

Illustration 1: Competition and cost accounting

One issue that we will revisit later on in more detail is when a more complex cost accounting system is more useful. The advantage of a more elaborate and detailed cost accounting system is that the estimated cost prices for individual products are more precise (Labro and Vanhoucke, 2007). Better cost estimates allow organisations to set smarter prices. Some textbooks have argued that in competitive markets, better cost systems are more valuable because profit margins will be smaller. On the other hand, in competitive markets, organisations will not be able to charge more than the price that competitors charge because customers can easily defect to the cheapest producer. In other words, organisations do not

need an elaborate costing system to find out the right price for their products. They only have to match the price that competitors are setting.

Illustration 2: Uncertainty and budgets

Another controversial issue is whether budgets are more valuable or less valuable when the firm operates in a more uncertain environment (Hartmann, 2000). In an uncertain environment where it is difficult to predict consumer demand, the firm will have difficulty in setting up a realistic budget at the start of the year. The uncertainty makes planning more difficult because expected demand and expected purchasing prices can change substantially. On the other hand, the budget and actual deviation from the budget during the year might provide information on these changes. If we plan to sell 100,000 units and half-way through the year we have sold only 40,000 units, we know that we should adjust our plans for the year. Uncertainty clearly affects how firms can use budgets but this does not necessarily mean that budgets are useless in high uncertain environments.

Illustration 3: Strategy and cost accounting

The strategy of a firm has also been highlighted as a factor that might influence the use of an accounting system. For instance, the argument has been made that cost control and consequently cost accounting systems are more valuable to firms who are following a cost leadership strategy. One important technical issue in cost accounting systems is how to assign costs from inventory and unused capacity. Most

accounting textbooks devote a whole chapter to this issue (see chapter 20 in Horngren et al., 2014). The following example will demonstrate that firms with a similar [4] cost leadership strategy can have totally different investments in inventory and capacity and hence in the need for an inventory costing system. The example shows why I define the strategy of the organisation based on its critical investments. Amazon is a very aggressive price cutter in almost every domain and they guarantee fast delivery by having a very extensive network of warehouses where inventories are constantly updated. OnePlus is a manufacturer of high end Android Smartphones at below market prices. Their strategy used to be to keep costs low by requiring potential customers of a phone to sign up during a limited subscription period. On regular intervals, they produce just enough of the phones to satisfy the demand of the customers who have signed up [5]. OnePlus is fully aware that they might miss out on some potential sales but they prefer to have no unsold inventory. From a cost accounting perspective, Amazon has to have a good grip on the cost of its inventories and warehouse capacity to keep its margins sustainable while OnePlus does not even have to consider the issue. While both companies try to be a cost leader they have a totally different cost accounting system with respect to inventory management.

4. At least similar at the surface
5. The subscription model has changed but the phones are still not easy to buy and fairly rare. OnePlus has abandoned its tactic of using subscription but it still has a strategy where it aims to match production as close as possible to actual demand for the phones.

Specific knowledge and employee involvement

In the absence of clear one-to-one rules of which accounting tools work best in given environment, the organisation will have to rely on the specific knowledge and experience of its employees. Often the introduction of a new system will require specific knowledge about the new system and that knowledge will be difficult to communicate. This knowledge can take two different forms. First, for instance changes in the budgeting process will require the *technical knowledge* of how budgets work. This is also the knowledge that this textbook is trying to teach you. When firms do not have the required experience in the form of a finance department or a dedicated management accountant, they can turn to professional or academic consultants. The role of these specialists is to understand the goal of the new system and translate it into a functional accounting system. The cost of hiring these professionals is an example of a transaction cost of implementing a new budgeting system.

This is not the only form of specific knowledge that is needed for the introduction of a new accounting system. Because the success of a new system is context specific, the implementation requires intimate knowledge of the specific environment in which the accounting system will operate, i.e. *operational knowledge.* For instance, the measures in a new performance evaluation system need to be relevant and understandable for the decision makers who will use the system. The design of the system has to take into account what the needs are of the users of the system. Often the employees that will be using the new system may have already developed their own unofficial accounting or budgeting system in spreadsheets. One danger of a top down implementation of

a new system is that it ignores the experience and unofficial systems of these users. One risk is that the new system will ignore valuable information that might inform the design of a better system. The local, ad-hoc data or metrics that have already been collected could help to develop a prototype of the new system because these are actual measurements from the actual operations. Another disadvantage of ignoring existing unofficial systems is that the local users are more familiar with their own accounting system and are not always willing to switch over to the new system (Wouters and Wilderom 2008, Wouters et al. 2009). Implementations that take into account the operational knowledge of current users will encounter less resistance to change of these users.

In short, to ensure that users of the new system are using it, the implementation of the new system will require their involvement in the design of the system. This means that the more knowledge employees have, the more they will interact with the new system, or the more they are accountable for the measures in the system, the more their input will be important for a successful implementation. This consultation process is time consuming and will constitute an important transaction cost of the implementation process. A successful implementation also requires to get the communication right between the employees with operational knowledge and management accountants and consultants with technical skills. These two groups often have different expectations and backgrounds which makes this a non-trivial problem to solve. Lastly, the use of a more complicated accounting system might require additional training for the users. All these changes and implementation steps are of course another source of transaction costs of a new accounting system.

Learning by doing through

trial-and-error

So far, we have seen that developing an accounting system that is appropriate for the organisation's environment is far from straightforward. The organisation will also have to consult with different people and integrate their specific knowledge. As a result, it is unlikely that at any point in time one person will know exactly what the best system will look like. All these considerations highlight how difficult it is to account for all possible obstacles in the design and successful application of a new management accounting system. Taking into account all these factors makes the development of a new accounting system highly complicated. If an organisation relies on specific knowledge from the rank-and-file, has an integrated strategy, and operates in a complex environment, implementing a new accounting system is equivalent to an optimising problem with a lot of moving parts that are best understood by different people.

It is unlikely that an organisation will design such an optimal system in one try. Organisations usually implement accounting systems through a process of trial-and-error. For instance, organisations will design a prototype for a cost accounting system and trial it in some of their divisions or for some of their products. Often the prototype is being used in concert with the existing system to compare and contrast the differences. If the differences make sense and can be explained, the new system is probably an improvement. For instance if a labor intensive product is allocated more costs in a new costing system, the organisation will feel more confident. However, if the differences between the old and the new cost prices are difficult to explain, the organisation will want to investigate the hidden assumptions behind the new costing system (Wouters and Wilderom 2008).

The use of prototypes and a gradual rollout will be especially useful if many different rank-and-file employees have to be involved in the system's development. In the gradual approach, the organisation can include the specific knowledge of the employees when it is most needed. For instance, while the overall strategy and design of the balanced scorecard is mostly driven by top management, lower level employees might have better knowledge of how to design specific performance measures in their area of expertise. As an example, the sales people might have a better idea how to measure repeated sales as an indicator of customer loyalty. That is, do we need to count the number of customers that buy from our company every week, every month or every year?

Because it is almost impossible to decide whether a new accounting system is perfect, the organisation needs to regularly evaluate and refine the system. Changes in the environment or in the strategy might require the development of new measures or render some measures obsolete. A cost accounting system can turn out to be too complex and evolved to use and it needs to be simplified. Incentive contracts or budget procedures might have unintended consequences where employees can game the policies for their own best interest without contributing to the organisations' goals. For any sufficiently complex accounting system, it will be difficult to predict the behaviour of all employees that interact with the system. As a result, the firm will need to monitor any unexpected reactions and gradually improve upon the existing accounting system.

