

UNIVERSITY OF WESTERN AUSTRALIA

BUSINESS SCHOOL

ACCOUNTING

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# ACCT3206: Performance Measurement and Evaluation

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# Chapter 1

## Introduction to the unit

### 1.1 Assessment

In this unit, I value participation highly. I want you to think about the content, discuss it with each other, and come to a better understanding through the discussion. The goal of this unit is that at the end of the semester you are able to read and understand a research paper in management accounting which gives you a great insight in how firms use incentives and measurement as part of managing employees. In addition, this unit will develop your ability to present, read, understand, and critically evaluate a technical report. These skills are invaluable no matter whether you want to start a career in accounting, the resources sector, the government, or (dare I say it?) academia.

The material and the assessment mechanism reflects these goals. The bulk of the work in the workshop revolves around 12 research papers. All presentations, discussions, and final exam questions will be centred around those 12 papers. As a result, you have to have read the research paper before the workshop. That does not mean that you have to understand the paper perfectly. After a first reading, you should get the main message of the paper and roughly understand where the researchers get their facts from. I am not interested in the details of the statistical analysis. Typically, you can understand the results from what the papers will call the descriptive statistics or from the figures. To make sure you have read the paper, in at least 3 of the workshops, you will have to answer a multiple choice test with simple questions about the research paper of that week. This is the first assessment item.

The next step in understanding the research paper better is that each week some of you will present the key parts of the paper. This is the second assessment item. In the second half of each workshop, we will discuss three or four questions about the paper. I will assess your participation when we discuss these questions in the workshop. After the workshop, you can further discuss the paper and the questions on the unit's blog. Your participation (online and in the workshop) is the third assessment item.

Some of the workshop questions will come back on the final exam, the last assessment item. Since the final exam is open book, I will not provide you with the exam answers to the questions.

I understand that this unit requires a lot of preparation during the semester. However, this is compensated by the fact that your preparation will immediately pay-off in your assessment for the multiple choice questions and the class participation. Your reward in the longer term is that all questions on the final exam deal with the same research papers that we discuss during the workshops.

## **Multiple Choice Questions (10%)**

I will start the second half of some randomly chosen workshops with a multiple choice test about the article. In such a test, there will be five questions. If you get a question correct, you get 1 mark, otherwise you will have 0. There will be at least 3 of these tests during the semester. Your best two scores out of five will count towards 10% of your total mark.

## **Presentations (20%)**

In the first half of each workshop, 4-6 of you will present a part of the assigned article. You will have to present twice during this semester. This gives you the opportunity to improve on your presentation skills during the semester. The two presentations together count towards 20% of your total marks for this unit. A single presentation should be around 5 minutes with no more than 5 slides. I will assess your presentation skills in three different ways. The three elements are all equally important.

1. Do you understand what you are presenting? I do not expect you to

present the article as if you are the researcher. I want you to present in your own words what you think the researchers are saying. If you do not understand parts of what you need to present, I prefer that you raise questions about what you do not understand than that you just read straight from the article. In this unit, I will reward if you make an effort to try to understand difficult problems. If you are wrong in your understanding, I will not punish you for that but give feedback so that you can learn from your mistakes.

2. I will evaluate how you use the slides for your presentation. Most of you will present arguments, numbers, and statistical analyses. You should present these with the help of diagrams, tables, with graphs. If possible, I want you to use these visual aids in the presentation.
3. I will assess your presentation style. Are you trying to engage the other students in the audience or are you just reading your presentation? Try to make eye contact with the audience. Do not read from the projection screen.

## Participation (30%)

In the second half of the workshop, we will discuss the questions that I put up before the workshop. Those questions can be found at the end of each lecture in these lecture notes. 30% of your total marks will depend on your participation during the workshop. I will take notes every week after the workshop. If you have said something (an answer, a question, a remark, a reaction to somebody else's answer), I will take note of that. At the end of the unit, I will transform your score for workshop participation to a mark on 30, *the workshop participation mark*. The transformation is a logarithmic function. This means that your first remark will lead to a larger increase in your participation mark than your fifth remark. The transformation is visualised in the following graph. On the x-axis, you can find your participation score, which is transformed to a mark on 30 on the y-axis.

You can also earn your participation marks by discussing the lectures and workshops on the blog. I will calculate a score where every comment by you on a blog entry counts for 1 point and every new comment by you on the same blog entry counts for 1/3 points. I count almost every comment except very short ones like "Thank you". This does not mean that you cannot thank other people for a good answer, a comment or a question but they will not count towards

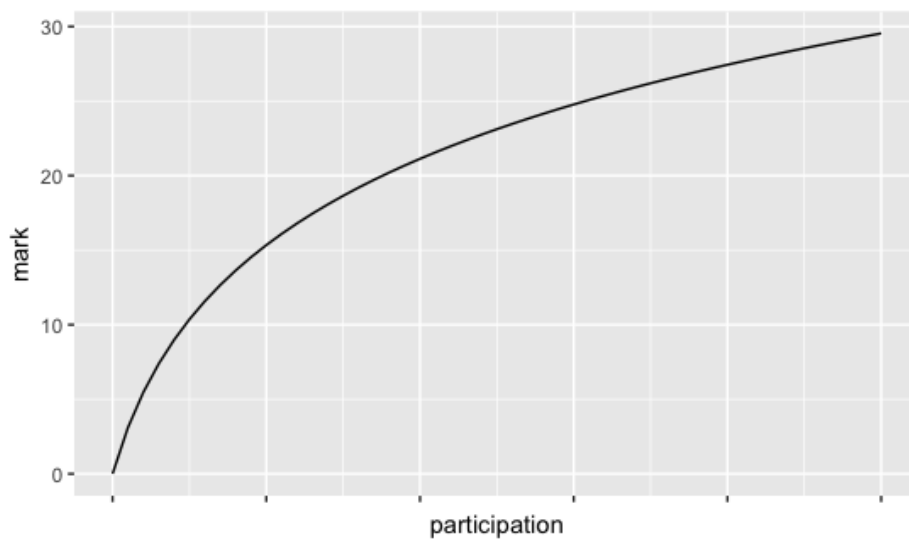


Figure 1.1: Transformation from score to participation mark

your marks. I will also penalise students who split up their summaries over more than two comments. They are fairly easy to identify for me. In general, if you try to game the system I will make a correction to the rules above. The points you gather for online comments will also be transformed to a mark on 30, *the online participation mark*.

You can keep commenting on the blog during the semester until the day before the final exam. However, comments made after the end of the final week of teaching will only count towards 50% of the normal points<sup>1</sup>. Your comments are meant to stimulate and engage other students. If you only add your comments late in the semester not everyone will be able to benefit. Hence, I will reward comments more if they are made during the teaching period.

Finally, I will also calculate a weighted average of the online and the workshop participation, *the mixed participation mark*. Your final score for your participation mark will be the maximum of the three participation marks, i.e. workshop, online, and mixed.

I know that for some of you a 30% presentation mark is daunting at the start. I have good reasons to weight the assessment so heavy towards the quantity of participation. First, there are good reasons from the research in this unit. As

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<sup>1</sup>In other words, a first comment on an entry gives you 1/2 of a point and follow-up comments on the same entry give you 1/6 of a point.

we will see over and over again during the semester: incentives matter. And they definitely work to increase effort. By rewarding you for your participation more of you will participate. More important there are knock-on effects from more participation, i.e. more creative questions (see Workshop 1) and more collaboration (see Workshop 11) will emerge which will help you all to better understand the material. Second, you do not have to take my word for it. The following is a quote from one of your colleagues on the SPOT questionnaire.

Going into the unit, I didnt like the idea of a heavy weighting on participation, however I felt that it did encourage me to participate and in doing that helped me to work through the answers and have a much greater understanding of the topics.

## **Final exam (40%)**

The final exam counts towards 40% of your total mark. The exam is open book; you can bring all research papers, all your notes, textbooks, or other printed/written material you deem necessary. The questions will be similar to the type of questions that we discuss during the workshops and most of them will relate to the journal articles of the workshops. The discussion in the workshops and online will be the most important preparation for the exam. However, do not underestimate the importance of the lectures. Most of the answers in the workshops will depend on the theories I present in the lectures and lecture notes. Moreover, some exam questions will not have answers in the workshops. This means that you will have to come up with the answers based on the theory in the lectures. The last chapter of the lecture notes contains a mock-up final exam to give you an idea what you might expect.

## **1.2 Blog**

This post contains some practical information on the use of the blog for this unit. You can find an introduction in plain English to both Twitter and blogging in the two YouTube movies below.

<http://www.youtube.com/watch?v=NN2I1pWXjXI>



On the blog (<https://acctuwa.wordpress.com>), you can put long or short comments. You can just leave a reply below the post by clicking on the number if you are on the main screen. If you are on the page of one blog entry, the comments appear at the bottom of the page. You can respond to another comment by clicking on reply or you can add your own comment by scrolling down to the text box that says 'leave a reply'. The topics you can talk about are very broad: limitations of the theories that are discussed, real life examples (if you can provide a link that would be wonderful), disagreement with my explanation in the lecture, your summary of the lecture or your answer to the workshop questions or just things that are not quite clear. Everyone is allowed to comment on your comment. If you have any questions, you can leave them in the comment section.

On the blog, I will occasionally point your attention to an online article that reports current affairs that are related to this unit. Feel free to add your thoughts on these entries as well. They also count towards your mark.

On the blog, you can also post anonymous comments. You might want to stay anonymous if you want to comment on any of the administrative elements in this unit or if you want to complain about the organisation of the unit. You can of course still do this under your own name but I allow anonymous comments if they stay civil. I do invite comments and questions on the unit's organisation because I am fully aware this unit is different than a lot of your regular units and I want to take away as much of the confusion from the start. The only repercussion for anonymous comments is that they do not count towards your participation mark because, obviously, I do not know who made the comment. That means that for most comments, you want to make sure that I can identify you. The format that I prefer is that you use your student e-mail address to log in. Your address will not be visible on the web but it is visible on my end and I can automatically extract your student number from your e-mail address. You are then free to use whatever visible screen name that suits you.

## Chapter 2

# The economics of performance measurement

### 2.1 Lecture 1: The mine and the landowner

#### The mine

Imagine a landowner with the property rights to do whatever he wants with the land. One day he discovers that his land might be rich in iron ore. He quickly realizes that he should mine his property for the precious metal. However, he is not quite sure how to do this. Fortunately enough, a number of experienced miners live in the same town as the landowner. They all have a wealth of experience in mining for different resources. They know the best techniques for drilling in different surfaces, testing for the quality of the ore, and the exploitation of different types of mines.

The economic problem is that the person who knows how to exploit the land does 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. Which one of the two solutions will play out depends on the costs of contracting on both solution. The cost of buying land involves a number of costs for the buying miner. He will probably spend a long time and need a number of special instruments to test the exact value of the resources in

the land. One cost for the landowner is that he does not know what the value is of the iron ore and so he might get a low price if the miners have conspired against him. 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 as possible because they can sell the resource themselves and reap the profit (ownership rights).

