Aalto University
School of Business

# Performance-based compensation for white-collar workers and firm performance

Accounting

Master's thesis

Outi Saari

2013

Department of Accounting
Aalto University
School of Business

Aalto University
School of Business

Aalto University, P.O. BOX 11000, 00076 AALTO
www.aalto.fi

**Abstract of master's thesis**

**Author** Outi Saari

**Title of thesis** Performance-based compensation for white-collar workers and firm performance

**Degree** Master of Science

**Degree programme** Accounting

**Thesis advisor(s)** Seppo Ikäheimo

**Year of approval** 2013 **Number of pages** 74 **Language** English

## Abstract

**Research objective.** This paper aims to explore whether a causal relationship exists between performance-based compensation (PBC) for white-collar workers (WCWs) and future firm performance. The paper also analyzes whether and how demographic factors of firm employees influence the outcomes of PBC schemes. Finally, the paper aims to contribute to prior literature regarding the effectiveness of individual and team incentives, and to shed light on how the effectiveness of these two types of schemes varies in companies with different employee demographics.

**Data and methodology.** The quantitative research employs a large and unique pay data covering over one million employee-year observations in Finnish industrial companies that are members of the Confederation of Finnish Industries (EK). Accounting data about firm performance and other firm-specific facts was collected from Voitto+ database. The final sample consists of 4511 firm-year observations for years 2007-2010. The statistical research methods applied include descriptive analysis, correlation analysis, and OLS regression analysis for testing the theory-based hypotheses.

**Results.** It is argued that the performance contingent incentives for white-collar workers can improve firm future performance. Weak support is found also for the argument that PBC effectiveness varies in companies with different demographic characteristics of employees. Interestingly, the results also weakly indicate that higher amount of incentives paid out does not yield superior firm performance. Finally, it seems that demographic factors may also influence the effectiveness of individual-based and team-based incentives. However, this indication is very weak and thus further research is required for drawing conclusions.

**Keywords** Performance based-compensation, financial incentives, white-collar workers, firm performance, individual-based compensation, team-based compensation

Aalto-yliopisto
Kauppakorkeakoulu

Aalto-yliopisto, PL 11000, 00076 AALTO
www.aalto.fi

**Maisterintutkinnon tutkielman tiivistelmä**

**Tekijä** Outi Saari

**Työn nimi** Performance-based compensation for white-collar workers and firm performance

**Tutkinto** Kauppatieteiden maisteri

**Koulutusohjelma** Laskentatoimi

**Työn ohjaaja(t)** Seppo Ikäheimo

**Hyväksymisvuosi** 2013 **Sivumäärä** 74 **Kieli** Englanti

**Tiivistelmä**

**Tutkimuksen tavoitteet.** Tämä tutkimus pyrkii selvittämään, löytyykö toimihenkilöille maksettavan tulospalkan ja yrityksen tulevaisuuden menestyksen väliltä kausaalista yhteyttä. Tutkimus analysoi myös sitä, vaikuttavatko yritysten työntekijöiden demografiset tekijät tulospalkkausohjelmien toimivuuteen ja millaisia nämä vaikutukset ovat. Lisäksi tutkimus pyrkii osallistumaan aiempaan keskusteluun yksilö- ja tiimiperusteisen palkitsemisen toimivuudesta, ja toisaalta valottamaan sitä, miten näiden kahden palkitsemistyypin toimivuus vaihtelee yrityksissä, joiden työntekijöiden demografiset profiilit eroavat toisistaan.

**Aineisto ja tutkimusmenetelmä.** Tämä kvantitatiivinen tutkimus hyödyntää laajaa ja ainutlaatuista palkkatietoaineistoa, joka käsittää yli miljoona toimihenkilövuosihavaintoa suomalaisissa Elinkeinoelämän keskusliiton (EK) alaisissa teollisuusyrityksissä. Yritysten menestystä koskeva laskentainformaatio sekä muut julkiset yrityskohtaiset tiedot kerättiin ”Voitto+”-tietokannasta. Lopullinen otos käsittää 4511 yritysvuotta vuosina 2007-2010. Tilastollisista tutkimusmenetelmistä tutkimus soveltaa aineistoa kuvailevaa analyysiä ja korrelaatioanalyysiä sekä lineaarista regressioanalyysiä, jolla teoriaan perustuvia hypoteeseja testataan.

**Tulokset.** Tutkimus esittää, että toimihenkilöiden suoritukseen sidotut kannustimet voivat parantaa yrityksen menestystä tulevaisuudessa. Tulokset osoittavat heikkoa tukea myös väitteelle, jonka mukaan työntekijöiden demografiset piirteet vaikuttavat tulospalkitsemisen toimivuuteen yrityksissä. Eräs mielenkiintoinen löydös on se, että tulosten perusteella on heikosti havaittavissa, että suurimmat tulospalkkiot parantavat yrityksen menestystä vähemmän kuin maltillisemmat tulospalkkiot. Vaikuttaa myös siltä, että demografiset tekijät voivat vaikuttaa yksilö- ja tiimiperusteisten kannustinten toimivuuteen. Tämä indikaatio on kuitenkin hyvin heikkoa ja vaatii jatkotutkimusta johtopäätösten tekemiseksi.

**Avainsanat** Tulospalkkaus, rahamääräiset kannustimet, toimihenkilöt, yrityksen menestys, yksilöperusteinen palkitseminen, tiimiperusteinen palkitseminen

# TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES

# 1. INTRODUCTION

## 1.1. Motivation for the study

Compensation is a sensitive and timely topic that touches everyone and is therefore of interest to all groups of society. Both media and researchers have recently paid extensive attention to executive compensation (e.g. Kauhanen & Napari, 2012; Larkin et al., 2012; T&T, 2010). At the same time, companies are becoming increasingly human capital intensive and compensation packages for employees more important (Frye, 2004). Executive compensation in Finland is yet increasing at a faster pace than employee pay and bonuses (e.g. HS 5.6.2012) evoking negatively toned public discussion. While human capital has emerged as the most critical asset for many companies and there has been some discussion in accounting literature about the effects of employee incentives since the early 1990s (e.g. Banker et al., 1996; Cooke, 1994), the topic has mainly remained in the shadow of top management compensation.

A notable share of prior literature focuses on blue-collar work although in today's economy white-collar work is of considerable importance (Hopp et al., 2009). There is some research that touches upon blue-collar employee incentives but less evidence regarding the effects of white-collar worker incentives on firm performance. Yet, job design, requirements and responsibilities of all three groups, executives, white-collar and blue-collar workers, are different and this should be reflected in compensation schemes (Kauhanen & Napari, 2012).

Studies conducted in the field of employee compensation often depict a specific industry or organizational context and focus on the behavioral impact of performance-based compensation (PBC) on employees. There is less evidence about the impact of employee compensation schemes on firm-level performance. Furthermore, the existing evidence is conflicting. As Belfield & Marsden (2003) document, the variation in the results regarding the effectiveness of PBC systems is "striking". Some studies find that PBC improves firm performance (e.g. Abowd, 1990; Bhargava, 1994; Conyon & Freeman, 2001; Frye, 2005; Piekkola, 2005; Zhuang & Xu, 1996), while others argue that monetary incentives may be detrimental for individual's performance in certain cases (Ariely et al., 2009; Gneezy & Rustichini, 2000).

Lately, we have seen the rise of individual performance pay and it is argued that individual pay is more important in human-capital intensive industries (Kvaløy & Olsen, 2012). At the same time, there is an on-going "hype" about team work in organizations, underlining the importance of effective team work for improved firm performance in organizations (Delarue et al., 2008). As a result, team-based compensation has emerged as an alternative design for successful compensation plans. Prior literature studies the superiority of individual vs. team-based compensation (see e.g. Barnes et al., 2011; Gerhart et al., 2009; Trevor et al., 2012) but results regarding the topic remain inconclusive.

Not only organizational context influences PBC effectiveness but also other factors such as demographics may have an impact. Gender wage gap is a debated topic since decades. "*Performance-based bonuses widen the gender wage gap in the financial sector*", is reported by Trade Union Pro (2013) which is the largest private sector union for clerical employees in Finland. Therefore, it is interesting to study the reasons behind the role of PBC in widening the gender wage gap. In academic literature, some authors argue that women are less likely to work under PBC plans than men, which might be due to gender differences in preferences (e.g. Croson & Gneezy, 2009; Dohmen & Falk, 2011; Kleinjans, 2009). In addition, employees' personal goals and motivation may vary across the different phases of their career (Ryan & Wiggins, 2001) and compensation schemes should be designed to reflect these variations.

This study is important, firstly for researchers, to clarify the currently mixed results regarding the effectiveness of employee incentives. In fact, the study aims to narrow down the research gap due to prior literature focusing either on the impact of employee incentives on individual effort and performance, or on the impact of executive incentives on firm performance, thus leaving the effect of employee incentives on firm-level performance with little attention. Secondly, as Bryson & Freeman (2010) argue, firms are found to frequently switch between different employee compensation schemes. This signals that organizations have difficulties in structuring optimal schemes. Therefore, knowing that PBC plans for employees are getting more popular, it is essential for practitioners to know which type of compensation plans work best and for whom.

This knowledge can be useful for organizations seeking to improve their management and performance by redesigning their compensation system to work in an optimal way.

The purpose of this paper is to contribute to accounting research by providing evidence about the link between performance-based financial incentives for white-collar workers (WCWs) and firm performance in the Finnish context. In addition, this paper sheds light on the impact of demographic factors (age, gender) on PBC effectiveness. Finally, the paper aims to compare PBC effectiveness when employee performance, based on which bonuses are determined, is evaluated at different levels (individual, group).

The data employed in this study is more comprehensive than what has been used in prior research with regard to individual-level pay information and firm-specific compensation plan information. Using data from the Confederation of Finnish Industries, the study comprises also non-listed companies for which information is not available from public sources. To my knowledge, this is the first study, if not globally at least in the European and the Finnish context, using such a comprehensive data about firm-specific PBC plans, reasons for companies to use them, perceived PBC plan success, and companies' intentions regarding further developing them.

This research delivers also practical value. The topic is cross-disciplinary combining the debated topic of accounting, compensation, with social psychology. It has the potential to contribute to the ongoing public discussion about gender wage gap. It is an interesting and novel finding if women really are less competitive and more risk averse (e.g. Apesteguia et al., 2012) and thus prefer fixed-compensation potentially leading to lower overall compensation. This study will not research individual preferences per se but that could be a potential topic for further research in case the results of this study suggest that gender differences may influence PBC effectiveness. Also age related results are valuable for practitioners. To my knowledge, it has so far not been studied whether age affects the link between PBC and firm performance or for which age groups PBC works the best. Further, there is even less evidence about the link between firm-level performance and the level of employee performance evaluation (individual, group) based on which bonuses are determined.

## 1.2. Objectives and scope

The objective of this paper is to explain the impact of performance-based compensation on firm performance. In addition, the paper studies the effectiveness of compensation schemes firstly in companies with varying employee demographics, and secondly in companies using different levels of performance evaluation for determining bonuses paid. Finally, the study aims to shed light into the impact of demographic factors on PBC effectiveness when performance is evaluated at different levels. In conclusion, the study explores the impact of employee incentives on firm-level performance instead of their impact on individual-level preferences, behavior, effort or performance.

The focus of the paper is on financial incentives, as opposed to for instance benefits or non-financial compensation such as training opportunities or office hour arrangements. Further, this study focuses on incentives for white-collar workers, i.e. employees whose work is knowledge intensive, in contrast to blue-collar workers who perform more manual work (STAT, 2013). Finally, the research is limited to industrial companies and, due to the data available, to the Finnish market only.

In this paper, firm performance is defined as profitability. Profitability is chosen as the indicator of firm performance since it is the most commonly used measure in prior literature. In addition, improvements in different dimensions of performance, such as revenue, operating efficiency or quality, should ultimately be reflected in firm profitability through increased profit or lower cost of assets.

## 1.3. Research design

The research employs a large and unique pay data received from the Confederation of Finnish Industries (EK) which is the leading business organization in Finland representing the entire private sector (EK, 2013). The data covers over one million employee-year observations in Finnish industrial companies that are members of EK. Using the EK data, the sample includes also non-listed companies. Accounting information for companies in the EK pay data was collected from Voitto+ database. The final sample consists of 4511 firm-year observations for years 2007-2010.

This quantitative study aims to explore the causal relationship between WCW incentives and firm future performance. The statistical research methods applied include descriptive analysis and correlation analysis, as well as OLS regression analysis for testing the theory-based hypotheses. The key variable of interest is PBC ratio and it is calculated as the share of performance contingent pay of total annual compensation. Profitability is measured using return on assets since market-based profitability measures are not available for the sample containing non-listed companies.

## 1.4. Results

Five testable hypotheses were constructed and at least weak evidence was found for four of them. The strongest support was found for the first hypothesis: the results show that performance contingent incentives for white-collar workers can positively influence firm performance measured by profitability, as expected based on prior literature. The result remained consistent both in the sample containing all firm-years as well as in the sample containing only firm-years when PBC was paid. In addition, there is some evidence indicating that demographic factors can influence PBC effectiveness. Interestingly, although no hypothesis was constructed regarding PBC effectiveness with increasing PBC ratios, there is weak indication that paying excessive bonuses does not yield superior firm performance.

Based on this research no conclusions can be drawn regarding the debate on the superiority of individual or team incentives. Instead, it might be that mixing the two types is the best alternative. Again, there is some weak evidence showing that demographic factors might influence the effectiveness of individual and team incentives. However, regarding gender differences the hypothesis was rejected and for age differences the evidence is only very weak.

## 1.5. Structure of the study

After this introductory chapter, the paper moves from presenting prior literature to conducting empirical research and to discussing key results in the following order. Chapter 2 introduces performance-based compensation as a concept and theories supporting the use of PBC at organizational and individual level. It also ties compensation to the organizational context and presents the different levels that are used as the basis for performance evaluation when determining bonuses paid. Chapter 3 reviews prior literature regarding PBC effectiveness and the impact of demographic factors on risk-taking, competitiveness and performance, which might influence PBC effectiveness. After this, prior research is summarized into a theoretical framework. In Chapter 4, hypotheses are constructed for testing them in Chapter 5, after which results are presented and discussed in Chapters 6 and 7, respectively.

# 2. PERFORMANCE-BASED COMPENSATION

## 2.1. PBC as a concept

In this study, performance-based compensation is defined as a compensation scheme that links employee pay to performance with any contingent element. This definition follows Belfield & Marsden (2003) who note that these types of schemes can also be categorized as a mix of input- and performance-based pay as they are not based solely on performance. For this study it is essential to make a difference between fixed-pay contracts and those that provide any performance contingent element.

Total compensation typically comprises also other elements than the basic salary paid to employees. On top of the basic salary, there can be performance-based pay, different types of benefits, and initiative and specialty bonuses. PBC refers to the part of total compensation that comes on top of employees' basic salary and that is linked to job performance at organizational or at profit center, group or individual level. (Vartiainen et al., 1998).

There are several ways to determine the total compensation paid to employees. For instance, compensation can be based on how demanding a position and the related tasks are. Compensation can also take into account competences of an individual or a group and how successful they were in accomplishing the required tasks. Finally, compensation can be based on output or performance which is the focus of this study. (Ahokas et al., 2011).

Compensation can be monetary or non-monetary. Although PBC does not always refer to financial rewards alone, the scope here covers financial incentives only. In this paper, different terms are used interchangeably when referred to performance-based compensation. Those terms include, among others, pay for performance, performance related/contingent/dependent pay, incentives, and variable pay.

This paper builds on the assumption that compensation has a motivational effect on employee behavior due to money being the means to acquire indispensable as well as many desired objects

in today's society. PBC is said to improve performance, among others, through its motivational impact on behavior, effort, productivity and satisfaction as suggested by several motivational theories and prior research introduced later, including expectancy and goal-setting theory. In contrast, there are also theories that oppose the motivational effect of compensation such as Herzberg's motivation-hygiene theory and Deci's theory on intrinsic motivation.

PBC is not a new phenomenon. In fact, as noted by Belfield & Marsden (2003), PBC was common in workers' compensation in the "heyday of UK manufacturing". The practice became less popular when manufacturing lost its relative economic importance. Since the 1990s, the use of PBC has gained popularity worldwide. With a survey study data representing one third of the Finnish private-sector, Piekkola (2005) shows that in six years from 1996 to 2002, the share of firms employing profit-related pay plans increased from 23% to 30%. Similar, and stronger, findings have been made abroad. In the UK, Conyon & Freeman (2001) find that in 1998, 37% of UK firms employed profit-related pay schemes, as opposed to 28% only three years before in 1995. As PBC has lately been re-adopted into the modern compensation schemes for employees, in this new context it is a relevant topic for research.

