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Organization

**How to incentivize your workforce: a theoretical and
empirical analysis**

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The question of how to incentivize employees is a highly debated topic in the economic literature. While multiple theories have been evolved in the past 40 years about how to incentivize employees, empirical research remains scarce and is often based on case studies or narrow segments in the workforce. In this thesis, foundations are formed of how to incentivize workforces in general, taking into account that objective performance measures are often not available. Proxies are chosen in order to identify if there is an empirical relationship between these foundations and the financial performance of firms in the whole of Europe. Although the conclusion of this thesis is that there is no significant relationship between the foundations to incentivize workforces and the financial performance of firms in Europe, this thesis forms a basis of how empirical research can be done in order to exploit how to incentivize workforces in general.

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1. Introduction

For a long time in economics, firms have been seen as a black box. Labor and physical input have been placed in the one end and output has come at the other at minimum cost and maximal profit (Gibbons, 2000). It is only since the 1970s that the interest of the economist has been focused on the internal organization of firms. This began with the principal agency theory. In the view of Gibbons (2000), the principal-agent theory should address questions such as what should be paid for and how. These questions have received substantial attention in recent literature.

Although the theory of the principal-agent problem is well-developed, empirical research remains scarce (De Phillipis, 2015). Most already conducted empirical research is based on case studies. This is particularly because firm characteristics differ because of the environment in which they are operating, or activities that are carried out in a particular firm. All these different characteristics of firms ask for customized human resource management systems that are developed and tested in the firm itself. This basically means that, while there is a developed principal-agent theory, the real world is far too complex and dependent on characteristics of firms to apply it in general to different firms.

Nonetheless, the theory helps researchers to think about what in general are the main causes of human resource management incentivizing employees in the optimal manner aimed at the firm's best interest. Therefore, it is interesting to see the progress in the theory and how this has been developed from the beginning. The initial theoretical models were very specific and have been expanded to be more applicable to the real world. In the early developed theory, it was assumed that contracts between the principal and the agent could be contracted objectively. This would ensure that both the principal and agent would have a perfectly clear and optimized contract that could be enforced by court. By observing the real world, however, it became clear that such an objective contract was rare since in most jobs the actions of the agent were not objectively measurable. This is because the task description of a job is often subjective. Consequently, subjective performance evaluation could complement or substitute the old objective performance measures. However, a significant difference between objective and subjective performance measurement is that subjective performance evaluation cannot be contracted explicitly. This implies that an implicit contract is required to contract on the reward of the subjective performance appraisal. An implicit contract cannot be enforced by court, so the relationship between the principal and agent becomes more important. Multiple articles have focused on this issue and have come to the conclusion that long-term commitment, clear

communication and trust are the most important factors in successfully contracting implicitly. In this light, the theory suggests that subjective performance evaluation in combination with long-term relationships and clear communication between the principal and agent form the central basis of giving agents well-specified incentives (Bull, 1987; Prendergast, 1999; Baker et al, 1994; Chassang, 2010; Gibbons & Henderson, 2012).

While this theory was developed recently, most firms in Europe became reluctant to give employees a permanent contract. Examining the portion of European employees that had a permanent contract and temporary contract in the period 2001-2014 (as seen in Figure 1), indicates that a downward trend in employees that are offered a permanent contract exists. Furthermore, relatively more employees are offered a temporary contract (OECD, 2016). Given the recently developed theory that subjective performance evaluation in combination with long-term relationships and clear communication have become the central basis of giving the agent well-specified incentives, this could lead to less incentivized firms in Europe.

To measure the implications of this trend, it is vital to investigate whether subjective performance evaluation in combination with long-term employment and clear communication result in a better financial position for a firm. This leads to the following research question: in general, do firms that use subjective performance appraisal in combination with a long-term relationship and clear communication have a better financial position than firms that do not emphasize this?

To give a satisfying answer to this research question, the development of the principal-agent theory will firstly be explicated. Following this theory, two propositions will be formed. The first proposition is:

“In the absence of appropriate objective performance measures, using individual performance appraisal in combination with long-term hiring of employees will lead to a better financial position for a firm.”

The second proposition is:

“In the absence of objective performance measures, using subjective performance appraisal in combination with regular meetings between the evaluator and employee will lead to a better and sustainable financial economic position for a firm.”

The European company survey will be used in order to research the stated propositions. This is a survey that focusses on human resource practices in firms that operate in Europe.

This research is relevant because it could prove the value of long-term employment. When results indicate that the use of subjective performance evaluation in combination with long-term contracting has a positive effect on the financial position of a firm, firms should take this benefit into account by weighing the cost and benefits of giving employees a permanent contract. Furthermore, in this thesis, a unique dataset with sufficient observations of firms in the whole of Europe is used. This dataset provides the opportunity to determine different proxies used in previous literature that will make a contribution in this field of research. The observations were obtained in the year 2013 and are therefore not outdated.

The remainder of this thesis is organized as follows. In Section 2, the history of the principal-agent problem is described. By exemplifying the theory, it will become clear how it has developed and what researchers thought about developing it. Following the theory, the two propositions already mentioned in this introduction will be formed. In Section 3, the survey and the data will be described. Multiple proxies will be defined and clarified. In Section 4, the empirical strategy will be explained. Two models will be estimated in order to test the propositions. In addition, the causality problem will be discussed and methods will be developed to counter it. Section 5 provides the results of the regression analysis, while Section 6 discusses the results and drawbacks of the empirical research. Finally, Section 7 will provide a short summary and the conclusion of this thesis.

2. Theoretical framework

The principal-agent theory has become one of the most important theories developed in the world of business economics. Questions have been asked as to how this relation between the employer (principal) and employee (agent) should be established to obtain the highest productivity and, even more importantly, the highest performance. Although this question has received substantial attention with multiple articles being written on the subject, empirical research remains scarce. This is particularly the case because the performance of an agent is often difficult to measure objectively. The lack of a well-defined objective measure that can be used as proxy for performance makes it difficult to measure a causal relationship between performance pay and the effort of the agent. Therefore, the general conclusion of papers that have been written on this subject is that contracts between principal and agent are mostly incomplete, and that the principal-agent problem therefore is far more complicated in the real world than suggested by the developed theory (Holmstrom & Milgrom, 1991; Milkovich et al, 1991; Baker et al, 1994; Bushman et al, 1996). Different environments observed by the different firms complicate the research that is being done even more.

In most firms, employees are the engine to success. This implies that it is important to explore how to hire the best employees and how to motivate those selected to their optimal level. The objective of this thesis is to explore how firms can motivate employees in the most optimal manner. Because every firm is unique, specific characteristics of how these unique firms should motivate employees are neglected. Instead, the foundations of employee motivation are researched to form a general and optimal basis of how to establish an ideal relationship between the principal (firm) and agent (employee). Multiple articles have already focused on this subject. These articles vary from specific cases to generalized theories. In this section, firstly the history of the principal-agent theory will be described. Multiple researchers have developed models while others have improved these models with new insights. After describing the theoretical models, the empirical articles will be discussed. By analysing these articles, both propositions will be formed.

Hölmstrom (1979) was one of the first to model the principal-agent theory. In his model, the principal does not observe the actions of the agent and it is therefore necessary to create an explicit contract that rewards the agent through some sort of measure that is observable for everyone. The principal could monitor all the actions of the agent to overcome this asymmetrical information. However, this is often impossible or subject to high monitoring cost for the principal. In the model, it is assumed that the agent and principal optimize their own

income and utility and that the agent is risk averse. A risk premium is therefore imposed on the agent, which is dependent on the chosen performance measure. The less influence the agent has on this measure that determines his reward, the higher the risk for the agent. A performance measure that does not align well with the actions of the agent is called a noisy performance measure. Because of this noise, the agent must bear more risk and is either less motivated or needs more compensation to perform his actions. This model is obviously a simplified version of the actual relationship between the agent and principal, but it defines the basic principal-agent problem well.

Baker & George (1992) continue with the model of Hölmstrom (1979), but argue that many organizations lack a clearly defined objective of the principal. This makes it impossible to form an explicit contract, since it is a necessary condition that the principal and agent can contract on the objective of the principal that must be observable by everyone. Baker & George (1992) assume that there is no clearly defined objective measure available and that it therefore cannot be used in the contract. There is, however, an arbitrary contractible performance measure that depends on the effort of the agent and some random variation, $P(e, \eta)$, where additionally e are the actions of the agent and η is the state of the world. The principal uses this measure to make a linear incentive contract of the following form: agent payoff = $S + bP(e, \eta)$, where S is the fixed wage and b is the bonus pay rate for the arbitrary contractible performance measure. Furthermore, Baker & George (1992) assume that the agent is asymmetrically informed about the state over the world and has superior knowledge about the actions that optimize this. Besides this, neither the principal nor the agent knows η beforehand, but the realization of η is known after the contract is signed. Both the agent and the principal cannot renege on the contract. Finally, it is assumed that the marginal product of the agent is somehow affected by the performance measure and the value of the principal, $V(e, \eta)$. Hence, since effort depends on the performance measure, it is also a random variable. This implies that the principal does not know how the agent will optimize his actions and therefore does not know if the actions of the agent are optimal.