On the other hand if the landowner hires a miner for his knowledge, there is still a problem. The landowner holds all the rights to do what he want with the land (decision rights) and he gets all the profits of the mine exploitation (ownership rights) while the miner has more expertise. This problem can partly be solved by assigning part of the decision rights to the miner. Now, the miner has the knowledge on mining and he has the rights 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 decisions, he is not necessarily motivated to do so. If he takes the right decisions, he will earn his salary. If he takes the wrong decisions, he will also earn his salary but he might just make his own life a little easier. For instance, he 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 him for good performance. One possibility 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 his earnings by taking the best decisions for the mining operation.

## Theories and topics

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 or working as a miner. In Lecture 2, I explain in more details where these costs come from ([Williamson, 1979, 1991, 2002](#)).

Others argue that the people with the right knowledge should get the decision rights. If the owners of the rights can not hire the knowledgeable people in the economy they might be better off selling their rights. These theorists, who will be discussed in lecture 3, argue that the distribution of knowledge ultimately determines how economic transactions will be structured ([Jensen and Meckling](#),

1995).

Game theorists have argued that what really determines the organisation of firms and economic transactions is whether there are good measures available. In lecture 4 and 5, I explain how economists define good measures. If these measures can be used in contracting, landowners can reliably grant decision rights to their knowledgeable farmers and they do not need to sell their ownership rights (Holmstrom and Milgrom, 1994) .

These three theories are not mutually exclusive but they have a different focus on what is important for the organisation of the activities inside and between firms. Together, the theories give a good indication of the role of performance measurement in the organisation of a firm but they differ on the importance of performance measurement.

However, not all the aspects of the structure of organisations has been covered. 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 (Fields et al., 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 firms even if that is not necessarily optimal. These institutional influences are explored in one of the lectures.

Other economists have focused on the role of the internal labour market to motivate and select employees. The internal labour market is the result of competition in the firm for promotion. We will see that promotion decision are not only based on objective but also on subjective performance measures (Baker et al., 1994). In two lectures, we will discuss how internal labour markets are used to motivate employees and to identify the most talented employees.

In the last lectures, we will divert our attention to the decision-making role of performance measures. Strategic measurement tools with multiple measures and causal links between these measures can help firms to better understand their business and make better decisions. We will discuss what the necessary elements are of these measurement tools and how the presentation of the measures influences the use of the measures.

After we went through these topics, you will have a fairly good overview of the contemporary research in management accounting. I hope you enjoy the ride.

## 2.2 Workshop 1: Creativity and incentives

The first article investigates how incentives can motivating people to come up with creative ideas (Kachelmeier et al., 2008a). In an experiment the authors measure the effect of motivating people to generate a lot of ideas, to generate ideas of high creativity or to generate as many creative ideas as possible. If you truly understand the results of this paper, you will also understand why I reward you for your participation in this unit.

You can download the paper [here](#). Look for a 'download' or 'pdf' button. You will only be able to download the paper for free if you are on the university's network. If you try to download the paper from home, you will have to set-up a [VPN connection](#). You should never have to pay for a paper in this unit. If you have problems with the download, leave a comment on the blog.

The questions I want you to prepare are posted below. Do not worry too much about the questions. They are just the starting points for discussing the paper during the workshop. You do not have to understand the paper in its entirety. If you can *partly* answer *some* of the questions at the start of the workshop, you are good to go.

1. What do you find surprising about this article? For instance, is there something that you did not expect in the methodology, in the results, in the conclusions or in the way the paper is written?
2. Are the results of this article most relevant to the theory of transaction costs, knowledge specificity, or measurement characteristics (see lecture 1)
3. Based on the results of this paper should firms give decision rights to their employees when the employees have to find creative solutions?
4. Why do the authors use the specific reward structure in the experiment with 5 dollar for the lowest performer and 45 dollars for the highest performer (see also p.351).

## 2.3 Lecture 2: Transaction cost economics

### Markets

This lecture explains the Transaction Cost Theory from Oliver Williamson (Williamson, 1979, 1991, 2002). This theory argues that there are three important governance structures that are the blueprints to organise business activities. The *market* is a meeting place for buyers and suppliers for a given product or service. 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.

The market is adaptive to disturbances or changes in the economic environment. If the demand for the products of the buyers goes up, the product that is sold between buyer and supplier becomes more valuable. As a result, buyers will (have to) pay a higher unit price to their suppliers. All the information of changes in the economic environment will be captured in the price of the product. As a result a perfect 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.

The other function of a perfect market is that it provides *incentives*. 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.

The role of performance measurement and evaluation systems is to provide information on performance and provide incentives, just like markets. Firms will often outsource some activities to suppliers because they believe that the market is better at evaluating and incentivizing the supplier. However, firms also keep a lot of activities within the firms. The next sections will explain how transaction costs play a role in determining whether markets, organisation, or an intermediate form is the optimal governance structure for an economic activity.

The story of the mine already reveals some transaction costs in imperfect markets. Not every potential miner might have 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 often grouped together under the umbrella term *transaction costs* for realistic markets.

## Asset specificity

Sometimes one specific buyer-supplier transaction can outperform the market if they both make an additional investment and the other buyers and suppliers in the market can not make this investment because they do not have the necessary knowledge or technology. The success of these types of investments depends on the investments being called asset specific investments. The investments can be better production technology, human capital, or assets that are specific to one consumer segment and cannot be reused.

Imagine that one supplier can make white computers and one buyer can build shops that make white computers look more attractive to consumers <sup>1</sup>. If the supplier sells his white computers to another buyer with another shop his investment in white computer technology is useless. If the buyer purchases black computers her investments in white computer shops are useless. Based on the price in the competitive market the supplier has no incentive to make the investment in white computer technology. Therefore the buyer has no incentive to invest in white computer shops.

This line of reasoning reveals another lesser known transaction cost of markets. Market competition can prevent the coordination of mutually beneficial investments.

## Long-term contracts

A solution for this conundrum is a long-term contract in which the buyer and supplier specify who has to do which investments. Contracts will also specify the rewards and punishments for (not) following the duties and responsibilities. By specifying both partners' duties, contracts coordinate the necessary investments. A contract will specify under which conditions, the buyer or supplier

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<sup>1</sup>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.

need to invest in the additional assets. The first transaction cost of a long term contract stems from all the contracting cost associated with the time and effort of drafting the contract.

Long term contracts also often have clauses on how the parties will address conflicts. They can resort to courts cases or try to negotiate for a solution out of the conflicts. The role of conflict resolution is to make sure that if the environment or requirements of the task change, the buyer and supplier can adapt the working relationship to deal with these changes. That is, the contract assures that when the economic circumstances change both parties adapt their investments. However, the adaptive capability with long-term contracts is limited. If a lot of changes are needed, negotiations will be too numerous to handle within a contractual relation. A typical transaction cost of long-term contracts is thus the difficulty to handle changes which can lead to costly conflicts or costly revisions to the existing contract.

## Organisations

Hierarchical organisations are formed to react quickly to changes in the environment when mutual asset specific investments are needed. In an organisation the buyer and supplier are no longer two different entities. The organisation will set-up formal responsibilities and duties to make sure that all investments in specific assets are done. Typically, one or a small group of persons, top management, will be responsible to ensure that everyone in the organisations 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 not need to rewrite a long-term contract to change the course of the organisation.

Another important function of the organisation is to address the internal conflicts in the organisation without resorting to expensive court cases. One of the advantages of organisations is that they can handle conflicts more efficiently than market. The flip side of efficient handling of conflicts is that the organisation will be more forgiving than the market. This is what Williamson calls the law of forbearance.

The reason for the increased forgiveness is that organisations realise that they are dependent on each other to create value. If the white computer makers and the retailer with the best shop know that they create value together, they might



be willing to forgive each other when small mistakes are being made. When the computer maker and the retailer merge together they will be even more likely to forgive each other. However, this will also decrease the strength of incentives in an organisation. Members of the organisation know that not all mistakes will be harshly punished as would be the case in an ideal competitive market. Later, we will discuss the different incentive mechanisms that an organisation can use but they will often be less powerful than the incentives from a market. The transaction costs associated with an organisation are the costs of setting up incentive systems to compensate for the forgiveness in organisation. Firms also have a formal structure with responsibilities and duties. These bureaucracies have their own transaction costs in the form of administrative personnel and IT-systems.

The important insight of transaction cost theory is that market, contracts and hierarchical bureaucracies are efficient for different activities. Hierarchical organisations are better at coordinating asset specific investments and resolving conflicts. 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.

## **2.4 Workshop 2: The structure of public-private collaborations**

The second article investigates how two public-private collaborations are structured ([Cools et al., 2011](#)). One project involves building and maintaining a swimming pool that is shared by multiple municipalities. The other project is the regeneration of the train station neighbourhood in another city. For the purpose of this unit, we are mainly interested in the differences in the formal structure between the two projects. We will see that the characteristics of the collaborations are related to the way the projects are structured as one would expect from Transaction Cost Economics in Lecture 2. You can download the paper [here](#).

1. What are the most important differences between the Design Build Finance Maintain Operate Project and the Urban Regeneration project described in the article?

2. What is the research question in this study?
3. Explain conveners in terms of Transaction Cost Economics. Which transaction costs are they minimising?
4. Explain champions in terms of Transaction Cost Economics. Which transaction costs are they minimising?

## 2.5 Lecture 3: Specific knowledge

### Specific knowledge versus general knowledge.

This lecture deals with the problem of assuring that the economic agents with the best knowledge, decide where to invest, which projects to undertake, and how to do them. First, we have to make a distinction between general knowledge which is easy to communicate and specific knowledge which is difficult to communicate ([Jensen and Meckling, 1995](#)).

Some information is difficult to communicate because people have cognitive limitation. We can not get all possible information in our head. Moreover, if we have to learn new knowledge, it takes time. Just reading this blog post is not enough for you to have the same knowledge that I have. The limitations on the cognitive capacity of humans makes it costly or even impossible to transfer large amount of information from one person to another.

The second reason for the specificity of knowledge is that a lot of knowledge is particular to an environment. The people who work in that environment know best what is important. For instance, the 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 very well. 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 will necessary leave out some details which might be important to take the decision.

## Markets and rights transfer

As we see before in the example of the mine, there are two possible solutions to assure that the people with knowledge take the decisions. The first solution are perfectly functioning markets. A market operates best when the rights to physical object are in private ownership and these rights are alienable. This means that the owners of the rights can transfer the rights to somebody else and they can capture the profits of the rights. 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. If voluntary transactions of the rights to physical objects are possible, 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. Since that price will be higher than what the current owners can earn from the machine, the owners will be happy to sell.

## Organisations and rights transfer

The other solution is in organisations where there is no voluntary exchange of rights. The sales department can not sell the goods to consumers and keep the money. The price that consumers pay belongs to the company. This set-up leads to conflicts of interest.

In the lecture, we illustrate this with the a simplified example of a computer manufacturer with a production department and a sales department. The production department can invest in a technology to produce white computers which can be sold at a higher price to consumers. 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 white computer technology. Whether they deliver a white computer or a black computer does not matter for the transfer price in our example.