## 2.2. Theoretical background

This section will introduce theories typically used as the theoretical background in compensation literature. Firstly, focus will be on the agency theory which discusses the principal-agent relationship and is the predominant model in today's financial economics literature. Secondly, the section will discuss motivational theories which aim to explain factors shaping motivation and actions at individual level.

### *2.2.1. Agency theory*

One of the underlying assumptions in the compensation literature is asymmetric information. The concept refers to situations where one party of a transaction or a contract possesses more information than then other party. Information asymmetries exist at different organizational levels. Firstly, information asymmetries are typical in companies where ownership and control

are separated, meaning that the owners (principal) delegate work to the management (agent). In these cases, management is often better aware of the economic realities of the company than the owners since management is responsible for the daily operations and has access to unadjusted financials. In addition, information visibility is limited because owners cannot perfectly monitor management's actions. Information asymmetries exist also in employment contracts between employers and employees. Only employees are aware of their true skills and exerted effort while managers cannot perfectly observe and measure these. Situations involving asymmetric information are deemed harmful since they may result in the abuse of the other party's lack of knowledge. (Eisenhardt, 1989).

Information asymmetry is a key assumption in agency theory which has served as the basis for early compensation literature. Agency theory involves a principal and an agent and a relationship where the former delegates work to the latter. On top of asymmetric information, Eisenhardt's (1989) agency theory assumes that the interests of the two parties are conflicting and that human are self-interested and risk averse individuals with limited rationality. In relationships where these assumptions come true, two contracting problems may emerge. Firstly, moral hazard means that agents avoid exerting effort. Secondly, adverse selection means that managers can never perfectly confirm whether agents truly possess the abilities they claim to possess. (Eisenhardt, 1989).

The traditional agency theory provides two cures for the agency problem. The first option is better monitoring which can be achieved through systems that reduce information asymmetries, such as budgeting and reporting systems, and thus reveal agents' unmoral behavior. The second cure is to increase efficiency through optimal contracting. In the agency theory context, this means outcome-based contracting which motivates agents by aligning their interests with those of the principal. Agency theory provides the traditional theoretical background for PBC research and is typically used to justify performance contingent incentive schemes. (Eisenhardt, 1989).

### *2.2.2. Motivational theories*

In addition to agency theory, also other theories have been used as theoretical background in pay for performance literature. Belonging to the field of psychology, motivational theories try to explain mental functions and behavior of individuals. In contrast to agency theory which supports PBC plans, motivational theories are used both to justify and to oppose monetary incentives as a motivational tool. Motivational theories can be classified into three categories: need theories, incentive theories and expectancy theories (Ruohotie, 1991). These categories are complementing and have developed one building on the other. Roughly speaking, earlier theories were need-based and formed the basis on which later contemporary motivational theories could be constructed. In the following, motivational theories are briefly introduced based on Robbins (1997) or some other author if separately named, after which their implications on PBC effectiveness as interpreted by the author of this study are commented on.

One of the earliest and most well-known motivational theories is **Maslow's hierarchy of needs** (orig. 1954). It divides human needs into five groups – physiological, safety, social, esteem, and self-actualization – and suggests that individuals aim to satisfy these needs in hierarchical order moving from one stage to the other only when the previous is well enough satisfied. The theory is still relevant as it is so widely known and shapes managers' thinking about employee motivation still today. (Robbins, 1997). Based on this hierarchy, basic salary can be viewed to fulfill safety needs since in today's society money is the means of securing the basic necessities of life. In contrast, PBC effectiveness is less straightforward. In case an individual considers money to bring esteem, monetary incentives can work. However, if bonuses do not fulfill any safety, social, esteem, or self-actualization related needs, PBC is ineffective.

Another need-based theory is McGregor's **Theory X and Theory Y** (orig. 1960). The theory assumes human have two sets of needs. Rather similarly to the approach of agency theory regarding the employer-employee relationship, according to Theory X, managers view their subordinates as lazy individuals who dislike work and responsibilities and aim to avoid those. This suggests that management should monitor employee effort and motivate for improved performance. On the contrary, Theory Y assumes that individuals like work, are creative, seek

responsibility and are able to exercise self-direction. (Robbins, 1997). As a result, in the light of Theory X, PBC could work as the optimal contracting tool that is suggested to alleviate agency problems, whereas following Theory Y PBC should not motivate for improved performance.

Incentive theories explain effects of external factors, such as compensation, on individual motivation and behavior. **Herzberg's motivation-hygiene theory** (orig. 1959) classifies factors affecting job attitudes into intrinsic factors leading to job satisfaction and extrinsic factors related to job dissatisfaction. What motivate individuals intrinsically are, for instance, factors related to the job itself, recognition, and growth and advancement opportunities. In contrast, extrinsic factors such as salary and relationship with manager and peers are perceived as hygiene factors. Eliminating problems in hygiene factors can alleviate job-related dissatisfaction but is unable to increase motivation other than in the short-term. Managing the hygiene factors is sort of a "carrot or stick" approach to motivation where external incentives or threat of punishment shape individual behavior. (Robbins, 1997). If Herzberg' theory is followed, PBC should not work since financial incentives do not motivate.

Expectancy theories are contemporary theories of motivation which acknowledge that not only needs and incentives shape motivation but also observations and expectancies have an impact. Vroom's (orig. 1964) **expectancy theory** suggests that an individual's motivation to increase effort depends on how strongly the performed action is expected to yield a given outcome and on how attractive that outcome is to the individual. Thus, the theory focuses on the relationships between the elements of the effort – performance – reward – personal goals chain. In brief, expectancy theory suggests that PBC has a motivational effect depending on employees' personal goals and on whether PBC helps to achieve the goals. (Robbins, 1997).

According to Adams' (orig. 1965) **equity theory**, human seek fair outcomes and therefore perception of equity has an important role in motivation. Individuals compare their job input-outcome relationship to that of their peers and aim to eliminate any inequities if perceived. This means individuals are not concerned only with the absolute amount of rewards received for an effort but compare this to what their peers receive for a similar effort. Individuals have several

options for eliminating inequities which include, among others, changing their input or affecting output of their actions. Thus, equity theory implies that employees must consider their compensation scheme fair or PBC is not effective. (Robbins, 1997).

Finally, **goal-setting theory** suggests that specific and challenging goals motivate individuals and lead to higher performance than general and too easy goals (orig. Locke, 1968). Therefore, PBC should be effective if compensation is tied to objective and adequately challenging goals. (Robbins, 1997).

Contrary to what agency theory suggests, some motivational research denies the motivational effect of compensation. Deci's (orig. 1971) **theory on intrinsic motivation** shows that money can in fact decrease intrinsic motivation when used as an external reward. Many motivational theories applied in social psychology, such as self-determination and motivation crowding theory, have evolved from research on intrinsic motivation. For instance, crowding-out theory argues that PBC works in a counterproductive manner since extrinsic motivators, such as monetary incentives, can weaken intrinsic motivation which again is seen extremely valuable for performing challenging tasks that involve creativity or problem-solving effectively. Despite being criticized for inadequate empirical proof, motivation crowding-out is accepted at a theoretical level also in economics (Frey & Jegen, 2001).

## 2.3. Compensation and PBC in organizational context

While motivational theories are used in explaining compensation plans from the perspective of an individual's motivation, this sections links the use of PBC to the organizational context. Compensation is a key area in the management accounting literature along fields such as cost accounting, strategic management accounting and budgeting. The topic can be approached from performance management and management control perspectives. Compensation is part of organizational performance management and tightly linked to setting objectives and evaluating performance. Therefore, compensation can play an important role in how firm performance develops.

In accounting literature, compensation can be classified under accounting for management control. Management control systems aim to align goals within an organization. An organization's core control system consists of four basic processes which are all required for an organization to perform well. The four elements are planning, operations, measurement system and evaluation–reward system. (Flamholtz, 1983.)

Malmi & Brown (2008) research the concept of management control systems as a package. They present a theory which is based on decision-making and control being separated and which divides management control systems into planning, cybernetic, reward and compensation, administrative and cultural controls. These controls are used to direct employee behavior in organizations. The role of reward and compensation controls is to motivate individuals and groups to improve their performance. Compensation works as a mechanism aligning objectives and effort of individuals to those of the organization as opposed to the situation where no explicit incentives are employed. In brief, compensation increases effort from three dimensions: it has an impact on effort direction, duration and intensity.

The ultimate purpose for using PBC is to improve firm performance. Most research on compensation relies on agency theory (e.g. Larkin et al., 2012). Agency theory broadly means that there are agency costs due to poorly aligned incentives. Agency costs include, among others, the cost of monitoring the agent and the cost borne by the principal if the agent abuses the principal's resources for achieving personal goals instead of maximizing the value of the resources that belong to the principal. In order to mitigate the misalignment, employees should be paid based on their performance, which should motivate them to improve their performance. According to Levin (2003), linking compensation contracts to performance can reduce incentive problems. Modern companies are getting increasingly knowledge-incentive and as Frye (2004) argues, decision-making authority is no longer concentrated at the top of the organizational chart. Therefore, aligning shareholder and employee interests may become increasingly important for firm performance.

However, aligning shareholder–employee or manager–employee incentives is not the only reason for organization to employ PBC contracts. Being an integral element of management control systems, PBC with clear performance measures provides a practical tool for management to communicate company strategy and goals. In addition, having a variable pay component provides companies with flexibility. Compensation is a considerable cost burden for companies, particularly in industrialized countries. Under the ever increasing profitability pressures, from a cost point of view, PBC provides a tool for companies to adjust their personnel costs to reflect actual employee performance and achieved firm profitability. While successful performance is rewarded for, on the other hand PBC schemes engage employees in risk-sharing since their pay is not fixed to a certain amount. In other words, PBC is riskier for employees than fixed pay.

Other reasons for companies to employ PBC include, among others, attracting, motivating and retaining capable employees (Banker et al., 2000; Frye, 2004; Gerhart et al., 1995). It is argued that particularly high-skilled and high-performing individuals are attracted rather by companies that link pay to performance than those that do not (e.g. Bonner & Sprinkle, 2002). On the other hand, Piekkola (2005) suggests that the use of PBC schemes can be explained by companies' willingness to decrease employee mobility. Finally, performance contingent incentives may be adopted in order to improve job satisfaction (Pouliakas, 2010) and collaboration (Barnes et al., 2011; Chao, 2010). The collaboration perspective is particularly important for this study.

## 2.4. Levels of performance evaluation

In this paper, PBC is defined as variable pay that is dependent on performance at organizational, profit center, team or individual level. Organizations may choose to evaluate performance at different levels due to several reasons. This section introduces the different bases for performance evaluation that determine bonuses paid out and describes the pros and cons related to each of them. In particular, the section focuses on collaboration, competition and risk related aspects attributable to each of the bases for performance evaluation.

Based on prior literature, Kvaløy & Olsen (2012) document a rise in individual performance pay, particularly in human capital intensive industries. Following the agency theory, employee pay should be linked only to individual performance in order to motivate and align employee interests with those of management (Conyon & Freeman, 2001). The classical problem with other than individual incentives is free-riding and moral hazard, as the agent is aware of the possibility of receiving bonuses without exerting effort but by taking advantage of peers' good performance. Therefore, according to agency theory, linking compensation to any other level of performance than the individual-level is an economic anomaly.

However, the free-rider argument regarding other than individual-based pay disregards interaction between colleagues. In modern organizations, working typically involves collaboration between individuals and task outputs can be co-produced. As is clear based on academic and practitioner literature, teams have emerged as an increasingly common way of organizing work in companies. The number of articles documenting this development is high. Coutu & Beschloss (2009) describe the phenomenon emerged around teams as "a cult". This cult seems to be so strong that even in the extremely independent American society teams are now regarded as the unquestionable norm. One driving force behind team-based organizational forms is the fact that organizational contexts are becoming increasingly complex and companies' environments more dynamic (Carlock, 2012). Cross et al. (2008) report that organizing work around teams is becoming more widespread particularly in white-collar and professional work and the trend seems not to be slowing down.

Characteristics of teamwork include, among others, collaboration, helping behavior and risk-sharing. By definition, it is obvious that teamwork involves collaboration and requires helping behavior between members to be successful. Chan et al. (2013) argue that "high-ability workers improve peer productivity under team-based compensation while hurting peers under individual-based compensation". This implies that team incentives are collaborative as opposed to the more competitive individual incentives.

Regarding the risk-sharing feature, evidence showing that groups are more risk averse than individuals is extensive. When working in a team, individual is not responsible for the output alone and thus performance risk and, under team incentives, also income related risk is spread. Individuals cooperate more to reduce risk when they work in groups than when they work as individuals (Gong et al., 2010). This result, proved by a behavioral laboratory experiment of a stochastic prisoner's dilemma game and a survey research, is found to be due to ex-post guilt aversion and blame avoidance. Groups also choose safe lotteries more often than individuals (Masclet et al., 2009). However, group risk appetite may depend on the risk intensity of a given situation. Shupp & Williams (2008) argue that groups are more risk averse on average than their average individual when high-risk is involved. In contrast, in low-risk contexts, groups are less risk averse than their average individual. Team incentives improve performance in groups with heterogeneous abilities (Chan et al., 2013). This means that the risk of individual incentives due to not possessing all required skills is mitigated when group incentives are used. Finally, consistent with teamwork involving a risk-sharing feature, Pizzini (2010) argues that companies use group incentives particularly when income risk is relatively high.

However, team-based work structures face also criticism. As Coutu & Beschloss (2009) argue, making teams work effectively may be challenging as teams are formed by individuals with different skills and objectives. In fact, teams have consistently been found to underperform despite the extra resources they deploy. Due to problems in coordination, motivation and competition, teams can end up as the worst option for working on challenging tasks. Other problems related to teamwork are the threat of free-riding and misallocating effort among different tasks due to conflicting individual incentives (Chao, 2010).

When organizing work in teams, successful team performance requires setting common targets that direct attention to achieving the shared performance goals (Tarricone & Luca, 2002). Due to the firm link between performance goals and incentive schemes, compensation related questions are relevant for team success. Success of a team depends on group interactions and incentives have the power to distort these interactions. When working in a team, individual contributions can be difficult to measure and reward directly, and thus designing a well-working and equitable

payment scheme based on individual performance may be impossible. In addition, Larkin et al. (2012) suggest that psychological costs may reduce the effectiveness of individual-based PBC. As a result, organizations often link compensation to group performance.

When individual's incentives depend on group performance, threat of peer sanctions forces all team members to make an effort (FitzRoy & Kraft, 1986). This is particularly true when team members are dispensable, meaning that they can easily be replaced. In these cases group-based compensation should be optimal due to peer pressure (Kvaløy & Olsen, 2012). For instance, according to equity theory, adopting a variable pay scheme that is perceived as unjust by individuals can have severe negative consequences for employee motivation and performance. Therefore, when outputs are delivered in teams, it may be necessary to base compensation on some aggregate measure of performance (Conyon & Freeman, 2001).

Moreover, organizations have goals that may sometimes collide with optimizing individual performance alone. This is the case particularly for teams that require collaboration and helping behavior. Successful team performance requires setting shared objectives and performance goals in order to make every team member work to achieve those goals (Tarricone & Luca, 2002). Therefore, effective teamwork may require linking individuals' pay to group performance, at least partially. Barnes et al. (2011) find that the level of co-operation is the highest in teams with pure team incentives.

According to FitzRoy & Kraft (1986), group-based pay may be beneficial for organizations when direct monitoring of individuals' interactions and collaboration is difficult. Similarly, Knez & Simester (2001) suggest that well-working mutual monitoring may turn group-based compensation effective. In professional services firms, team-based compensation is employed when tasks are interdependent, income risk is relatively high, self-monitoring between team members is cost-effective and companies are relatively small (Pizzini, 2010). Further, group-based pay is used to empower employees by decentralizing decisions (Ortega, 2009).

On the other hand, equity theory underlines that in case individuals' contributions to teams vary, the variation should be recognized with differentiation in compensation (Barnes et al., 2011). One problem recognized with peer-dependent incentives is their de-motivating effect on indispensable employees who after delivering a high output receive a low payment due to poor peer performance (Kvaløy & Olsen, 2012). These high-performing individuals can hold up to the value they create and try to renegotiate compensation thus making team-based PBC adoption difficult. These difficulties in implementing team-based incentives may explain the recent rise of individual performance pay.

Individual's total compensation can depend also on the performance of the entire organization. When compensation is contingent to individual or small-team performance, employees may have inadequate interest in pursuing broad organizational goals (Gerhart et al., 1995). Thus the idea behind for instance profit-sharing is to align the interest of employees' with those of owners by making the organizational result relevant for employees at all levels. However, the challenge of broad-based compensation schemes is their poor line of sight which means that regular employees lack understanding on how they can help reach the firm-level objectives (e.g. Sweins, 2011). The relationship between individual and firm performance is not linear and broad-based bonus might not correspond to individual performance improvement which can decrease motivation (Cooke, 1994). Therefore, the motivational effect of broad-based plans is often also questioned.