Baker et al (1994) elaborate further on the problem of inappropriate objective performance measures. Multiple examples are mentioned in the article in which the principal chooses an inappropriate performance measure that led to undesirable actions of the agent. In the article, subjective performance measures are evaluated, since they may complement or improve the objective performance measures. The idea of subjective performance measures is that workers are assessed on their actions by the principal themselves or another person that can better

evaluate the specific worker. Hence, these actions of the worker and the evaluation by the person responsible cannot be contracted explicitly, since an outsider (third party) cannot observe the agent's actions. Therefore, an implicit contract must replace the explicit contract. Because outsiders cannot judge an implicit contract, the principal could renege on this contract. As a result, trust between the worker and principal becomes more important. In addition, reputation effects for the firm on the labor market will constrain the firm to renege, since this could be a very costly action for the firm (Bull, 1987). To guarantee the reputation effect and the trust between the principal and agent, the implicit contract should be designed for the long term. It is too attractive in a single period for the principal to renege on the reward afterwards, and the agent who knows this will not put in effort. Consequently, in order to formalize the role of trust an infinitely repeated relationship is required. It is assumed that both principal and agent will employ a trigger strategy, essentially meaning that the relationship holds as long as the present value of the infinite contract is higher than the value of reneging the contract. Obviously, since the present value is infinite, the time period is infinite as well. Therefore, in an infinite time horizon, the extent to which principal and agent discount the present value is the crucial factor that determines if the contract will hold. This implies that the two parties cooperate until one of the parties discounts the present value at a too high rate.

Prendergast (1999) observed that most of the empirical research is done in the management and CEO field, since this data is often the most complete. Although this is interesting to investigate, most jobs are very different than those found in this field. Prendergast (1999) argues that most people do not work at those jobs, but instead are subjectively evaluated, where the firm determines how this evaluation is rewarded. Therefore, future research should be based on how subjective evaluation works in practice.

MacLeod (2003) models an optimal incentive contract which is based on individual performance evaluation. In this model, the beliefs about performance (signals) of agent and principal are seen as most important for the success of an implicit contract, in contrast to the previously named objective performance measures that were seen as signals. When the signals of the agent and principal are perfectly correlated, it is not difficult to optimize an implicit contract. Hence, this is the same as an explicit contract that is based on an objective performance measure that is perfectly correlated with the effort of the agent. An increase in the bias of beliefs leads to a decrease in the agent's effort and compensation. Since the beliefs of principal and agent should at least somehow align with each other when forming an efficient contract, it is important to research how this could be done in the most optimal manner.

Levin (2003) states that trust is the essential ingredient to many contracting relationships. Especially in complicated environments in which the contract cannot be specified *ex ante*, the relationship must be based on a good faith agreement. The problem is that disputes will arise when the beliefs of the principal and the agent about the agent's performance are biased. Levin (2003) suggests mediation as a potential solving mechanism. Mediators could create value by collecting objective information about the performance of the agent to decrease the gap between the beliefs. By using mediation in this kind of disputes, unnecessary conflicts between principal and agent can be avoided. It can even improve the relationship when there is a mutual understanding of why these beliefs about performance differed. Consequently, what the principal expects of the agent and what the agent thought the principal expected of him become clearer.

Supplemental to complicated environments, Manso (2011) wrote an interesting article about how to motivate agents in innovative environments, in which he makes a distinction between the actions of an agent in the form of exploration and exploitation. Exploration is defined as new and untested actions, while exploitation is defined as well-known actions. Obviously, in innovative environments, it is important that agents also undertake new untested actions, since there could be a high pay-off when this leads to new innovations. However, the agent who is uncertain about the success of this new action will not undertake such actions if they face the chance of being punished if this new action is not successful. Besides this, it can often take a long time to perceive the pay-off of exploration. Therefore, Manso (2011) argues that long-term commitment and trust between principal and agent is a necessary condition for a firm to motivate employees to explore new actions. Additionally, Acharya et al (2014), researched a newly adapted "wrongful discharge law" and the resulting influence on innovation. The wrongful discharge law was adopted in a majority of U.S. States and its purpose was to ensure that the termination of an employee occurs only due to a just cause. Good faith was one aspect of this law that has been seen as the most-far-reaching. There were multiple lawsuits in which firms, for example, threaten to fire an employee who invented a highly successful new product or service in order to reduce his bargaining position. In other words, these firms broke trust by renegeing on the implicit contract between principal and agent. By adopting this type of law, a court that values good faith and thereby enforces an employer to not fire an employee should enhance innovation. This is because the employee should be less afraid to be held up after an invention. As might be predicted, innovation grew significantly in firms that were bound by this law. This suggests that ensuring good faith between both the principal and agent is

extremely important for an innovative firm. Recall that objective performance measures become noisier when it is unclear if a new action leads to higher pay-off. This implies that objective performance measures are less desirable when firms would like to let their employees explore new actions and ensure good-faith. Subjective performance measures could instead be the solution by motivating employees to be innovative. When the principal subjectively evaluates if the agent has done a good job (which is independent of the pay-off of a new action), the employee faces less risk or unfairness. In short, although Prendergast (1999) states that all jobs are subjectively evaluated, Manso's (2011) model and the empirical research of Acharya et al (2014) indicate that good faith between principal and employer becomes even more important in innovative environments, which can be achieved by using subjective performance appraisal, long-term commitment and clear communication.

The theories that have been discussed and described above only indicate how employees can best be motivated. These theories make no direct link to a firm's financial performance. It is only suggested that better motivated employees will optimize the pay-off of the agent and principal. Taking into account that the principal's surplus should be firm performance, this will lead directly to a better financial performance. However, it could be the case that principals use their optimized payoffs for other matters. Fortunately, some prominent articles have tried to form a direct causal interference between employee practices and financial performance. For instance, Huselid (1995) investigated the influence of human resource practices on employee turnover, productivity and corporate financial performance. Following Huselid (1995), human resource practices could influence individual employee performance through their influence over skill and motivation, as well as through organizational structures that allow employees to improve their knowledge of how the job could be done in the most efficient manner. For this thesis, the motivation of the employees is of interest. Huselid (1995) creates a variable, "employee motivation", that captures formal performance appraisals and links these tightly to employee compensation, employee merit and promotion decisions. "Employee motivation" is significantly and positively related to productivity and corporate financial performance. These results thus indicate that motivating employees through performance appraisal is of high importance for the success of a firm. Lazear (2000) conducted research into performance pay in the form of piece rate bonuses and found that this new form of rewarding employees increased productivity by 44%. In addition, Lazear argues that firm performance must also be better, since the productivity increase outweighs the extra cost that the firm made by introducing the incentive system. These articles confirm the developed theory about the principal-agent

problem by providing evidence that better incentivized employees do indeed lead to better performance of both employees and firms. However, these articles are case studies. For this thesis, the foundations of the models will be used in order to apply the general theory to all firms.

Gibbons & Henderson (2012) have made a huge step in this field in the sense that they examined the broad reality of giving incentives to employees in a firm. They argue that, in most firms, it is required that both the employee and manager act in ways that cannot be fully specified ex ante or verified ex post. This implies that firms must rely on relational contracts to obtain a good understanding of what both will do (in other words, what beliefs the employee and manager will form). Gibbons & Henderson (2012) use the example of Nordstrom. For many years, this highly successful firm had an employee handbook of one sheet that said:

Welcome to Nordstrom

We are glad to have you with our company. Our number one goal is to provide outstanding customer service. Set both your personal and professional goals high. We have great confidence in your ability to achieve them.

Nordstrom rule #1: Use good judgement in all situations. There will be no additional rules.

Please feel free to ask you department manager, store manager, or division general manager any question at any time.

As this indicates, good judgement can be easily defined, but cannot be described ex ante or verified ex post. This example makes very clear that in every job the principal has expectations of the agent that can only be contracted implicitly.

Gibbons & Henderson (2012) discuss the literature about relational contracting and argue that this can be a source of sustainable competitive advantage. A reason why it could be a “sustainable” competitive advantage is that relational contracts slowly diffuse and so performance differences persist over time. In the literature, four explanations have been formed over why relational contracts slowly diffuse in general. The first theory is the perception problem: firms simply do not know that they are behind. The second theory is the inspiration problem: firms do know that they are behind but do not know what to do about it. The third theory is the motivation problem: firms know they are behind and know what to do but do not have the proper incentives to adopt the new practice. Finally, the fourth theory is the

implementation problem: Firms know they are behind, know what to do, desperately want to carry out the new practice, but cannot get it done in practice.