Looking back and forward

In earlier chapters, I explained how organisations replace market mechanisms such as price signals and incentives at a

cost, i.e. transaction costs. The above discussion on the difficulties of implementing management accounting system revealed some examples of transaction costs of running a firm. In this specific case, they all refer to explicit and implicit implementation costs such as paying higher wages, the opportunity costs of trial-and-error, the time lost through involvement of rank-and-file employees or the fee to be paid to external consultants.

One obvious but often ignored cost of the implementation of new systems is that employees might need convincing to accept the new system. One way to overcome initial reluctance to a change is to increase the wage of the employees. Especially changes to the compensation structure go hand in hand with increases of the labour cost. Another related cost is the time of retraining and communicating the changes to employees. These activities often negatively effect short-term productivity of the employees because they can no longer pay full attention to their main tasks.

The current chapter also shows why management accounting systems are not always able to fully replace market mechanisms. It can take a lot of incremental improvement before a management accounting system is sufficiently fine tuned. Both an imperfect fit with the environment and frictions with the existing company culture can lead to more disagreement and less cooperation and communication. These transactions costs are the result of the less than optimal design of the system.

In addition, the size and complexity of some systems will make the use of the system more costly. Budgets, even when they work well, are often criticised for being (too) time consuming. The time to ask every division at all levels of the organisation for their budget needs and to reconcile these needs with each other and the overall business strategy is a daunting task.

The current chapter gives a range of costs that organisations have when they replace market mechanisms with accounting systems. If organisations can keep these transaction costs under control they will be able to reap the benefits of integrating different investments. In the following sections, I will discuss three accounting systems. In each chapter, I will focus on how accounting can help with replacing market incentives and price signals by coordinating different divisions and investments outside of the market, translate subjective knowledge into objective information for better decision making, align the incentives of the employees with the strategy of the organisation, or communicate with powerful institutions.

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PART II
BUDGETING

10.

WHAT ARE BUDGETS (GOOD FOR)?

Stijn Masschelein

Budgets are a quantitative expression of a business plan for a specific period of time (p.184 in Horngren 2012). In my view, they are the quintessential accounting tool and they should be the first one that every textbook discusses. Although not necessarily all firms use budgets (Hope and Fraser 2003), the majority of firms still use them (Libby and Lindsay 2010); both large multinationals and start-up firms, both firms with high profit margins and razor thin margins have budgets. The ubiquity of budgets is an indication that budgets can serve different functions in different environments. Just from the definition above, you can already guess that budgets will help with the integration of different parts of the organisations. Having an overall plan for the organisation in the form of a budget is one step in making sure that the divisions in the organisation are coordinated by headquarters. Budgets are also explicitly a quantitative version of the overall plan. When organisations budget for the next year, they are not just estimating whether their products will sell more but they estimate how much more, at which price, and what the cost is of producing the products. This means that the organisation is translating some of the specific knowledge of its sales people, production planners, and engineers into financial terms which

makes it easier to integrate all that information in one plan. Finally during the year, the organisation can use the budgeted sales and costs as a target for its managers and reward them for reaching those targets.

Traditionally, these same functions of the budget are described as planning and communicating investments, implementing strategies, gathering feedback on the success of investments, and motivating and evaluating employees (Hansen and Van der Stede 2014). The ubiquity of budgets can easily be explained when you see strategies as a combination of investments that give the organisation a competitive advantage. When long-term budgets are informed by the strategy, they are quantified versions of more ambiguous strategic plans. The yearly operational budget translates the plan for the year in concrete targets and budget allocations which are easier to communicate through a large organisation compared to fuzzy qualitative plans.

In my view, an often underappreciated feature of budgets is that they force an organisation to make choices between different investments. While an university might have the aspiration to offer the best education, perform world class research, work with industry, and influence the public discourse, budget constraints, both in time and money, will make it very hard to accomplish all these objectives. The university's budgeting process will inform the strategy, i.e. which combination of investments in teaching, applied, and basic research are feasible. Once these decisions are taken, the agreed upon budget allocation to different projects makes it clear for the whole university which projects have priority for top management.

The budget targets also serve as a way to evaluate the performance of employees and divisions. The explicit and implicit incentives based on the budget allow the firm to align the interest of the organisation with the interest of the

employees. When divisions exceed their assigned budget, the performance of their manager will be negatively evaluated which affects their bonuses and promotion changes. Alternatively, budgets can set the boundaries within which employees have to do their job. This approach to budgeting is appropriate when employees have more autonomy because of their specific skills such as in the fashion industry (Davila 2013) or at Google[1]. When the employees are expected to be creative in their task, the firm wants to set boundaries to the creativity to ensure that the employees work together, or perform the more routine tasks as well. For instance, I am, as a lecturer, happy to look through the latest news for examples I can use in my lectures. However, I need some external motivation to finish marking on time because that is a more dreary task. That is why the university has a budget on how much time I can spent on marking and why they are giving me a deadline.

The *problems* that are associated with budgets often stem from the difficulty to combine the different and sometimes conflicting functions. A lot of these problems are related to the problem that middle managers and rank-and-file employees have specific knowledge which top management wants to incorporate in the financial plan. However, the employees also know that the budget will be used to evaluate their subsequent performance and that the information they give top management will determine the budget they get allocated. As a result, employees have an incentive to game the budgeting process. When asked for their input, they try to steer the

1. For Google, I am referring to the famous rule where some of the computer engineers have to spent 80% of their working time on assigned projects while they can spend 20% of their time on their own chosen projects. The budget allocation in this case is time not monetary resources.

budget in a way to get more budget allocated to their own projects. The next section will describe how this problem affects the process of setting a budget and how organisations solve that problem.

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11.

THE BUDGETING PROCESS

Stijn Masschelein

Budgets have multiple distinct roles in managing an organisation which means that organisations will have multiple budgets for different purposes (e.g. the operational budget or the capital budget) or for different divisions within the organisation. The goal of this part on budgets is not to provide a comprehensive overview of all possible ways a budget can work in an organisation. A budget can be a plan for the entire organisation, for some division of the organisation, or for a one-off project. It can be for the long term or the short term. It can be an operational budget or a capital budget.

In this chapter, I will focus on two archetypes (or stories) of implementing a budget because they explain how organisations can deal with the fundamental tension at the heart of a budget: (1) the organisation wants to use as much information as possible when setting the budget and (2) also use that information to set targets for employees. Unfortunately, that gives the employees an incentive to not reveal their specific knowledge because they want to avoid that the information is used to set more challenging targets. This chapter describes the budgeting process as it is often presented in textbooks as one approach to manage that tension and a practitioner's example of a start-up implements budgets.

There are significant differences between these two approaches that be explained by the tension between collecting information and managing incentives of the employees that provide the information. Both these approaches are viable ways to organise a budgeting process and in the final section of this chapter I will reconcile their differences.

The textbook approach

The textbook approach is the typical decision making approach: First gather all the relevant information, based on the information make a plan, execute the plan. Typically, the budgeting process will require the following steps.

1. Identify the main organisational problem and uncertainty
2. Obtain information
3. Make predictions about the future
4. Make decisions by choosing among alternatives
5. Implement the decisions, evaluate performance, and learn

Based on Horngren (2012)

In the case of an annual operational budget, in the first stage, the organisation has to decide what the overall profit target is for the year and what the important competitive factors will be. Is the organisation able to increase sales and maintain a targeted profit margin or will competitors enter the market? The organisation will also investigate potential

increases in its costs such of labour and raw material or services. In the second stage, the organisation collects information about customer demand, its suppliers, and competitors to reduce the uncertainty in its estimates. The organisation will use publicly available information, historical internal data, general knowledge from consultants, and specific knowledge from employees to estimate customer demand, production volumes, costs, and customer price sensitivity. Consultants, for instance, can share benchmarking data from comparable organisations. An example of internal knowledge is the market insights of sales staff who have a better understanding of customer preferences and customer demand than top management.