The sales department can invest in the lightning in the shops which will increase customer demand. The investment is so substantial that the sales department alone will not profit enough to invest. In the numerical example of the lecture both investments were profitable for the firm as a whole. We expect

that in this situation headquarters would force the departments to invest in the white computer technology and the lightning. However, for the reasons discussed above, specific knowledge of the departments is not necessarily available to headquarters. We can assume that headquarters do not know how much the investment in white computer technology costs, and it is likely that the production department has a better idea of these costs. Similarly, it is more difficult for headquarters to predict the change in demand as a result of the new lights in the shops. The sales department has more experience with customers and has a better understanding of customer's preferences.

## Decentralisation

As a first step to address the problem of limited knowledge, headquarters can decentralize the decision rights for investments to the departments. This is not enough because the white computer investment is not profitable for the production department and the light investment is not profitable for the sales department. Neither of the divisions is motivated to do the necessary investments in better technology. The second and necessary step is to tie the compensation of both departments to the total firm profit. The departments are now motivated to make decisions that increase total firm profit and will make the necessary investments.

In contrast to market transactions, firms do not transfer the ownership rights to their employees; they only give 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. Lastly, firms can give or restrict the freedom through the budget process. If employees get a budget they can spend as they please they have much more freedom than if they get a budget where all the line items are allocated a fixed amounts.

If a firm assigns too much decision rights to employees, they run the risk that employees do not act in the best interest of the firm. The firm has to balance the advantages of decentralisation (use of specific knowledge) versus the disadvantages (misalignment of interest). One way to limit the disadvantage is to reward employees based on performance measures. For instance, business

units can be evaluated as cost or profit centers. In this unit, we will focus on pay-for-performance and promotion decisions as potential reward mechanisms. We will see further on that there are costs associated with incentive contracts. When a firm gives more decision rights to employees they will have to trade-off the advantages of better decision making with the disadvantages of more costly incentive contracts ([Prendergast, 2002](#)). The next two lectures will deal with the problem of designing incentive contracts.

## 2.6 Workshop 3: Convenience store franchises and knowledge

The article investigates which stores are franchised by convenience store chains and which ones are not ([Campbell et al., 2009](#)). The author explains what the advantages are of franchising as an organisational structure and this explanation fits well with the theory of specific knowledge as discussed in the lecture. If you are on the university network you can download the paper [here](#). The questions for this workshop are the following.

1. For the purpose of this study, what are the most important differences between a franchised store and a chain owned store for a store manager?
2. What is an important determinant of the choice to franchise a convenience store according to this article? Why is this factor important?
3. What are the statistical tests in Table 9 on p. 1774 trying to show? How does this relate to the theory of specific knowledge?
4. The tests in Table 6 report why chains franchise all stores, some stores or no stores at all. The tests in Table 7 show why individual stores are franchised or not within a chain. Why do the authors perform the tests in Table 7? What is their explanation?

## 2.7 Lecture 4 and 5: Measures in incentive contracts

### The elements of incentive contracts

The section on specific knowledge explained that when employees get more decision rights, the firm also want to make sure that they use their decision rights in the best interest of the firm. One of the tools to align the interests of the employees with the interests of the firm is 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 is *the performance measure(s)* that determine(s) whether the employees get a reward or that determine(s) the size of the reward. The measure can be financial, non-financial or even the subjective judgment by a superior.

In summary, the theory of incentive contracts can apply to a wide range of settings. In the remainder of this section, the focus will be on explicit bonuses for middle and higher level managers but keep in mind that the theory is broader than these settings. For instance, the chapter on internal labour markets will explicitly explain how subjective, non-verifiable judgements and promotions work as incentive contracts. The remainder of this section proceeds as follows. First, the goal of incentive contracts from the point of view of the firm is explained in more detail which will help us to understand beter why firms are using incentive contracts over just monitoring their employees. The following parts will explain the characteristics of good performance measures and how the combination of multiple performance measures can improve incentive contracts. Lastly, we 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 stimulate 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. 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 firm 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 firm's incentive contract, their effort will be more in the commercial interest of the firm. 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. CEO's 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 CEO's with stock rewards.

The simplified timeline of a labour relationship under an incentive contract is as follows. First, the employer and employee agree on a basic salary and on a bonus for the employee depending on the outcome of a performance measures. Second, the employee works and takes decision. The underlying assumption is that employees 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 employees performance completely and that despite the employees 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 his salary and bonus ([Holmstrom and Milgrom, 1994](#); [Lambert, 2001](#)).

**It is very important to realise that in this simple model, the behaviour of the employee is not changed by the fact that they receive a bonus or no bonus. The behaviour of the employee comes first and determines (partly) whether the employee receives a bonus or not. Not the other way around.**

To better understand the role of incentive contracts, we can contrast incentive contracts with giving directions to employees and fire 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 management. They have the experience of doing the job day in day out or they have the specific education. In addition, communicating the directions through the different hierarchical levels is sometimes costly and 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, 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.

## Risk, sensitivity, and precision

The advantage of incentive contracts for firms is that contracts make employees spend their time at the right tasks and spend more effort for the firm. The advantage for some employees is that they enjoy the responsibility and decision rights instead of following directions. However, since firms 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<sup>2</sup> is a transaction cost or a contracting cost for the employer. The firm 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 firm's *and* the employee's point of view is a measure that picks up only what the employee has done and nothing else. 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 if employees change their behaviour it will have a sizeable impact on the measure. If a measure is sensitive, it is easier for an 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 or they can set more demanding targets without offering egregious large rewards (Holmstrom, 1979; Banker and Datar, 1989).

Precision and sensitivity are different from one another. Measures can be affected by little outside influences (*a precise measure*) and at the same time not respond to the behaviour of the employee (an insensitive measure). Similarly, a

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<sup>2</sup>You can think of it as a risk premium in financial transactions



measure can be affected by the behaviour of the employee (*a sensitive measure*) but also affected by a number of other factors (a noisy or imprecise measure). For such measures, the firm and employees need to trade-off precision and sensitivity.

## Multiple measures

One way to improve the incentive contract is to make the reward dependent on more than one measure. The idea is that two measures that are very insensitive or very noisy might together be informative about the performance of an employee. For instance, it might be optimal to include measures in a contract that are uncontrollable by employees (= insensitive to their decisions) but that decrease the noise in the reward. For instance, firms 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, it will pay off to include these measures in the contract. Taking into accounting peer and competitive performance will take away some of the noise in the performance measure of the employee and make the total compensation less risky.

For instance, a car retailer 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.

## 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. In real-life settings, a lot of the measures are compiled out of information and reports gathered by the employees. This means that employees can influence the measure without improving task performance. The employee can take two actions that will influence the performance measure, i.e. measurement manipulation and performance improvement.

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. Thus, also incongruent measures can be rectified by adding additional measures to the bonus contract (Holmstrom and Milgrom, 1991). This is also the idea behind the Balanced Scorecard which we will discuss further in this unit. In addition, firms can replace incentives based on accounting measures by stock plans which are equivalent to bonus contracts based on the value of the stock price of the firm.

In summary, a *congruent measure* is a measure that captures all the actions of an employee that are improving the firm's value and no other actions. Similarly as with precision and sensitivity, sometimes firms and employees will have to make a trade-off between incongruence and these other characteristics. Very few measures are at the same time precise, sensitive to the desired actions and completely congruent with the firm's goal. For instance, the profit of a division is arguably more sensitive than firm profit to the decisions of the division's manager. If we would only think about the sensitivity of a measure then divisional profit is a better measure for the incentive contract than firm profit. However, firm profit is arguably more congruent with the firm's goal.

The trade-off might be difficult. Let us assume that the head of the division can invest in two projects that both improve divisional profit but only one improves firm profit. One setting where that could occur is when the division receives the revenues of the project while another division bears the costs. Rewarding the head of the division only based on divisional profit will increase the effort in the profitable project but also in the unprofitable project (from the firm's point of view). Depending on the specific parameters it might be better to use both firm and divisional profit, only divisional profit (when the incongruence is not too bad and firm profit is very insensitive) or only firm profit (when the incongruence of divisional profit is large and firm profit is sufficiently sensi-

tive to the head's actions).

These issues are at the forefront in discussion on the reorganisation(s) at Microsoft. Whereas until recently, Microsoft had strong internal competition between divisions (such as hardware, the Office software, or the Windows software division), they have reconsidered that structure. Because of the strong focus on division profit, division refused to cooperate with other divisions and invested in project that caused headaches for other divisions. For instance, the Office division was [for a long time not willing to adapt their software for a touch and stylus interface](#).

## 2.8 Workshop 4: Good performance measures and delegation

The study for this workshop investigates which performance measures allow firms to give decision rights to business units. As discussed in the theory section, the reason firms need incentive systems is so that business units have more decision rights and take better decisions ([Moers, 2006](#)). However, incentive systems are costly for the firm and the benefits of better decision making need to be weighted against the costs of the incentive system. The little mathematical model in this paper formalises the trade-off. You can find the study [here](#).

If you have to present this paper and you do not understand crucial parts of what you have to present, you can also raise questions. Explain what you understand and specify where you are lost. This is one of the more difficult studies and I will definitely take that into account.

1. The author argues that bad measures make it more costly to provide incentives. What are good measures according to the author? Explain what the extra costs are from bad measures?
2. From the three important measurement characteristics (precision, sensitivity and congruence), congruence is not explicitly mentioned in the article. Explain how congruence is still important for this study.
3. The author says he controls for the marginal benefits of delegation. What does the author mean by the marginal benefits of delegation? How does the author control for the benefits of delegation? Why does he do that?

## 2.9 Workshop 5: Expensive sticks and efficient carrots

This study adds a new layer to the agency theory framework that underlies lectures 4 and 5. One important insight of agency theory is that incentive contracts are costly for firms because firms need to pay a risk premium for the risk that employees do not get their bonus. The new study adds that people are not only trying to avoid uncertain outcomes (risk aversion) but also try to avoid losses (loss aversion) (Frederickson and Waller, 2005). This paper shows that just as firms have to pay a risk premium to make employees accept an incentive contract they might also have to pay a "loss aversion" premium. You can find the study [here](#).

1. How are the different elements of agency theory represented in the experiment?
  - a. What is the decision of the employee?
  - b. What is the outcome for the employer?
  - c. Describe the performance measurement system.
  - d. How are precision and sensitivity of the measures incorporated in the experiment?
2. How would you visualize the disutility of the punishment contract in Figure 2.
3. Why is most of the offered contract (salary and reward for the outcome) already determined by the researchers? What is the problem with this approach?
4. Why has the experiment a story instead of a completely abstract task description?

## 2.10 Workshop 6: Learning to design incentive contracts in banks

In previous lectures, the implicit assumption was that, on average, firms are using the optimal incentive contract and organisational structure. The following study relaxes that assumption and investigates how banks move towards the optimal organisational design Bol and Moers (2010). More specifically, the study investigates how the board of directors of bank branches change the incentive

contract of the general managers. The authors show that the board of directors need to learn what the best possible system is for their branch. You can find the study [here](#). The questions for the workshop are the following.