In brief, the effectiveness of incentives based on individual-level or peer-dependent performance evaluation is a debated topic. There is no unambiguous view about the type of pay scheme that accompanies the best organizational performance. Several pros and cons have been identified for each scheme in both theoretical and in empirical papers.

Practitioners have adopted compensation schemes that combine individual and team incentives (Gerhart et al., 2009). In this paper, compensation schemes combining the two types of incentives are referred to as "mixed contracts". Currently, there is no single theory explaining the superiority of employing mixed contracts. Rather, their application seems to result from the

shortcomings of the other two contract types. Chao (2010) introduces a model that gives strong support for using mixed contracts, particularly in team synergy settings. In team production, individuals exert two types of effort: effort for improved personal performance and effort to help other team members. While no theory suggests that individual rewards would promote co-operation but rather the opposite, at the same time however, using group incentives alone involves a tradeoff between increased helping of others and reduced individual effort. Thus, balancing between individual and team incentives might be essential and mixed contracts could be the optimal solution for effective PBC schemes.

# 3. PBC AND FIRM PERFORMANCE

## 3.1. PBC effectiveness

The ultimate purpose of employing PBC is to improve organizational performance through motivating employees. The number of prior empirical studies documenting a positive relationship between employing PBC and future firm performance is extensive. These studies typically differ in their empirical realization, level of performance evaluation determining bonuses under research, and type of financial incentives observed (profit-sharing, employee stock options, etc.). Some papers employ objective measures of financial performance while others focus on subjective ranking by sample companies of their performance relative to industry peers. Yet, they share the same idea of researching the link between performance contingent compensation and level of performance.

Performance effects can be observed at individual or at organizational level. Although in this section some individual-level performance effects are dealt with, in this study PBC effectiveness refers particularly to the impact of PBC on firm performance. Further, PBC effectiveness describes the impact of PBC on firm financial performance, instead of on other measures of performance such as quality which is used in many other studies.

Regarding performance of individuals, there is evidence that PBC increases productivity. Studying self-selection of people into different types of payment schemes under a controlled laboratory setting, Dohmen & Falk (2011) find higher effort levels and outputs in variable-pay plans than in fixed-payment schemes. The difference in productivity is attributed to personal characteristics of individuals. The authors argue that gender and risk appetite affect pay preferences and that more productive workers systematically prefer variable-pay. In two experimental tests in a controlled environment, Gneezy & Rustichini (2000) study the effect of monetary incentives on individuals' performance using university students and school children. The authors confirm that higher the pay, higher the performance.

Regarding PBC and future firm performance in terms of sales, productivity and profitability, several studies report a positive relationship. Piekkola (2005) argues that PBC improves firm productivity and profitability. According to Rayton (2003), best performers in the manufacturing industries use PBC schemes. Studying a retail company and using sales as the performance measure, Banker et al. (1996) document an increase in sales after adopting a PBC scheme. The sales increase is found to persist over years. In a different cultural context, Zhuang & Xu (1996) show that profit-sharing improves company productivity and profitability within their sample of 800 Chinese state owned enterprises.

Some studies compare companies employing PBC schemes to those not doing so. Typically companies using PBC have been found to outperform their peers that do not. Based on the UK Workplace Employee Relations Survey (WERS) data in the 1990s, where firms' subjectively rank their performance relative to industry peers, Belfield & Marsden (2003) find strong support for the argument that PBC can improve financial performance. They conclude that workplaces employing PBC perform better on average when compared with peers that do not. Also Conyon & Freeman (2001), using partly the same WERS data, argue that companies adopting shared compensation plans outperform their peers in productivity.

Instead of the use of incentive schemes in general, also the effect of PBC adoption in particular has been studied. There is less documentation on whether continuous profitability improvement attributable to an existing PBC scheme exists. In one of the first studies around the topic, Bhargava (1994) argues that adopting profit-sharing has a significant, positive impact on firm profitability. He finds no evidence that profit-sharing would bring continuous profitability improvements but the adoption seems to cause a one-time positive impact that persists.

While prior literature presented above supports the positive relationship between PBC and firm performance, not all results are unambiguous and a number of researchers argue that the relationship is not definitive. Factors affecting PBC effectiveness are numerous. These include, among others, performance evaluation measures used, amount of compensation received by employees, employees' knowledge of the pay scheme, and individuals' responses to incentives.

Companies typically mix different kinds of pay programs, which for instance Gerhart et al. (1995) argue to be the right solution. This however renders compensation plans easily very complex. In order for incentives to work effectively, knowledge of the pay system must be distributed in the organization, since employees' knowledge of how the system functions directly affects the system's motivational power (Sweins, 2011). An incentive plan as such does not increase motivation sufficiently but the system must be understood. Thus, employees with sufficient knowledge of the pay system should be the most motivated.

Conclusions about PBC effectiveness in prior research vary depending on the basis of figures used to measure firm performance. In particular, results differ depending on whether accounting-based or market-based figures are used. Studying managerial compensation of 16,000 managers at 250 large U.S. corporations, Abowd (1990) documents a positive relationship between performance-sensitivity of compensation and future firm performance. He argues that increasing the sensitivity of managerial compensation to either after-tax gross economic return or total shareholder return may be linked to better performance of that same measure in the future. However, the author finds that while economic and market measures show strong evidence of this relationship, for accounting-based measures (ROA and ROE) the relationship seems to be weaker or nonexistent. Similarly, Frye (2004) investigates two samples of over 150 American companies in the early and late 1990s and argues that equity-based compensation (EBC) for employees is associated with improved firm performance. This holds, however, only when Tobin's q is used as an estimate. In fact, in the latter sample, when ROA is used as performance measure, higher levels of EBC lead to lower future accounting returns.

In addition, PBC effectiveness may vary depending on the amount of salary and incentives paid to employees. There is evidence that PBC payments should exceed a certain minimum level in order to be effective. With their two experimental tests on monetary incentives in a controlled environment, Gneezy & Rustichini (2000) confirm that the higher the pay the higher the performance. Interestingly, however, they argue that a small amount of monetary incentives may in fact reduce performance level. Similarly, studying the impact of bonuses based on the British

Household Panel Survey, Pouliakas (2010) argues that monetary incentive may increase workers' utility and performance as long as they are large enough.

D'Art & Turner (2004) document some evidence of the positive impact of profit-sharing on firm performance. The authors employ data from the 1999 Cranfield survey for which nearly 3000 firms in 11 European countries self-assessed their organizational performance with different measures, including financial performance, level of productivity, service quality, product to market time, and rate of innovation as well as two behavioral measures which were labor turnover and absenteeism. Interestingly, contrary to analyzing all observations as one sample, when companies are considered country by country the relationship is found to be inconclusive instead of positive. In addition, the authors find no significant impact of profit-sharing on the behavioral measures of absenteeism and turnover suggesting that profit-sharing has no effect on these behaviors.

Direction of the causal relationship between PBC and firm performance is not always clear. It is possible that firms with higher performance decide to adopt PBC plans. Reviewing different types of performance contingent compensation schemes, Gerhart et al. (1992) argue that a positive relationship between PBC and firm performance exists but evidence on the direction of causality remains unclear. This is the case regarding profit-sharing plans in particular. Also Belfield & Marsden (2003), who find that PBC enhances firm performance, note that uncertainty exists regarding the direction of causality between incentives and firm performance.

## 3.2. PBC effectiveness with different levels of performance evaluation

A crucial issue when designing PBC systems is to decide on the level of performance evaluation based on which bonuses are paid to employees (Gerhart et al., 2009). Prior literature provides varying theoretical views on the optimal level of employee performance evaluation. In the following, it will be discussed which levels of performance evaluation seem to make PBC work in practice: individual incentives, group incentives, or mixed contracts?

### *3.2.1. Individual incentives*

Traditionally, performance related pay was linked to individual performance. Therefore, the earliest PBC related research deals mainly with individual incentives although the focus has not been the level of performance evaluation, individual or group, per se. Later on when research on group incentives was introduced, more studies emerged with the particular aim to support compensation based on individual performance. For instance, Trevor et al. (2012) support individual-based compensation arguing that justified and well-earned pay dispersion improves team performance when work is interdependent. While there is some debate around the relationship between PBC schemes and firm performance, most studies argue that the relationship is positive.

### *3.2.2. Team incentives*

Following the criticism faced by the agency theory for providing a too simplified description of the world, literature suggesting that PBC should be linked to group-level performance instead of solely individual performance emerged. The number of studies supporting the effectiveness of group or team incentives is extensive.

Chao (2010) argues that team-based compensation yields higher welfare than individual or mixed contracts when team synergy is high. Knez & Simester (2001) studied the effect of Continental Airline's firm-wide incentive plan covering all 35,000 hourly employees. The authors report that "the incentive scheme raised employee performance despite the apparent threat of free riding". Kim & Gong (2009) find a positive relationship between group-based pay and firm performance measured by ROA and Tobin's q. The authors suggest that firm performance is mediated by organizational citizenship behavior (individual's discretionary behavior that enhances firm functioning but is not directly recognized by the formal reward system). Using a sample of 841 U.S. manufacturing firms, Cooke (1994) shows that joint compensation enhances firm performance when measured as value added net of labor cost per employee. FitzRoy & Kraft (1986) find "strong effects of profit-sharing and worker ownership shares on residual owners' return on capital".

However, evidence on group-based pay is not only positive either. Although a peer performance dependent incentive plan may increase organizational performance on average, it may lower the effort of the highest performing individuals or units i.e. result in performance converging to a standard (Hansen, 1997).

### *3.2.3. Mixed contracts*

According to Chao (2010), mixed contracts should result in higher welfare than purely individual-based or group-based compensation when team-synergy is low, despite the possible free-riding effects of the group-based component. However, implementing mixed contracts is not completely unambiguous either. Research addressing the topic has yielded mixed results regarding the relative effectiveness of mixed contracts. For instance, when compared with pure group incentives, under mixed contracts employees may work faster but less accurately and direct attention rather to their own tasks then helping team members. The latter trade-off is referred to as the social dilemma (Barnes et al., 2011). In addition, mixed contracts can lead to overly complex payment schemes that are difficult for employees to understand. This can blur the line of sight rendering the PBC scheme ineffective (Gerhart et al., 2009).

## 3.3. Demographic factors and personality traits

Traditional economic theories are based on the assumption that human are rational decision-makers whose behavior is guided by the goal of outcome maximization. However, it is evident that individuals' actual decision-making process is not rational but limited by numerous factors such as bounded rationality or intuitive decision-making. On top of limitations to rationality, human behavior is influenced by individual-level variables. These include, among others, ability, personality and objective demographic factors such as age, gender, education, and occupation.

While there is debate on whether demographic factors affect employee performance and job satisfaction directly, personality traits are said to have a direct impact on performance and satisfaction in a given work context, shaped for instance by competition or risk. On the other hand, demographic factors may be linked to certain personality traits and therefore, via

personality traits, demographic factors can in fact influence employee performance and job satisfaction. (Robbins, 1997).

This section aims to shed light on how objective biographical factors may affect individual behavior and choices through certain personality traits. For instance, gender and age have "an economically significant impact" on individual risk-taking attitudes (Dohmen et al., 2011). In addition, it is argued that gender affects attitudes towards competition as well as performance under competition (Kleinjans, 2009). The personality traits of risk tolerance and competitiveness influence individuals' performance and motivational drivers. This paper focuses on the demographic factors of age and gender. In particular, impact of these factors on risk-taking, preference for competition or collaboration, and performance is explored.

### *3.3.1. Gender, risk-taking, competitiveness, and performance*

In general, women are significantly less willing to take risks than men. This is one of the main findings of Dohmen et al. (2011) whose paper employs self-assessments of over 22,000 individuals regarding their willingness to take risks. The results of the self-assessment survey were confirmed in a real-stakes lottery experiment where the self-assessments were linked to the individuals' actual behavior.

In their study linking job satisfaction, work environment and rewards, Sell & Cleal (2011) argue that "women pursue job security more than men". Search for higher security can be associated with lower risk tolerance. Reviewing literature on gender differences in economic experiments, Croson & Gneezy (2009) document significant differences in risk-taking; women are more risk averse than men with the exception of managers and entrepreneurs. According to Apesteguia et al. (2012), this holds also at group level since all-women teams are more risk averse than teams with one or more men.

On top of risk-taking attitudes, there are vast amounts of evidence suggesting that gender impacts also competitiveness. Flory et al. (2010) show that women "shy away from competitive work settings" and that men are attracted by competition – sometimes even too much. Kleinjans (2009)

suggests that women, compared to men, have a higher distaste for competition and thus underperform under competition more often. Through the link with occupational expectations and outcomes, this can explain also economic choices. Croson & Gneezy (2009) identify significant gender differences in competitive preferences. They find that women choose more often not to compete and that men, relative to women, improve their performance under competition. Also according to Apesteguia et al. (2012), women do not only seem to be less competitive than men, but under competition men improve their performance relative to women.

Finally, gender differences seem to exist also regarding performance in certain contexts. Apesteguia et al. (2012) study the effect of gender composition on teams' economic performance. They find that in a large business game played in groups of three, all-women teams significantly underperform when compared with any other gender combination. Also Ivanova-Stenzel & Kübler (2010) show that gender performance gap disappears when mixed teams are used.

Approaching from another angle, one can also look at collaboration. Women have been found to be more cooperative then men. Ivanova-Stenzel & Kübler (2010) base their paper on several studies that report women to be more cooperative and less competitive than men. Ortmann & Tichy (1999) report that women cooperate more in mixed-sex environments but that cooperation rates slightly converge in single-sex environments. In addition, Hamilton (2011) interviewed 30 employees at an American university and found that in men-only groups horizontal co-ordination was viewed as "something undertaken in unusual circumstances". In contrast, for women reciprocal helping was more common implying that women are more collaborative. In fact, the author suggests that concepts of teams and teamwork may be "male norms of horizontal co-ordination".

However, some authors find opposing results and question the existence of gender differences in competitiveness. Gunkel et al. (2007) find no support for the claims, popular in literature and in media, suggesting that men are competitive and assertive by nature whereas women have other stereotypical characteristics.

### *3.3.2. Age, risk-taking, competitiveness, and performance*

Age has an economically significant impact on willingness to take risks (Dohmen et al. 2011). The authors argue that risk appetite decreases significantly with age. Today, short-termism is rather generally associated with riskiness. In their recent study, Brochet et al. (2012) measure managers' time horizon in their communication with investors and argue that corporate short-termism is linked to greater company risk.

Influence of age and career horizon on managerial time horizon has been studied in academia. Several researchers discuss a phenomenon referred to as the "horizon problem". The conflict means that when approaching retirement there might be a shift in managers' focus from long-term to more short-term outcomes. Greater short-termism of the oldest managers would thus imply riskier managerial behavior leading to increased organizational risk.

According to Ryan & Wiggins (2001), both the oldest and the youngest managers have incentives for short-termism. The oldest managers are nearing retirement and may no longer be fully motivated while the youngest managers must build their reputations in order to advance their careers quickly. In contrast, middle managers search for stability. Davidson et al. (2007) explore the link between CEO turnover, earnings management and bonus plans using a sample of 597 turnovers during 1992-1998. They argue that people approaching retirement age no longer necessarily direct all their focus on the company's long-term strategies but may instead prioritize short-term performance in the hope of increasing their own wealth. Although age does not perfectly correlate with career phase, it gives a sufficient estimate.

Researchers have documented age-related differences also regarding the competition/collaboration perspective. Using survey responses of over 1,100 office employees in Finland clustered in five age groups, Rothe et al. (2012) study how differences in preferences regarding work environment vary across age. The authors find that the youngest cluster finds environments supporting team working significantly more important than all the other clusters.

## 3.4. Impact of demographic factors on optimal compensation scheme

Just like individuals differ in their personality traits regarding risk tolerance and competitiveness, compensation schemes differ in how they encourage individuals for risk-taking and competition, as described in Chapter 2. Personality traits affect individuals' preferences and, as a result, determining the optimal pay scheme structure for each individual. In this section, differences in personality traits due to demographic factors are linked to differences in compensation system characteristics with regard to risk profile and competition/collaboration. Prior empirical evidence is introduced about how demographic factors influence individuals' preferences for and choice of incentive schemes. First, the section deals with demographic factors and PBC in general, and then it moves on to discussing how demographics influence the optimal incentive scheme structure (individual incentives, team incentives, or mixed contracts).