In the third and fourth stage, top management will use this information to make predictions about future costs and revenues. These predictions will also guide which investments, projects, and new products are worth pursuing, and which products or services might have to be cancelled. Finally, the decisions will be made explicit in the form of budget allocations and budget targets for different departments, geographical areas, product lines, or employees. In the fifth stage, these decisions that are implicitly embedded in the budget are implemented by all employees. The organisation will communicate the budget and should explain how the targets and allocations are determined. During the course of the year, the organisation will compare the actual performance to the predicted performance in the budget. The organisation will learn which projects are performing as planned and which ones will need additional attention. How exactly organisations can learn from comparing the actual results to the budget is something I will explain in the chapter on variance analysis.

This idealised textbook process emphasises the importance of using all available information to intelligently coordinate the different functions in the organisation. In this approach,

the budget adds most value through better coordination of the organisation where the cost of gathering the information and managing the incentives to truthfully reveal specific knowledge is a necessary transaction cost. This process also acknowledges that not all information is available at the start of the budgeting cycle and based on new information during the cycle, the budget might need to be adjusted. This is reminiscent of the trial-and-error process I discussed in the chapter on chapter on implementation issues.

A practitioner's perspective

I derive the practitioner's approach from an essay by Ben Horowitz on budgeting in a start-up firm. He is a partner of the venture capital firm Andreessen Horowtiz and co-founder of three start-ups in Silicon Valley. In the essay, Horowitz discusses how the textbook approach can lead to a bloated budget in a start-up firm because it gives the engineers the opportunity to ask for more budget then they need. He proposes the following, more top-down budgeting process.

1. Determine the goal of the organisation and the resulting resource constraints and reduce the available budget by 10%-25%
    - Based on increase in sales compared to last year
    - Based on aspired profit or acceptable loss
    - Based on engineering growth rate
2. Communicate the budget to the team
3. Encourage the managers to do the best they can with the allocated budget.

4. If one group can perform more with more money, allocate more from the 10%-25%.

Based on Horowitz (2015).

The budgeting process should start from certain constraints on the new budget. The constraints are necessary to limit the growth rate of the firm's operations and thus its costs. The growth rate can be in terms of the actual budget numbers or the employee count of the previous year. In this budgeting process, the primary concern is to avoid using the potentially unreliable specific knowledge of the employees with the cost that the organisation is not using all relevant information.

The next step is to communicate the budget to the employees in the company and motivate the employees to perform as good as possible within the budget constrains. Importantly, the rank-and-file employees are far less involved in setting the budget compared to the textbook approach. Only a limited amount of the total budget is allocated based on the input from the employees and this allocation is treated as an exception in step 4.

Reconciling the differences

The differences between the two approaches reveal some important features of budgets. First of all, there is not necessarily one budgeting approach that works for every firm and every approach has its own set of advantages and disadvantages. The textbook approach is likely to be more appropriate in larger established firms while the Horowitz approach is more apt for start-up firms. Here, I will go into more detail why this is the case.

The textbook approach is more vulnerable to budgetary slack creation and budget gaming because employees can

distort their true knowledge to get easier targets or more budget. The distortions make it more difficult to assess different investments and plan for the next year. To limit budget gaming, organisations sometimes opt to not evaluate the employees based on budget targets which takes away the incentives for employees to create budgetary slack. Planning and coordinating the budget of different divisions is often more important in larger firms with multiple business than in a start-up. The former have more activities and investments that need to be coordinated. Similarly, the more diverse the organisation, the more difficult it is for top management to be involved in every aspect of the business. As a result, the local, specific knowledge will be more valuable for planning the following year's operations and it is more more important to gather that information in the budget.

In contrast, in a start-up firm, the future of the company is even more unpredictable than in an established firm. Planning one-year ahead might be a difficult task because the product, the market, and the organisation are still rapidly changing. For such an organisation, guiding the behaviour of the employees is more important than planning for the next year. Start-ups are often more cash constrained and any serious budget overrun can have disastrous consequences for the survival of the firm. Oversimplified, the start-up only has two goals: not run out of cash and bring a product to the market. The most important part is that the employees work towards those two goals.

Established firms have also more tools they can use to avoid budget gaming. For one, they can create a culture where employees are committed to the budget process. In Johnson & Johnson, employees are often promoted internally which means that managers have worked with the employees they are supervising and they have experience with and trust in the budget process. In other words, managers have sufficient

knowledge of the day-to-day process to understand when budget demands by subordinates are not realistic. They have experienced and absorbed the norms that make the budgeting process work (see p. 202 in Horngren (2012)). We have seen before that promotions are used by organisations to find employees that have a good understanding of the internal processes and that are a good match with the organisation. The fit between the budgeting process and the internal promotions at Johnson & Johnson is a concrete example of this argument. Other organisations solve the incentive problem directly. They provide incentives to managers and employees for accuracy in their budget proposals. They pay a bonus for budget estimates that are difficult and accurate (see p. 202 in Horngren et al. (2012)). These bonuses are a direct application of the principle that incentives should be congruent with the goal of the organisation. If it is important for the organisation to incorporate all information in the budget, they should reward employees for accurate budget estimates.

Start-up firms will have difficulty to develop such tools because they will often not have the opportunity to only promote current employees when they have to hire new people to expand their operations. In the short lifetime of a start-up, it is not always possible to develop and maintain the norms that are necessary for a positive budgeting culture as in Johnson & Johnson. Furthermore even for established firms, there are transaction costs involved in establishing a culture or using incentive contracts to secure honest budget proposals. Johnson & Johnson has to exclude a lot of potential employees because they prefer to recruit managers from inside the firm. The transaction cost of an incentive contract for honest budget proposals is that firms have to pay a bonus for when employees submit honest budget proposals.

In this chapter, I explained how budgets can be used to coordinate the strategic investments but that this coordination

comes at a transaction cost to manage the incentives of employees to ensure that they do not misrepresent their local knowledge. Some organisations forego these benefits of budgets because the transaction costs are not worth it. Instead, they use the budget to set boundaries and guide the behaviour of employees. Nevertheless, no matter the specific goal of the budget, an organisation wants to track during the budgeting period whether the organisation and its employees are completing the plan or stick to the boundaries set in the budget. The organisation can check for deviations from the budget to adjust the plan and to reward employees who stick to the plan or punish the ones that break the boundaries. In the next chapter, I explain how organisations can use variance analysis to analyse the deviations.

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12.

VARIANCE ANALYSIS

Stijn Masschelein

While the previous chapter focused on how the budget is set, in this chapter I will show how an organisation can use the budget at the start of the year and compare it to the actual results. The purpose of this comparison, or *variance analysis*, is to provide feedback on the progress of the strategic plan during the budgeting period, assess the success of the strategic plan at the end of the period, and evaluate the performance of employees. The main advantage of the variance analysis is that the organisation can use the objective financial information to quantitatively estimate deviations from the plan and break the overall deviations down in smaller parts. It does not have to solely rely on subjective knowledge to evaluate the plan and the employees. Still, as we will see, subjective knowledge is going to be important in how the organisation should interpret the calculations.

Easy Business Company Limited

The rest of this section builds on a case study that I have used when teaching this material: Easy Business Company Limited. The case describes how Sindy Sin starts a new recruiting agency in China in 1998. After economic reforms, China was in an economic boom until a relatively short-lived

international financial crisis hits the economy. Sindy starts her business at the time where firms are still keeping close tabs on their cost structure but they are starting to hire again. Sindy's business is one of many established and new recruiting agencies that provides services to match firms and job seekers.