1. Why do the local banks not immediately adopt the incentive system.
2. p. 729 explains that complexity of the incentive system makes its use more difficult. How does this fit into agency theory?
3. Explain in your own words the response bias test on p. 727.

## **2.11 A graphical representations of the costs and benefits of incentives**

In the [Moers \(2006\)](#) workshop, we discussed the cost-benefit analysis of delegation when the incentive system has good or bad measures. The following two graphs illustrate the same trade-off for the use of incentive contracts. I leave the interpretation of the graphs as an exercise but it should be relatively straightforward in light of the [Moers \(2006\)](#) workshop.

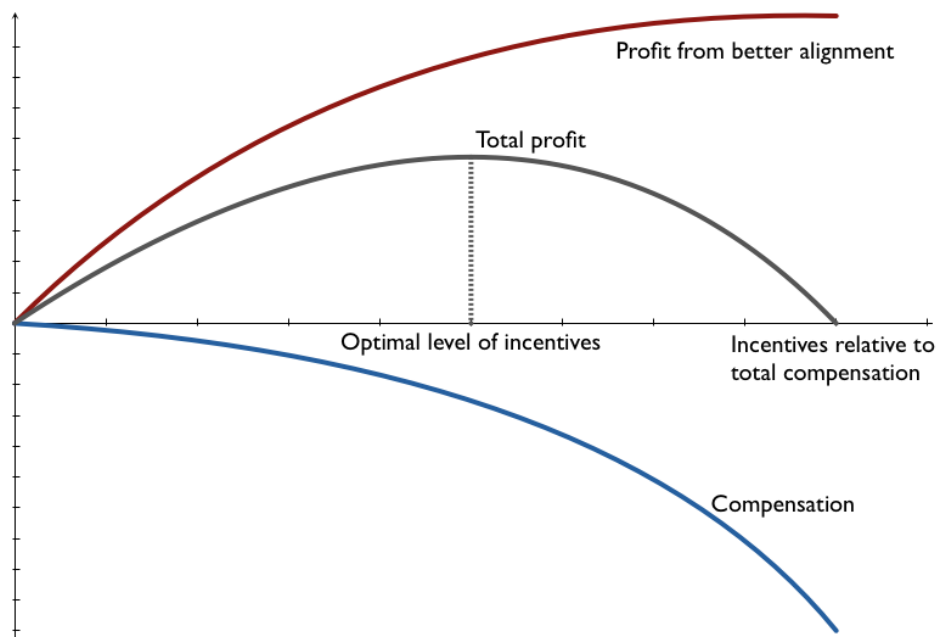


Figure 2.1: Trade-off with incentives

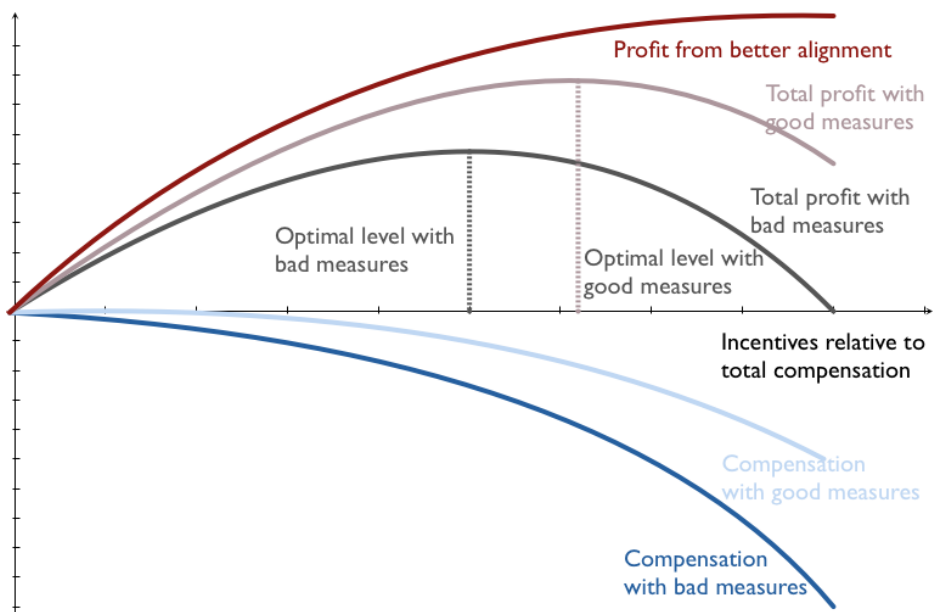


Figure 2.2: Costs of bad performance measures

# Chapter 3

## Research methods

### 3.1 Lecture 6: The elements of an experiment

#### Manipulation

This lecture discusses the philosophy behind using experiments in research. An experimental design has two main ingredients. First, the researcher *manipulates* the variable of interest. Despite the somewhat nefarious connotation, there is nothing bad about manipulation in an experiment. It means that if a researcher is interested in the effect of creativity incentives on creative output, she will design an experiment where some participants have to perform a creative task with creativity incentives and some without creativity incentives. The researcher deliberately intervenes to create the situation she wants to study. The manipulation creates a difference between participants in the experiment ([Libby et al., 2002](#)).

#### Randomisation

The second ingredient is *random assignment* of participants which means that whether a participant will have creativity incentives or not is determined by a lottery. For every participant, there is a 50% chance of creativity incentives and a 50% chance of no creativity incentives. The upshot of random assignment is that all factors that can differ across the participants groups are also randomly distributed over the groups ([Libby et al., 2002](#)). So, we can expect that statis-

tically speaking there will be no difference in how artistic, educated, smart or lazy the participants in the incentive group and in the no incentive group are. If there is a difference in creative outcome between the incentive group and no incentive group, we can use simple statistical tools to calculate how likely it is that our randomization was not successful and that the difference is not caused by the incentives but by something else. In other words, because of random assignment, we can test how unlikely it is that our manipulation is not causing the difference in performance.

## Causal inference

The manipulation is a deliberate difference in the experimental environment while the random assignment of participants makes sure that everything else is the same in the experiment. As a result, we can be reasonable sure that if there is a different outcome in the two groups it is *caused* by our manipulation. With real life data it is far more difficult to know what the causal relation is between two factors which can lead to very strange (and wrong) conclusions as demonstrated by the xkcd-cartoon. The difficulty with testing causal relations is the topic of the next lecture in the research notes.

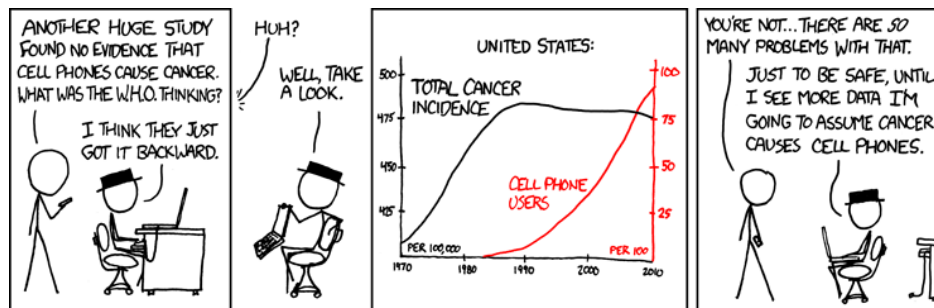


Figure 3.1: [xkcd cell phones](#)

In studies, we are interested in causal relations because we want to use the information in the study to change something in a real business, or economy. For instance, if we see that companies in creative industries use more creativity incentives than companies in other industries, we cannot be sure that more creativity incentives causes more creative production. Maybe, those companies only use to creativity incentives to attract a certain type of employee. As a firm, that might not be what want we to know. We want to figure out if we use more creativity incentives, will creativity go up in our company.



## Field experiment

There are two different ways how experiments can be used to test causal relations. The first type of applications are *field experiments*. A variant of this type of experiments, A/B-testing, is very popular in technology firms such as [Facebook](#) and [Google](#).

These type of experiments try to exploit or create random assignment in real life situation to assess whether a policy measure, an education method or a reward system has an effect on some outcomes of interest. An example of a study that in the controversial area of U.S. health care is the, [Oregon Health Study](#). In 2008, the state Oregon wanted to expand the provision of Medicaid public insurance for low-income residents. In the beginning of the year, 85,000 people signed in on a waiting list. Because of budget restriction, only 30,000 people were randomly drawn from the list and they could apply for coverage. Because of this lottery system, we can be reasonably sure that the 55,000 people who were not chosen are similar in every respect to the 30,000 people who were chosen except for the public insurance. This provides an excellent setting to assess the potential health care benefits or the disadvantages of government provided health care insurance. Normally, people with health care insurance are likely to be more vulnerable. That is why they choose the coverage. As a result the comparison between people with and without insurance is potentially misleading ([Allen et al., 2010](#)). Field experiments such as the Oregon Health Study can provide a better picture of the advantages and disadvantage of Medicaid. Field experiments are typically performed to test the causal effect of a policy by exploiting the features of a random design. As such, they can be of immediate interest for improving firm or government policy decisions.

## Lab experiment

Lab experiments generally serve a different purpose. Lab experiments are typically used to test a theory. Loosely defined, a theory explains the causal relation between abstract concepts. The Agency Theory framework describes how measurement properties effect the use of incentive compensation in a contract between a principal and an agent. The principal can be the firm while the agent is the CEO. However, the CEO can also be the principal while a divisional manager is the agent. The abstract concepts of principal and agent allow us to generalize the predictions of Agency Theory to different settings. Lab experiments try to create an experimental task that stays as close as possible to the theory.

As such, if the theory holds the findings of the experiment can be generalised to all settings where the theory applies ([Peecher and Solomon, 2001](#)).

The power of lab experiments is that researchers can stay as close as possible to the theory because they control the experimental task and they manipulate the independent variables. The focus of lab experiments is more towards getting the manipulation right compared to field experiments. It is a common mistake to expect lab experiments to be as realistic as possible. However, that is not the goal of such a study. The goal of such a study is to assess whether a theory holds or not. Further generalisation should follow from the theory ([Peecher and Solomon, 2001](#)).

## 3.2 Lecture 7: Disentangling the knot of simultaneous decisions

### Correlations and difference in averages

In this lecture, we deal with some difficulties that arise in assessing the statistical results of a study. Most analyses we encounter, such as OLS regressions, logit regressions or Analyses of Variance, report an average effect for the whole dataset. For instance, they will report how strong the correlation or association between the use of franchising and the diversity of markets in a chain is. They might also report the average difference between two groups. For instance, the difference in market diversity between chains that use franchising and firms that do not use franchising (see workshop 3 - [Campbell et al. \(2009\)](#)).

However, as we will see further, these average effects are not enough to conclude that market diversity is causing the use of franchising. Maybe franchising and market diversity are related to each other for another reason.

[A blogpost by Noah Smith \(@noahpinion\)](#) explains three potential problems with studies with this type of observational data (as opposed to experimental data).