The focus of this thesis will be the implementation problem. Chassang (2010) states that cooperation can be hard to build and sustain and models a framework that considers how fear of miscoordination affects the sustainability of cooperation. This model differs from the models of Baker & George (1992) and Baker et al (1994) in the sense that discount rates are fixed and that the principal and agent can renege at the end of every period. It is assumed that both the agent and principal in every period can choose to cooperate or to exit. When the value of cooperating is higher than the value of breaking the relationship, logically both players will cooperate. Therefore, for the implicit contract to be maintained, both principal and agent must have cooperated in all previous periods. The principal and the agent individually get a noisy signal that is represented by the following function: $x_{i,t} = w_t + \sigma \varepsilon_{i,t}$, where w_t is the state of the world and $\varepsilon_{i,t}$ is a random independent variable. In a complete information game, $\sigma = 0$. In an incomplete information game, $\sigma > 0$. In the case of the incomplete information game, miscoordination can be apparent since $\varepsilon_{i,t}$ add noise to the signal that the agent or principal obtain. The more periods of cooperation, the more information about and knowledge of the game the principal and agent accumulate. It is plausible, that the more periods have taken place, the lower σ will become, leading to less miscoordination when cooperating in the long term. Taking into account that the future value of cooperation is higher than future value to exit every end of the period, the principal and agent will continue to add present value to their own income and utility function. This has two implications. Firstly, it stresses the importance of long-term commitment between the principal and agent in optimizing their own income and utility. Secondly, it indicates that long-term commitment improves the value of both the agent and principal and most importantly that this is persistent over time, since there is a learning process. This leads to the first proposition of this thesis:

Proposition 1: In the absence of appropriate objective performance measures, using individual performance appraisal in combination with long term hiring of employees will lead to a better financial position for a firm.

Gibbons & Henderson (2012) are among the first to introduce the clarity problem. Whereas in previously discussed models the credibility problem is examined (should one party believe another's promise), the clarity problem addresses the question of whether one party can understand another's promise. The credibility problem states that the reward or roles cannot be

verified ex post and the clarity problem states that the reward or roles cannot be fully articulated ex ante. As seen in the example of Nordstrom, the agent is expected to use good judgement but since individuals could have a different perception of how to make a good judgement this could lead to a misunderstanding between principal and agent. In this light, building a shared language will increase the understanding between what is expected of the agent and what they get paid for. It is thus important that the principal and agent communicate with each other every period, so that miscoordination ex ante will diminish as well. In the sense of the model of Levin (2003), improving communication will diminish the differences in beliefs. This leads to the second proposition of this thesis:

Proposition 2: In the absence of objective performance measures, using subjective performance appraisal in combination with regular meetings between the evaluator and employee will lead to a better and sustainable financial economic position for a firm.

3. Data description

To empirically test the propositions made in the previous section, the European Company Survey (ECS) will be used. The ECS is conducted by the European Foundation of the Improvement of Living and Working Conditions (Eurofound) – an autonomous agency of the European Union, funded by the general budget of the European Commission. Since 2004, the survey has been conducted every 4 years. In this paper, the last (third) survey will be used, which was carried out in the spring of 2013. This survey was mainly focused on human resource practices, employee participation and social dialogue and is conducted in 32 countries, of which 27 were EU member states. Questions were asked about the attitudes of managers and the employee representation with regard to some of these practices, as well as perspectives on work climate and trust relations at the workplace. Therefore, this dataset seems to be appropriate to use in answering the research question developed in the previous section.

Unfortunately, by using this dataset it will be difficult to obtain a causal interference between the independent and dependent variable because of two problems. Firstly, it will become challenging to form a causal interference between subjective performance appraisal in combination with long-term hiring or regular meetings and economic performance, since it is a survey of firms with different characteristics. Taking all these different characteristics into account, well-defined variables are required to control for these differences. However, it is impossible to control for every single firm characteristic that could influence the financial performance of that single firm. Therefore, the control variables will be chosen with care and it will be argued why these characteristics could have influence on the financial performance of firms. In this section, the control variables will be chosen and exemplified. Secondly, a method must be developed to exclude reversed causality. It could be possible that firms which enjoy a good financial economic position consider trying different things, such as long-term hiring in combination with subjective performance appraisal, only because it is going well in the firm. To find a satisfying answer to the research question, it is desirable that reversed causality is ruled out. This method will be developed in the next section after defining the simpler models that only estimate the correlation between the independent and dependent variables.

To test all the propositions, multiple proxies should be determined to measure the economic performance of the firm, the presence of subjective performance appraisal, the degree of long-term hiring and the degree of communication between the agent and principal in firms. Table 1 presents a summary of the statistics. The observations differ by certain variables because

respondents could also fill in “don’t know” or failed to fill in the answer at all. These observations are neglected in the regressions.

Dependent variable

To test the two propositions empirically, the dependent variable that measures the financial performance of a firm must be determined. Although it was also interesting to test productivity as a dependent variable, the lack of a well-defined proxy for overall productivity in the dataset makes it impossible to research this. There is, however, a well-defined proxy that measures the financial position of the firm. The proxy is subjectively measured by the respondents who had to answer the following question: how would you rate the financial positions of this establishment; very good, good, neither good or bad, bad, very bad. This variable is consequently rated on a 5-point scale (1 being very good, 2 being good, and so on). Table 1 shows that respondents were generally more positive than negative about the financial position of their establishment.

In the research field, subjective measurement is often described as undesirable. Multiple reasons have been given for this, including the difference in perception that respondents could have. A respondent that is overconfident, for example, will form a bias in the relationship between the dependent and independent variable. On the other hand, subjectively measuring the economic position of the firms also has an advantage with regards to this research. The firms in this dataset perform different activities in different markets, so it would be very difficult to compare their different financial positions objectively as different activities can lead to different objective financial firm performance.

Independent variables

To evaluate whether a firm uses subjective performance appraisal, two questions in the survey can be used. The first question is, “could you please tell me for each of these options, whether or not they are available to at least some employees?” One of these options was, “variable extra pay linked to the individual performance following management appraisal; yes or no”. This question is not well-defined because it does not measure the actual importance of subjective performance appraisal in the establishment. Hence, if only some employees in the organization receive individual performance appraisal, the respondent will answer this question with yes. The second question is, “approximately what percentage of employees have a performance appraisal or evaluation at least once a year?; none at all, less than 20%, 20% - 39%, 40% - 60%, 60% - 79%, 88% - 99%, all”. Consequently, this variable is rated on a 7-point scale (1 for none at all, 2 for less than 20%, and so on). This question defines more explicitly how important and

apparent subjective performance appraisal is within the establishment, since it measures how many employees are actually evaluated based on subjective performance appraisal. Therefore, the second question will be used as proxy for subjective performance appraisal. Observing the mean of subjective performance appraisal, most firms have many employees that are evaluated based on subjective performance appraisal. This suggests that most firms find it valuable to give incentives to their employees through this method.

To measure the degree of long-term hiring, a proxy must again be chosen. This proxy measures the degree of long-term hiring of the firm based on the proportion of employees that have an open-ended contract. The proportion of employees is determined by the following question: “could you tell me for this establishment the number of employees, who have an open-ended contract?; none at all, less than 20%, 20% - 39%, 40% - 60%, 60% - 79%, 88% - 99%, all”. This proxy gives a good indication of how many employees are hired in the long term. Again, this variable is based on a 7-point scale (1 for none at all, 2 for less than 20%, and so on). The mean of the long-term hiring variable implies that most employees of the establishments in this survey are offered a long-term contract.

To rate the degree of communication between employee and management, one proxy will again be selected. This proxy determines the degree of communication between the employee and immediate manager. Hence, following the theory, this immediate manager is often responsible for evaluating their employees. The respondents had to indicate if the following practices were used to involve employees in how work is organized. The practice that is used was defined as follows: “are there regular meetings between employees and immediate manager; yes, no”. A dummy variable is created and indicates if establishments have regular meetings between the immediate manager and the employee. As can be derived from Table 1, most firms do have regular meetings between the immediate manager and employees, since 81% of all establishments indicate that they have such meetings.

Control variables

As already mentioned in the beginning of this section, there is a selection problem. To test the pure relationship between dependent and independent variables, other influencing factors must be held constant. In order to achieve this, control variables will be added. Taking into account the fact that it is impossible to hold all factors constant that could influence the relationship between the independent and dependent variables, the control variables will be limited depending on their relevance. All control variables will be carefully chosen through grounded arguments.