The following presents a simplified and slightly altered cost structure of the new business. Sindy's revenues are driven by the number of vacant positions she can fill. She expect to earn 2000RMB for each of the 250 positions she will fill over the course of a year. For a recruiting agency, most of the costs are fixed costs. I assume there are two important variable costs, a bonus for the sales people per position filled and the cost of advertisement in the local paper. Following the case study, I assume that the bonus is set at 300RMB for each year. Normally, advertisements are not variable costs, i.e. Sindy would have to pay for the advertisements whether the position is filled or not. I assume here that Sindy was able to negotiate a deal with the paper where she only had to pay for the advertisement once the position is filled. The following table presents an overview of the variable costs and revenues for Easy Business. In addition to the variable costs, Sindy expects to have 300,000RMB in fixed costs.

Table 12.1: Planned Variable Costs and Revenues Easy Business

Category	Revenue and Cost per Position
Revenue	2,000
Sales Bonus	300
Advertisement	100

Level 1: Static Budget Variances

From the information above, we can calculate the planned budget and we are going to compare it to the actual costs and revenues that are given in the next table. The planned budget calculations are the planned positions filled times the variable revenues and costs or:

- $\text{revenues} = 250 \times 2,000$
- $\text{bonus} = 250 \times 300$
- $\text{advertisements} = 250 \times 100$

The difference between the budget and the actual results is calculated in the level 1 variance analysis and the differences are called *static budget variances*. The variances are denoted by (F) for favourable variances and (U) for unfavourable variance. Variances are favourable when actual revenues exceed the budget and when actual costs are lower than in the budget. Unfavourable variances happen when sales are lower and costs are higher than budgeted.

Table 12.2: Static Budget Variances Easy Business

	Actual	Static Budget Variance	Planned Budget
	(1)	(2) = (3) – (1)	(3)
Positions Filled	225	25 (U)	250
Revenues	405,000	95,000 (U)	500,000
Bonus	63,000	12,000 (F)	75,000
Advertisements	27,000	2,000 (U)	25,000
Total Variable Costs	90,000	10,000 (F)	100,000
Contribution Margin	315,000	85,000 (U)	400,000
Fixed Costs	275,000	25,000 (U)	300,000
Operating Income	40,000	60,000 (U)	100,000

The actual operating income of 40,000 RMB is 60,000 RMB lower than in the planned budget. The level 1 analysis splits the differences up over the different revenue and cost components which helps Sindy to figure out why operating income is lower than expected. It is easy to see that part of the explanation is that Sindy could only fill 225 positions compared to the 250 positions she expected to fill. The total variable and fixed costs are lower than expected which dampens the effect of the decreased sales.The lower variable costs should not come as a surprise because she filled less positions the variable costs are expected to go down. In order to improve the profitability of Easy Business, Sindy will want to know whether the lower sales are the main reason for the drop in profits or whether there are

also other explanations. The level 2 analysis in the next section will try to disentangle the sales drop from other factors.

Level 2: Flexible budget variances.

The *flexible budget* calculates budgeted costs and revenues with the actual output for the year instead of the budgeted output. In other words, the flexible budget adjusts the original budget after the fact for the actual number of positions filled instead of the budgeted number of positions filled. This allows us to calculate at the end of the budgeting period what the budget would have been if we correctly predicted the actual output for the year. If we then find any deviations between the flexible budget and the planned budget, we know that these come from the *sales volume.* If we find any deviations between the flexible budget and the actual results, we know they cannot be because of the sales volume. This is exactly what Sindy wants to figure out after the static budget analysis in the previous section.

The flexible budget for the variable costs is calculated as 225 times the unit variable costs in Table 12.1. The fixed costs are by definition not expected to change when the output changes. As a result, the flexible budget fixed cost is the same as the budgeted fixed cost. The variable components of the variable budget can then be calculated as follows:

- $\text{revenues} = 225 \times 2,000$
- $\text{bonus} = 225 \times 300$
- $\text{advertisements} = 225 \times 100$

The resulting flexible budget is shown in column (3) of the next table.

Table 12.3: Flexible Budget Variances Easy Business

	Actual	Flexible Budget Variance	Flexible Budget	Sales Volume Variance	Planned Budget
	(1)	(2) = (3) – (1)	(3)	(4) = (5) – (3)	(5)
Positions Filled	225	–	225	25 (U)	250
Revenues	405,000	45,000 (U)	450,000	50,000 (U)	500,000
Bonus	63,000	4,500 (F)	67,500	7,500 (F)	75,000
Advertisements	27,000	4,500 (U)	22,500	2,500 (F)	25,000
Contribution Margin	315,000	45,000 (U)	360,000	40,000 (U)	400,000
Fixed Costs	275,000	25,000 (F)	300,000	=	300,000
Operating Income	40,000	20,000 (U)	60,000	40,000 (U)	100,000

The difference between the planned budget and the flexible budget in column (4) is called the *sales volume variance* and it is a measure of how much of the variance between the actual operating income and the budgeted operating income can be explained by the difference in positions filled. The total effect of the drop in positions filled is a decrease in the contribution margin by 40,000 RMB which is two third of the total decrease in operating income. I want to highlight that it makes most

sense to look at the total contribution margin and not at variable revenues and costs separately for the sales volume variance because the only change is the sales volume and all variable components are changing proportionally to the sales volume by definition.

The difference between the actual results and the flexible budget is called the *flexible budget variance* and is calculated in column (2) of Table 12.3. The flexible budget variance for the revenues indicates that even accounting for the lower than expected positions filled, Easy Business lost 45,000 RMB in sales compared to the the planned budget. This difference must be the result of a lower sales price per position filled. The actual price per position filled of 1,800 RMB [1] is indeed lower than the planned price of 2,000 RMB in Table 12.1. Similarly, we can see that the flexible-budget variance is favourable for the bonus which means that the average bonus per position is lower than planned. In contrast, the advertisement variance is unfavourable which means that the average advertisement cost is higher than the planned advertisement costs. These findings are also supported by the actual unit costs in Table 12.4. Finally, the variance for the fixed costs shows that Easy Business had 25,000 RMB lower fixed costs than expected. All in all, the results show that the remaining third of the variance between expected and actual income is driven by a lower than expected price per position filled which are partly offset by significant cost savings in fixed costs.

1. We can calculate the unit sales price as $\frac{405,000}{225}$

Table

Category
Revenue
Sales Bonus
Advertisement

There are a number of possible explanations for the lower sales and the consequent sales volume variance. Maybe the competition of other recruiting agencies has been harsher than expected or the labour market was less hot than expected and firms did not have that many positions to be filled. Or the sales people were not willing to work hard enough to fill positions because they did not receive a high enough bonus (RMB 1,800 instead of RMB 2,000). While Sindy cannot directly control the competition and demand, she can control the bonus she pays. The variance analysis gives her a tool to evaluate whether it is worthwhile to increase the bonus for sales staff if it leads to more positions filled. Because the variance analysis is quantitative, she can directly compare the cost of increasing the bonus to the benefits of more sales. This is one of the key advantages of the variance analysis. It is easy to quantitatively compare costs and benefits.

Finally, the flexible-budget variance for the advertisement cost gives an indication of how well Sindy was able to control the advertisement cost given the actual positions filled. The advertisement costs are 20 RMB higher than expected per advertisement. There are two main explanations for the higher than expected advertisement costs if I tell you that the advertisement costs are calculated per word in the advertisement. Easy Business either had more words per advertisement than expected and/or the price per word was higher than expected. With some additional information, a

level 3 budget analysis can separate the contribution of those explanations to the flexible cost variances.

Level 3: Price variances and efficiency variances.

The level 3 analysis separates the flexible cost variance in a price variance and an efficiency variance. The *price variance* of a variable cost is the additional costs of an increase in the cost price per input. The *efficiency variance* quantifies the cost of consuming more of the underlying input per unit of output. In the case of Easy Business, the input is the number of words, the cost price per unit of input is the price per 10 words, and the unit of output is the number of positions filled. In other words, the price variance reflects the effect of an increase in the cost per word in the advertisement (not the additional cost of the advertisement itself!). The efficiency variance reflects the cost of using more or less words per advertisement. We use the information in Table 12.5 to calculate the price and efficiency variance.