The first is reverse causality. There's a correlation between roosters crowing and the sunrise, but that doesn't mean roosters summon the sun. ... The second danger is omitted variables. These are things

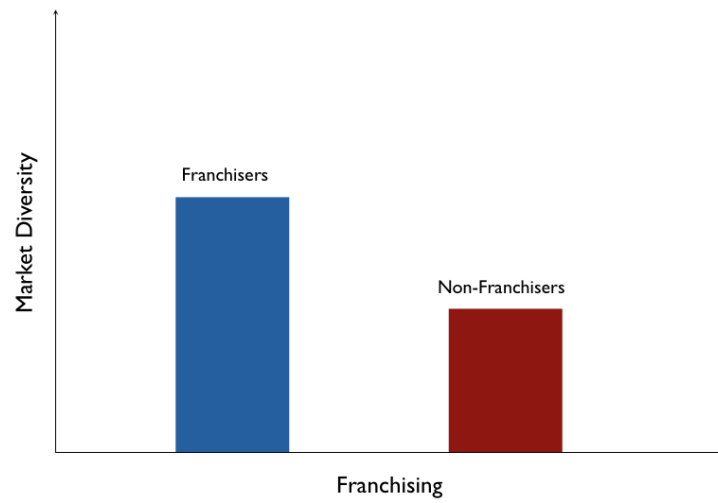


Figure 3.2: Average difference

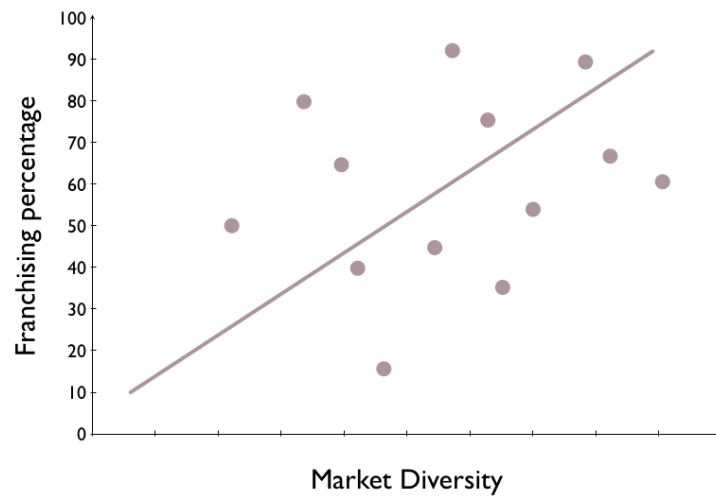


Figure 3.3: Average correlation

that cause both X and Y separately, but which the person doing the study didn't think about. ... Another big problem that plagues studies like this is selection bias. This is when your sample is not chosen randomly. ...

Noah explains the problems in the context of a study that looks at the relation between your love life pre-marriage and the success of your marriage. The problems are probably more intuitive in this context than in the setting that we are looking at in this unit. So, you should definitely read his blog post.

Noah also voices the main reason I want you to be aware of these type of problems.

Gosh, am I tired of the pop-sociology and pop-psychology studies popping up in my news feed. Almost every one of these has severe limitations that get ignored in the hype.

## Simultaneous decisions

In a situation where firms take simultaneous decisions and we investigate the effect of one decision on the other, we run into statistical problems because the two decisions are not independent from each other. So, it is difficult to know whether the correlation we observe is due to choice 1 having an impact on the choice 2, whether the effect run in the opposite direction or whether both effects play a role.

We have encountered this problem with the franchising study ([Campbell et al., 2009](#)). The authors are interested in the organisational design choice of convenience store chains. More specific, they investigate the effect of the diversity in a chain's markets on the decision to franchise. However, aggressive expansion into more diverse markets is also easier for chains that have franchised stores. In other words, chains might be operating in more diverse markets because they have a policy of franchising. As a result, the diversity in markets is not randomly distributed to the convenience store chains but it is a deliberate choice by the chain.<sup>1</sup>

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<sup>1</sup>You can compare this to the following advice. "Do not go swimming on weekends. More people are attacked by sharks during the weekend." The problem with this advice is that people are not randomly assigned to days of the week to go swimming. More people go swimming in weekends and therefore they are also more likely to be attacked.

The problem of simultaneous decisions makes it difficult for researcher to establish whether franchising leads to more diversity, or more diversity leads to more franchising or whether both causal explanations are true. The problem is that with our standard tools, we can only estimate an association between franchising and diversity (if one increases so does the other, and vice versa). However, both the theory we want to test and the reverse causality explanation predict there will be a positive association between diversity and markets.

An example of simultaneous choices in your own life is the choice of which majors to choose. You can choose two majors at the same time. In the business school, we observe a correlation between the enrolments in the accounting and the finance major. However, it is harder to investigate why this is the case. Is it because students who want to do accounting feel they will benefit from also following a finance major. Is it the reverse effect? Is it both effects? Maybe there is even an omitted correlated variable; students who are interested in making a lot of money are more likely to choose finance and accounting. As you can see all the problems that were highlighted by Noah Smith will come back when we are confronted with a situation where firms (or students) can make simultaneous decisions.

## The problem

We ran into a similar problem when we discussed the decision to delegate decision rights and the decision to use good (i.e. sensitive and precise) financial performance measures in workshop 4 ([Moers, 2006](#)). The author explains that delegation will lead to more extensive use of financial measures but he wants to test whether the availability of good financial measures makes it easier to delegate decision rights. [Moers \(2006\)](#) investigates the latter relation; the effect of performance measurement on delegation of tasks. Again, the underlying problem is that the use of financial measures is not randomly distributed but a deliberate choice of the firms. The statistical problem is that we have two possible effects (from delegation on performance measurement and from performance measurement on delegation) but we can only observe one correlation between delegation and performance measurement.

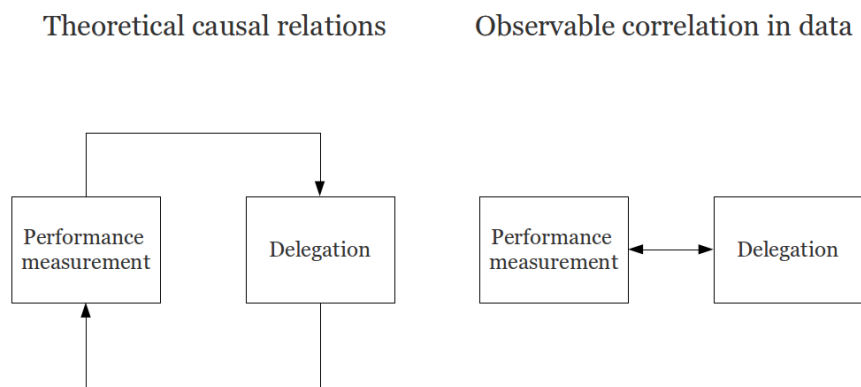


Figure 3.4: Simultaneous decisions - The problem

## The approach to a solution

The problem is shown in Figure 3.4. Theoretically, we expect two relations but in the data we can only observe the single correlation which captures both relations. We can try to solve the problem in two different ways which are both used in Moers (2006). Before, we go to the solutions it is good to think of the performance measurement variable as existing of two parts: (1) the extent of performance measurement that is *caused* by delegation and (2) the extent of performance measurement that is *not caused* by delegation. We can do the same for delegation where we theoretically distinguish delegation *caused* by performance measurement and delegation *not caused* by delegation. Remember that we can not directly measure the two parts of performance measurement or delegation (there is only one measure for performance measurement and one for delegation) but the distinction makes the two *theoretical* relations more explicit.

## Control variables

Because we are interested in the link from performance measurement to delegation (not delegation to PM), we try to control for the other explanation's influence on the correlation between performance measurement and delegation. This can be done by incorporating another variable that has an effect on that relation from *delegation (not PM)* to *performance measurement*. Benefits of delegation will theoretically only affect the amount of *delegation* and not *PM (not delegation)*. The more benefits there are to delegate decisions to business units, the more firms will delegate. Indirectly, this will have an impact on PM (only delegation) but only through the impact on Delegation.

We can test the following following regression:

$$Delegation = \beta_0 + \beta_1 Performance\ Measurement + \beta_2 Benefits + \epsilon$$

From this regression, we know that if the inclusion of Benefits makes the coefficient  $\beta_1$  smaller than the correlation between PM and Delegation, it is the result of a decrease in the influence of the link from Delegation (Not PM) to PM (Only delegation). Remember that Benefits can *theoretically* only affect the lower link in Figure 3.5 not the link from PM (delegation) to delegation (only PM). In conclusion, the influence of the link we are not interested in is smaller

in  $\beta_1$  than in the simple correlation. Thus,  $\beta_1$  is a better estimate of the strength of the effect that we are interested in.

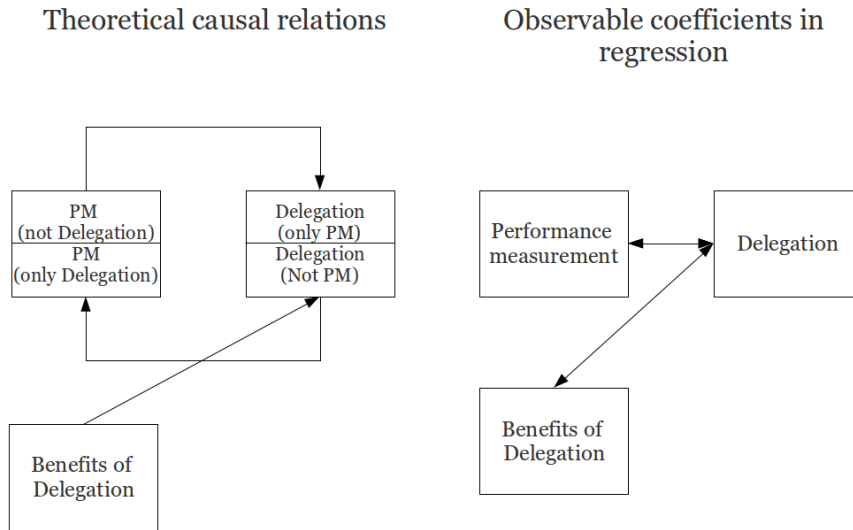


Figure 3.5: Simultaneous decisions - Solution 1

## Separating the direct and reverse effect

We can go one step further and try to separate PM (not delegation) from PM (only delegation). The article is not interested in PM (only delegation) so we try to get rid of this. This can be done by running first the regression  $PM = \gamma_0 + \gamma_1 Sales + \gamma_2 R\&D + \epsilon$ . The indicators Sales and R&D are a reflection of the functional background of the business unit manager. The idea behind this is that manager in sales are more likely to express their performance in financial terms and those in R&D are less likely to express performance in financial terms than other managers. The idea behind this regression is that in theory Sales and R&D only affect PM (not delegation) and not PM (delegation). This means that  $\gamma_0 + \gamma_1 Sales + \gamma_2 R\&D$  is an estimate of PM (not delegation) and is not related to PM (delegation). We can use this estimate as a new measure for PM (not delegation). In a second stage, we now run the earlier regression with this estimate for PM(not delegation) instead of PM. As such we effectively



distinguish between PM delegation and PM (not delegation). As such, the new coefficient  $\beta_1$  is an even better estimate of the relation we are interested in.