The first control variable that could influence the financial position of the firm is the size of the firm. Size could influence the financial position of a firm because of increasing returns of scale. Furthermore, most firms that have more employees and are thus generally greater in size have a higher market share than smaller firms, which could again influence the financial position. The proxy that is used for the size of the firm is based on the number of employees in the firm. Respondents had to indicate on a 3-point scale how many employees worked for them. There were 3 categories: “10-49”, “50-249” and “250 or more”. When a firm had “10-49” employees this was rated as 1, “50-249” as 2 and “250 or more” as 3. As can be again derived from Table 1, most firms have 50-249 employees, since the mean is 1.66.

The second control variable that will be added is whether a firm is controlled by the public sector or private sector. Research in this area has proven that there is a difference in sorting between the private and public sector, which influence the financial position of an establishment. Furthermore, the public sector and private sector aspire to different goals. Therefore, this should be included to hold this factor constant. The proxy is a dummy variable that indicates whether the establishment is privately owned. Observing the mean in Table 1, it becomes clear that most firms in the survey are privately owned. Indeed, 91% of the firms in the dataset is privately owned.

The third control variable is the country in which the firm is operating. Depending on the country, different cultures or law systems can influence the financial position of a firm. Dummy variables for all countries are developed and indicate 1 if an establishment is in a particular country. These 32 dummies are included in the regression analysis, but are not presented in Table 1 or the regression analysis, since the details of the dummies are not informative.

The fourth control variable is the general level of education in a firm. Multiple studies have concluded that higher education in a firm generally leads to higher productivity, which could again influence the financial position of an establishment. This proxy precisely indicates the percentage of the employees in the firm that have acquired a university degree. This is rated on a 7-point scale, where none at all is indicated by 1, less than 20% by 2, and so on in the same manner as the proxies for subjective performance appraisal and long-term hiring. With a mean of 2.71, it can be concluded that 20% of the employees of the average firm have an university degree.

Finally, the fifth control variable is the gender of the respondent. Since the questions are based on the subjective evaluation of the respondent, gender could influence the answer to different

questions. For example, multiple articles have concluded that men are generally more confident than women. The proxy is measured by a dummy-variable that is indicating if the respondent is a woman. Table 1 shows that 57% of the respondents were female.

Correlations

In Table 2, the correlation between the incorporated variables is presented. As can be seen, there are no unexpected or troubling correlations. The existing correlations are not too high and so should not lead to difficulties in the regression analysis.

4. Empirical strategy

In order to test the two propositions, two models must be developed. In this section, these models will be individually exemplified. After explaining the models, the reversed causality problem will be discussed.

The first model

The first proposition will be empirically tested using this model. The proposition is defined as follows:

Proposition 1: In the absence of appropriate objective performance measures, using individual performance appraisal in combination with long term hiring of employees will lead to a better financial position for a firm.

The dependent variable will be the financial position of a particular firm. To determine the individual performance appraisal in combination with long-term hiring, an interaction term is created.

The following formula defines the estimation in the first model:

Financial position

$$\begin{aligned} &= \beta_0 + \beta_1(\text{longtermhiring}_i * \text{subjectiveperformanceappraisal}_i) \\ &+ \beta_2\text{long term hiring}_i + \beta_3\text{subjectiveperformanceappraisal}_i + \beta_4\text{size}_i \\ &+ \beta_5\text{privivasteestablishment}_i + \beta_6i.\text{country}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i \end{aligned}$$

Following proposition 1, $\beta_1 < 0$.

The second model

The second proposition will be empirically tested using this model. The proposition is defined as follows:

Proposition 2: In the absence of objective performance measures, using subjective performance appraisal in combination with regular meetings between the evaluator and employee will lead to a better financial economic position for a firm.

For the second model, the dependent variable is again the financial position of the firm. In addition, an interaction term is created to estimate the combination of regular meetings between the employee and immediate manager and subjective performance appraisal.

The following formula defines the estimations of the second model:

$$\begin{aligned}
& \text{financial position}_i \\
& = \beta_0 + \beta_1(\text{meetings}_i * \text{subjectiveperformanceappraisal}_i) + \beta_2\text{meetings}_i \\
& + \beta_3\text{subjectiveperformanceappraisal}_i + \beta_4\text{size}_i + \beta_5\text{privateestablishment}_i \\
& + \beta_6i.\text{country}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i
\end{aligned}$$

Following proposition 2, $\beta_1 < 0$.

The reversed causality problem

As already revealed in Section 3, the models that are developed in this section represent only the estimated correlations between the dependent and independent variables. Although this relationship is interesting, the purpose of this thesis is to research what the effect of subjective performance appraisal in combination with long-term hiring or regular meetings is on the economic financial position of a firm and not the other way around. In this paragraph, two methods will be developed that attempt to overcome the reverse causation problem.

Firstly, it should be recalled from the theoretical framework and the two propositions that it is only valuable to introduce subjective performance appraisal if appropriate objective performance measures are not available to evaluate the actions of the agent. Therefore, the independent variables should only cause a better financial position when there is a lack of useful objective performance measures. Following the research field, it becomes less desirable to reward the agent based on one performance measure when jobs become more multidimensional (Hölmstrom, 1991). Additionally, the more innovative an environment becomes, the more innovative the agent has to become in order for the firm to be successful and thus to be in a good financial position. To induce the agent to be innovative, long-term commitment, good faith and a well-defined understanding of what is expected of the agent become even more important (Manso, 2011; Acharya et al, 2014). Assuming that giving an open contract encourages long term commitment, subjective performance measures induce good faith over time and regular meetings lead to a better understanding of what is expected of the agent, the correlation between financial performance and these three proxies that are the foundations for an optimal contract between principal and agent should be stronger in innovative environments. This makes it interesting to empirically explore if the estimated correlations of the two models are more strongly correlated within firms that carry out activities that are innovative.

The survey distinguishes three different activities: “design or development of new products or services”, “production of goods or services” and “sales or marketing of goods or services”. Obviously, the establishment activity that has the most innovative characteristics is the design or development of new products or services. The other activities, such as sales or marketing,

are more directly measurable for the principal through, for example, the number of sales. They also require more routine actions of employees. Therefore, following the theory, subjective performance appraisal in combination with long-term contracts and regular meetings should cause an even better economic position if firms are carrying out the activity research and development of new products or services. Proving this will make it more plausible that it is indeed the subjective performance appraisal in combination with long-term contracts or regular meetings that causes a better financial position.

To test this, both models will again be estimated, but now in two subsamples. In the first subsample, only firms that carry out the design and development of new products or services are included. From now on, these firms will be called innovative firms. In the second subsample, only firms that do not carry out the design and development of new products or services are included.

Secondly, three 2SLS regressions will be conducted. Firstly, two instruments are determined: one for long term hiring and one for subjective performance appraisal.

From the models and theories discussed in the theoretical framework, it becomes clear that trust between the agent and principal is one of the most important conditions to build up a successful long-term relationship. Consequently, when there is more trust between both parties, more employees are hired in the long term, which should result in a better financial position for an establishment. In the questionnaire of the ECS (2013), there was a statement regarding trust in employee representation. The statement was, “the employee representation can be trusted; (1) strongly agree, (2) agree, (3) disagree, (4) strongly disagree”. This will be taken as proxy of how management trusts employees in general in their particular establishments. Although this proxy for trust is not perfect, it is the most convenient one that can be used to determine the trust level between management and employees. Trust will be the exogenous factor that influences the endogenous factor of long-term hiring. Long-term hiring (depending on the exogenous factor trust) will be influencing the financial position of the establishment. For trust to be a valid instrument, two conditions are necessary. Firstly, trust must be significantly correlated with long-term hiring. In Table 3, an OLS-regression is performed to verify if trust is indeed significantly correlated with long-term hiring. Examining the results in Table 3, it becomes clear that this is the case. Increasing the proxy for trust by one point, the long-term hiring proxy decreases significantly by approximately 0.4 points. This means that when trust becomes lower, fewer people are offered an open contract. This is exactly the correlation that was expected from the theory. Secondly, trust should not be correlated with the error term of

the model, essentially meaning that trust between management and employees must not be correlated with the financial position in any other way than via long-term employment. In this thesis, it is assumed that respondents are rational and have perfect knowledge. Therefore, respondents can perfectly verify if the employee representation can really be trusted without being influenced by the financial position of an establishment. Under this assumption, trust is a valid instrument for long-term hiring.