Table 12.5: Actual and Budgeted Advertisement for Easy Business

Budgeted words per advertisement	50
Actual words per advertisement	80
Budgeted price per 10 words	RMB 20
Actual price per 10 words	RMB 15
Budgeted cost per advertisement	RMB 100
Actual cost per advertisement	RMB 120

The price variances in Table 12.5 are calculated as follows. First, we need to calculate the total number of inputs necessary, i.e. the total number of words in the advertisements. For the flexible budget, the actual numbers filled (=225) times the budgeted number of words per advertisement (=50) gives the total number of words. That is, under the assumptions of the flexible budget, Sindy expected to need 11,250 words for advertisements. The actual number of words used is calculated as 225 times 80 which equals 18,000. The efficiency variance is the difference between these two numbers, RMB 13,500, and it quantifies the total cost of using more words per advertisement, keeping the cost price per word the same. The price variance is the difference between the total actual cost and the actual number of units used, times the budgeted price per 10 words, RMB 9,000 [2]. It quantifies the decrease in the cost

2. $18000 \times \frac{(20-15)}{10} = 36000 - 27000$

of advertisement because of the lower cost price per word. The variances split up the effect of using more words (efficiency variance) than expected at a lower cost per 10 words (price variance).

Table 12.6: Price and Efficiency Variances for Easy Business

	Actual Results	Price Variances	Actual Inputs	Efficiency Variances	Flexible Budget
	(1)	(2) = (3) – (1)			
Positions Filled	225		225		225
Total Words	18,000	–	18,000	6,750 (U)	11,250
Price Per 10 Words (RMB)	15		20		20
Advertisement (RMB)	27,000	9,000 (F)	36,000	13,500 (U)	22,500

There is more than one potential explanation for the efficiency variance. The positions may have been more complicated and needed more words to advertise. Or alternatively, Sindy was not careful in crafting the advertisements and used too many words. The price per words might have been lower because Sindy found a cheaper outlet to put the advertisements in and the change of outlet could also be the reason for the lower number of positions filled. A variance analysis cannot attribute the variance to one of these causes but what it can do is quantifying whether a change in the original plan was good or not. In this case, whether the favourable price variance in the advertisement was worth the unfavourable sales-volume variance. The latter is RMB 40,000 (U) versus a RMB 9,000

(F) price variance. If Sindy moved to a cheaper outlet than her savings are definitely not worth the loss of 25 customers.

As outsiders it will always be difficult for us to understand, what the deep underlying reasons are for the budget variances. These questions can be better answered by managers and employees with specific operational knowledge. For instance, Sindy might have heard from applicants that they learn about the position through other means than the outlet and they normally only check the traditional newspapers. A common refrain of this book is that formal systems, like budget variance analysis, always need to be complemented with specific knowledge from employees. The question is not whether objective or subjective knowledge is superior. Most meaningful decisions will involve both types of knowledge.

Budgets, Variance Analysis, and on-Financial Measures.

I want to add one little addendum to this chapter. Traditional management accounting tools such as budgets have often been criticized for being too focused on financial measures such as profits and cost prices. The variance analysis in the previous section shows that judicious use of budget variances is not just about profits and variances. It can also help to link cost overruns to operational measures and help identify the causes of bad performance. This book will further discuss the Balanced Scorecard as a tool to
explicitly include non-financial measures and causal links in management accounting systems. The existence of more modern tools like the Balanced Scorecard should not overshadow that budgets can already incorporate productivity measures like the number of words per advertisement. The

strength of variance analyses is that it allows to compare the size of different variances to make explicit trade-offs.

PART III
COST ACCOUNTING

13.

THE VALUE OF COST INFORMATION

Stijn Masschelein

In this part, I will discuss the role of cost accounting information. In the typical textbook, cost accounting will be the first topic in the textbook. I introduced budgets first because they are the quintessential strategic management accounting tool in my book [1]. Nevertheless, we already talked about the difference between variable and fixed costs, a distinction that is important for flexible budgets. In the simple examples we have seen so far, the company only had one service, filling a job position, and we could allocate all the costs to the one service. In a simple business, the budgets can fulfill its strategic role but advanced cost accounting is not really necessary. Advanced cost accounting will be more relevant when the organisation has a lot of products, services, and processes because we will need to allocate many more costs to the different products, services, and processes. Nevertheless, an important distinction will remain

The purpose of this chapter is to emphasise and explain that better cost information [2] is not always necessary. I find

1. Sorry!
2. whatever that means

that this sometimes surprises students but it should not if you have absorbed the lessons from transaction cost economics: all management accounting tools have costs and benefits and we should weigh the costs and benefits to decide whether a management accounting tool is useful. In this chapter, I will mainly focus on the benefits of better information.

The main question to determine the value of (cost) information is whether the organisation would take a different decision when they have access to better information. I will make a distinction between three different decisions that organisations take based on cost information: (1) Set the price of a product or service, (2) Determine whether to offer a product or service, (3) Engineer a product or service to lower its cost.

Pricing Decisions

Let us start with the pricing decision because we have implicitly already talked about pricing decisions in a competitive market. In that chapter on transaction cost economics, I emphasised two features of market prices in a competitive market: prices incorporate all relevant information and they provide incentives for sellers to keep costs low. The last part is key for the decision on pricing. If an organisation sells a product at a price that is higher than the market price, no buyer will be willing to buy it. Thus, the only information relevant for the correct price is whatever the price is that competitors are charging. If organisations would only use cost information for setting the price of goods and services in a competitive market, they have no incentive to

invest in advanced or detailed costing systems [3]. Another way of thinking about pricing in a competitive market is that the market price is general knowledge available to organisations which means they do not have to develop costly cost accounting systems to make pricing decisions.

Obviously, organisations do develop advanced costing systems and they spend time and money on data collection, data validation, and IT systems to process and disseminate the cost data because organisations either operate in a market that is not fully competitive or they are using the cost information for a different purpose than setting the price of goods and services.

Monopoly Pricing

Let us tackle the issue of not perfectly competitive markets first. Not all organisations operate in a competitive market all the time. For instance, if an organisation launches a new product that is not directly competing with an existing product, they have some leeway in how to set the price of the product. You can think of the launch of the Apple iPhone as an example. In such a case, there are no competitors yet and

3. The Lehigh Steel Harvard Business Case, which I sometime use in my courses, shows that activity based costing can reveal a lot of information about the profitability of different products. One proposed solution for unprofitable products is to increase the price of the products. The Lehigh Steel case provides some arguments why this might not be possible. Most firms in the steel industry are price-takers and they cannot change the price of their products without being hit by a large decrease in demand. In other words, market forces put a limit on how much a firm can change its price.

there is no market price that Apple needs to follow. The Apple example also highlights a second way how organisations can create leeway in how they set prices. Through a combination of marketing, product design, and technological lock-in, Apple has been able to create a customer perception that their computers and phones are a different product category than respectively Android phones or Windows PCs. If, in the customers' perception, the product has no competitors, Apple can set a different price than Samsung, Huawei, or Lenovo.

When an organisation produces multiple products and services, they can also create a unique customer experience by explicitly or implicitly bundling these products and services. One simplified example is Microsoft that has two important software products; the Windows operating system and the Office application. Office works best when it is integrated in the Windows operating system and Microsoft knows it will sell more Office subscriptions when more people have a Windows operating system. This means that Microsoft has an incentive to ask a lower price than the market price for the operating system because they know that more people will buy it and more people will buy the Office subscription. Interestingly for Microsoft, they will also be able to set a higher price than the market price for the Office subscription. The higher price and/or higher sales for the Office subscription subsidize the lower price for the operating system.