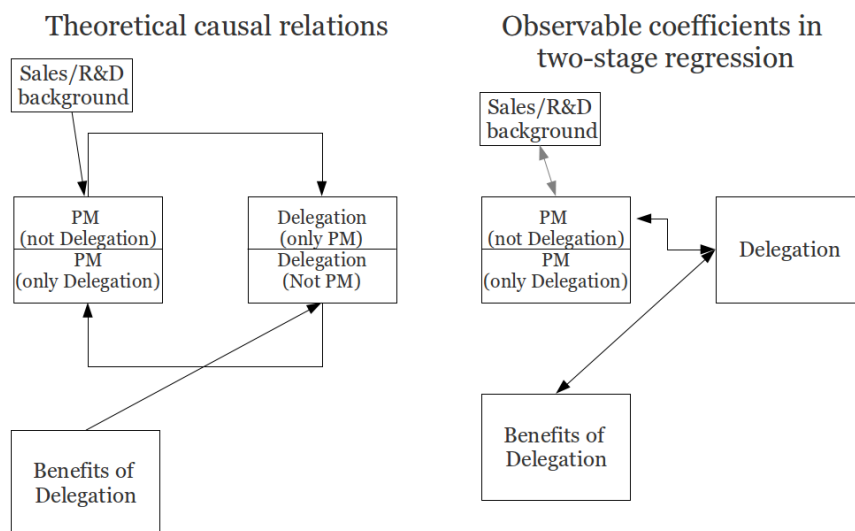


Figure 3.6: Simultaneous decisions - Solution 2

The statistical techniques behind these solutions is of course far more complicated than portrayed in this summary. Sufficient additional tests have to be performed to assure that all the assumptions are warranted.

In the example of the effect of accounting enrolments on finance enrolments, there are a couple of potential variables that could be used in the first stage regression (i.e. they play the role of sales and R&D). For instance, if the Institute of Chartered Accountants increases the value of its membership through internships, we would expect an uptick in the accounting major enrolments. We would not expect any change in the finance major except if the additional accounting students also choose for the finance major. This increase of enrolments in the finance major would be the measure of the effect of accounting enrolments on finance enrolments.

## **The problem with studying performance or efficiency**

The problem in both the franchising and the performance measurement study is that the independent variable (market diversity or use of good financial measures) is not randomly assigned to chains or business units. The firms are deliberately choosing to go into diverse markets if they have franchised stores and business units choose to use financial measures if they delegate more. This problem of self-selection into the independent variable is something that is always a problem when the dependent variable is efficiency, profit or any other performance metric. Firms, business units, people will choose the incentive system, organisational design or, the work method that works best for them, i.e. that yields the highest pay-off. Therefore a direct comparison of the effect of performance on two different incentives system with non-experimental data is problematic if researchers compare the performance of firms with incentive system 1 to the performance of firms with incentive system 2. If firms have chosen the incentive system that fits their circumstances the best, we would expect that all firms have high performance. Moreover, if firms have different incentive systems they are very likely to operate in different circumstances. So if we are comparing the performance between the two groups and we find a difference, we do not know whether this difference in performance is caused by the different incentive system or by the difference circumstances.

# Chapter 4

## Institutional theory

### 4.1 Lecture 8: Institutional theory: When the players set the rules

#### Economic theory and institutional theory

Institutional theorists start from the observation that a lot of organisations have a very similar hierarchical structure. There is one CEO on top, with top managers. There is division of labor in different business unit based on products or geography. Furthermore, a lot of these similarities are related to norms and expectations of professionalism, and the use of bureaucratic systems. One explanation for this observation is that for-profit firms feel a pressure from capital markets to adapt the structure, compensation practices, and information systems to the economic environment. 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, it 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. Thus, 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. In times of uncertainty, and unpredictability, humans and organisations have a tendency to look for stability and structure. One form of stability is introducing a formal hierarchy with clear role descriptions for every individual and organisation in the field. A bureaucratic system of communication is installed that determines how and with who to communicate in a firm. The bureaucratic rules also determine how the role descriptions and hierarchy can be changed. As a result permanent structures arise which can be organisations (for-profit and not for-profit, financial 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.

## **Institutions shape the environment**

These institutions can become very influential. Instead of adapting to their environment they change their environment. Institutions can take decisions that influence a large number of other players. 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 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 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 and individuals have to conform to the powerful institution. Economic efficiency will only be a secondary consideration (but still important!) because survival primarily depends on the powerful institution.

Another role of institutions is to set the example. For instance, [the balanced scorecard](#) was initiated by Harvard scholars (an institution). One factor in the success of the balanced scorecard is the fame of Harvard. Firms will be more willing to adopt a new strategic performance measurement system if it is backed by a well known institution. Similarly government agencies start to see business practices as examples to run the agency, i.e. government agencies are pressured to take use the methods and structure of private companies. By copying or learning from each other, 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 and education institutions 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. This might lead to limited diversity between the professionals in the field.

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.

## **4.2 Workshop 7: Outsourcing of hospital services: A tale of two theories.**

The next study investigates which factors drive outsourcing of services in the US hospital sectors ([Balakrishnan et al., 2010](#)). Transaction cost economics is one theory that can explain the outsourcing decision because it is basically the decision between a market transactions (outsourcing) and an organisational structure (in-house services). The current study shows that institutional factors drive different outsourcing differences between different type of ownerships in hospitals and between clinical and non-clinical services. The study can be found [here](#). The questions for the seminar are the following.

1. What is managed care?
2. Explain shortly the transaction cost argument and the institutional argument why outsourcing of non-clinical activities is easier than outsourcing of clinical activities.
3. Explain in your own words what the authors mean by "... our panel data raises concerns about heteroskedasticity and sample dependence ...".

### 4.3 Workshop 8: Twelve year evolution of an Australian Hospital

The next paper traces back the evolution of the organisational structures and the accounting system of a hospital in Victoria from 1979 to 1991. The authors identify several institutional forces inside and outside the hospital that have an impact on who these changes are implemented. The authors also point out that not all of the changes are purely driven by these institutional forces but some of the choices are deliberate decisions by some of the managers. The long term perspective in this study complements the Bol and Moers (2010) paper in that it also investigates how new and better organisational structures and accounting systems are developed. You can download the paper [here](#). The questions for this seminar are the following.

1. What are the important changes that the hospital went through?
2. What are the most important institutional pressures that helped or hindered the changes?

# Chapter 5

## Internal labour markets

Lecture 4 and 5 on incentive contracts explain how performance measures and rewards can be used to motivate employees. The focus of these lectures is on the characteristics of the performance measures, i.e. sensitivity, precision, and congruence. All things being equal, better measures allow firms to offer contracts with more incentives than worse measures. A sales person whose sales numbers are informative about his effort is more likely to work on commission. A CEO is more likely to be paid in stock when the stock price reflects their decisions. A business unit managers will have a higher bonus to salary ratio when the profit of the business unit is informative about their decisions. These example illustrate that most rank-and-file employees are not necessarily motivated through the typical incentive contracts. Instead, firms use promotions as rewards and subjective evaluations by supervisors as performance measures. The insights about performance measures from lecture 4 and 5 still hold but there are also specific problems and advantages with promotions and subjective evaluations. These are the subject of the two lectures in this chapter.

### 5.1 Lecture 9: Promotions: Competition within the firm

Besides direct incentives from a bonus contract, employees are also motivated by the opportunity to get a promotion. The role of promotions is not yet extensively studied but a couple of insights can be derived from the existing research. It has been clear that promotions serve multiple roles. This lecture discusses

two different roles of promotions. First of all, because employees who are promoted have been working in the firm for a while a firm will have more knowledge about the employee than about an external hire and the employee will have more knowledge about the firm. Second, a promotion is often desirable and employees will be motivated to get the prize of a promotion, i.e. the promotion is the reward in an implicit incentive contract.

## Discovering the ability of employees

The first function of promotions is 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 firm, 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.

[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. 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 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.

## Tournament incentives

Another role of promotions is to provide incentives. Employees might perform better if they know that their work will be rewarded with a promotion. Promotion based incentives are studied in tournament theory. The idea is that a



promotion scheme is similar 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. By filtering out the common uncertainty, the tournament creates an incentive system that is less noisy than a pure bonus based incentive system. Because promotions are based on the relative performance of an employee, they implicitly use peer performance as a performance measure. This is a performance measure that is similar to the weather signal in the [Frederickson and Waller \(2005\)](#) paper in workshop 5.

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 is less sure 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. As a result, 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. 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.

## **Mutual beneficial knowledge**

The results of [Baker et al. \(1994\)](#) also show that the promotion decisions are not structured as a loose collection of market interactions but they fit better in a hierarchical organisation. The results indicate that the hierarchy and the type of promotions are quite stable over time and only a subset of the employees has a reasonable chance of competing for the promotion. In a true market, there are no restrictions on entering the market. This condition seems not to apply to promotions in firms. One advantage of a stable structure is that it makes it easier for employees to know what the reward (i.e. the promotion) is and how

hard they need to work to get the promotion.

Another reason for the advantage of a hierarchical organisation is that the firm and employees are mutually dependent on each other. We already explained that firms have more knowledge about their employees than competing firms and therefore they are willing to pay more to their employees than a competing firm would. Similarly, employees have more information on how to work within the firm than outsiders. [Baker et al. \(1994\)](#) report that new hires compensate for their limited specific knowledge by having more general knowledge through education and experience in the industry. So incumbents have special information that they can only use in the firm they are working for. The firm they are working for is the only one willing to pay a higher compensation for their knowledge. 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. 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 another company. As such, it is one of the drivers of a fixed hierarchical structure instead of a loosely based market competition between employees and outsiders.

## 5.2 Workshop 9: Tournaments and performance decreasing feedback

The next workshop paper is an experimental study that studies the different effect relative feedback (information on how well an employee does compared to others) when employees are motivated by a tournament scheme or a bonus contract. The study provides a nice illustration of advantages and disadvantages of tournaments. As seen in the lecture, tournaments are a good model for promotion decisions. You can find the paper [here](#).

The questions to be answered are the following:

1. Explain in your own words – a couple of sentences – the experimental task. What does the following quote on page 910 mean?

“First, recall that the table provided to the participants con-

tained 11 dominated choices. Because the expected value of a dominated choice is clearly lower than an alternative choice, selection of a dominated choice is evidence of an ineffective task strategy."The next seminar paper is an experimental study that studies the different effect relative feedback (information on how well an employee does compared to others) when employees are motivated by a tournament scheme or a bonus contract. The study provides a nice illustration of advantages and disadvantages of tournaments."

2. What are the potential negative effects of tournament schemes? What effect plays a role in the experiment?
3. The authors find that more fine feedback reduces the average performance under a tournament scheme. However, firms often use benchmarking information. How can we combine these two facts?

