

Bonus: Changing the Distribution of Wages?

An investigation of variable wages in wholesale and retail

by

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Abstract

The concept of variable wages is in many countries used as means of enhancing organisational efficiency and company performance. A production bonus is often set by the employer to influence and motivate the employee. Firms are dependent on employees to achieve the desired production outcomes. The cost of employees makes up the largest part of the total running costs of a business, and there is an increasing need to have flexible expenses in order to compete successfully in a fast growing and highly demanding market. In Norway, the use of variable wages is not very common compared to many other European countries. The importance of variable wage systems might be regarded as more relevant in some trades than others, for instance, when there is a need for individual decision making and creativity, motivating employees through the payment of a production bonus might be more applicable than paying a fixed salary.

This thesis investigates the role of wage levels between output-related and non output-related payment systems and discusses the individual characteristics of workers in output-related occupations compared to non-output related occupations in the wholesale and retail trade, based on answering the following two research questions:

1. "What is the effect of a bonus on wage levels?"
2. "What are the individual characteristics of the recipients of bonus payments compared to non-bonus recipients?"

The analysis takes a multidimensional view, as it looks at data at population, establishment and occupational levels.

First, I investigate the effect of output-related pay systems on wage levels and compare the concept of variable wage with that of straight pay. Then, I investigate the individual characteristics of employees in output-related payment systems. Theories explaining the behaviour of participants in the employer-employee relationship and firms' reasons for using variable pay schemes as well as previous research are drawn on to formulate and test a hypothesis. I use unique individual, occupational and establishment level data from the

Norwegian wholesale and retail industries for the years 1983 to 1996, which had more than 245 000 employees in more than 30 000 establishments.

This thesis focus on four expressions of hourly wages. These are defined as: (1) *straight salary*, which is fixed pay and exclusive to non-output related payment systems; (2) *base wage*, which is the fixed component of compensation paid to individuals who also receive a bonus component; (3) *bonus*, which refers to the variable pay component used in output-related pay systems; level of bonus is often directly related to performance; (4) *base wage plus bonus*, which is the total wage paid to employees in output-related pay systems. The wage component (2, 3 and 4) is thus exclusive to output-related payment systems, while straight salary (1) is exclusive to non-output payment systems.

From the investigations done in this thesis, there is support for that the size of the variable wage is large enough to make up a substantial part of a firm's variable expenses. The effect of variable wages, and in particularly the bonus wage component, varies according to gender, trade, region and size of firm. Finally, the flow of information in the employer-employee relationship and policy making seem to be important in arriving at the decision to use a variable wage system compared to paying a straight salary.

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1 Introduction

Output-related payment systems - such as commissions and piece rates - are common in many jobs. Their central feature is that the wage of an employee is tied directly to her current performance.

(Petersen, 1992a:67)

Historically, output-related payment systems are connected with sales commissions and variable pay based on reaching fixed production targets. The key issue of output-related systems versus non-output related systems is the ability to motivate. According to the Oxford Latin Dictionary, the word motivation stems from Latin “motivus” and means “to start movement” (Glare, 2000). Many modern organisations are making variable compensation a significant percentage of employee compensation in the form of profit sharing, bonuses and stock options. “Variable pay” can be defined as employee compensation that changes compared to “fixed salary”, which is most often paid in monthly equal proportions throughout the year. The idea is that when the company is successful, the employees also prosper. It is, however, unclear to what extent a variable wage motivates the individual or if the variable pay has other purposes, such as providing financial flexibility for the firm.

The term “variable pay” is a very broad one, and its definition is not always clear. For the purpose of this thesis, variable pay differs from “fixed pay”, in which that the latter form of remuneration is agreed to in advance. Variable pay implies an element of uncertainty both for the employer and the employee. Uncertainty is created in respect of both individual and collective performance, which is measured on the basis of the output by individual employees, by teams or by firms.

Variable pay is used generally to recognise and motivate employee contribution towards increased company productivity, profitability, team-work, safety, quality or any other metric deemed important. Thus, variable pay can be regarded as an incentive contract with the purpose to align the individual’s preferences more with the preferences of the owners; this tenet is also known as “Principal-Agent” situation. Economic incentives which aim to stimulate employee effort and enhance firm output are under some circumstances referred

to as the “technical-economical” system. The technical-economical system can be traced back to the “scientific management” (Taylor, 1911) proposed by Fredrick Taylor who designed a system based on increasing individual performance. Reactions to his system were strong. Subsequently, the human resource movement emphasised the importance of individual interest beyond means of production (Silverman, 1970). There has also been carried out studies in Norway on how the technical-economical system can be viewed from the perspectives of the employee. One such study is Lysgaards (1985) theory of the *arbeiderkollektivet* (translated into “community of employees”, for the purpose of this thesis), who refers to an informal system of norms which sets boundaries for employee behaviour. The employees act and behave based on a “collective understanding” of their situation. This collective understanding of the employees might have some undesirable characteristics for the employer. One such undesirable characteristic might be to work at a pace slower than what the employers feel is in the best interest of the firm. For the employer to motivate or change the collective employee understanding, motivations can be provided by variable wages.