This loss leader strategy does require a sophisticated costing system because the organisation sets a lower price than competitors and sometimes even lower than the cost of producing the goods for the loss leader product (the Windows operating system) and makes up for it by setting a higher than competitive price or more sales of another product (the Office subscription). A further complication for Microsoft Office is that the subscription gives customers access to different software products (Words, Excel, Outlook), online and offline

versions of the products, and different levels of support. Different customers will use the different Office products and services differently and Microsoft wants to charge heavy users, such as business, more than light users, such as university students. In the next chapter, I will introduce Activity Based Costing which is a natural cost accounting approach to deal with these complications.

Product Design Decisions.

The ability to set a better price will not always be the main reason to adopt or improve a cost accounting system. Another important advantage of better cost information is the ability to find potential cost savings when designing a product or producing a product. One obvious extension to the previous discussion is that an organisation that is a price taker and cannot raise prices. This organisation might find out that at the end of the year, they are not profitable or they did not reach the goals in their planned budget. Because this organisation cannot increase profitability by increasing its prices, it has to investigate its cost structure. A lack of profitability is typically the trigger for organisations to invest in better cost accounting systems as you will see when you study specific cases.

Detailed cost information will help organisations figure out which parts of the production process are too costly and need to be redesigned to use less resources. If that is not possible, the organisation might decide to no longer produce the product because they cannot produce it in a way where production costs are lower than the selling price. Not unlike with variance analysis, the numbers alone will only be a guide and the employees with the best knowledge of the production process will have to be involved in how to interpret the cost

information and how to improve the cost structure of loss-making products. It will not surprise you that I believe it is important to combine objective and subjective knowledge when making product design decisions.

Some organisations go one step further and meticulously investigate the expected costs of the different steps and parts when they design a new product in an approach that is called *target costing*. With target costing, an organisation will use objective information such as the price of similar products and subjective knowledge from its marketing and sales team to decide on a feasible price first. They then decide the product so that it can be produced at a product cost that gives them a sufficiently high profit margin. There is little known about the Apple decision making process but from the outside, their high profit margins, relatively limited product variety, and strong emphasis on product design suggests that Apple follows the principles of target costing when launching new products.

Summary

In this chapter, I structured the discussion of when better information is valuable around whether it leads to better decision making or not. Just having better information is not enough, if we cannot change the price or cost of a product. That also means that, in my view, it is never sufficient to advise an organisation that they need a better cost accounting system if you cannot explain which decisions will improve.

14.

ACTIVITY BASED COSTING

Stijn Masschelein

In this chapter, I introduce the cost accounting approach that is often seen as the first modern cost accounting approach, Activity Based Costing. I will introduce activity based costing and show how and when more detailed cost accounting systems provide useful insights for better decision making. The next chapter focuses on a specific cost, the cost of unused capacity, and its treatment in activity based costing systems. Strategic investments such as machines or highly skilled employees are often not used at full capacity and activity based costing is well equipped to quantify the cost of unused capacity.

Cost Object

The goal of every cost accounting system is to allocate costs to different cost objects, which can be everything that an organisation wants to know the cost of. For instance, car manufacturers are interested in the unit cost of producing one

car [1] but they will also be interested in all the costs that are assigned to one specific car brand [2]. If an organisation has both businesses and individuals as customers, it will be interested whether one class of customers causes higher costs than the other. Or the organisation may be interested in the costs absorbed by a department or the costs caused by one of its suppliers. For different decisions, different cost objects will be relevant. To set the price of a car, we need to know the cost of producing one car but to decide whether to discontinue producing a certain car brand, we need to treat the brand itself as the cost object.

Direct and Indirect Costs

All cost accounting systems distinguish between direct and indirect costs where a *direct cost* is a cost that can be immediately assigned to a cost object. For instance, the cost of a tutor can be immediately assigned to a unit. On the other hand, I am paid a salary to teach and do research. My salary can not immediately be assigned to this unit because my salary pays for more than one unit and for the non-teaching part of my job as well. We will have to find a way to quantify how much of my salary should be assigned to the unit. For instance, I could make a guess of how much of my time is spent on the unit [3]. As a result, whether a cost is direct or indirect depends on the cost object that we are interested in. For instance, if we want to determine the cost per student, the cost of the tutor

1. as in, the car I have, which happens to be a Hyundai Getz
2. as in, all Hyundai Getz produced
3. For instance, how much of time is dedicated to writing this book

will be an indirect cost because a tutor will typically deal with multiple students at the same time. It is theoretically possible, to track exactly every second that a tutor spends on a specific student, maybe with some eye tracking technology. However, the cost of tracking the time of the tutor to the second would be uneconomical. Whether a cost should be considered direct or indirect is thus also a practical decision that depends on the transaction cost of tracking the cost usage. Sometimes, it is just not worth the effort to trace a cost directly to the cost object that we are interested in.

If we cannot directly trace a cost directly to a cost object, that means that we need to *estimate* the indirect cost per object. In my previous example, to estimate the cost of a tutor per student, we can divide the cost of the tutor by the number of students. This is the typical, traditional volume based cost allocation because we use the volume (number of students) to allocate the indirect cost. This approach gives the average cost per student which is appropriate if either that is what we are interested in or if all students need approximately the same level of attention. However, if the university is interested in knowing the cost of different types of students and those students need different levels of attention by the tutors this average, volume based approach is no longer appropriate [4]. This is where Activity Based Costing comes in.

4. One way to think about this that an average cost per student can be informative about the actual cost of any given student when the students are fairly similar but not when the students are heterogeneous.

Activity Based Costing

Activity Based Costing aims to make the allocation of indirect costs more methodological by focusing on what the firm is actually doing. The first step of an activity based costing analysis should be to perform an activity analysis. A firm can interview employees, observe them, and analyse internal data to find out the main activities in the organisation. A prototypical example for a manufacturing firm is given in Figure 14.1 below which makes a distinction between five primary activities that are supported by four other activities.

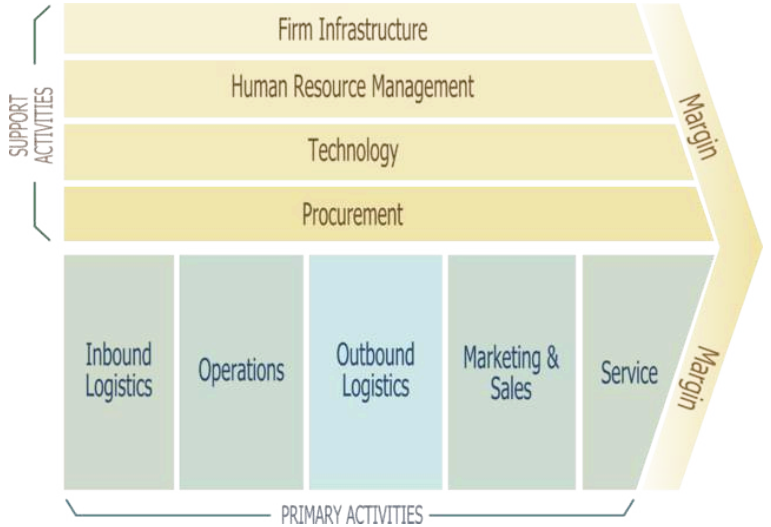

Figure 14.1: Michael Porter's Value Chain, 1985 by Dinesh Pratap Singh

From Resources to Activities

For a lecturer, the important teaching activities are unit preparation, lecturing, exam design, exam marking,

assignment marking, and general administration. With Activity Based Costing, a cost accountant wants to allocate the salary of the lecturer to these activities according to a *resource driver*. The most straightforward way is to use (or estimate) the hours the lecturer spends on these different activities and calculate the percentage of time that a lecturer spent on these six different activities. I made some guesses for how much time I spend on preparing and teaching my units [5] as a lecturer and I show them in Table 14.1.