For subjective performance appraisal, another instrument is available. Recall from the theory that by using subjective performance appraisal, the implicit contract between principal and agent cannot be evaluated by a third party. Therefore, when an employee did not perform as was defined in the implicit contract, the principal should have the privilege to fire the agent. Taking this into account, it could be very harmful for the principal for the agent to be protected by a third party. The government could be that party by protecting employees through law. This kind of law enforcement exists in all countries in Europe. The OECD has developed indicators of how high employee protections are in particular countries in Europe (OECD, 2016). These indicators are based on the probationary period, notice of periods/procedural requirements, reasons for individual dismissals, consequences of unlawful dismissals and severance payments. In other words, these are all indicators that make it more difficult and costly to fire employees in general and most certainly without objective reasons. The higher the indicator, the higher employee protection is in a particular country. As already mentioned, this employee protection will make subjective performance appraisal less attractive for the principal when they must prove the rightful dismissal of the agent (more) objectively. Therefore, following the theory, it is expected that employee protection is negatively and significantly correlated with subjective performance appraisal. In Table 4, this relationship is tested with an OLS-regression. Examining Table 4, it becomes directly clear that there is a negative relationship between the degree of employment protection and the degree of subjective performance measurement. A one-point increase in the degree of employment protection leads to a decrease of approximately 0.1 points in the degree of subjective performance appraisal. The correlation is thus as expected. Furthermore, for employee protection to be a valid instrument, it should also be uncorrelated in any other way to the financial position of an establishment. This is more difficult to argue. It could be that, when there is financial distress, the financial position of a firm is influenced by high employee protection, since employees cannot easily be fired and high compensation rates must be given to dismissed employees. However, at the time that this survey was carried out (2013), there was no case of a general economic crisis in Europe. Therefore, in this thesis, it is

assumed that the financial position is generally not directly influenced by employee protection. Under this assumption, employee protection is a valid instrument.

In order to specify the IV approach, two additional models must be developed. Because both models contain an interaction term, the IV approach must be performed with care. Bun & Harrison (2014) mention three different approaches to do this. In this thesis, the most preferred approach, which is also theoretically confirmed in the article of Bun & Harrison (2014) as the best approach, will be used to do the instrumental variable regression. For the first proposition, the following formula estimates Model 3 for the instrumental approach:

$$\begin{aligned}
 \text{financial position}_i &= \beta_0 + \beta_1(\text{longtermhiring}_i * \text{subjectiveperformanceappraisal}_i) \\
 &+ \beta_2\text{longtermhiring}_i + \beta_3\text{subjperfapr}_i + \beta_4\text{size}_i + \beta_5\text{privateestablishment}_i \\
 &+ \beta_6i.\text{country}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i
 \end{aligned}$$

In the first case, trust is the instrumental variable for long-term hiring. Following the most preferred approach, there must be two instruments. One instrument is trust and the other is trust*subjective performance appraisal. The endogenous variables are long-term hiring and the interaction term (long term hiring*subjective performance appraisal).

The formula that estimates the 2SLS regression is the following:

$$\begin{aligned}
 \text{financial position}_i &= \beta_0 + \beta_1(\widehat{\text{longtermhiring}}_i * \widehat{\text{subjectiveperformanceappraisal}}_i) + \beta_2\widehat{\text{longtermhiring}}_i \\
 &+ \beta_3\widehat{\text{subjperfapr}}_i + \beta_4\text{size}_i + \beta_5\text{privateestablishment}_i + \beta_6i.\text{country}_i + \beta_7\text{education}_i \\
 &+ \beta_8\text{female}_i + \varepsilon_i
 \end{aligned}$$

Where the fitted values of the interaction term and long-term hiring are estimated in the first stages. This first stages are presented in Table 7. Following proposition 1, $\beta_1 < 0$.

In the second case, employee protection is the instrumental variable for subjective performance appraisal. In this case, there must also be two instruments. The first of these is employee protection and the second is employee protection*long term hiring. The endogenous variables are subjective performance appraisal and the interaction term (long term hiring*subjective performance appraisal). Since employee protection is already a characteristic for a country, the dummy variables that represent the country of the establishment are dropped out of the estimation. If this were not done, collinearity could cause a bias in this estimation. In Table 8, an OLS regression is presented where the country dummies are not included.

The formula that estimates the 2SLS regression is the following:

$$\begin{aligned}
& \text{financial position}_i \\
& = \beta_0 + \beta_1(\text{longtermhiring}_i * \widehat{\text{subjectiveperformanceappraisal}}_i) \\
& + \beta_3\widehat{\text{subjectiveperformanceappraisal}}_i + \beta_2\text{longtermhiring}_i + \beta_4\text{size}_i \\
& + \beta_5\text{privateestablishment}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i
\end{aligned}$$

The interaction term and subjective performance appraisal are the fitted values that are estimated by the two first stages of the 2SLS regression. These first stage regressions are displayed in Table 8. Following proposition 1, $\beta_1 < 0$.

For the second proposition, Model 4 is estimated using the following formula:

$$\begin{aligned}
& \text{financial position}_i \\
& = \beta_0 + \beta_1(\text{meetings}_i * \widehat{\text{subjectiveperformanceappraisal}}_i) \\
& + \beta_3\widehat{\text{subjectiveperformanceappraisal}}_i + \beta_2\text{meetings}_i + \beta_4\text{size}_i \\
& + \beta_5\text{privateestablishment}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i
\end{aligned}$$

In case of the second proposition, there is only an instrument for long-term hiring. This is done in exactly the same manner as described for Model 3. Long-term hiring and the interaction term that captures the combination of long-term hiring and meetings is instrumented by meetings*employee protection and employee protection. Again, the country dummies are not included for the reason previously highlighted. Once more, an OLS regression is done in which the country dummies are not included. This regression is presented in Table 9.

The 2SLS regression is estimated using the following formula:

$$\begin{aligned}
& \text{financial position}_i \\
& = \beta_0 + \beta_1(\text{meetings}_i * \widehat{\text{subjectiveperformanceappraisal}}_i) \\
& + \beta_3\widehat{\text{subjectiveperformanceappraisal}}_i + \beta_2\text{meetings}_i + \beta_4\text{size}_i \\
& + \beta_5\text{privateestablishment}_i + \beta_7\text{education}_i + \beta_8\text{female}_i + \varepsilon_i
\end{aligned}$$

The interaction term that captures the combination of meetings and subjective performance appraisal and subjective performance appraisal are again the fitted values of the two first stage OLS regressions that are presented in Table 9. Following proposition 2, $\beta_1 < 0$.

5. Results

The results in tables 5 and 6, that represent the first and the second models, are divided into four different OLS regressions. In the first regression, the interaction term is not included so that the correlations between the financial position of an establishment and the proxies individually can be determined. In the second regression, the interaction term is included, so that the correlation between the combinations of the proxies of interest and the financial position of an establishment can be explored. In the third regression, only innovative firms are incorporated to measure the correlations between the combination of proxies and the financial position of an establishment for innovative firms. In the fourth regression, only non-innovative firms are included to test the before named relationships for not-innovative firms.

The results of the first regression displayed in Table 5 show that long-term hiring and subjective performance appraisal are both negatively correlated with the degree that measures the financial position of an establishment. In the case of long-term hiring, this correlation is significant. To be precise, a one-point increase in the degree of long term hiring is related to a 0.03-point decrease of the degree that measures the financial position of an establishment. This implies that long-term hiring is positively associated with the financial position of an establishment, which was already expected following the theoretical framework. Subjective performance appraisal is not significantly correlated with the financial position of an establishment. Consequently, this result is not as was expected by following the theory.

The control variables are correlated to the financial position as expected. The number of employees is positively correlated with the financial position of a firm, which indicates increasing returns of scale and stability. Being a private company is positively correlated with the financial position of a firm. A higher proportion of educated people is positively correlated with a firm's financial position. Being a female is negatively correlated with the financial position, which could imply that females evaluate the financial position of a firm lower than man or that females are overrepresented in firms with a lower financial position.

Familiar results for subjective performance appraisal and long-term hiring individually emerge in the second regression where the interaction term is included. However, the interaction term that determines the degree of subjective performance appraisal in combination with the rate of long-term hiring is positively correlated with the degree of the financial position of an establishment. This indicates that when an establishment is more engaged in subjective performance appraisal and long-term hiring at the same time, this is associated with a worse financial position of such an establishment. This is in contradiction with Proposition 1.

Additionally, this result is not significant, meaning that Proposition 1 cannot be empirically confirmed.

The third and fourth regression analyses in Table 5 show the results for firms that carry out the activity research and development of new products or services, as well as for firms that do not carry out this activity. Comparing these two models, it can be concluded that the results are approximately the same. This suggests that it is not more important to invest in long term commitment and subjective performance appraisal for innovative firms. This is not what was expected from the theory. However, this result could confirm the statement of Prendergast (1999) that all jobs are in fact multi-dynamic. It is therefore equally important for both innovative and non-innovative firms to use subjective performance appraisal in combination with long-term hiring to give workers optimal incentives.