### *3.4.1. Demographic factors and PBC in general*

Research on demographics-dependent differences in preference for PBC is extensive. Variable-pay is considered riskier than fixed-pay. For instance, Gerhart et al. (1995) refer to variable-pay as "pay at risk". Studying self-selection of people into different types of payment plans, Dohmen & Falk (2011) argue that women prefer fixed payment schemes more than men who self-select into variable-pay plans more often. The authors explain these differences with women's lower risk tolerance and productivity. They argue that higher risk appetite and productivity are positively related to preference for performance pay. This highlights that the nature of variable-pay is, due to earnings volatility, considered riskier than fixed-pay which yields a "safe payoff". Also according to Flory et al. (2010), women prefer fixed compensation to a higher extent than men do. Instead of examining individual preferences, this paper aims to find out whether the impact of this phenomenon shows at the organizational level.

Gender differences in preference for PBC, resulting partly from differences in competitiveness, have been offered as an explanation for the existing gender wage gap. Chauvin & Ash (1994) argue that a significant proportion of the gender wage gap results from the part of pay that is performance-related. Again, the authors explain their results with, among others, gender

differences in risk-taking and performance. In addition, performance-based bonuses have been accused of increasing the gender wage gap in Finland (Trade Union Pro, 2013).

Some authors, however, oppose this view. According to Manning & Saidi (2010), women are less likely, but only slightly, to work under PBC contracts. Since the impact of PBC on overall pay is minor and does not vary remarkably between genders, differences in competitiveness are unable to explain the gender wage gap. Also according to Gunkel et al. (2007), there are no differences in performance-based compensation related preferences between men and women.

Earlier it was argued that both the oldest and the youngest managers tend to be more short-term oriented, which is associated with greater risk-taking. Therefore, older and younger managers might prefer PBC contracts to fixed pay as the former are riskier and can yield higher individual pay. In contrast, managers in the middle of their career seek for safe payoff and may prefer fixed pay. However, there is no prior empirical evidence on the topic.

### *3.4.2. Demographic factors and individual or team incentives*

This section discusses evidence showing how age and gender influence the preferred level of performance evaluation for determining bonuses. In contrast to the relationship between demographics and preference for fixed vs. variable pay, there is much less prior empirical evidence on this latter topic.

In experimental economics laboratory sessions, Healy & Pate (2011) found that women prefer to compete in teams while men prefer to compete as individuals. They explain this with gender differences in competitiveness instead of, for instance, in risk appetite or confidence. The authors argue that designing environments that encourage teamwork could add women's participation in competitive fields. In addition, there is weak evidence that men improve their performance either when competition exists or when women are present, and that men perform the worst when they collaborate with another man. This is what Ivanova-Stenzel & Kübler (2010) show in their paper exploring the influence of gender composition of teams on gender performance gap.

Flory et al. (2010) study job-entry decisions of nearly 7,000 applicants in a natural field experiment. Women apply significantly less when fixed-pay contract is changed to heavily individual-based pay. However, no such effect is documented when fixed-pay contract is changed to heavily team-based pay. This is a very interesting finding and suggests strongly that women prefer team-based compensation over individual-compensation. Again, there are also opposing views in prior literature. Manning & Saidi (2010) argue that both genders are equally likely to choose incentive schemes based on independent performance evaluation.

As mentioned at the end of the previous section, earlier it was discussed that both the oldest and the youngest managers tend to be more short-term oriented, which is associated with greater risk-taking. Therefore, contrary to managers in the middle of their career, older and younger managers might prefer individual incentives that are riskier and offer the opportunity to pursue higher individual pay.

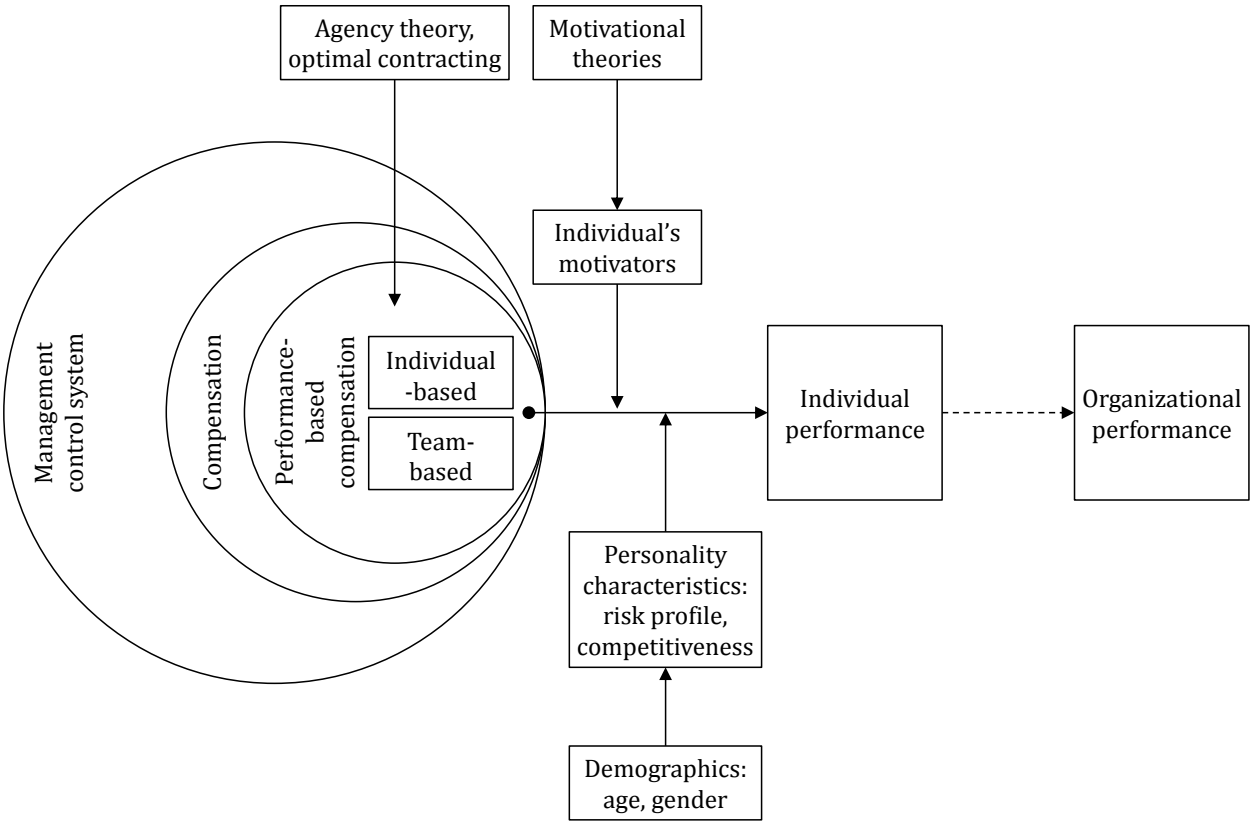
## 3.5. Theoretical framework

Figure 1 draws together into a theoretical framework the prior literature reviewed above. In accounting literature, compensation is viewed as one of the four key processes required for successful organizational performance (Flamholtz, 1983) and as a management control mechanism that is utilized in motivating individuals and groups for improved performance (Malmi & Brown, 2008). Performance-based compensation is part of employees' total compensation and it can be based purely on individual performance or include elements that depend on the performance of a larger unit. From employee perspective, different types of compensation schemes differ in their characteristics with regard to income risk and level of competitiveness encouraged.

The relationship between incentives and an individual's performance is not linear. Instead, the relationship is distracted by factors that motivate the individual as well as by personality characteristics of the individual which are partly shaped by demographic factors and which may influence the motivational power of variable pay. Finally, the relationship between individual and organizational performance is not linear either, since the number of factors affecting

organizational performance is extremely high. Therefore, in Figure 1, this relationship is marked by dotted line. The framework constructed excludes other factors affecting organizational performance and focuses on illustrating that improved individual performance should ultimately show at company level.

**Figure 1. Theoretical Framework**



# 4. HYPOTHESES

This section introduces the testable hypotheses established based on the review of theories and previous empirical studies. Since prior literature was already extensively discussed, only key points from prior literature will be provided here to support the hypotheses.

Monetary incentives have been found to increase effort level and performance at individual level (Dohmen & Falk, 2011; Gneezy & Rustichini, 2000). At company level, best performers in manufacturing industries link employee pay to performance (Rayton, 2003) and companies that have performance contingent pay schemes in place outperform their peers (Belfield & Marsden, 2003). Performance related pay improves firm performance measured among others by sales (Banker et al., 1996), productivity (e.g. Conyon & Freeman, 2001; Zhuang & Xu, 1996) and profitability (e.g. Abowd, 1990; Bhargava, 1994; Frye, 2005; Piekkola, 2005).

Hypothesis 1: Performance-based compensation for WCWs improves future profitability of the firm

Different compensation schemes, fixed pay, performance contingent pay, and individual or peer incentives, vary in their characteristics regarding risk profile and support to competition or collaboration. These characteristics influence interactions between individuals under a given scheme and attract different types of individuals since also individuals vary in their corresponding personality traits.

Performance-based compensation is variable pay and referred to also as “pay at risk” (Dohmen & Falk, 2011; Gerhart et al., 1995). Men are argued to have higher risk appetite than women (Apesteguia et al., 2012; Croson & Gneezy, 2009; Dohmen et al., 2011; Sell & Cleal, 2011) and to be more competitive than women (Apesteguia et al., 2012; Croson & Gneezy, 2009; Flory et al., 2010; Kleinjans, 2009) while women are found to be more co-operative than men (Hamilton, 2011; Ivanova-Stenzel & Kübler, 2010; Ortmann & Tichy, 1999). In addition, women are found to avoid pay contracts that depend heavily on individual performance (Flory et al., 2010).

Similarly, age influences willingness to take risks, and risk appetite is found to decrease with age (Dohmen et al., 2011). On the other hand, the oldest managers are argued to have a potential tendency for short-termism (Davidson et al., 2007; Ryan & Wiggins, 2001), which can be associated with risk-taking (Brochet et al., 2012).

Hypothesis 2: The positive effect of performance-based compensation on future profitability of the firm is stronger for male than female WCWs

Hypothesis 3: The positive effect of performance-based compensation on future profitability of the firm is stronger for the youngest and the oldest WCWs

Teamwork is characterized by collaboration and a risk-sharing feature (Gong et al., 2010; Masclet et al., 2009). Therefore, team incentives, which promote collaborative behavior and reduce income risk of an individual when compared with individual incentives, should attract and work more effectively for employees with corresponding personality traits. In fact, women seem to prefer competing in teams while men do not hesitate to compete individually (Healy & Pate, 2011) and women are found to avoid incentive schemes that are heavily based on individual performance but not to avoid performance pay that is heavily based on team performance (Flory et al., 2010). Prior literature has not documented similar findings with regard to age profile and preferred compensation scheme. However, the following hypothesis regarding age profile and preferred compensation scheme will be based on the same literature on personality traits and associated demographic factors as Hypothesis 3 above (the references will not be repeated here).

Hypothesis 4: The positive effect of individual-based compensation on future profitability of the firm is stronger for male than female WCWs

Hypothesis 5: The positive effect of individual-based compensation on future profitability of the firm is stronger for the youngest and the oldest WCWs

# 5. RESEARCH DESIGN

## 5.1. Data

The research employs a large and unique pay data about Finnish industrial companies for years 2002–2011. The dataset includes information about components forming an individual's total annual compensation as well as about demographic profile (age, gender and education) of each WCW in the sample. On top of individual pay data, the study employs a second dataset about experiences and insights of companies regarding their compensation schemes. This data on compensation systems distinguishes, among others, the level of performance evaluation on which PBC in a given company is based on (individual, team, profit center, company, etc.).

The pay and the compensation system datasets were received from the Confederation of Finnish Industries (EK), which is the leading business organization in Finland representing the entire private sector. As EK member companies represent over 70% of Finland's GDP and 95% of the country's exports (EK, 2013), the dataset employed is very comprehensive. The dataset is unique particularly as it contains information also for non-public companies which could not be collected from public sources.

Both of the two datasets are based on regular survey questionnaires administered by EK. To collect the pay data, EK sends out survey questionnaires to all of its member companies every year in October. The salary statistics include many variables at individual level, such as information on demographic profile, education, employment contract type, years worked under the current contract, role in the organization and different components of pay. As the information is collected for EK's official salary statistics, survey response rates are usually high. The compensation system survey is sent out by EK every three years and it includes firm-specific information about, for instance, structure of the company's compensation system, reasons for adopting PBC, experienced effectiveness and benefits of PBC, and intentions to develop the PBC system further. This study employs the compensation system survey of year 2011.

In order to match the EK pay and compensation system data with firm-level financial information, accounting information about firm performance and other firm-specific facts was collected from Voitto+ database. Voitto+ is the most extensive and comprehensive company information database in the Finnish markets. At the time of the data collection, Voitto+ accounting information for year 2012 was still incomplete and therefore the last year included in this research is 2011.

This study focuses only on industrial companies instead of including also the services sector. This restriction was made to control for possibly varying incentive structures in the two different sectors. The original pay data for the industrial sector included 1,106,804 individual pay observations during years 2002–2011. These observations belong to 2825 firms and 7240 firm-years. For the companies in the EK pay data, financial information from Voitto+ was available for 2225 companies in years 2004–2011. Merging individual pay data and company financial information left 544,215 individual pay observations for years 2004–2011. Observations before year 2007 were removed from the sample due to their very small number.

As the next step, PBC variable was calculated, as will be explained in the variables section, and the half a million pay records were aggregated at a company level. This means that company-level averages were calculated for all individual-level variables in order to use them in the model that will be presented further. For instance, the age of individual employees was transformed into a variable indicating the average employee age per company per year. Similarly, gender and education were given a company-level index indicating the share of male WCWs of all and the share of WCWs with academic degree of all, respectively.

Only firm-years for which all relevant pay and financial data were complete were included in the final sample. For instance, companies for which turnover or return on assets ratio was missing were removed from the final sample. However, firm-year observations with blank values for variables not included in the regression model were not removed. This means that all firm-year observations include values for each variable required by the model. Then the dataset was trimmed by 1%, meaning that 0,5% of the smallest and the largest values of each key variable,

and the entire respective firm-year observation, were removed. Only for the sales variable the highest 0,5% of the values were not removed. This is because the largest Finnish companies can be thought to have relatively sophisticated compensation systems in place and thus it is interesting to keep them in the sample. Finally, firm-years with only one WCW were ruled out since the model, which will be introduced in the methodology section, requires calculating variance of PBC paid to WCWs by a company in a given year, which is not possible for one-WCW companies with one PBC observation only.

After these steps, 4511 firm-year observations for years 2007-2010 were left in the final sample. Note that the sample is written to run only until year 2010 since the model contains ROA of the current year (*t*) and the following year (*t+1*) as input variables for a firm-year observation of the current year (*t*). This means that the accounting information collected for the last year 2011 is included in the sample but only as part of the firm-year observations of the base year 2010.

The final sample consists of companies from different industries. The distribution of firm-year observations across industries is illustrated in Table 1. The companies were grouped using the Standard Industrial Classification TOL 2008 by Statistics Finland (STAT, 2013). Most firm-year observations in the sample represent the manufacturing industry, manufacture of basic metals in particular.

**Table 1: Distribution of Firm-Year Observations by Industry***

| Industry | N | % |
|---|---|---|
| Manufacturing | | |
| Manufacture of food products and beverages | 410 | 9,1 |
| Manufacture of textiles | 80 | 1,8 |
| Manufacture of wearing apparel | 53 | 1,2 |
| Manufacture of leather and related products | 38 | 0,8 |
| Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 87 | 1,9 |
| Manufacture of paper and paper products | 143 | 3,2 |
| Printing and reproduction of recorded media | 509 | 11,3 |
| Manufacture of coke and refined petroleum products | 21 | 0,5 |
| Manufacture of chemicals and chemical products | 125 | 2,8 |
| Manufacture of rubber and plastic products | 343 | 7,6 |
| Manufacture of other non-metallic mineral products | 208 | 4,6 |
| Manufacture of basic metals | 1245 | 27,6 |
| Manufacture of furniture | 102 | 2,3 |
| Other manufacturing | 22 | 0,5 |
| Electricity, gas, stream and air conditioning supply | 448 | 9,9 |
| Construction | | |
| Construction of buildings | 349 | 7,7 |
| Civil engineering | 117 | 2,6 |
| Specialized construction activities | 211 | 4,7 |
| Total | 4511 | 100,0 |

*following the Standard Industrial Classification TOL 2008 by Statistics Finland

The EK pay information is the principal dataset employed in this research. In addition, the EK compensation system survey concerning experiences and insights of companies with regard to their compensation schemes is employed. The survey is, however, available only for year 2011 and for 652 companies. Therefore, it is utilized only to validate whether the variance of PBC paid by a company can be used to reflect the use of a more individual-based or rather team-based compensation scheme, as will be explained in the variables section. Merging the compensation system survey with the final 4511 firm-year observations (i.e. combined EK pay and Voitto+ accounting information), results in 266 observations in year 2011.