## **5.3 Lecture 10: Subjective evaluation of employees**

### **The reason for and the problem with subjective evaluation**

The implicit assumption in previous lectures has been that the performance measures in the employee contracts are objective and can be verified by a third party. However, the decision to grant an employee a bonus or promote an employee often has a subjective component. Supervisors want to take into account less objective aspects such as their perceptions of the employees performance and the employee's attitude or their collaboration with co-workers. The supervisor might also feel the need to take into account -what they perceive as- the long-term performance of a business unit and not only the profit and other objective measures. The advantage of subjective evaluations is that they can be more congruent with the interest of the firm.

The problem with these 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, he can always understate the performance of the employee. The supervisor might even have an incentive to understate the performance of the employee, if the bonus or the higher salary is paid from the supervisor's budget. Nevertheless, in the long run the supervisor

might be motivated to establish a reputation for being a fair assessor. If he establishes such a reputation, his employees are motivated to work hard because they know if they perform well they will earn a bonus or a promotion. On the other hand, if he does not have such reputation, employees have no incentive to work hard because their performance will not affect the likelihood of earning a bonus or a promotion ([Prendergast, 1999](#)).

One reason why firms have a stable structure with clear career paths as seen in the previous lecture is to make it easier for employees to know what their promotion chances are. If they see that their predecessors got fairly evaluated and received a promotion, they are more likely to be motivated and work hard to receive a promotion. Most firms will also have a policy with formal rules on how promotion decisions should be made. These formal rules will help supervisors to establish a reputation.

This theory of subjective measures is not only applicable to soft measures or subjective judgements but it can also apply to measures of profitability. If the bonus for a movie star is 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 in the short run to underestimate the profitability of the movie but this might backfire in negotiation with other actors and actresses for new movies. 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 profit calculations and they will only accept incentive contracts based on gross revenues. The revenues can be verified by comparing them to independent measures of box office numbers. While profit is a more congruent measure from the studio's point of view, they cannot fully use it in contracts because actors fear that the studios will not fairly calculate the profit.

## **Other experiences with subjective measures**

Other potential problems 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. Employees can influence their supervisor's judgement without actually improving their performance.

Subjective measures are also influenced by psychological biases. Supervisors sometimes put a higher weight on information that is externally generated, e.g. by customers, than internally generated information, e.g. by the own employees. Most evaluators favour financial information over non-financial information and objective, quantifiable measures over subjective, qualitative judgements. Furthermore, research shows that measures with a performance target are easier to interpret than measures without a target.

Ittner et al. (2003) present data on these biases from a financial service provider with a balanced scorecard. The scorecard has six dimensions. Based on a number of measures the supervisors of this firm have to assess the performance of local bank managers on the six dimensions. The supervisors 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 but other dimensions are based on internally generated information. Some measures in the scorecard are objective and quantifiable while other information is subjective and 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 some of the variation in the judgements of the supervisors.

## **5.4 Workshop 10: Promotions to reward management skills in a fast food chain**

This workshop studies a fast food chain with a similar structure as the convenience chains in Campbell et al. (2009). The author of the current study looks into the factors that determine whether a restaurant manager gets a promotion or not (Campbell, 2008). The author shows how headquarters and regional supervisors combine objective information on profitability, costs, and non-financial information in general information about the restaurant manager. You can find the paper [here](#).

The questions for this seminar are the following:

1. The promotion system is not a pure market with multiple tournaments but there is a need for an organisational structure (see also p. 299). Explain why he thinks this is the case?
2. Explain the difference between learning effects of promotion incentives and effort effects of promotion incentives?
3. Give some examples of why this is an interesting dataset for studying research questions on promotion decisions?

# Chapter 6

## Emerging themes in performance evaluation

### 6.1 Lecture 11a: Incentives and sorting

So far, we have always assumed that organisations use incentive contracts to motivate employees to work harder or take decisions in the interest of the firm. In addition to motivating employees, incentives also play an important role in attracting certain types of employees. This so called sorting effect is the first one of the special topics in this lecture ([Bloom and Van Reenen, 2011](#); [Lazear et al., 2007](#)).

The idea of sorting is that when a firm puts more weight on the bonus than on the fixed salary they are going to attract different employees than when they put more weight on the salary. Most of the research has focused on the introduction of piece-rate systems in firms that used no incentive system before. The researchers found that after the introduction the productivity of the workers goes up. Half of this improvement can be explained by workers working harder and half of it can be explained by a change in the type of workers. Employees that are not willing to work hard tend to leave the company while more able and motivated employees take their place. These employees are willing to work under an incentive system because they know that they can earn a high bonus while workers that are not capable or motivated enough are less likely to earn a decent bonus. Others have shown that capable and motivated workers are more likely to work for firms with a bonus system when the bonus system uses

measures with little noise and high sensitivity. When the bonus system is more effective (less risk for the employee), the system not only motivates employees but it also attracts the right employees ([Lazear et al., 2007](#)).

The sorting and retention of employees has also been investigated with firm wide stock (option) plans. Since lower level employees have relatively little influence on the stock market performance of the firm, stock compensation looks like a rather low quality performance system. However, employees who are willing to work under a stock compensation system expect that the stock price of the firm will increase over time, i.e. they are optimistic about the future of the company. These optimistic employees are likely to be more motivated to work for this firm. Their good feeling about the firm translates in good work attitude.

Incentives plans can also have unintended or unwanted selection effects. Since bonus contracts are inherently more risky for the employees than flat salaries, incentives systems can also attract risk seekers over risk averse employees. This is not necessarily unwanted from the firm's point of view however there might be a point where firms are attracting too many risk seekers. Similarly, firms might not necessarily attract more capable workers but they might attract employees who think of themselves as capable. Workers who overestimate their own skills are willing to work under an incentive system because they (unrealistically) think they are able to gain a large bonus. A follow-up study on the creativity study from [Kachelmeier et al. \(2008b\)](#) showed that participants who chose to work under a creativity incentive scheme overestimate their own creativity [Kachelmeier and Williamson \(2010\)](#).

In addition, incentive systems also attract people who are mainly motivated by the bonus and not necessary by intrinsic motivation for the job itself. Whether this is a problem are not will largely depend on the importance of intrinsic motivation and the quality of the incentive system. Some people have argued that this problem might be compounded by the signals that are given by an incentive system. When a firm uses an incentive system, they are telling employees that they believe that intrinsic motivation is not enough to do well on the job or that they do not trust the employee to work hard enough. When employees believe this signal they might reciprocate these feelings. Employees might believe that the job is boring and distrust their employer. Experiments that investigate these theories indicate that this is mainly a problem for penalties and restrictive control system but not for rewards [Christ et al. \(2012b,a\)](#).



## 6.2 Lecture 11b: Group and team incentives

The second part of the special topics focuses on the use of group and team incentives. So far, these notes focused mainly on individual incentive schemes but firms often use profit or gain sharing agreements to motivate a whole business or functional unit. The obvious problem with group incentives (and group work) is the free-rider risk. Individuals in the group can profit from the work of others and may not have the right incentive to do their share. There is however evidence that firms can circumvent the free-rider problem.

There is relatively little known about team incentives compared to incentives for individuals. One of the problems with looking at group incentives is that when firms change to a group incentive they often also change towards an organisational structure where team work is more important. This is a repetition of a common theme in this unit that the incentive system is intrinsically related to the organisational structure of the firm. This makes it difficult to distinguish between the benefits of working in teams and the benefits of team incentives. The rest of this section presents a couple of ways how team work and team incentives have been shown to improve firm performance.

By working in teams, workers observe how their peers are performing. That means that they receive relative performance feedback. As we have seen before in the (Hannan *et al.*, 2008) study, when employees compare themselves with peers they are more motivated to work harder. This effect of team work is similar to students who go to the library to study for the exams. In the library, they can see that others are working and therefore they are less likely to procrastinate. There is some evidence that when employees are also rewarded for good performance, workers are more motivated to exert social control over other employees. The more productive workers are motivated to encourage the other workers and employees unwilling to improve feel more pressure to leave.

One rather surprising finding is that at least in some settings, the most productive workers are the ones that are most enthusiastic about team work and team incentives. The explanation for this finding is not entirely clear. The most productive workers have most to lose from team incentives. Their excellent performance may be diluted by worse performance of other team members. One potential explanation is that the most productive workers are inherently more cooperative (Bloom and Van Reenen, 2011).

A consequence of enthusiastic, highly productive employees is that they can

share their knowledge, skills, and motivation with other team members. One of the advantages of team incentives is that highly productive employees are more willing to help less productive employees to do better. In that sense, team work increases learning from peers. In addition, the biggest positive effect from team work are in diverse teams. In diverse teams, all team members can teach something to the others and the team as a whole has more skills.

### **6.3 Workshop 11: Can incentives improve group creativity?**

This paper ties some of the previous concepts together. We are looking at the development of a creative solution in teams. The paper in the first workshop showed that creativity incentives for individuals do not seem to work ([Kachelmeier et al., 2008b](#)). In the current paper, teams are either working under a group incentive scheme or an individual incentive scheme ([Chen et al., 2012](#)). The incentive scheme can be a tournament or a piece-rate reward. You can find the paper [here](#). The questions for this week are:

1. Which behaviour of the participants improves the group solution and which behaviour has no effect on the group solution?
2. Give a number of other tasks instead of creative tasks, that could benefit from the best incentive system in the study.
3. How can I, as a teacher of this unit, implement the best incentive system as determined by this study?
4. Based on the results of this study, how can firms improve the creativity of team work without using an incentive system?

### **6.4 Lecture 12: The visual effects of using a balanced scorecard**

This lecture deals with the balanced scorecard and how firms can use the balanced scorecard to evaluate the performance of managers or divisions. In the

lecture and the workshop on subjective evaluation, we established how firms can use objective measures and combine them into a subjective overall assessment. Firms might use the measures but how they combine the measures will depend on the subjective opinion of the evaluators. One way to organise different measures is a balanced scorecard. Implicitly, we have already seen a similar performance measurement technique in [Bol and Moers \(2010\)](#), where banks organised the performance measure in a customers, employee, and financial stability dimension.

The current lecture focuses on one specific aspect of a balanced scorecard, i.e. the organisation of measures in groups or dimensions. I discuss two articles that propose two different effects of the grouping of measures. [Lipe and Salterio \(2002\)](#) argue evaluators will put less weight on similar measures that are grouped together in one dimension. [Cardinaels and van Veen-Dirks \(2010\)](#) on the other hand explain that balanced scorecards make it easier to identify financial measures and will increase the weight users give to financial measures. This latter study explains the findings of [Lipe and Salterio \(2002\)](#) with a bias on financial measures. In a follow-up experiment, the authors show that they can debias the decisions of users by adding indicators (+, =, or -) next to the measures which makes the balanced scorecard easier to interpret.