Table 6 presents the results of the second model. Beginning with the first regression, it is again the case that subjective performance appraisal is not significantly correlated with the financial position of an establishment, just as in the first model. Having regular meetings, however, is significantly and negatively correlated to the degree measuring the financial position of an establishment. To be specific, having regular meetings between employees and their immediate manager is associated with a 0.11-point decrease in the degree that measures the financial position of an establishment. This suggests that establishments in which regular meetings occur between employees and immediate managers are generally associated with a better financial position.

As in Model 2, the control variables are as expected correlated with the financial position of an establishment.

In the subsequent regression analysis of the second model, the interaction term that measures the combination of subjective performance appraisal and regular meetings is positively associated with the degree of the financial performance of a firm. This implies that having regular meetings between employees and immediate managers, combined at the same time with a higher degree of employees that are evaluated by subjective performance appraisal, relates to a worse financial position of the firm. This is in contradiction with Proposition 2. Moreover, this result is not significant, which implies that Proposition 2 cannot be confirmed empirically.

Again, the third and fourth regression analyses are subsamples that make a distinction between innovative and non-innovative establishments. Once again, these subsamples will be compared with each other. Examining table 6, it is striking that, for innovative establishments, the

interaction term is positively correlated with the degree of the financial position of an establishment. For non-innovative firms, this interaction term is negatively correlated with the degree that measures the financial position. In other words, when a non-innovative establishment makes greater use of the combination of regular meetings and subjective performance appraisal, they are in general associated with a better financial position. Conversely, innovative firms that use the same combination of subjective performance measures and regular meetings are generally related to a lower financial position. Although these results are not significant, this is in contradiction with what was expected based on the theory. It was expected that more innovative firms should benefit more from the combination of subjective performance measures and regular meetings than non-innovative firms. In these subsamples, there is also a difference for regular meetings. It seems that regular meetings are of more importance in an innovative establishment than in a non-innovative establishment, since the correlation is stronger and more significant for the financial position of innovative firms and insignificant and weaker for that of non-innovative firms. This could indicate that a well-defined understanding of what is expected of the agent is more important in innovative establishments. In both subsamples, subjective performance appraisal is insignificant, but as with regular meetings the correlation seems to be stronger for innovative firms than for non-innovative firms. This means that individually both regular meetings and subjective performance measures are acting as expected from the theory, but that the combination of both somehow is not.

Table 7 contains the instrumental variable approaches for Model 3 in the first case. In this case, where long-term hiring is instrumented by trust, the results are not as expected. The degree of subjective performance appraisal in combination with long-term hiring is positively correlated with the degree of the financial position. This implies that by using more subjective performance measurement in combination with long-term hiring causes a worse financial position. Besides this, the interaction term is not significantly correlated with the financial position of an establishment. Consequently, Proposition 1 cannot be confirmed. However, the variable of long-term hiring is significantly and negatively correlated with the financial position. This suggests that more long-term hiring causes a better financial position. In the second case, the results are presented in Table 8, in which subjective performance appraisal is instrumented by employee protection. These results are again not as expected; the degree of long-term hiring in combination with subjective performance appraisal is negatively correlated with the degree of financial position. However, the result is again not significant, implying that

Proposition 1 still cannot be confirmed empirically. Both long-term hiring and subjective performance appraisal are also not significantly related to the financial position of an establishment.

Table 9 presents the results of Model 4. These results are again not significantly correlated with the financial position of an establishment. However, the interaction term that measures the combination of subjective performance appraisal and regular meetings is negatively correlated with the degree that measures the financial position of an establishment. Furthermore, this relationship is strong. This result is more in line with Proposition 2 than was the case with the OLS-regressions of Model 2, but Proposition 2 still cannot be confirmed empirically.

6. Discussion

Firstly, the results of the OLS approaches will be discussed. This will be followed by a discussion of the instrumental variable approach.

The two propositions that were drafted following the theory are both not empirically confirmed by the OLS-regressions of Model 1 and Model 2. This suggests that the combination of subjective performance appraisal and long-term hiring or regular meetings is not significantly related to the financial position of an establishment. However, the interpretation of this result should be treated with caution for multiple reasons.

Firstly, it is striking that the proxy for subjective performance appraisal is not significantly related to the financial position of an establishment in both models. This could indicate that subjective performance appraisal in general is not significantly associated with the financial position of an establishment, but it could also be the case that the proxy is not adequate. The exact question was, “approximately what percentage of employees have a performance appraisal or evaluation interview at least once a year?” The problem could be that variable pay does not need to be linked to this performance appraisal or interview. Besides this, most firms perform such an interview with their employees and immediate manager about their performance each year, but it does not need to be the most important manner to incentivize employees. Therefore, it is interesting to see what happens when another proxy for subjective performance appraisal is used. The other proxy, already mentioned in Section 3, was based on the next question: “could you please tell me for each of these options whether or not they are available to at least some employees?” One of these options was: “variable extra pay linked to individual performance following management appraisal; yes or no”. As already indicated in Section 3, this is not an accurate proxy because it fails to indicate the extent to which an establishment uses variable pay linked to the performance following management appraisal. Although this is the case, this proxy is completely clear about the link between variable pay and subjective performance appraisal. In Table 10 and Table 11, this second proxy is used to evaluate whether the results are different using this proxy instead of the other. Observing these tables, it becomes directly clear that the results are different. The second proxy for subjective performance appraisal is significantly related to the financial position in both models, as expected following the theory. Furthermore, although the interaction term remains insignificant, it is correlated negatively instead of positively with the degree of the financial position of an establishment. This is more in line with the theory. In other words, in a research

like this that tries to generalize the most important aspects of human resource management, it could be the case that the proxies are too vague or general to draw conclusions from.

Secondly, there could be a bias in comparing innovative and non-innovative establishments. In the dataset, the activities of establishments were asked in three categories only. These are activities that most firms carry out anyway, regardless of the industry they are operating in. When industries are known, firms can be better compared on the basis of this characteristic than on the basis of the activity that they carry out. Furthermore, it could be that one establishment carries out multiple activities, which could explain the lack of differences in the results between innovative and non-innovative establishments.

Finally, this dataset was a snapshot of how establishments had organized their human resource management in 2013 and how they were performing at that specific moment. Therefore, it could be that firms have simply implemented certain work practices and that the result of this is not yet visible. Moreover, a great deal can happen in one year that can lead to a worse financial position than a year before, so it could also be that such a snapshot gives a skewed image of the overall performance. One way to overcome this data limitation is to use panel data. Unfortunately, this is often not available in this kind of survey. However, for better empirical research, panel data is required and it is therefore recommended that the ECS conduct this survey every four years and label the different establishments so that panel data can be created.

In the case of the instrumental variable approach, the results for the interaction terms are again insignificant. This again implies that the combination of subjective performance appraisal and long-term hiring or meetings does not have an impact on the financial position of an establishment. These results, however, should also be treated with caution. Hence, in this thesis, two assumptions are made to assure that the instruments are valid. In both cases, these assumptions are questionable in practice.

In the first model, the assumption was that respondents could perfectly identify whether employees were trustworthy independently on the financial position in order to exclude correlation between the error term of financial position and trust in employees. This is a realistic assumption when the respondents have perfect knowledge and are acting rationally. However, in practice, it could be the case that respondents do not have perfect knowledge. This is most certainly the case if the respondent cannot measure the contributions of employees to the financial position perfectly. This could cause a better financial position to be mistakenly attributed to the contribution of employees. Taking this into account, it is possible that trust is

correlated with the error term of financial position, which implies that the instrument is not perfectly valid.

In the second model of the 2SLS regression, it is assumed that establishments in general have no financial distress, in order to exclude a correlation between the error term of the financial position and employee protection. Although it is indeed the case that in the period of 2013 there was no economic crisis, it could be that in certain establishments there was financial distress because of other more specific reasons. It is impossible, however, to take these particular situations into account for all the establishments. Therefore, this assumption must be made in order to perform a research such as this.

Nevertheless, this thesis is still relevant and contributing to the principal-agent theory because of the following motives. Firstly, this thesis forms a basis of how empirical research can be done with a large sample of different firms. Secondly, the ECS is one of the best surveys available at this time to research the propositions that were drafted in this thesis. Thirdly, although the proxies could be better specified, they define to a large extent the foundations that were formed in the theoretical framework.