## 5.2. Variables

### *5.2.1. Dependent variable: future firm performance*

In this study, firm profitability is used to indicate firm performance. Profitability measures can be divided into two categories: market-based and accounting-based measures. This study relies on accounting-based measures since the data employed contains mainly non-listed Finnish companies for which market-based measures are not applicable. According to Kauhanen & Napari (2012), if an incentive plan is based on one measure only, for white-collar workers that is usually a profitability measure.

More specifically, this paper employs the profitability measure return on assets (ROA) as the proxy for firm performance. ROA ratios were collected from Voitto+ database which uses the following formula for calculating them (Asiakastieto, 2013):

$$\textit{Return On Assets} = \textit{Income Before Extraordinary Items} + \textit{Interest Expense (12 Months)} / (\textit{Total Assets}_{(t+1)} + \textit{Total Assets}_{(t)}) / 2 \times 100$$

ROA is a widely applied performance measure and the primary measure of profitability in many previous studies (e.g. Abowd, 1990; Hochberg & Lindsay, 2010; Kim et al., 2012). These papers use also market-based measures which is not possible in this study. Other measures used are operating profit (Banker et al., 2009), return on capital (Bhargava, 1994; FitzRoy & Kraft, 1986), ROE (Abowd, 1990), sales (Bhargava, 1994), and subjective rankings of financial performance compared to industry peers (D'Art & Turner, 2004; Belfield & Marsden, 2003). However, ROA is a good objective measure and compared to return on equity unaffected by leverage.

This paper aims to find out whether PBC has an impact on firm performance in the future. There are both theoretical and practical reasons for using future performance. Firstly, also in prior literature researchers study the impact of PBC in the current year on company performance in the subsequent year (e.g. Abowd, 1990; Frye, 2004). In addition, Bhargava (1994) shows that adopting profit sharing yields a strong one-off profitability improvement and that profitability

seems to remain at the once reached higher level in profit sharing firms. This means that the impact of PBC should show also when future performance is used as the dependent variable. Finally, the importance of designing responsible compensation schemes that create sustaining value has recently received a great deal of attention in the public discussion and among political decision-makers. For instance, the Commission of European Communities gave a recommendation on remuneration policies in order to tackle the short-termism they have contributed to (EC, 2009). Although the recommendation concerns executive compensation and listed companies, it captures the spirit in which incentive schemes are discussed in public. Therefore, it is important to find out whether PBC can improve firm profitability in the future.

What comes to practical reasons, one cannot be certain whether the PBC payments in the EK pay data have been reported on cash basis or on accrual basis. By using future firm performance as the dependent variable, one can be convinced that firm performance is not measured before PBC was paid. Therefore, variables of a given year (*t*) are used to explain ROA in the following year (*t+1*). For instance, independent variables for year 2010 are used to explain ROA in 2011.

Kauhanen & Napari (2012) explain that while the output of blue-collar work can be measured over short time periods, even on an hourly basis, the output of white-collar work is measurable only over longer time period. The authors find that the frequency of bonus payments to white-collar employees is lower than to blue-collar employees. In a similar manner, the time horizon is shorter for WCWs when compared with executives. As this study concerns WCWs whose output realizes between the frequent time horizon of blue-collar workers and the longer-term cycle of executives, using a gap of one year for measuring the impact of incentives on subsequent firm performance is justified.

### *5.2.2. Independent variable: performance-based compensation*

Performance-based compensation is the key variable of interest in this study because its ability to explain future firm performance is being explored. As the proxy for PBC, this study employs either PBC dummy or PBC ratio. PBC dummy is used when testing the impact on firm

performance of either having or not having paid PBC in a given firm-year. If PBC was paid the dummy receives a value equal to 1, and if PBC was not paid the dummy gets a value equal to 0.

PBC ratio is used to explore how the use of PBC influences future firm performance among companies that have paid PBC. PBC ratio is calculated for each WCW individually using the following formula:

$$PBC\ ratio = Annual\ PBC / (Annual\ PBC + 12 \times Monthly\ Fixed\ Salary) \times 100$$

PBC ratio equals to the share of PBC of total annual compensation where total annual compensation is the sum of annual fixed salary and PBC in a given year. After this, the average PBC ratio is calculated per firm-year. Current year PBC ratio is used to explain firm performance in the subsequent year. Information required for calculating PBC dummy and PBC ratio is included in the EK pay data.

After testing the effect of PBC on future firm performance, focus will be on exploring differences between individual-based and group-based compensation. For this purpose, PBC ratio is replaced by the natural logarithm of the variance of PBC ratios within a company in a given year. The logarithmic transformation is applied in order to reduce the highly positive skewness of the variance variable distribution.

Variance is used as the proxy for variation in PBC paid by a company in a given year. If there is little variation in PBC paid, it can be assumed that compensation is based on rather similar targets and thus the PBC scheme should contain some kind of a team or company performance contingent element. In contrast, when variation in PBC paid is high, compensation should be based more on individual performance. Since calculating variance requires more than one observation, firm-years for which there was information about one WCW only were removed from the sample. In addition, using variance of PBC paid means that only firm-years when PBC was actually paid can be included in the analysis of individual- vs. team-based compensation despite the type of scheme they actually used.

In order to compare PBC ratio variances of employees at different organizational levels, PBC ratios of lower- and upper-level WCWs are standardized before calculating one PBC ratio variance for a company. In the EK pay data, WCWs are divided into lower- and upper-level white-collar workers. According to the definitions based on the Classification of Socio-economic Groups 1989, lower-level employees have administrative and clerical occupations whereas upper-level employees have administrative, managerial, professional and related occupations (STAT, 2013). Job design, responsibilities and ability to influence firm-level performance vary between these groups. Compensation typically reflects responsibility carried, and thus more PBC is paid to more senior level employees. According to Kauhanen & Napari (2012), the share of PBC of regular earnings is, on average, 9% for upper-level WCWs and 5% for clerical WCWs. This supports the need for standardizing individual PBC ratio observations in order to calculatie one PBC ratio variance per firm. If individual ratios were not standardized, larger PBC ratios of upper-level WCWs would be too heavily weighted when calculating variance, which would distort identification of individual and group incentives.

### *5.2.3. Control variables: firm- and individual-level factors*

Future firm performance is a sum of numerous factors. In order to explore the role of PBC in improving firm performance, other factors that may have an impact on firm profitability must be controlled for. Therefore, several control variables are included in the model. As in the case of the independent variable, control variables of the current year are used to explain firm performance in the subsequent year.

Following Frye (2004), firm-level control variables include past firm performance, firm size and financial leverage. These three firm-level control variables were collected from Voitto+. As in the case of the dependent variable, ROA is used to measure also past firm performance. Natural logarithm of turnover is selected as the proxy for firm size. Log-transformed variable is used in order to induce symmetry in the turnover distribution which is substantially skewed due to larger number of smaller firms. Finally, financial leverage is measured with gearing which in Voitto+ database is calculated as (Asiakastieto, 2013):

*Gearing = (Net Debt – Cash) / Equity x 100*

Gearing ratio generally indicates company risk and it may therefore be associated with future firm profitability. The higher the share of assets financed by debt, the higher the financial leverage of a company. If additional debt contributes to increasing sales or to improving efficiency, ROA increases. This phenomenon is called leverage gain. However, if the cost of debt exceeds the increase in net income, ROA decreases. In fact, high leverage is risky since it is sensitive to economic fluctuations. The impact of financial leverage on firm profitability can be either negative or positive. However, due to the financial crisis and the resulting challenging economic conditions in Finland during the time period under observation, the impact of gearing on firm profitability is expected to be negative.

Control variables derived from the individual-level pay data and aggregated at firm-level are company-specific salary level, employee age, education and gender. Gerhart et al. (1992) argue that pay level may directly influence companies' capabilities to attract and retain employees. If a company manages to recruit the most talented individuals to its service, this should positively contribute to its performance. According to Du Caju et al. (2009), more profitable companies pay higher wages to their employees. Firm average salary level is calculated as the natural logarithm of the average monthly fixed salary paid to WCWs by a company.

In addition, selected demographic factors are controlled for, as discussed in the literature section, due to their potential impact on PBC effectiveness and therefore on future firm profitability. Natural logarithm of the average age of WCWs, the proportion of male WCWs of all and the proportion of WCWs with academic degree in a company are selected as proxies for age, gender and education, respectively. Although education was not dealt with in the literature review section, it is included in the model. On the one hand it can be thought that a larger share of highly educated individuals brings more talent to the company and is thus valuable. On the other hand, earning higher salaries on average, these individuals are an important cost component and may thus negatively affect firm profitability. As a result, it makes sense to control also for education.

Finally, macroeconomic influence on profitability should be controlled for (e.g. Bhargava, 1994; Kim et al., 2012). This means that the impact of the general market situation, such as the economic shock caused by the financial crisis, is separated from the impact of other variables. In this paper, year dummy variables are used to control for temporal variation in firms' profitability. Firm-fixed effects are not controlled for due to the relatively short time series.

## 5.3. Methodology

The study aims to find out whether a causal relationship exists between PBC and future firm performance and which factors may influence this relationship. Based on prior research, causality is assumed to exist. Empirical analysis is conducted using quantitative statistical methods that are applied to a comprehensive dataset. In more detail, theory-based hypotheses are tested applying pooled OLS regressions to the panel data. In addition, correlation analysis is conducted. In order to draw conclusions, results of the correlation and regression analyses are interpreted in the light of existing theory and hypotheses.

The empirical analysis of the study is conducted using three nearly identical models. First, the effect of either having or not having paid bonuses on future firm performance is tested by estimating the following model:

$$(1)\ Future\ firm\ performance = \beta_0 + \beta_1 PBC\ dummy + \beta_2 Past\ performance + \beta_3 ln(Turnover) + \beta_4 Financial\ leverage + \beta_5 ln(Salary\ level) + \beta_6 ln(Age) + \beta_7 Gender + \beta_8 Academic\ degree + \alpha_1 Year\ dummies + \varepsilon$$

Model (1) is estimated using the entire sample. In model (1), PBC dummy receives a value equal to 0 if PBC was not paid and equal to 1 if PBC was paid in a given firm-year. Next, PBC dummy is replaced by PBC ratio in order to explore how PBC effectiveness varies among companies that have paid PBC:

$$(2)\ Future\ firm\ performance = \beta_0 + \beta_1 PBC\ ratio + \beta_2 Past\ performance + \beta_3 ln(Turnover) + \beta_4 Financial\ leverage + \beta_5 ln(Salary\ level) + \beta_6 ln(Age) + \beta_7 Gender + \beta_8 Academic\ degree + \alpha_1 Year\ dummies + \varepsilon$$

Model (2) is first estimated for those firm-years when PBC was paid. After this, in order to study the impact of demographic factors on PBC effectiveness, the data is sorted into eight equally large groups based on the dimension under observation. For instance, to study the impact of gender on PBC effectiveness, the sample is sorted based on the proportion of male WCWs and then the data is divided into eight groups of equal size. After this, the regression model is estimated for each of the eight groups separately. Resulting coefficients are then compared in order to identify differences between the groups. The method was tested also by dividing the data into other numbers of groups than eight, but ultimately eight groups were chosen based on the amount of statistically significant differences found.

Finally, PBC ratio is replaced by the natural logarithm of the variance of PBC ratios within a firm-year to reflect the use of individual or team incentives, as explained in the previous chapter:

$$(3)\ Future\ firm\ performance = \beta_0 + \beta_1 ln(PBC\ ratio\ variance) + \beta_2 Past\ performance + \beta_3 ln(Turnover) + \beta_4 Financial\ leverage + \beta_5 ln(Salary\ level) + \beta_6 ln(Age) + \beta_7 Gender + \beta_8 Academic\ degree + \alpha_1 Year\ dummies + \varepsilon$$

The steps conducted for model (2) are repeated for model (3), meaning that first the model is estimated for those firm-years when PBC was paid and then the data is sorted according to the factor under observation (gender, age) and divided into eight groups. Regression coefficients are then compared and interpreted in order to identify association between variation in PBC paid and firm future profitability under a given demographic dimension.

## 5.4. Descriptive statistics

The final sample size is 4511 firm-years for the times series of 2007–2010. Table 2 presents descriptive statistics for the main characteristics of the sample firms. The number of observations is complete for all variables included in the regression model.

**Table 2: Descriptive Statistics of Sample Firms**

| Firm characteristic | Mean | Median | St. Dev. | Min | Max | N |
|---|---|---|---|---|---|---|
| # of WCWs | 90 | 22 | 466,35 | 2 | 13271 | 4511 |
| # of male WCWs | 60 | 13 | 341,29 | 0 | 9610 | 4511 |
| # of female WCWs | 30 | 7 | 130,52 | 0 | 3661 | 4511 |
| Salary level[1] | 3243 | 3209 | 535,51 | 1734 | 5694 | 4511 |
| Avg. WCW age | 44 | 44 | 3,98 | 29 | 59 | 4511 |
| Turnover[2] | 112 | 17 | 858,94 | 0,3 | 30907 | 4511 |
| # of employees | 241 | 77 | 771,94 | 2 | 17464 | 4064 |

[1]euros
[2]million euros

From Table 2 one can see that on average, the average (median) salary for WCWs over the firm-years is 3243 euros (3209 euros). According to EK's publications on salary statistics, average monthly salary for WCWs was 3832 euros in 2010 (EK, 2011) and 3490 euros in 2007 (EK, 2008). The EK values are higher than the average calculated in this study. This is because EK includes in the salary figures the taxable value of fringe benefits, whereas here only monthly base salary is displayed. In addition, the mean here is calculated from firm-year averages instead of all individual WCW salary observations, which twists the weighting so that salary levels of smaller companies get relatively too heavily weighted. Therefore, the mean of 3243 euros calculated here is in line with EK statistics.

The largest company in the sample, measured by turnover, has sales of 31 billion euros. This sounds reasonable as the value corresponds to the parent company sales of the largest Finnish corporation in 2007, Nokia Oyj (Nokia, 2007). The smallest company in the sample has turnover of 0,3 million euros. Average (median) turnover for the sample companies is 112 million euros (17 million euros).

Measured by the number of employees, the average (median) size for the sample companies is 241 (77) employees. Minimum number of both employees and WCWs at a company is two. In this sample, companies employ on average more male than female WCWs, 60 against 30, respectively. There are some companies employing only men or women. On average, the mean (median) WCW age in the companies is 44 (44) years.

Table 3 describes the variables used in the regression analysis. On average, the mean PBC ratio per firm-year, i.e. the share of PBC of total annual compensation, is 1,28%. This figure is rather low since in 64% of the firm-years in the final sample no PBC was paid. Looking at the 1632 firm-years when PBC was paid, the mean (median) PBC ratio is 3,53% (3,05%). The value sounds reasonable knowing that the combined PBC ratios for clerical and managerial WCWs in industrial companies have varied from 3%-8% between 2007-2010 (EK, 2008; EK, 2011). The highest average share of PBC of total annual salary for a firm-year is 14,66%.

ROA figures ranging from -57,70% to 84,40%, the sample includes both very profitable and rather unprofitable firm-years. Similarly, good level of gearing ratio being below 1 (Asiakastieto, 2013), there are companies with a healthy financial structure as well very risky companies. Although the acceptable level of gearing ratio is determined by comparing it to companies within the same industry, financial structures of the sample firms seem to be at rather acceptable level mean gearing ratio being 1,25.

As the gender variable gets a mean of 63%, one can say that on average the sample companies employ more male than female WCWs. In addition, on average 36% of the WCWs in a sample company hold an academic degree.