Table 14.1: Indirect and Direct Labour Costs for Higher Education Teaching

Activities	**Lecturer (Indirect)**	**Tutors (Direct)**
Unit Preparation	15 %	22 hours
Lecturing	6 %	44 hours
Exam Design	1 %	
Exam Marking	2 %	15 minutes / student
Assignment Marking	3 %	
Administration	3 %	

I contrast the indirect lecturer costs with the direct tutor costs for my undergraduate unit which has two weekly 2-hour workshops for eleven weeks. The university allocates one hour of preparation for every two hours of actual teaching. The cost of marking by tutors can be immediately allocated to a student

5. which is only one part of my job description.

because the university policy is that marking should take no more than 15 minutes per exam paper. From this description, you can see that it is easy to allocate the cost of the tutors directly to the unit. We just need to multiply the cost per tutor hour [6] by the total hours the tutors dedicate to the unit. So, the intermediate step of allocating the cost of the resource (tutors) to the activities is not necessary for a direct cost.

From Activities to Cost Objects

I am coordinating and teaching two units per year, an undergraduate unit and an honours unit [7]. Table 14.2 has more information on the two units which we use to allocate the cost of the lecturer activities to the two cost objects, i.e. the undergraduate unit and the honours unit.

6. e.g. AUD 30 per hour.
7. An honours year in Australia is a fourth undergraduate year in which students write a research thesis.

Table 14.2: Activity Driver for Lecturer's Activities

Activity Driver	Undergraduate	Honours
Number of Students	100	15
Teaching hours per week	7	3
Preparation Load	40%	60%
Final Exam	Yes	No
Written Assignments	24 per semester	7 per student

In the honours unit, I am required to present the latest research in accounting and finance and thus the unit needs regular updating. I estimate that I spend about 60% of my preparation time on the honours unit and 40% on the undergraduate unit (see Table 14.2). As a result, 9% [8] of the lecturer cost should be allocated to the honours unit and 6% [9] to the undergraduate unit. In the undergraduate unit, I lecture one hour per week and run three two-hour workshops per week for seven weeks in total. In the honours unit, I teach a three-hour research seminar. This amounts to spending 4.2% [10] of my total time teaching in the undergraduate unit and 1.8% [11] in the honours unit.

The exam design and exam marking activities are easier to

8. $60\% \times 15\%$
9. $40\% \times 15\%$
10. 7 / 10 \times 6 \%
11. 3 / 10 \times 6 \%

allocate because only the undergraduate unit has a final exam. The written assignments in the undergraduate unit are written reports written by groups of 4 or 5 students. Over the course of the semester, there are 24 group assignments that need marking. In the absence of a final exam, the honours students have continuous individual evaluation in the form of seven individual assignments. Over the course of the semester, there are 105 [12] assignments that need marking. Thus, assignment marking for the undergraduate unit takes up 0.56% [13] of my time and marking for the honours unit takes up 2.44% [14] of my time. Notice that this calculation assumes that every assignment takes about the same amount of time to mark [15]. Finally, I allocate the administration cost by the number of students [16].

12. 7 \times 15
13. 24 / (105 + 24) \times 3\%
14. 105 / (105 + 24) \times 3\%
15. This assumption is wrong.
16. $100/115 \times 3\%$ for the undergraduate students and $15/115 \times 3\%$ for the honours students

Table 14.3: Indirect and Direct Labour Costs for Each Unit as Percentage of Lecturer Cost

Activities	Undergraduate	Honours
Unit Preparation	6 %	9 %
Lecturing	4.2 %	1.8 %
Exam Design	1 %	–
Exam Marking	2 %	–
Assignment Marking	0.56 %	2.44 %
Administration	2.61 %	0.39 %
Total	*16.37 %*	*13.63 %*

Initial Conclusions

While the calculations are instructive, there are broader lessons to be drawn from this exercise. First of all, the calculations show why activity based costing can be valuable. If I would have used the number of students (i.e. volume based cost accounting) to allocate costs, the undergraduate unit would have received more of the costs and the honours a lot less. The costs for each of the activities in Table 14.3 differ considerably from the 15-100 split in students.

Nevertheless, if the university would have decided that each unit takes about the same amount of time from the lecturer with a small adjustment for units with larger students, they would end up roughly in the same place as the totals of 16% and 14%. After doing an exercise like this the university's cost accountant might reasonably decide that they would not repeat this exercise for each lecturer but it would be too time

consuming. Notice that I could provide such a detailed breakdown because the estimates are based on my actual work and thus my specific knowledge.

Extensions

The advantage of the activity based cost approach is that we can be more discerning in which costs are treated as if they are varying. Not necessarily varying based on the volume of production but varying based on the activities that the organisation undertakes. In the example above, some costs vary based on the number of students, some based on the type of unit, or some depend on the number of assignments. We have seen in the chapter on variance analysis and the flexibility budget that we can use the distinction between variable and fixed costs to answer certain what-if questions. The flexible budget is the answer to the question "What if we had made the planned budget for exactly the volume that we actually observe at the end of the period?" By treating more costs as potentially varying in activity based costing, we can answer a broader set of questions. For instance, what are the cost savings of decreasing the number of assignments? In other words, activity based costing allows the decision makers in the organisation to quantify the impact of a broader set of decisions.

More generally, in activity based costing, we allow for costs to vary at different levels. For instance, the number of students is the traditional, *volume level* in the cost hierarchy. In a manufacturing firm, the number of units produced is at that same level but some costs vary at a different level. For instance *batch level* costs are not associated with a unit of production but with a production run or an order. Machine set-up costs between production runs and administration and handling costs of customer orders are examples of batch level costs.

R&D costs and marketing costs are examples of *product level* costs and are associated with a specific product line. Other costs can vary by the supplier, or by customer, or by the plant facility.

Value of Activity Based Costing.

As always, the value of activity based costing for a specific form will be a trade-off between the benefits and the costs. If the firm has highly effective technology to track all costs [17], it is able to directly assign costs to cost objects and it does not need activity based costing. In other words, only if the *indirect costs are sufficiently large* will activity based costing be advantageous to the firm. Even with a lot of indirect costs, when there are only a few resources, a few activities, or a few cost objects, activity base costing may be of limited value. Activity based costing will be of most value when a firm offers a large diversity in products or services, when these services consume different activities at a different rate, and the activities draw differently from the resources. In the example, above if a unit has no exam, there will be no costs allocated from the activity exam marking. However, if all units have an exam, we could as well split the costs of exam marking based on the volume, i.e. the number of students. If there is not much difference in the use of activities and resources, it will not make a large difference in cost calculations when we make a distinction between activities. In other words, when the *cost objects are homogeneous*, the distinctions that activity based costing makes are of little value. In the example above, if a lecturer puts the

17. e.g. scanning technology to track different parts, electronic tracking of employees.

same amount of preparation work in a postgraduate unit as in an undergraduate unit, we do not need to take that distinction into account.

The transaction costs of activity based costing are relatively straightforward. Setting up an activity based costing system is much more time consuming because the organisations needs to perform an activity analysis which requires deep specific knowledge about the production process. I could only do the current exercise because it is about my job. Also, the IT requirements for a realistic system with over a hundred activities and thousands of cost objects are much larger than for a traditional and more simple system [18]. Lastly, updating a complex activity based costing system is much harder. The organisation has to incorporate new activities and new products or customers over time, which is much harder than for a more simple cost accounting system. With a complex activity based costing system, the addition of a new type of customer could mean that all cost allocations of all activities need to be adapted to accommodate every new customer. As a result, if progress in information technological helps firms to manage the complexity and the updates of an activity based costing system, than technology can lead to more firms adopting ABC.