In this chapter I will first give a brief introduction of bonus as a variable wage component, look at some recent concerns in the media of bonus and give an introduction to what economic factors that might cause changes to wage components. Then, I will introduce the wholesale and retail trade, in which my research was performed. Finally, I will introduce the research questions of this thesis.

1.1 Introducing bonus as a variable pay component

The use of the bonus seems to be increasing in Norway (Lunde & Grini, 2007), signifying the growing importance of variable wages. There are potential implications for policy making, in terms of salary negotiations and relations with trade unions. One immediate question that arises is this: is the bargaining power of labour unions affected when wages are variable? There is some fear that unions would no longer be needed and might disappear if the trend to variable wages continues.¹

¹ Jorun Berland, chair of the Finance Sector Union, had the following to say on the issue of development patterns in variable wages in an interview with a Norwegian newspaper: “The changes in the Norwegian labour markets’ payment structures are so extensive that the Finance Sector Union of Norway fears to be erased within 10-15 years if the trend continues” (*Aftenposten*, February 2nd, 2008).

In this thesis, special emphasis has been placed on contrasting the straight salary with the base wage plus bonus. In the latter case, the base wage is usually a higher proportion of the total remuneration than the bonus. Nevertheless, the bonus is often a *significant* proportion of the total remuneration. Here, I will treat the use of the bonus as an incentive mechanism for employees and as an opportunity for financial flexibility for employers. Social scientists have studied such payment structures for many decades (Pearson, 1960; Spence & Zeckhauser, 1971; Blakemore, Low & Ormiston, 1987; Petersen, 1992b, to name a few). In this section I will take a closer look at concerns for having variable wage systems. But first, I will provide a thorough explanation of the bonus and explain why there are some concerns about its wide use in supplementing regular payments.

Bonus

This thesis will consider the bonus as a variable pay component in the wholesale and retail trade, and investigate what effects, compared with a straight salary, this form of compensation might have on the distribution of wages. Only a bonus paid as money will be taken into account; other benefits, such as free phone, car, stocks, options, etc., are not included. Further, it is not possible to distinguish between different types of bonus – for instance, that paid according to number of sales, or paid quarterly or once a year – because of the way the data is reported by Statistics Norway (SSB); the total amount of bonus pay per person is reported to the SSB once a year, and is reported in the data as 1/12 of the yearly sum each individual received. This means that, even though the term bonus may be used under different circumstances and may refer to several elements of the payment system (i.e. sales commission, profit sharing), there is no such differentiation in the way the bonus is reported in these data.

A bonus is often based on one of the following (Lunde & Grini, 2007:7):

- Profit sharing
- Individual or team-based arrangements
- Combined agreements, by which the employee shares in profit on the basis of how well the company is doing.

While the base wage can be compared to a straight salary, a bonus differs in several ways. One difference is that a bonus is not necessarily contractually agreed upon prior to the

outcome. A straight salary, on the other hand, is normally agreed upon in a contract that is signed before the employee starts his or her work.

Another apparent difference is that a straight salary is paid regardless of effort and results. The whole idea of a bonus can, however, be said to be to reward employees for work done exceeding what would “normally” be expected of them to do. If the employee was not expected to perform above the level of what could be regarded as normal, a straight salary would be more suitable for the type of occupation in question.

A third difference is that the straight salary and the base wage are heavily influenced by the national actors in the labour market, i.e. unions and other types of employee organisation. The terms of bonus is also often set by the national actors, but the actual size received by the individual might vary according to number of sales or other criteria set by the firm.

A fourth difference is that a bonus normally does not bind the firm financially if certain conditions are not met. The conditions the employee has to fulfil will almost always result in a higher profit to the firm, assuming the employers develop contracts that are in their interest. If these conditions are not met, the firm has no responsibility to pay the variable part of the wage to the employee.

A fifth difference can be found between bonus and ordinary wage in the wage *development*. If, for instance, a five percent raise is agreed upon one year, it is seldom an option to cut wages by five percent the following year, since the contract is normally fixed. This is, however, normally quite the opposite situation with a bonus, as the idea itself is normally to avoid obligating the employers to the same extent as a straight salary does. As the bonus wage component does not legally bind the employers to the same extent, a bonus provides a firm with *financial flexibility*.

Concerns regarding bonus

In this section I will look at some of the issues raised in recent media debates regarding the use of bonuses.