**Table 3: Descriptive Statistics of Regression Model Variables**

| Variables | Mean | Median | St. Dev. | Min | Max | N |
|---|---|---|---|---|---|---|
| PBC ratio[1] | 1,28 | 0,00 | 2,34 | 0 | 14,66 | 4511 |
| PBC ratio[2] | 3,53 | 3,05 | 2,68 | 0,01 | 14,66 | 1632 |
| ln(PBC ratio variance) | 1,24 | 1,69 | 2,26 | -8,32 | 6,11 | 1632 |
| $ROA_{t+1}$ | 7,54 | 6,70 | 14,31 | -50,60 | 73,80 | 4511 |
| $ROA_t$ | 8,89 | 7,80 | 14,98 | -57,70 | 84,40 | 4511 |
| ln(Turnover) | 9,90 | 9,77 | 1,56 | 5,59 | 17,25 | 4511 |
| Gearing | 1,25 | 0,30 | 6,39 | -25,40 | 133,20 | 4511 |
| ln(Salary level) | 8,07 | 8,07 | 0,16 | 7,46 | 8,65 | 4511 |
| ln(Avg. WCW age) | 3,79 | 3,79 | 0,09 | 3,38 | 4,08 | 4511 |
| Gender ratio | 0,63 | 0,66 | 0,21 | 0 | 1 | 4511 |
| Academic degree ratio | 0,36 | 0,36 | 0,20 | 0 | 1 | 4511 |

[1]PBC ratio for all firm-years

[2]PBC ratio for companies firm-years when PBC was paid

# 6. EMPIRICAL RESULTS

## 6.1. Correlation analysis

The results of the correlation analysis are presented in Table 4, which contains internal correlations for all variables used in the research. Coefficients for Spearman's correlation are presented in the upper right corner and for Pearson's correlation in the lower left corner of the table. Statistically significant correlation at the 5% level or better are marked in bold. Pearson's correlation coefficient is a measure that reflects the linear dependence between two variables. Correlation coefficient equal to +1 indicates perfect positive dependence and -1 inversely related variables whereas coefficient equal to 0 means that no linear relationship between the variables exists. Spearman's rank correlation coefficient, or Spearman's rho, is similar to Pearson's with the distinction that while Pearson's correlation coefficient measures the dependence between the "raw numbers", for Spearman's rho, the raw numbers are first ranked, after which the dependence between the ranked variables is measured.

Based on correlation coefficients, however, one cannot confirm causality between variables. Correlation coefficient equals one-variable regression coefficient, whereas regression analysis enables to test multiple hypotheses simultaneously. High correlation between independent variables indicates the possibility of multicollinearity in the regression model. Multicollinearity does not damage the entire model but it may distort the values that the highly correlated variables get and, in case there are other problems with the model, it may reinforce the bias in results.

Based on the results of the correlation analysis, one can observe that the dependent variable, future firm performance ($ROA_{t+1}$), has a statistically significant positive correlation with the explanatory variable PBC ratio, as was expected based on prior literature. Also in line with expectations, there is a strong positive statistically significant correlation between profitability of the current year and the subsequent year. In addition, also the other accounting variables, company size and gearing, correlate statistically significantly with the dependent variable. For gearing, the relationship gets a negative coefficient, which is in line with expectations of lower financial leverage being associated with higher profitability. From those firm-level variables that

are based on individual WCW information, only WCW salary level correlates statistically significantly with future firm performance, the relationship being negative. For all the correlations between the dependent and each independent variable, both Pearson's and Spearman's correlation coefficients are similar with regard to sign, significance and strength of the coefficient.

With regard to correlations between the explanatory variable PBC ratio and the control variables, PBC ratio has the strongest positive correlation with variation in PBC ratio within a company and with company size. In addition, PBC correlates positively with current year profitability, WCW salary level and the share of WCWs with academic degree. For PBC ratio and gearing, Pearson's correlation gives a statistically significant negative relationship, while Spearman's correlation gives a positive relationship. Finally, PBC ratio correlates negatively with the share of male of all WCWs.

Looking at the correlations between independent variables, no coefficient gets a value close to +1 or -1 and therefore there should be no threat of multicollinearity. The strongest correlation is between PBC ratio and the natural logarithm of the variance of PBC ratio (Pearson's correlation is 0,507 at 1% significance level). However, these variables are not included in the model simultaneously and even if they were, the value of the correlation coefficient is not too high. Another remark to make is the share of WCWs with academic degree which is positively correlated with the natural logarithm of WCW salary level and negatively correlated with the natural logarithm of WCW average age. This means that academic degree is associated with higher salary and younger age, which seems reasonable applying only common sense and knowing that university degrees are today more common in Finland than they used to be.

## Table 4: Results of the Correlation Analysis

The table illustrates correlations between all variables used in the research. Coefficients for Spearman's correlation are presented in the upper right corner and for Pearson's correlation in the lower left corner. The sample includes member companies of the Confederation of Finnish Industries (EK) in 2007–2010. Correlations significant at the 5% level or better are marked in bold.

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. $ROA_{t+1}$ | – | **0,077** | 0,047 | **0,594** | **0,033** | **-0,162** | **-0,063** | -0,026 | 0,003 | -0,003 | **0,119** | **-0,083** | -0,024 | -0,004 |
| 2. PBC ratio | **0,080** | – | **0,580** | **0,075** | **0,293** | **0,087** | **0,106** | -0,014 | **-0,135** | **0,060** | -0,012 | 0,021 | -0,003 | -0,007 |
| 3. ln(PBC ratio variance) | 0,013 | **0,507** | – | **0,083** | **0,213** | -0,038 | **-0,271** | **-0,248** | **0,096** | **0,228** | 0,029 | 0,013 | -0,029 | -0,012 |
| 4. $ROA_t$ | **0,578** | **0,090** | 0,040 | – | **0,075** | **-0,206** | **-0,081** | -0,018 | **0,033** | -0,025 | **0,117** | **0,087** | **-0,132** | **-0,065** |
| 5. ln(Turnover) | **0,031** | **0,252** | **0,238** | **0,074** | – | **0,149** | **0,322** | **-0,165** | **0,033** | **0,304** | 0,000 | 0,015 | -0,013 | -0,001 |
| 6. Gearing | **-0,079** | **-0,029** | 0,007 | **-0,088** | 0,002 | – | **0,069** | 0,010 | -0,007 | 0,025 | -0,002 | 0,002 | -0,006 | 0,006 |
| 7. ln(Salary level) | **-0,055** | **0,124** | **0,230** | **-0,080** | **0,323** | 0,024 | – | **-0,059** | **0,253** | **0,487** | **-0,220** | **-0,043** | **0,095** | **0,157** |
| 8. ln(Age) | -0,009 | -0,025 | **-0,209** | 0,000 | **-0,130** | 0,001 | **-0,033** | – | **-0,057** | **-0,401** | -0,017 | -0,021 | -0,002 | **0,040** |
| 9. Gender | -0,027 | **-0,050** | **0,087** | -0,005 | **0,068** | 0,010 | **0,287** | **-0,057** | – | **0,217** | -0,007 | -0,010 | 0,008 | 0,009 |
| 10. Academic degree ratio | -0,008 | **0,080** | **0,220** | **-0,41** | **0,301** | 0,007 | **0,498** | **-0,391** | **0,220** | – | **-0,067** | **-0,039** | **0,046** | **0,056** |
| 11. Year 2007 | **0,104** | -0,005 | 0,022 | **0,105** | 0,002 | -0,025 | **-0,219** | -0,021 | -0,003 | **-0,068** | – | **-0,317** | **-0,316** | **-0,310** |
| 12. Year 2008 | **-0,094** | 0,019 | 0,008 | **0,079** | 0,012 | -0,009 | **-0,037** | -0,022 | -0,009 | **-0,037** | **-0,317** | – | **-0,356** | **-0,350** |
| 13. Year 2009 | -0,011 | -0,016 | -0,027 | **-0,130** | -0,013 | 0,027 | **0,096** | 0,000 | 0,005 | **0,047** | **-0,316** | **-0,356** | – | **-0,349** |
| 14. Year 2010 | 0,007 | 0,002 | -0,002 | **-0,049** | -0,001 | 0,005 | **0,149** | **0,041** | 0,007 | **0,055** | **-0,310** | **-0,350** | **-0,349** | – |

## 6.2. Regression analysis

This section reports the results for the regression analyses that explain the impact of PBC and the control variables on future firm performance. The study does not research temporal variation over years, and thus the regressions are estimated using all firm-years 2007-2010 as one cross-sectional dataset. The analysis is conducted in phases. First, the analysis focuses on the impact on future firm performance of either having paid or not having paid PBC in a given year. Next, focus is only on companies that have paid PBC. Finally, the impact of PBC and the impact of PBC variation within a company are explored in firms with different characteristics.

### *6.2.1. Impact of PBC on future firm performance*

Table 5 reports the results from the regression analysis that tests the impact on future firm performance of whether PBC was or was not paid (PBC dummy receives a value equal to 0 if PBC was not paid and equal to 1 if PBC was paid in a given firm-year). The table presents the results for four regressions that differ in terms of variables included at a time. In columns (1) only accounting-related control variables are included, whereas columns (2) contain all variables. Both models are also estimated with and without year-fixed effects.

Table 5 shows that the use of PBC has a positive and statistically significant impact on firm performance. This is consistent with expectations based on prior literature (e.g. Abowd, 1990; Bhargava, 1994; Frye, 2005; Piekkola, 2005) giving thus strong support to Hypothesis 1. The finding indicates that compared to firms that have not paid PBC in a given year, the ones that have paid perform better in the future, measured by profitability. The result is robust across estimations using different combinations of control variables, as demonstrated by the positive and statistically significant coefficient of the PBC dummy in all the columns (1) and (2).

Grouping companies into those that use PBC and those that do not is done here based on firm-years when PBC was and was not paid. This classification disregards, however, companies that use PBC but performed poorly and as a result did not pay bonuses. Instead of recognizing whether bonuses are received by employees, it would be crucial to identify companies that have

incentive schemes in place. For this study, classifying companies accurately was not possible due to the lack of complete information regarding the actual compensation schemes in use.

With regard to control variables, profitability in the current year has a strong positive and statistically significant influence on future firm profitability, as expected based on prior literature. Company size measured by turnover does not seem to affect future firm profitability. In contrast, higher gearing has a negative statistically significant effect on future profitability. This might mean that for the firm-years under observation the risks involved in higher financial leverage have realized, perhaps due to the global economic downturn dominating the sample period. None of the variables constructed from the WCW pay data, i.e. salary level, WCW average age, gender distribution or academic degree ratio, have an impact on future firm profitability. Finally, year dummies have a positive impact and very high statistical significance in the model. Based on the β-coefficients of the year dummies, the weakest future profitability has been in year 2008 since all the other years have a positive statistically significant relationship with future profitability. The highest future profitability has been in year 2009. This means, in fact, that for the sample companies year 2009 has been the least and year 2010 the most profitable.

The explanatory power of the model is reasonably good, adjusted $R^2$ varying from 0,335-0,355. Indeed, while adding year-fixed effects increases the model's explanatory power, adding the pay data based variables does not have a similar effect. However, the variables are kept in the model because in the next phase the regression is estimated with a different main explanatory variable and a smaller sample, and thus these control variables may be necessary. In conclusion, based on F-statistic, the model with all variables is highly significant ($F$=226,984, $p$<0,000) at less than 1% level. Equal significance applies also to the other three variable combinations tested.

## Table 5: Impact of PBC on Future Firm Performance

The table reports the results from the OLS regression that tests the impact of the use of PBC on future firm performance. The dependent variable is return on assets in the subsequent year ($ROA_{t+1}$). The independent variables are *PBC dummy, $ROA_t$, ln(Turnover), Gearing, ln(Salary level), ln(Avg. WCW Age), Gender ratio, and Academic degree ratio*. Below the β-coefficients, corresponding t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | | Dependent variable: $ROA_{t+1}$ | | | |
|---|---|---|---|---|---|
| Independent variable | Expected sign | (1a) | (1b) | (2a) | (2b) |
| (Intercept) | ? | 4,247*** | 0,696 | 14,398 | 15,882 |
| | | (3,748) | (0,603) | (1,235) | (1,350) |
| **PBC dummy** | **+** | **0,899**** | **0,944**** | **0,835**** | **0,882**** |
| | | **(2,391)** | **(2,550)** | **(2,189)** | **(2,346)** |
| $ROA_t$ | + | 0,550*** | 0,561*** | 0,550*** | 0,562*** |
| | | (47,057) | (48,134) | (46,821) | (48,009) |
| ln(Turnover) | ? | -0,185 | -0,181 | -0,220* | -0,194 |
| | | (-1,596) | (-1,576) | (-1,763) | (-1,576) |
| Gearing | - | -0,064** | -0,065** | -0,063** | -0,064** |
| | | (-2,346) | (-2,423) | (-2,320) | (-2,394) |
| ln(Salary level) | ? | | | -1,094 | -1,351 |
| | | | | (-0,833) | (-1,015) |
| ln(Avg. WCW Age) | ? | | | -0,233 | -1,030 |
| | | | | (-0,110) | (-0,492) |
| Gender ratio | ? | | | -1,443* | -1,392 |
| | | | | (-1,677) | (-1,639) |
| Academic degree ratio | ? | | | 2,317** | 1,839 |
| | | | | (2,038) | (1,641) |
| Year 2007 | ? | | 4,520*** | | 4,468*** |
| | | | (9,139) | | (8,948) |
| Year 2008 | ? | | - | | - |
| | | | - | | - |
| Year 2009 | ? | | 4,972*** | | 4,980*** |
| | | | (10,446) | | (10,424) |
| Year 2010 | ? | | 4,260*** | | 4,290*** |
| | | | (8,933) | | (8,922) |
| F-statistic | | 569,343 | 355,419 | 285,843 | 226,984 |
| p-value | | (0,000) | (0,000) | (0,000) | (0,000) |
| Adjusted $R^2$ | | 0,335 | 0,355 | 0,336 | 0,355 |
| N | | 4511 | 4511 | 4511 | 4511 |

In table 6, results are reported for the regression analysis that explores the effect of average PBC ratio on future firm performance. In columns (1) only accounting-related control variables are included, whereas columns (2) contain all variables. Both models are estimated also with and without year-fixed effects.

The explanatory power of the model with PBC ratio is better than the explanatory power of the previous analysis with PBC dummy, adjusted $R^2$ varying now from 0,385-0,404. Adding year-fixed effects still increases the model's explanatory power, but in this case also adding the pay data based variables has a marginal improvement impact. Based on F-statistic, the model with all variables in column (2b) is highly significant ($F$=101,305, $p$<0,000) at less than 1% level.

The analysis shows that the average PBC ratio has a positive statistically significant impact on future firm profitability. This result is the most significant when the model contains both accounting and pay data based variables as well as year-fixed effects. The result is in line with the finding from the previous analysis of whether PBC was paid or not and suggests that not only paying performance-based compensation can improve firm performance but also that higher level of PBC of total compensation yields higher firm performance in the future. The results are consistent with expectations based on prior literature (e.g. Abowd, 1990; Bhargava, 1994; Frye, 2005; Piekkola, 2005) and confirm the support to Hypothesis 1.

As found in the previous analysis, profitability in the current year has a positive and statistically very significant influence on future firm profitability. With regard to other control variables, the results are slightly different for the model containing PBC ratio for which also the sample contains only firm-years when PBC was paid. Now company size measured by sales has a negative statistically significant impact on future firm profitability, meaning that from the companies that paid PBC, larger performed poorer. In contrast, gearing no longer has a statistically significant impact. One possible explanation for this is that the sample includes only companies which have paid PBC and which must therefore have achieved their targets at least partly and performed relatively well. In contrast, risky companies for which risks have realized and which have not have achieved their targets are excluded from this sample and thus gearing

might not have the negative effect that it has in the sample including all companies. None of the variables constructed from the WCW pay data still seems to influence firm performance, apart from gender distribution. In fact, gender ratio has a strong negative and highly significant impact on future firm performance, which suggests that increasing the share of female WCWs improves company performance. This is a surprising finding since I have not come across prior literature dealing with gender distribution and firm profitability, or suggesting that higher share of women would improve firm profitability. Finally, year-fixed effects have a highly statistically significant positive impact in the model. Based on the β-coefficients of the year dummies, the weakest future profitability has been in year 2008 and the highest in year 2009.

Finally, column (3) in Table 6 reports the results when log-transformed PBC ratio variance is used as the key explanatory variable. Results are presented only for the model containing all variables since the explanatory power of this model is the highest as shown in column (2b). Replacing PBC ratio with its log-transformed variance has a marginal negative impact on the models explanatory power. The model remains highly significant ($F$=100,660, $p$<0,000) at less than 1% level and has adjusted $R^2$ of 0,402.

No hypothesis was constructed regarding the superiority of individual or group incentives due to ambiguous results reported in prior literature (e.g. Barnes et al., 2011; Gerhart et al., 2009; Trevor et al., 2012). Based on this study, it seems that nothing can be concluded on the debate either since no significant effect is found for log-transformed PBC ratio variance which is used to describe variation in PBC paid within a company. Large variance means that WCWs received different proportions of performance-based pay which roughly put indicates that the compensation scheme in place must have rewarded for successful individual performance. On the contrary, small variance indicates similar shares of incentives received which can be interpreted as rather team-based compensation. This topic will be, however, further analyzed in the next section by estimating the model separately in portfolios with lower and higher PBC ratio variance and in firm with different characteristics, since this might uncover differences in PBC effectiveness between these groups. Finally, as shown in column (3), β-coefficients for other independent variables are similar to those when PBC ratio is used.