18. Just think about the number of footnotes I would need when my example would include every unit at the University of Western Australia

15.

COST ACCOUNTING AND PRODUCTION CAPACITY

Stijn Masschelein

In the previous chapter, I explained that one advantage of activity based costing is that we can treat more variables as varying based on the activities of the organisation. In a working example, I allocated the cost of my salary as a lecturer to different units [1] and argued that we can use the cost allocation to decide whether it would be cost effective to have fewer assignments. Still, if the university policy is to reduce the number of assignments, that does not mean that the university will immediately save money. My salary is still being paid. The university will only save costs if they also assign me different activities that allow the university to grow without increasing staff numbers [2]. This reasoning implies that at any point in time I might have some free capacity to take on new activities or do more of my existing activities. In this chapter, I show how activity based costing systems deal with this unused production capacity.

1. i.e. courses
2. or they can get rid of me.

In the cost calculations so far, the capacity of the activity has been given. In the example in the previous chapter, I assumed that I could spend 100% of my time productively. This is not a realistic assumption. The useful productive capacity is typically lower than 100%. The typical choices are the capacity in normal circumstances, the maximum possible production in normal circumstances, or the theoretical possible production capacity. These different possibilities are respectively called the *normal capacity*, *practical capacity*, and *theoretical capacity*. In most cases, the practical capacity should be used for cost accounting calculations because we want to allocate costs to the unused capacity, i.e. machine time that was available but not used for production. The cost of unused capacity should give us an idea whether it is worthwhile to either scale down the production capacity or whether we should keep the current capacity. If we use the normal capacity in our calculations, under normal circumstances there will be no cost of unused capacity. In other words, normal capacity assumes that the firm in normal circumstances is working in full capacity. Theoretical capacity on the other hand overestimates how much the organisation realistically can produce.

Lehigh Steel Example

The example in this chapter is based on the Harvard Business Case on Lehigh Steel, an American steel manufacturer. In the case study, the costs for five sample products is calculated where a large part of the costs come from five activities in the production process. Each activity has its own associated costs because of the cost of the machines that are necessary in the production step, the maintenance of the machines, and the cost of power for the machines. One of the production

activities, steel rolling, is run at its maximum capacity but the other four activities all have spare capacity. Lehigh Steel's machines are capable of doing more of the four other activities but there is no point in running these machines for longer because there is one step in the production process that is constrained by its current capacity. An important strategic question for Lehigh Steel is how to adjust their investment in machines and whether they provide a competitive advantage. Cost calculations of spare capacity can clarify the cost-benefit trade-off of investing or divesting these large investments. In the calculations, I will use the case of the finishing machine for which the costs of the machines is $1.28 million, the cost of maintenance is $0.78 million, and the power cost is $0.87 million.

The case study [3] gives the key numbers for the calculations and I will reproduce them here. The finishing machine is used for 4.06 million minutes which is also the value for the normal capacity. I assume that the used capacity for the critically important rolling machine, 8.26 million minutes, is the theoretical capacity for all the machines. In reality, the organisation would have to use its understanding of the production process to calculate the the theoretical capacity. With this assumption, the maximum capacity of the finishing machine is 8.26 million minutes. Lehigh Steel is probably using additional resources to make sure that the rolling machine's operations are never interrupted because the rolling activity is critical to its operations. The finishing machine however may have some interruptions or may need to wait for the intermediate products coming from the rolling machine. One typical estimate for the practical capacity in a normal year

3. specifically Exhibit 6

is 85% of the theoretical capacity (= 7.02 million minutes) [4]. The practical capacity represents the maximum number of machine minutes accounting for a reasonable expected maintenance time.

Table 15.1 shows the calculation of the activity driver rates with normal capacity and practical capacity. The normal capacity activity driver is the one that is used in the case study. In most realistic scenarios, the practical capacity is often a better indicator of capacity in activity based costing calculations because it allows to calculate the cost of unused capacity. Normal capacity assumes that the firm is using all machines and employees at full capacity in the current circumstances, and that the machine could not be used more.

Table 15.1: Capacity of Finishing Machine at Lehigh Steel

Capacity	**Activity Driver Rate ($/minute)**
Normal Capacity	$\frac{1.18 + 0.78 + 0.87}{4.06} = 0.72$
Practical Capacity	$\frac{1.18 + 0.78 + 0.87}{7.02} = 0.42$

Table 15.2 shows the cost per minute of finishing for the sample products (condition round, roller wire, chipper knife, round bar, and machine coil) under the two different capacity regimes. For instance, to make one condition round it takes 0.06 minutes on the finishing machines which amounts to a

4. More intimate knowledge of the production process can help in refining the estimate

cost of 4.32 cent under the normal capacity assumption and 2.52 cent under the practical capacity constraint. One key advantage of the practical capacity is that the costs of one product are not affected by production changes for the other products. If Lehigh Steel decides to change its product mix so that it needs less actual finishing minutes, the finishing driver rate and the cost of finishing for the existing products will increase under normal capacity. This is a strange conclusion because the production process of the existing process has not changed at all.

Table 15.2: Cost of Finishing for Five Sample Products

	Condition Round	Roller Wire	Chipper Knife	Round Bar	Machine Coil
Finishing Machine Time (minutes)	0.06	0.02	0.07	0.08	0.05
Normal ($ cent)	4.32	1.44	5.04	5.76	3.60
Practical ($ cent)	2.52	0.84	2.94	3.36	2.10

The other advantage of the practical capacity approach is that it is possible to calculate the cost of the unused capacity. In the example of the finishing machine there are $2.96 = 7.02 - 4.06$ million minutes of unused finishing capacity. The excess capacity costs Lehigh Steel $2.96 \times 0.42 = 1.24$ million dollar.

Unused Capacity and Strategy

We can interpret this cost in different ways depending on the strategy of the firm. The unused capacity might be superfluous and represent an avoidable cost. In that case, the organisation will want to reduce the capacity and its associated costs. Machines can be sold, or, less drastically, not replaced when they are no longer functioning. Employees can be fired or reassigned to activities that are value-adding. However, not all excess capacity is an indication of inefficiency. Firms might have good reasons to have more capacity than they are currently using. Overcapacity may give a firm more flexibility in ramping up production when demand increases or in changing its product mix when customer preferences change. Excess capacity in seasonal downturns also helps a firm to cope with periods of high seasonal demand. Another reason to build up excess capacity is to threaten potential entrants to markets where the organisation has a high profit margin. Manufacturing firms can build overcapacity so that they can increase production quickly when competitors would enter the market. The excess capacity credibly signals to potential competitors that the incumbent organisation is capable of unleashing a price war. Possible entrants will think twice about competing with this organisation. They know that the firm can easily flood the market and drive the price down. The overcapacity helps firms to set a price higher than the competitive price.

The advantage of the practical capacity approach to costing is that it allows the accountant to quantify the cost of not using the capacity. This cost can be compared to the benefit of meeting demand and preventing customers from entering the market which allows the firm to make a cost-benefit analysis of the excess capacity. In contrast, an important consideration for

a small business is to limit fixed costs (=capacity). If customer demand is disappointing, the firm will still have to pay the fixed costs. Recent research shows the opposite is true in more mature firms (Banker et al. 2014). For those firms the bigger risk is not to have capacity that needs to be paid for but to disappoint customers when demand is surging. Mature firms can find credit to bridge periods of disappointing demand but they cannot recover sales once they had to turn away customers.

References

Banker, Rajiv D., Dmitri Byzalov, and Jose M. Plehn-Dujowich. 2014. "Demand Uncertainty and Cost Behavior." *The Accounting Review* 89 (3): 839–65. https://doi.org/10.2308/accr-50661.

REVIEW STATEMENT

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