7. Conclusion

In this thesis, it is assumed that most jobs must be evaluated subjectively by an immediate manager, since most jobs are multidimensional and more importantly not verifiable ex ante or ex post. After extensively describing most of the prominent models that are made in the history of the principal-agent field, the foundations of the principal-agent theory have been formed. To be specific, these are the foundations required to successfully evaluate employees subjectively in the absence of objective performance measures. Long-term commitment, good faith and clear communication between the agent and principal are defined as the foundations to successfully give optimized incentives to agents in the case of subjective performance appraisal. These optimized incentives should lead to better firm performance, since the pay-off of the principal (mostly the firm) is also optimized. Multiple articles have also found positive relations between optimally incentivized firms and firm performance.

To test the proposed foundations empirically, the European Company Survey (ECS) was used. This is a survey that primarily focusses on work practices in firms. Proxies for subjective performance appraisal, long-term hiring and clear communication were chosen and used as the independent variables. The financial position of the firm is used as a dependent variable. Two interaction terms are created to test the combination of subjective performance appraisal and long-term commitment or clear communication.

The results for the combination of long-term hiring and subjective performance appraisal are all not as expected following the theory. In the OLS-regressions, the combination of subjective performance appraisal and long-term hiring is insignificant, as well as negatively associated with the financial position of an establishment. In the first case of the instrumental variable approach, the combination of long-term hiring and subjective performance appraisal is again negatively and insignificantly correlated with the financial position of an establishment. In the second case, however, the combination of long-term hiring and subjective performance appraisal is positively correlated with the financial position of an establishment. Although this result remains insignificant, the fact that the combination of long-term hiring and subjective performance appraisal is positively correlated with the financial position is more as expected from the theory. Because of all the insignificant results, Proposition 1 cannot be confirmed empirically. However, as already stated in the discussion section, the results should be treated with caution. Consequently, it is not possible to give a satisfying answer on the research question if it is in general more profitable for firms to use the combination of long-term hiring and subjective performance measurement.

Furthermore, the results capturing the combination of regular meetings and subjective performance appraisal are also not as expected from the theory. The OLS-regressions indicate that subjective performance appraisal in combination with regular meetings is negatively and insignificantly related to the financial position of an establishment. This implies that Proposition 2 cannot be confirmed. In contrast, by using a 2SLS regression, the combination of regular meetings with subjective performance appraisal is positively correlated with the financial position of an establishment. Although this result is insignificant and Proposition 2 still cannot be empirically confirmed, this result is closer to the expectation formed following the theory than was the case when using the OLS-approach. Therefore, it is again not possible to give a satisfying answer on the research question if it is more profitable to have better communication between agent and principal in combination with subjective performance appraisal.

Taking all the results into account, the conclusion of this thesis is that the foundations to give proper incentives when using subjective performance appraisal do not have any effect on the financial performance of an establishment. However, taking into account the drawbacks of this empirical research, it is too soon to conclude that the foundations to give employees the most efficient incentives have no empirical effects on financial firm performance in general. Further research is required to examine the precise effects of subjective performance appraisal in combination with clear communication or long-term commitment on a firm's financial performance.

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9. Appendix

Figure 1: Permanent and temporary contracts in Europe

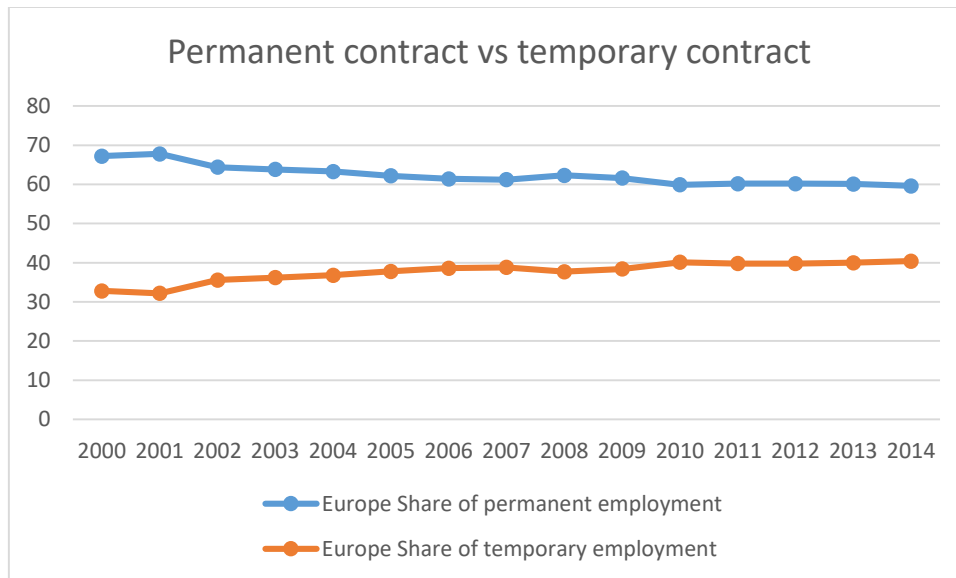


Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Financial position	26058	2,32	0,84	1	5
Subjective performance appraisal	26652	4,58	2,59	1	7
Long-term hiring	26710	5,81	1,51	1	7
Regular meetings	26908	0,88	0,32	0	1
Size	27019	1,66	0,75	1	3
Private firm	26922	0,91	0,28	0	1
Education	25326	2,77	1,43	1	7
Female	27019	0,57	0,50	0	1

Table 2: Correlation table

	Financial position	Long-term hiring	Subjective performance appraisal	Regular meetings	Size	Privately-owned	Education	Woman
Financial position	1.0000							
Long-term hiring	-0.1254	1.0000						
Subjective performance appraisal	-0.0156	0.0244	1.0000					
Regular meetings	-0.0664	0.2042	0.0134	1.0000				
Size	-0.0623	0.1148	-0.0812	0.0692	1.0000			
Privately owned	-0.0648	-0.0167	0.0221	-0.0127	-0.0806	1.0000		
Education	-0.0799	0.1681	0.0347	0.1103	0.0665	-0.0866	1.0000	
Woman	0.0306	-0.0059	-0.0027	-0.0071	0.0797	-0.0392	0.0944	1.0000

Table 3: OLS-regression trust in the employee representation

	Long term hiring
Trust in employee representation	-0.396 ^{***} (0.0357)
_cons	5.701 ^{***} (0.0693)
<i>N</i>	13154
<i>R</i> ²	0.009
adj. <i>R</i> ²	0.009
F	123.1

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: OLS-regression employee protection

	Subjective performance appraisal
Employee protection	-0.106 ^{***} (0.0215)
_cons	6.075 ^{***} (0.0483)
<i>N</i>	19315
<i>R</i> ²	0.001
adj. <i>R</i> ²	0.001
F	24.22

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: OLS regressions of model 1

	(All) Financial position	(All) Financial position	(Innovative) Financial position	(Not-innovative) Financial position
Subjective performance appraisal *long-term hiring		0.00167 (0.00133)	0.00174 (0.00192)	0.00161 (0.00187)
Long-term hiring	-0.0301*** (0.00221)	-0.0399*** (0.00806)	-0.0387*** (0.0116)	-0.0396*** (0.0114)
Subjective performance appraisal	-0.00375 (0.00359)	-0.0108 (0.00677)	-0.0122 (0.0103)	-0.00992 (0.00902)
Size	-0.0548*** (0.00710)	-0.0546*** (0.00710)	-0.0610*** (0.00920)	-0.0317** (0.0117)
Privately owned	-0.226*** (0.0206)	-0.226*** (0.0206)	-0.278*** (0.0283)	-0.163*** (0.0302)
Education	-0.0442*** (0.00395)	-0.0444*** (0.00395)	-0.0329*** (0.00526)	-0.0566*** (0.00612)
Woman	0.0352** (0.0110)	0.0352** (0.0110)	0.0317* (0.0148)	0.0369* (0.0164)
_cons	3.026*** (0.0687)	3.068*** (0.0767)	2.880*** (0.0958)	3.083*** (0.123)
Country dummies	Included	Included	Included	Included
<i>N</i>	24045	24045	13100	10945
<i>R</i> ²	0.092	0.092	0.085	0.101
adj. <i>R</i> ²	0.091	0.091	0.083	0.098
F	67.41	65.79	33.27	32.72

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: OLS regressions of model 2