## Table 6: Impact of PBC on Future Firm Performance in Firms Where PBC Is Paid

The table reports the results from the OLS regression that tests the impact of PBC ratio or the natural logarithm of PBC ratio variance on future firm performance. The dependent variable is return on assets in the subsequent year ($ROA_{t+1}$). The independent variables are *PBC ratio* or *ln(PBC ratio variance), $ROA_t$, ln(Turnover), Gearing, ln(Salary level), ln(*Avg. WCW Age*), Gender ratio, and Academic degree ratio*. Below the β-coefficients, corresponding t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | | Dependent variable: $ROA_{t+1}$ | | | | |
|---|---|---|---|---|---|---|
| Independent variable | Expect. sign | (1a) | (1b) | (2a) | (2b) | (3) |
| (Intercept) | ? | 6,892*** | 4,250** | -9,444 | -9,571 | -11,554 |
| | | (3,904) | (2,367) | (-0,502) | (-0,503) | (-0,606) |
| **PBC ratio** | **+** | **0,152** | **0,163*** | **0,183*** | **0,200**** | |
| | | **(1,568)** | **(1,702)** | **(1,859)** | **(2,056)** | |
| ln(PBC ratio variance) | ? | | | | | 0,015 |
| | | | | | | (0,125) |
| $ROA_t$ | + | 0,575*** | 0,583*** | 0,575*** | 0,581*** | 0,587*** |
| | | (31,012) | (31,531) | (30,647) | (31,212) | (31,824) |
| ln(Turnover) | ? | -0,438*** | -0,432*** | -0,469*** | -0,447** | -0,418** |
| | | (-2,618) | (-2,612) | (-2,695) | (-2,590) | (-2,396) |
| Gearing | - | 0,023 | 0,026 | 0,026 | 0,030 | 0,021 |
| | | (0,405) | (0,467) | (0,451) | (0,538) | (0,378) |
| ln(Salary level) | ? | | | 2,300 | 2,104 | 2,482 |
| | | | | (1,112) | (0,993) | (1,161) |
| ln(Avg. WCW age) | ? | | | 0,208 | -0,029 | -0,265 |
| | | | | (0,060) | (-0,009) | (-0,077) |
| Gender ratio | ? | | | -4,621*** | -4,717*** | -4,503*** |
| | | | | (-3,678) | (-3,793) | (-3,629) |
| Academic degree ratio | ? | | | -0,342 | -0,811 | -0,672 |
| | | | | (-0,180) | (-0,430) | (-0,355) |
| Year 2007 | ? | | 3,297*** | | 3,423*** | 3,430*** |
| | | | (4,527) | | (4,668) | (4,670) |
| Year 2008 | ? | | - | | - | - |
| | | | - | | - | - |
| Year 2009 | ? | | 4,210*** | | 4,221*** | 4,169*** |
| | | | (6,110) | | (6,110) | (6,029) |
| Year 2010 | ? | | 2,064*** | | 2,538*** | 2,519*** |
| | | | (3,749) | | (3,631) | (3,599) |
| F-statistic | | 256,700 | 156,027 | 130,847 | 101,305 | 100,660 |
| p-value | | (0,000) | (0,000) | (0,000) | (0,000) | (0,000) |
| Adjusted $R^2$ | | 0,385 | 0,400 | 0,389 | 0,404 | 0,402 |
| N | | 1632 | 1632 | 1632 | 1632 | 1632 |

### *6.2.2. Impact of PBC in firms with different characteristics*

Table 7 illustrates the results for several regressions testing the impact of performance contingent pay in firms with different characteristics. Firstly, it was tested whether the amount of PBC paid has an effect on how strong the impact on firm performance actually is. For this purpose, the sample was sorted by the level of PBC ratio and divided into eight groups from smaller to larger, after which the regression model was estimated for each of the eight groups separately. As a result, it was possible to compare the β-coefficients of PBC ratio in portfolios where less and more incentives were paid. Same steps were repeated for gender ratio and average WCW age in order to explore whether PBC effectiveness varies in groups with different gender distributions and younger or older employees. Finally, the data was sorted by PBC ratio variance in order to explore whether incentives have a different impact on profitability in the context of more individual-based or rather team-based compensation.

Regarding the amount of incentives paid, the positive and statistically significant impact of PBC is slightly lower in portfolios with higher proportion of PBC paid of total compensation. The result suggests that the positive impact of PBC on future firm performance is the highest at moderate amounts of PBC paid. In other words, it seems that maximal incentives do not yield superior performance. If reflected to prior literature regarding incentives and individual-level performance, the finding supports Ariely et al. (2009) who argue that moderate monetary incentives yield higher performance than very high incentives. In contrast, the finding conflicts with Gneezy & Rustichini (2000) who claim that higher amounts of monetary incentives lead to better performance. The detrimental effect of larger monetary incentives can be interpreted to partly support the theories suggesting that pay for performance might direct individual's attention to self-serving targets as higher amounts of incentives result in smaller increases in profitability.

For gender distribution, as expected, the positive statistically significant impact of PBC is larger in the portfolio where the proportion of male WCWs is higher. This result indicates support for prior literature suggesting that performance-based incentives attract more male than female employees and are thus more effective for men than women (Flory et al., 2010). Based on this finding, Hypothesis 2 arguing that the positive effect of PBC on future profitability of the firm is

stronger for male than female WCWs can be supported. Yet, also in groups with higher share of female WCWs, the effect of performance-based pay on future firm performance is positive. Therefore, the results do not support the view that performance-based incentive schemes, in which competitiveness is implied, work in a counterproductive manner for women as could be induced based on studies suggesting that women underperform under competition (Apesteguia et al., 2012). However, taking firm-level averages from individual-level data obviously hides a lot of information that would be visible if individual-level data was observed alone. Therefore, it is difficult to say what the impact of PBC is for female employees alone.

With regard to incentives for different age groups, as expected, the results show that the positive and statistically significant impact of PBC is the strongest in the portfolio with lower WCW average age. While also the mid-aged portfolio shows positive but lower and only weakly statistically significant results, for the older portfolios no statistically significant results are found. As the finding indicates support only for the stronger impact of incentives for the youngest WCWs, Hypothesis 3, which argues that the positive impact of incentives is stronger for both the youngest and the oldest WCWs, can be supported only partly.

Finally, although no results were found regarding the superiority of individual vs. team incentives when the entire sample was used in the previous section, now it was tested whether the impact of PBC varies between portfolios where compensation depends more on individual performance or rather on group performance. The results show weak statistical significance for the positive effect of individual-based compensation on future firm profitability. However, based on this result nothing can be concluded regarding the debate on the superiority of either type of scheme (e.g. Chao, 2010; Cooke, 1994; FitzRoy & Kraft, 1986; Hansen, 1997; Kim & Gong, 2009; Knez & Simester, 2001), which means that this study supports the view that mixed contracts might yield higher performance than purely individual-based or group-based compensation (Chao, 2010). Based on this finding, it seems that the type of compensation scheme as such does not matter, but the characteristics of the employees the scheme applies to may influence the outcome of the scheme.

## Table 7: Impact of PBC on Future Firm Performance in Firms with Different Characteristics and Where PBC Is Paid

The table reports the results from the OLS regression that tests the impact of PBC ratio on future firm performance. The regression is estimated for 4x8 portfolios, which are constructed as follows: first the data is sorted ascending by four firm characteristics, (1) *PBC ratio*, (2) *Gender ratio*, (3) *Avg. WCW age,* and (4) *PBC ratio variance*, after which the data is divided into eight equally large portfolios for running the regression in each portfolio separately. This table reports β-coefficients for the independent variable *PBC ratio*. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

*β-coefficients for the independent variable PBC ratio in 8 portfolios sorted by 4 firm characteristics*

| | Firm characteristic | | | | |
|---|---|---|---|---|---|
| Portfolios | PBC ratio | Gender ratio | Avg. WCW age | PBC ratio variance | N |
| P0 (No PBC) | - | - | - | - | 2879 |
| P1 (Low) | -2,057 | -0,150 | 0,082 | 0,271 | 204 |
| P2 | -0,768 | 0,399* | 0,821*** | 0,413 | 204 |
| P3 | 6,179* | 0,652 | -0,149 | 0,620 | 204 |
| P4 | 4,864* | -0,123 | 0,125 | 0,215 | 204 |
| P5 | -1,613 | -0,032 | 0,424* | 0,306 | 204 |
| P6 | 1,061 | 0,306 | -0,268 | -0,141 | 204 |
| P7 | 2,920** | 0,606** | 0,262 | 0,483* | 204 |
| P8 (High) | 0,003 | 0,247 | 0,266 | 0,252 | 204 |

In Table 8, results are reported for the regressions that compare the impact of individual and team incentives on future firm performance in firms with different characteristics. Instead of PBC ratio, now the explanatory variable in the model is log-transformed PBC ratio variance. The study discusses team-based compensation but, in fact, PBC ratio variance does not distinguish between team and other group performance dependent elements, such as unit or organizational level incentives. Therefore, PBC ratio variance describes the range from individual incentives to team and organizational-level incentives. As the results are discussed further, it should thus be kept in mind that team incentives refer not only to "work team" incentives but also to bonuses determined on a broader basis.

As before, the sample was sorted by gender ratio and average WCW age, after which it was divided into eight groups from smaller to larger for estimating the regression in each of the groups separately. Regarding gender distribution, the results show weak statistical significance for the positive effect of PBC ratio variance in the portfolio where the proportion of female WCWs is higher. This indicates that increasing the variation in PBC paid, which here is interpreted as increasing individual incentives, improves firm future profitability in groups with relatively higher share of women. This finding does not support research arguing that individual-based compensation is avoided by women (Flory et al., 2010) and is rather ineffective for women. However, this study hypothesized only that the positive effect of individual-based compensation is stronger for male than female WCWs. Unfortunately no statistically significant results are found for the portfolios where the proportion of male WCWs is higher. Therefore, as behavior of these portfolios cannot be compared, support cannot be provided for Hypothesis 4.

Finally, what comes to PBC ratio variance and organizations with varying average WCW age, the results show the strongest positive and statistically significant impact for a portfolio with lower WCW average age. Weakly significant positive impact of PBC ratio variance is found also for a portfolio with higher average WCW age while for a portfolio in between the weakly significant impact is negative. These observations indicate that for organizations with younger and older WCWs, compensation based on individual performance improves firm performance. This finding is in line with expectations as being attracted by individual-based compensation corresponds to the risk profile of these groups based on earlier literature (Dohmen et al., 2011; Davidson et al., 2007; Ryan & Wiggins, 2001). In contrast, as described in the literature review, age groups in between might be more risk averse and therefore increasing pay risk placed on these individuals may be counterproductive for firm performance. In conclusion, the research provides weak support for Hypothesis 5. However, it must be noted that these results provide only weak indication of the existing causality as significant results are found only for some portfolios which, in addition, are mostly significant at the 10% level only.

All in all, it must be noted that the results in tables 7 and 8 must be interpreted with caution. For none of the columns sorted by a different variable of interest, all eight portfolios show a significant coefficient for PBC ratio. However, nothing surprising or unexpected is found among the portfolios where PBC has a statistically significant impact and, in fact, results for those portfolios are mostly in line with expectations based on prior literature.

### Table 8: Impact of Individual-based vs. Team-dependent PBC on Future Firm Performance in Firms with Different Characteristics and Where PBC Is Paid

The table reports the results from the OLS regression that tests the impact of the natural logarithm of PBC ratio variance on future firm performance. The regression is estimated for 2x8 portfolios, which are constructed as follows: first the data is sorted ascending by two firm characteristics, (1) *Gender ratio*, and (2) *Avg. WCW age*, after which the data is divided into eight equally large portfolios for running the regression in each portfolio separately. This table reports β-coefficients for the independent variable *ln(PBC ratio variance)*. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

*β-coefficients for the independent variable ln(PBC ratio variance) in 8 portfolios sorted by 2 firm characteristics*

| | Firm characteristic | | |
|---|---|---|---|
| Portfolios | Gender ratio | Avg. WCW age | N |
| P0 (No PBC) | - | - | 2879 |
| P1 (Low) | -0,428 | 0,048 | 204 |
| P2 | 0,448* | 0,829** | 204 |
| P3 | 0,088 | -0,652* | 204 |
| P4 | 0,026 | -0,003 | 204 |
| P5 | 0,304 | 0,522* | 204 |
| P6 | 0,030 | -0,595 | 204 |
| P7 | 0,378 | 0,106 | 204 |
| P8 (High) | -0,148 | -0,440 | 204 |

# 7. CONCLUSIONS

## 7.1. Discussion on the main results

This study has aimed to contribute to prior literature regarding the effect of performance-based incentives for white-collar workers on future firm performance, and to explore how demographic factors potentially influence the outcome of performance contingent pay. In addition, the research has aimed to shed light on how the impact of incentives varies in companies with different demographic characteristics of employees when individual performance based and team performance dependent incentives are used.

The data used in the research consists firstly of pay information about individual white-collar workers in Finnish companies that are members of the Confederation of Finnish Industries (EK), and secondly of accounting information for those companies. The final sample included 4511 firm-year observations for years 2007-2010. In addition, data from EK's compensation system survey, available only for year 2011 and for 266 firms in the final sample, was used to confirm that PBC ratio variance describes the use of individual or team performance based compensation fairly well.

The main explanatory variable employed is PBC ratio which describes the share of incentives of a white-collar worker's total annual compensation, on average in a company. In addition, variance of PBC ratio is used to describe whether compensation is based more on individual or rather on team performance. In 36% of the firm-years, PBC was paid and for these observations the mean PBC ratio was 3,53%. The highest average PBC ratio in a firm-year was 14,66%.

Five testable hypotheses were constructed based on earlier literature. The first hypothesis aimed to confirm the impact of PBC on future firm performance, the following two explored PBC effectiveness in firms with different employee characteristics with regard to gender and age, and the final two aimed to explore the impact of individual and team incentives in firms varying by the same employee characteristics of gender and age. Support of different strength was found for

four of the hypotheses whereas one of them could not be interpreted based on the model and thus had to be rejected.

The results confirm that performance contingent incentives for white-collar workers can positively influence firm performance measured by profitability (e.g. Abowd, 1990; Bhargava, 1994; Frye, 2005; Piekkola, 2005). This provides support to the optimal contracting approach which suggests that performance contingent pay can alleviate agency problems. In addition, the result suggests that, at least among white-collar workers in the industrial sector, compensation seems to have motivational power, a view denied by some individual-level motivational theories, such as Herzberg's motivation-hygiene theory (orig. 1959) and Theory on intrinsic motivation (orig. Deci, 1971).

While in general PBC ratio positively contributes to firm future profitability, when observed in eight portfolios sorted by the intensity of incentives paid, interestingly, the results weakly indicate that the higher amount of incentives paid does not yield superior firm performance. This finding questions the justifiability of the controversial excessive bonuses. On the other hand, the topic should be definitely researched further.

It seems that gender and age can influence PBC effectiveness. In line with expectations based on differences in risk tolerance and competitiveness, the results weakly indicate that performance contingent incentives are more effective for male and for younger WCWs. The finding that the effectiveness of compensation schemes seems to vary across groups with different demographic characteristics supports the observation made in the financial sector in Finland: monthly bonuses for male clerical WCWs are double compared to female clerical WCWs, and at expert level the pay gap in monthly bonuses is triple (Trade Union Pro, 2013).

In case incentive scheme structures risk contributing to pay inequality and gender wage gap, it is worthwhile to consider the implications from different perspectives. From society's point of view, gender wage gap is unacceptable just as any other form of pay inequality due to discrimination: gender, age, race, and so forth. However, designing an incentive scheme that

yields the best organizational performance is in the interests of a company. Therefore, if basic pay for a job is fair and the same for everyone, from a company's perspective it is justified and rational to reward those employees who have performed well and contributed most to the company's success. For an individual company PBC is not a question of pay inequality but at societal level it might become one. In order to ensure pay equality in a broader context, it might be necessary to more carefully consider the designs of performance contingent incentive schemes. Incentives should be structured so that they equally encourage all types of employees to improve their individual performance, instead of being attractive and thus beneficial only to employees with certain characteristics.

So far there is no unanimous view on whether individual or team incentives are more effective, and this research cannot conclude anything on the debate either. Instead, it seems that elements of both schemes should be combined, which makes sense knowing the pros and cons of both. As a result, practitioners are left with the same challenge of trial and error in finding the optimal compensation scheme structure for their company, employees and context.

In conclusion, performance contingent incentives seem to improve firm performance. This was an expected result based on prior research and knowing that incentive schemes have been and still are widely applied by practitioners. What also remains certain is that all companies are different and that the optimal compensation plan structure depends on many contextual factors, among others on employee demographic factors as argued by this research.