[Lipe and Salterio \(2002\)](#) predict that when measures are grouped together in a dimension and they contain similar information, balanced scorecard users might perceive the measures as overlapping and therefore they put less weight on these individual measures. To assess this effect, the authors develop an experiment where they compare the decision of participants when they get 20 measures grouped in a balanced scorecard versus when they get the same 20 measures in an unstructured list. The authors give each participant two business units to evaluate on scale from 0 to 100 (very poor - excellent). The blue unit performs remarkably above target on the customer measures while the green unit performs remarkably below target on the customer measures. The authors predict that the participants will rate the performance of the blue unit lower with a balanced scorecard than without the balanced scorecard. On the other hand they will rate the performance of the green unit higher with the balanced scorecard than without the balanced scorecard. The reason is the same in both cases. Because the balanced scorecard groups all the customer measures together, evaluators will put less weight on these measures if they all indicate the same performance. The prediction of [Lipe and Salterio \(2002\)](#) is that evaluators' judgements are less extreme with the balanced scorecard.

The results of the experiment in Figure 1 follow this prediction quite close.

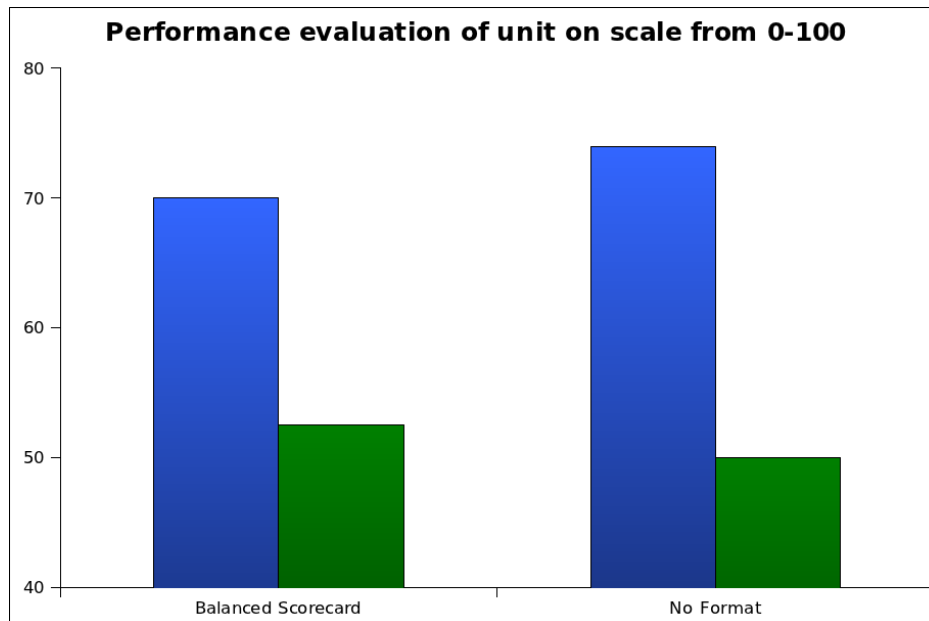


Figure 6.1: Lipe and Salterio

With a balanced scorecard, the participants evaluate the blue unit worse and the green unit better than without a balanced scorecard. However, [Cardinaels and van Veen-Dirks \(2010\)](#) have an alternative explanation for this result. They argue that the results are not driven by less weight on the customer dimension but by the tendency of people to focus on financial measures. If all the financial measures are grouped together in one dimension then you might expect that it is easier for evaluators to focus on the financial measures. The authors explain that in the [Lipe and Salterio \(2002\)](#) experiment the balanced scorecard increases the bias towards financials and participants to do not pay as much attention to the difference in customer measures.

[Cardinaels and van Veen-Dirks \(2010\)](#) test their theory explicitly by running their own experiment. They also construe their own performance measures for a blue unit that performs above target and a green unit that performs below target. They make four different conditions. In the first condition, the blue unit performs above target for the financial measures and the green unit performs below target for the financial measures. In the second condition, the blue unit performs above target for the customer dimension and the green unit performs below target for the customer dimension. In a similar vein, for the third and fourth condition, the difference between the blue and green unit is on the measures of respectively internal business processes and learning and growth. When

the difference in performance between blue and green is in the financial measures a balanced scorecard will direct the attention of users more towards the financials and it will increase the difference in performance rating between blue and green. In contrast to [Lipe and Salterio \(2002\)](#), the prediction is now that for financial measures the balanced scorecard will make the judgements of evaluators *more* extreme. [Cardinaels and van Veen-Dirks \(2010\)](#) predict that this effect will only play a role for the financials because the balanced scorecard direct the attention of users more towards financials. If the difference between blue and green is in the customer, internal processes or learning and growth dimension than the balanced scorecard will have no effect on the evaluation judgement.

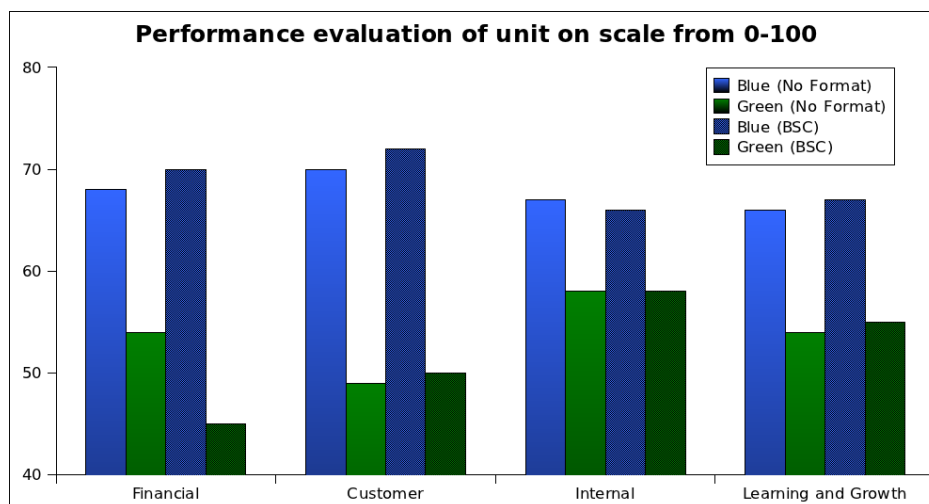


Figure 6.2: Cardinaels and van Veen (1)

The result of their experiment is presented in Figure 2. The figure shows that with a balanced scorecard (the dark columns), the performance evaluation becomes more extreme than without a balanced scorecard (the lighter columns) when the difference between blue and green is in the financial measures but not when the difference is in one of the other dimensions. The authors conclude that this result is quite problematic because it suggests that the balanced scorecard increases the bias towards financial measures while one of the goals of a balanced scorecard is to move away from evaluations based on financials only.

The authors provide a solution for this problem. They suggest to make the balanced scorecard easier to interpret. If balanced scorecard users can quickly make an overall assessment of the performance they will rely less on biases to make their decision. One way to make a balanced scorecard easier to interpret is to mark all the measures with + for above target performance, with = for on

target performance and with - for below target performance (in the assumption that above target is good). [Cardinaels and van Veen-Dirks \(2010\)](#) conducted a new experiment to test this prediction. The results of the experiment with balanced scorecard with marks is presented below.

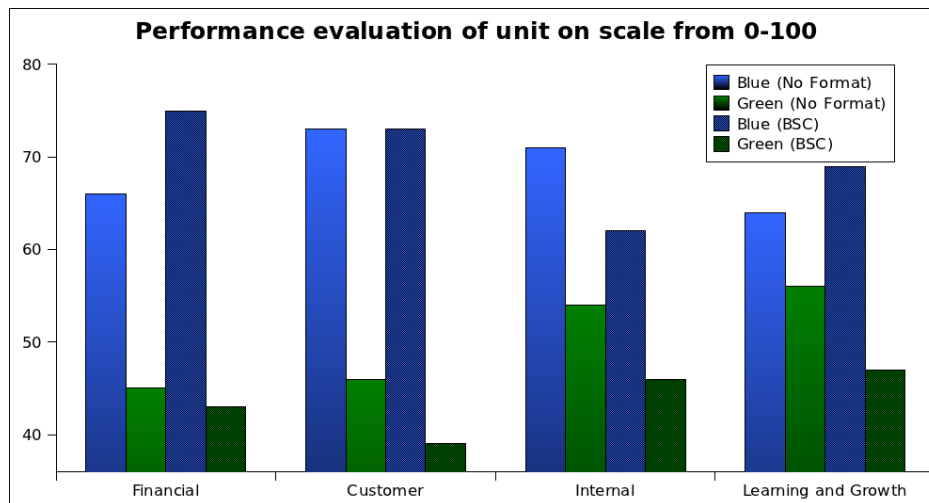


Figure 6.3: Cardinaels and van Veen (1)

The results show that the difference between blue and green becomes more extreme for three dimensions (Financial, Customer and Learning and Growth) with a balanced scorecard with markers. This result shows that the markers debias the focus on financial measures.

## 6.5 Workshop 12: Using a Balanced Scorecard to evaluate a firm strategy

The last workshop paper deals with another aspect of a balanced scorecard than the dimensions, i.e. causal links between measures. One core idea of the balanced scorecard is that improvements in customer measures and employee measures are causal predictors of improvement in the financial dimension. [Tayler \(2010\)](#) shows that these causal links can prevent decision makers from taking biased decisions. You can find the paper [here](#). The questions for this workshop are the following.

1. On page 1100, the author explains that some features of a balanced score-

card allow “motivated reasoning”. Which features of the balanced score-card encourage motivated reasoning in the experiment?

2. Give your thoughts on footnote 14.

# Chapter 7

## Example exam

### 7.1 Questions

1. Moers (2006) argues that it is costly to incorporate insensitive and noisy measures in a bonus contract for business unit managers. Explain why these contracts are more costly for the firm than contracts with sensitive and precise measures. (3 marks)
2. The Kachelmeier, Reichert, and Williamson (2008) paper deals with the characteristics of creativity measures. Of the three main measurement characteristics – sensitivity, precision, and congruence -, which characteristic(s) is (are) the focus of this paper. Shortly explain your answer. (3 marks)
3. The Kachelmeier et al. (2008) paper shows that creativity incentives do not work for individuals. The Chen, Williamson, and Zhou (2012) paper shows that creativity incentives for groups do work. Use the theory from Lecture 11 on group incentives to explain why group creativity incentives work in contrast to individual incentives in the Chen et al. (2012) experiment. (3 marks)
4. In Abernethy and Chua (1996), the new CEO's change the composition and the appointment procedure of the board of the hospital. Use institutional theory to explain why CEO's focused on the board. (2 mark)
5. In the Balakrishnan et al. (2010) paper, the authors argue that it is easier for hospitals to outsource non-clinical than clinical services. Use transaction



cost economics (not institutional theory) to explain why it is easier to outsource non-clinical services. (4 marks)

6. In this question, I want you to consider the reward system in this unit. Take into account that your grades are rescaled so that the average is around 70 %.
  - a. Explain to what extent the reward system for this unit reflects an individual reward system and a tournament system as defined in the article of Hannan, Krishnan and Newman (2008). (2 mark).
  - b. There are a couple of drawbacks associated with tournaments. Explain how the tournament aspect of the reward system for *this unit* can cause one of these drawbacks. (1 mark).
  - c. Assume that as a unit coordinator you will teach this unit for the next 20 years and that you have the liberty to change the system of rescaling the grades every year. How will you test whether the tournament aspect of the reward system causes the drawback you have identified in 6b? (2 marks).

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