	(All) Financial position	(All) Financial position	(Innovative) Financial position	(Not-innovative) Financial position
Subjective performance appraisal*regular meetings		0.00696 (0.0105)	0.0255 (0.0172)	-0.00601 (0.0135)
Regular meetings	-0.105*** (0.0171)	-0.145* (0.0630)	-0.240* (0.103)	-0.0688 (0.0807)
Subjective performance appraisal	-0.00405 (0.00359)	-0.0101 (0.00994)	-0.0272 (0.0166)	0.000726 (0.0124)
Size	-0.0625*** (0.00707)	-0.0625*** (0.00708)	-0.0664*** (0.00917)	-0.0407*** (0.0117)
Privately owned	-0.226*** (0.0205)	-0.226*** (0.0205)	-0.280*** (0.0283)	-0.161*** (0.0300)
Education	-0.0517*** (0.00390)	-0.0518*** (0.00390)	-0.0396*** (0.00519)	-0.0638*** (0.00605)
Woman	0.0347** (0.0110)	0.0348** (0.0110)	0.0278+ (0.0148)	0.0408* (0.0164)
_cons	3.039*** (0.0667)	3.074*** (0.0853)	2.968*** (0.125)	2.658*** (0.102)
Country dummies	Included	Included	Included	Included
<i>N</i>	24201	24201	13179	11022
<i>R</i> ²	0.087	0.087	0.081	0.095
adj. <i>R</i> ²	0.085	0.085	0.078	0.092
F	64.46	62.76	32.06	31.10

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: 2SLS regression of model 3 instrumented by trust in employees

	(First stage) Subjective performance appraisal*long-term hiring	(First stage) Long-term hiring	(2SLS) Financial position
Subjective performance appraisal*long-term hiring			0.00251 (0.0328)
Long-term hiring			-0.533** (0.197)
Trust in employees	0.884 (0.882)	-0.324* (0.0243)	
Trust in employees*subjective performance appraisal	-0.371* (0.147)	0.0151 (0.0243)	
Subjective performance appraisal	5.496 (0.283)	-0.0134 (0.469)	-0.00341 (0.156)
Size	1.171*** (0.166)	0.215*** (0.0276)	0.0581* (0.0251)
Privately owned	1.058** (0.377)	0.175** (0.0624)	-0.144*** (0.0416)
Education	1.924*** (0.946)	0.318*** (0.0157)	0.126*** (0.0319)
Woman	-0.180 (0.255)	-0.0303 (0.422)	0.0527* (0.0259)
_cons	-17.882*** (1.849)	2.426*** (0.306)	3.415*** (0.879)
Country dummies	Included	Included	Included
<i>N</i>	11750	11750	11750
<i>R</i> ²	0.337	0.200	.
adj. <i>R</i> ²	0.334	0.198	.
F	156.32	77.25	.

Table 8: 2SLS regression of model 3 (without country dummies) instrumented by employee protection

	(OLS) Financial position	(First stage) Subjective performance appraisal*long-term hiring	(First stage) Subjective performance appraisal	(2SLS) Financial position
Subjective performance appraisal*long-term hiring	0.000316 (0.00137)			-0.118 (0.120)
Long-term hiring	-0.0369*** (0.00828)	6.149*** (0.0839)	0.0301 (0.191)	0.657 (0.706)
Subjective performance appraisal	-0.00891 (0.00698)			-0.0669 (0.641)
Size	-0.0630*** (0.00726)	-0.985*** (0.0729)	-0.217*** (0.0139)	-0.209*** (0.0352)
Privately owned	-0.227*** (0.0205)	0.786*** (0.202)	0.154*** (0.0394)	-0.0909* (0.0389)
Education	-0.0402*** (0.00385)	0.373*** (0.0444)	0.0636*** (0.00817)	0.0197+ (0.0117)
Woman	0.0653*** (0.0109)	-0.280* (0.113)	-0.0581** (0.0223)	0.000846 (0.0208)
Employee protection		-0.231* (0.104)	-0.0890+ (0.0468)	
Employee protection*long- term hiring		-0.113** (0.0372)	-0.0109 (0.00855)	
_cons	2.919*** (0.0496)	0.349 (0.337)	6.093*** (0.114)	3.281 (3.797)
Country dummies	Not-included	Not-included	Not-included	Not-included
<i>N</i>	24045	17720	17720	17720
<i>R</i> ²	0.029	0.8126	0.0178	.
adj. <i>R</i> ²	0.028	0.8161	0.0175	.
F	97.33	14185.60	52.90	

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: 2SLS regression of model 4 instrumented by employee protection

	(OLS) Financial position	(First stage) Subjective performance appraisal*regular meetings	(First stage) Subjective performance appraisal	(2SLS) Financial position
Subjective performance appraisal*regular meetings	0.00707 (0.0109)			-0.882 (0.797)
Subjective performance appraisal	-0.0149 (0.0102)			0.0796 (0.764)
Regular meetings	-0.181** (0.0650)	6.113*** (0.0515)	0.221 (0.150)	5.020 (4.611)
Size	-0.0729*** (0.00724)	-0.183*** (0.0129)	-0.215*** (0.0138)	-0.234*** (0.0377)
Privately owned	-0.229*** (0.0204)	0.154*** (0.0365)	0.156*** (0.0393)	-0.0754+ (0.0425)
Education	-0.0472*** (0.00381)	0.0617*** (0.00754)	0.0636*** (0.00803)	0.0127 (0.0115)
Woman	0.0677*** (0.0109)	-0.0534** (0.0206)	-0.0585** (0.0223)	0.000557 (0.0225)
Employee protection		-0.0259*** (0.0668)	-0.0775 (0.0635)	
Employee protection*regular meetings		-0.116*** (0.0230)	-0.0649 (0.0672)	
_cons	2.953*** (0.0664)	0.0789+ (0.0467)	6.023*** (0.149)	2.448 (4.454)
Country dummies	Not-included	Not-included	Not-included	Not-included
<i>N</i>	24201	17794	17794	17794
<i>R</i> ²	0.020	0.682	0.018	.
adj. <i>R</i> ²	0.020	0.682	0.017	.
F	68.28	35967.41	52.40	

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: OLS regressions of model 1 (using another proxy for subjective performance appraisal).

	(All) Financial position	(All) Financial position	(Innovative) Financial position	(Not-innovative) Financial position
Subjective performance appraisal (2)*long-term hiring		-0.00570 (0.00417)	-0.00615 (0.00583)	-0.00606 (0.00612)
Long term-hiring	-0.0273*** (0.00225)	-0.0248*** (0.00296)	-0.0231*** (0.00435)	-0.0250*** (0.00410)
Subjective performance appraisal (2)	-0.0860*** (0.0110)	-0.0597** (0.0223)	-0.0553+ (0.0321)	-0.0560+ (0.0315)
Size	-0.0476*** (0.00712)	-0.0476*** (0.00712)	-0.0544*** (0.00923)	-0.0264* (0.0117)
Privately owned	-0.217*** (0.0206)	-0.217*** (0.0206)	-0.271*** (0.0283)	-0.154*** (0.0302)
Education	-0.0417*** (0.00396)	-0.0415*** (0.00397)	-0.0301*** (0.00526)	-0.0544*** (0.00614)
Woman	0.0319** (0.0110)	0.0322** (0.0110)	0.0284+ (0.0148)	0.0350* (0.0164)
_cons	3.031*** (0.0657)	3.018*** (0.0665)	2.828*** (0.0766)	3.042*** (0.110)
Country dummies	Included	Included	Included	Included
<i>N</i>	24008	24008	13067	10941
<i>R</i> ²	0.094	0.094	0.087	0.103
adj. <i>R</i> ²	0.093	0.093	0.084	0.100
<i>F</i>	68.67	67.00	33.62	33.52

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11: OLS regressions of model 2 (using another proxy for subjective performance appraisal)

	(All) Financial position	(All) Financial position	(Innovative) Financial position	(Not-innovative) Financial position
Subjective performance appraisal (2)*regular meetings		-0.0321 (0.0342)	-0.0542 (0.0509)	-0.0287 (0.0477)
Regular meetings	-0.0932*** (0.0172)	-0.0809*** (0.0223)	-0.0581 (0.0370)	-0.0828** (0.0281)
Subjective performance appraisal (2)	-0.104*** (0.0108)	-0.0750* (0.0326)	-0.0504 (0.0488)	-0.0767+ (0.0450)
Size	-0.0529*** (0.00710)	-0.0529*** (0.00710)	-0.0580*** (0.00921)	-0.0329** (0.0116)
Privately owned	-0.215*** (0.0205)	-0.215*** (0.0205)	-0.270*** (0.0283)	-0.150*** (0.0300)
Education	-0.0479*** (0.00391)	-0.0479*** (0.00391)	-0.0361*** (0.00519)	-0.0606*** (0.00607)
Woman	0.0302** (0.0110)	0.0303** (0.0110)	0.0228 (0.0148)	0.0377* (0.0164)
_cons	3.042*** (0.0633)	3.032*** (0.0646)	2.870*** (0.0948)	2.674*** (0.0766)
Country dummies	Included	Included	Included	Included
<i>N</i>	24177	24177	13157	11020
<i>R</i> ²	0.090	0.090	0.082	0.098
adj. <i>R</i> ²	0.088	0.088	0.080	0.095
<i>F</i>	66.13	64.54	32.50	32.41

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$