## 7.2. Limitations of the study and suggestions for further research

It must be noted that the empirical research conducted has also its limitations. Perhaps the biggest limitation is the loss of information when firm-year averages are calculated from the individual-level data. Taking gender ratio as an example, there is a more linear relationship between PBC effectiveness and gender of an individual WCW than between PBC effectiveness and gender distribution of WCWs in a company. Similarly, taking the average age of WCWs in a company ignores the distribution of individuals of different age. This potentially skews the composition of

the eight portfolios formed based on gender ratio and average WCW age. In brief, explaining company-level outcomes with individual-level variables poses a challenge for the model.

For most parts of this study, only firm-years when PBC was paid are considered in the analysis, due to the lack of complete information about actual compensation schemes employed by companies. In addition, calculating the explanatory variables PBC ratio and PBC ratio variance requires PBC ratio values above zero. Looking at these firm-years alone, however, disregards companies that use PBC but performed poorly and as a result did not pay bonuses. It might be also that companies not paying PBC applied unsuitable incentive schemes for their employees, which further contributed to not achieving individual and company targets, but which now remains unobserved. In other words, to draw conclusions regarding for example the superiority of individual, team or company incentives one should look at all companies and the actual incentive schemes in place. This exploration could reveal whether companies with specific type of compensation scheme, combined with specific WCW characteristics, underperform the others.

Finally, the study measures performance only with the profitability measure ROA. Using also other measures would make the research more comprehensive. In addition, the study discusses team-based compensation but does not distinguish between team and other group performance dependent elements, such as unit or organizational level incentives.

Suggestions for further research tackle the aforementioned limitations of the study. Firstly, in order to accurately measure the impact of demographic factors on PBC effectiveness, it would be essential to research individuals' preferences regarding compensation schemes. Prior literature covers gender and age differences in competitiveness and risk-taking. Some studies test how different groups are attracted by different types of compensation schemes but these studies are conducted mainly as blind tests, related to for instance job search decisions. Finally, some studies explore employee attitudes towards incentive schemes, but these studies are mostly qualitative. I have not come across quantitative research linking employee preferences regarding compensation with demographic factors or firm performance. Gender and age, under focus in this study due to the dataset available, are not the only demographic factors affecting motivation but also

education, position, career stage, marital status and number of children, among others, might have an impact. Further, the amount of personal debt relative to income level might strongly influence an individual's risk appetite and thus PBC effectiveness. Conducting an extensive survey that connects individuals' demographics, risk tolerance and competitive profile to their motivation and perceived impact of incentives would thus fill the current research gap.

Another alternative for more accurately linking the impact of demographic factors to PBC effectiveness is to choose a few large companies for a case study. Using then data on employee demographics and individuals' compensation, performance targets and target achievement across time could reveal what kind of compensation elements fit for whom. In addition, other variables could be added to the analysis, such as job role and occupation.

Finally, this study could be extended to cover also the services sector. The research could reveal interesting differences due to the nature of the services sector and the role performance contingent incentives play there. PBC paid in different services sectors varies to a great extent, the financial sector leading the amount of bonuses paid also in Finland (EK, 2011). In addition, different services sectors, e.g. financial services and social services, can be assumed to vary also in what comes to their gender distribution, etc. Thus the research could further contribute to the discussion on gender wage gap and the role of performance pay in widening the gap. For the analysis of the services sector, it would be particularly interesting to include the impact of incentives on turnover, since it is often argued that performance pay works particularly well in the sales context where individuals are rather well in command of the chain from individual effort to visible performance improvement and to compensation.

# 8. REFERENCES


Abowd, J. M. (1990). Does performance-based managerial compensation affect corporate performance? *Industrial & Labor Relations Review, 43*(3), 52-73-S.

Ahokas, P., Hakonen, N., Hänninen, J., Kopra, V., Mäkinen, J., Neuvonen, J., Suokas, J. (2011). *Yksityisten alojen palkkausjärjestelmät*. JTO-Palvelut Oy.

Apesteguia, J., Azmat, G., & Iriberri, N. (2012). The impact of gender composition on team performance and decision making: Evidence from the field. *Management Science, 58*(1), 78-93.

Ariely, D., Gneezy, U., Loewenstein, G., & Mazar, N. (2009). Large stakes and big mistakes. *Review of Economic Studies, 76*(2), 451-469.

Asiakastieto. (2013). Tunnusluvut, http://www.asiakastieto.fi/voitto/ohje/tunnusluvut.htm (visited 7.4.2013).

Banker, R. D., Lee, S., & Potter, G. (1996). A field study of the impact of a performance-based incentive plan. *Journal of Accounting and Economics, 21*(2), 195-226.

Banker, R. D., Lee, S., Potter, G., & Srinivasan, D. (2000). An empirical analysis of continuing improvements following the implementation of a performance-based compensation plan. *Journal of Accounting and Economics, 30*(3), 315-350.

Barnes, C. M., Hollenbeck, J. R., Jundt, D. K., DeRue, D. S., & Harmon, S. J. (2011). Mixing individual incentives and group incentives: Best of both worlds or social dilemma? *Journal of Management, 37*(6), 1611-1635.

Belfield, R., & Marsden, D. (2003). Performance pay, monitoring environments, and establishment performance. *International Journal of Manpower, 24*(4), 452-471.

Bhargava, S. (1994). Profit sharing and the financial performance of companies: Evidence from UK panel data. *Economic Journal, 104*(426), 1044-1056.

Bonner, S. E., & Sprinkle, G. B. (2002). The effects of monetary incentives on effort and task performance: Theories, evidence, and a framework for research. *Accounting, Organizations & Society, 27*(4), 303-345.

Brochet, F., Loumioti, M., & Serafeim, G. (2012). Short-termism, investor clientele, and firm risk, Harvard Business School Accounting & Management Unit Working Paper No. 12-072. Available at SSRN: http://ssrn.com/abstract=1999484.

Bryson, A., & Freeman, R. B. (2010). How does shared capitalism affect economic performance in the United Kingdom? *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-Based Stock Options,* 201-224. University Of Chicago Press.

Carlock, R. S. (2012). Assessment tools for developing and leading effective teams. INSEAD Working Paper No. 2012/50/EFE. Available at SSRN: http://ssrn.com/abstract=2055676.

Chan, T. Y., Li, J., & Pierce, L. (2013). Compensation and peer effects in competing sales teams (March 22, 2013). Available at SSRN: http://ssrn.com/abstract=1367441.

Chao, H. (2010). *Three essays on team incentive contracts in the presence of synergy*. Ph.D. dissertation, University of Texas at Dallas.

Chauvin, K. W., & Ash, R. A. (1994). Gender earnings differentials in total pay, base pay, and contingent pay. *Industrial & Labor Relations Review, 47*(4), 634-649.

Commission of the European Communities: Recommendation (30.4.2009), C(2009) 3177, Brussels, http://ec.europa.eu/internal_market/company/directors-remun/index_en.htm.

Conyon, M. J., & Freeman, R. B. (2001). Shared modes of compensation and firm performance: UK evidence, NBER working paper no. 8448.

Cooke, W. N. (1994). Employee participation programs, group-based incentives, and company performance: A union-nonunion comparison. *Industrial & Labor Relations Review, 47*(4), 594-609.

Coutu, D., & Beschloss, M. (2009). Why teams DON'T work. *Harvard Business Review, 87*(5), 98-105.

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature, 47*(2), 448-474.

Cross, R., Ehrlich, K., Dawson, R., & Helferich, J. (2008). Managing collaboration: improving team effectiveness through a network perspective. *California Management Review, 50*(4), 74-98.

D'Art, D., & Turner, T. (2004). Profit sharing, firm performance and union influence in selected European countries. *Personnel Review, 33*(3), 335-350.

Davidson, W., Xie, B., Xu, W., & Ning, Y. (2007). The influence of executive age, career horizon and incentives on pre-turnover earnings management. *Journal of Management & Governance, 11*(1), 45-60.

Delarue, A., Van Hootegem, G., Procter, S., & Burridge, M. (2008). Teamworking and organizational performance: A review of survey-based research. *International Journal of Management Reviews, 10*(2), 127-148.

Dohmen, T., & Falk, A. (2011). Performance pay and multidimensional sorting: Productivity, preferences, and gender. *American Economic Review, 101*(2), 556-590.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*(1), 57-74.

EK. (2012). Confederation of Finnish industries, www.ek.fi (visited 1.10.12).

EK. (2008). Confederation of Finnish industries: *Palkkatilastokatsaus vuosi 2007*.

EK. (2011). Confederation of Finnish industries: *Kuukausipalkkatilasto lokakuulta 2010*.

FitzRoy, F. R., & Kraft, K. (1986). Profitability and profit-sharing. *The Journal of Industrial Economics, 35*(2), 113-130.

Flamholtz, E. G. (1983). Accounting, budgeting and control systems in their organizational context: Theoretical and empirical perspectives. *Accounting, Organizations and Society, 8*(2–3), 153-169.

Flory, J. A., Leibbrandt, A., & List, J. A. (2010). Do competitive work places deter female workers? A large-scale natural field experiment on gender differences in job-entry decisions, NBER working paper no. 16546.

Frey, B. S., & Jegen, R. (2001). Motivation crowding theory. *Journal of Economic Surveys, 15*(5), 589–611.

Frye, M. B. (2004). Equity-based compensation for employees: Firm performance and determinants. *The Journal of Financial Research, 27*(1), 31-52.

Gerhart, B. A., Milkovich, G. T., & Murray, B. (1992). Pay, performance, and participation, CAHRS working paper #92-28. Available at http://digitalcommons.ilr.cornell.edu/cahrswp/314.

Gerhart, B. A., Minkoff, H. B., & Olsen, R. N. (1995). Employee compensation: Theory, practice, and evidence, CAHRS working paper #95-04. Available at http://digitalcommons.ilr.cornell.edu/cahrswp/194.

Gerhart, B., Rynes, S. L., & Fulmer, I. S. (2009). 6 pay and performance: Individuals, groups, and executives. *Academy of Management Annals, 3*, 251-315.

Gneezy, U., & Rustichini, A. (2000). Pay enough or don't pay at all. *Quarterly Journal of Economics, 115*(3), 791-810.

Gong, M., Baron, J., & Kunreuther, H. (2010). Why do groups cooperate more than individuals to reduce risks, Wharton School, University of Pennsylvania, working paper #2010-02.

Gunkel, M., Lusk, E. J., Wolff, B., & Li, F. (2007). Gender-specific effects at work: An empirical study of four countries. *Gender, Work & Organization, 14*(1), 56-79.

Hamilton, J. L. (2011). 'Caring/Sharing': Gender and horizontal co-ordination in the workplace. *Gender, Work & Organization, 18*, e23-e48.

Hansen, D. G. (1997). Worker performance and group incentives: A case study. *Industrial and Labor Relations Review, 51*(1), 37-49.

Healy, A., & Pate, J. (2011). Can teams help to close the gender competition gap? *Economic Journal, 121*(555), 1192-1204.

Helsingin Sanomat. (2012). *Johtajan palkka on herkkä asia*, 5.6.2012. Retrieved from http://www.hs.fi/paakirjoitukset/Johtajan+palkka+on+herkk%C3%A4+asia/a1338795875280.

Hopp, W. J., Iravani, S. M. R., & Liu, F. (2009). Managing white-collar work: An operations-oriented survey. *Production & Operations Management, 18*(1), 1-32.

Ivanova-Stenzel, R., & Kübler, D. (2011). Gender differences in team work and team competition. *Journal of Economic Psychology, 32*(5), 797-808.

Kauhanen, A., & Napari, S. (2012). Performance measurement and incentive plans. *Industrial Relations: A Journal of Economy and Society, 51*(3), 645-669.

Kim, H., & Gong, Y. (2009). The roles of tacit knowledge and OCB in the relationship between group-based pay and firm performance. *Human Resource Management Journal, 19*(2), 120-139.

Kim, K., Baik, B., Evans, J. H., & Yanadori, Y. (2012). White-collar Incentives. Available at SSRN: http://ssrn.com/abstract=2147561.

Kleinjans, K. J. (2009). Do gender differences in preferences for competition matter for occupational expectations? *Journal of Economic Psychology, 30*(5), 701-710.

Knez, M., & Simester, D. (2001). Firm-wide incentives and mutual monitoring at continental airlines. *Journal of Labor Economics, 19*(4), 743.

Kvaløy, O., & Olsen, T. E. (2012). The rise of individual performance pay. *Journal of Economics & Management Strategy, 21*(2), 493-518.

Larkin, I., Pierce, L., & Gino, F. (2012). The psychological costs of pay-for-performance: Implications for the strategic compensation of employees. *Strategic Management Journal, 33*(10), 1194-1214.

Levin, J. (2003). Relational incentive contracts. *American Economic Review, 93*(3), 835-857.

Malmi, T., & Brown, D. A. (2008). Management control systems as a package—Opportunities, challenges and research directions. *Management Accounting Research, 19*(4), 287-300.

Manning, A., & Saidi, F. (2010). Understanding the gender pay gap: What's competition got to do with it? *Industrial and Labor Relations Review, 63*(4), 681-698.

Masclet, D., Colombier, N., Denant-Boemont, L., & Lohéac, Y. (2009). Group and individual risk preferences: A lottery-choice experiment with self-employed and salaried workers. *Journal of Economic Behavior & Organization, 70*(3), 470-484.

Nokia Corporation. (2008). *Nokia in 2007*, http://i.nokia.com/blob/view/-/165244/data/5/-/ (visited 7.4.2013).

Ortega, J. (2009). Employee discretion and performance pay. *Accounting Review, 84*(2), 589-612.

Ortmann, A., & Tichy, L. K. (1999). Gender differences in the laboratory: Evidence from prisoner's dilemma games. *Journal of Economic Behavior & Organization, 39*(3), 327-339.

Statistics Finland. (2013). Classifications, http://www.stat.fi/meta/luokitukset/index_en.html (visited 17.5.2013).

Piekkola, H. (2005). Performance-related pay and firm performance in Finland. *International Journal of Manpower, 26*(7), 619-635.

Pizzini, M. (2010). Group-based compensation in professional service firms: An empirical analysis of medical group practices. *Accounting Review, 85*(1), 343-380.

Pouliakas, K. (2010). Pay enough, don't pay too much or don't pay at all? The impact of bonus intensity on job satisfaction. *Kyklos, 63*(4), 597-626.

Rayton, B. A. (2003). Firm performance and compensation structure: Performance elasticities of average employee compensation. *Journal of Corporate Finance, 9*(3), 333-352.

Robbins, S. P. (1997). *Organizational behavior: Concepts, controversies, applications* (8th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Rothe, P., Lindholm, A., Hyvönen, A., & Nenonen, S. (2012). Work environment preferences – does age make a difference? *Facilities, 30*(1), 78-95.

Ruohotie, P. (1991). *Kannustava johtaminen* (4th ed.). Helsinki: ORD-Finland.

Ryan Jr., H. E., & Wiggins III, R. A. (2001). The influence of firm- and manager-specific characteristics on the structure of executive compensation. *Journal of Corporate Finance, 7*(2), 101-123.

Sell, L., & Cleal, B. (2011). Job satisfaction, work environment, and rewards: Motivational theory revisited. *LABOUR: Review of Labour Economics & Industrial Relations, 25*(1), 1-23.

Shupp, R. S., & Williams, A. W. (2008). Risk preference differentials of small groups and individuals. *Economic Journal, 118*(525), 258-283.

Sweins, C. (2011). *The impact of pay knowledge on organisational performance: Investigating Finnish profit-sharing schemes*. Ph.D. dissertation no. 35/2011, Aalto University School of Science.

Tarricone, P., & Luca, J. (2002). Employees, teamwork and social interdependence – a formula for successful business? *Team Performance Management, 8*(3/4), 54-59.

Tekniikka & Talous. (2010). *Tasan ei käy tulospalkkaus*, 19.5.2010. Retrieved from http://www.tekniikkatalous.fi/tyo/tasan+ei+kay+tulospalkkaus/a407138.

Trade Union Pro. (2013). Tulospalkkiot lisäävät naisten ja miesten palkkaeroja rahoitusalalla, 19.4.2013. Retrieved from http://www.proliitto.fi/fi/media/uutiset/tulospalkkiot-lisaavat-naisten-ja-miesten-palkkaeroja-rahoitusalalla.html.

Trevor, C. O., Reilly, G., & Gerhart, B. (2012). Reconsidering pay dispersion's effect on the performance of interdependent work: Reconciling sorting and pay inequality. *Academy of Management Journal, 55*(3), 585-610.

Vartiainen, M., Hakonen, N., & Hulkko, K. (1998). *Ryhmien ja tiimien palkitseminen*. Metalliteollisuuden kustannus Oy.

Zhuang, J., & Xu, C. (1996). Profit-sharing and financial performance in the Chinese state enterprises: Evidence from panel data. *Economics of Planning, 29*, 205-222.