The topic of bonus is subject to much debate in the media: One of the main concerns is that a variable wage, and in particular a bonus wage component, is believed to serve the

purposes of the firm and not the individual employees' welfare. "*A bonus is not rational as a wage component as it has the effect of working against what is in the best interest of the employee*".² When the economy is booming, it will be easy to receive a bonus based on sales commissions as there will be more buyers in the market. When the economy has reached its climax and starts to cool down, however, customers are likely to disappear, as does the bonus. Therefore, a bonus can be viewed as enforcing an accommodation of changing economic circumstances. When times are good, a bonus enforces an increase in the buying power of the individual employee, and a decrease in individual buying power when times are poor, while a straight salary is less likely to have either of those effects. A recent interview in a newspaper concluded; "*Bonus is like fudge. It tastes sweet, but does not last very long*".³

A bonus is also associated with risk, with the risk aspect connected to information principles. When receiving a straight salary, one knows when to expect the salary and how much salary to expect. In the case of a bonus, the individual neither knows when to expect it, nor how much he or she is to receive. This saying presupposes that the employee does not have a fixed agreement on how much bonus to receive. When facing the choice of two contracts, one with a fixed salary and the other with a variable wage, which in many cases will appear to give a higher pay, many will be tempted by the bonuses.

Why do pay structures change?

Towards the end of the 1980s and in the early 1990s, there were changes in the world economy due to economical instability. This is referred to as the bank crisis and also had a large impact on the Norwegian economy. When such impacts are had on the general economy there are large consequences for companies within all sectors. Companies are forced to adapt and make changes to their structure in order to successfully face a new environment. Norwegian structural changes to organisational forms are well documented, especially for the banking sector (OECD, 1992; Olberg, 1995). Even though economic stress is not desirable for any country, structural changes are bound to happen and make for a very interesting situation suitable for researching changes to labour markets. One important part of such changes is payment structures. In this thesis I will take a closer look

² Interview with Bjørn Helge Gundersen, Managing Director of AFF, *Dagens Næringsliv* 08.04.2008

³ Interview with Jorunn Berland, Chair of the Finance Sector Union of Norway, *Aftenposten* 25.03.2007.

at payment systems in the period from 1983 to 1996 and I will discuss the political framework concerning wage formations for the period in question. More specifically, I will investigate the distribution and effect of the variable wage component, the bonus.

Employers use the bonus as a motivational factor to raise employee productivity. In addition, employers have more flexibility with firm's equity in the case of changing market conditions as wages are variable. Hence employers would, in theory, always prefer to pay a bonus over a fixed pay increase. The general idea of variable wages is that the employee will perform better and become more loyal as there is motivation to perform the job above what is expected when being paid in a non-output related pay system. Another idea is that the level of pay in a variable wages system should be higher than in a straight salary system as there are more risks involved in the *variable nature* of the pay. Petersen and Snartland (2004) note:

With respect to wages, it is thus thought that workers paid according to output related wage systems on average are given extra compensation in part for working harder and in part for the additional risks they face.

(Petersen & Snartland, 2004:254)

The worker is also less likely to change jobs when wages are higher, in a given firm. This again lowers cost to employers when considering the cost of hiring and training. There are, however, important aspects to consider on the employee side of the effect of a bonus: First, a bonus is not a reliable source of income. A bonus does not only depend on the employee's own effort, but also that of his co-workers, and on his managers, the general economy and random events. Second, a bonus might raise an employee's motivation in one round, but be de-motivating in the next. It does not necessarily motivate the employee to work hard, or to achieve the goals that qualify him or her for a bonus, when coming to realise that the current year's extra effort was all for nothing. There is no guarantee the company will have a surplus to distribute among the employees. For example, the risk of production faults could be ascribed to the worker, which means less risk to the company owners. When a company is not able to motivate its employees in the long run, or random factors such as changing market conditions prevents the company from reaching the desired surplus, employees might get fired or be forced to look for new employers. Third,

when a bonus is received over a longer time period, the employee will automatically start relying on it as a source of income in the same way as they do on fixed pay. In the worst-case scenario, this might result in personal bankruptcy if bonus payments should suddenly cease. Currently⁴, the world economy is threatened by going into recession. If there is a crisis in the global economy, it is not unlikely that even Norwegian companies will have to cut costs. And where will they start? By cutting variable pay⁵:

Undoubtedly there were a lot of disappointed workers at mid-year bonus time this summer. Companies that are tightening their belts for the first time in years are finding their variable pay plans put to the test. (...) During the recent boom times, variable pay awards and stock options with value have been treated like entitlements (Fraser-Blunt, 2001).

In Section 1.2, I will give a short introduction to the wholesale and retail trade. The definitions of the wholesale and retail trade will be given in order to make differences between them clear. Then an elaboration of the development of in wholesale and retail is provided. Finally, indications of the rate of unionisation and tariff agreements in the private sector are briefly elaborated on.

1.2 The wholesale and retail trade

Wholesale means selling goods to other businesses, for example, sales via commission to franchises such as grocery stores, farms, industrial firms, construction firms, etc., which use goods for commercial purposes (SSB, 2007).

The definition of wholesale is much wider than the one for retail. Wholesale includes delivery of merchandise to industries as building & construction, hotels & restaurants, private & business services and public sector. One

⁴ 2007/2008

⁵ In Norway, lowering wages is normally not an option due to union regulations ensuring employee security. What is done instead is letting employees go. However, a bonus is not as easily regulated by legislation since a bonus is a variable pay component and more often viewed upon as an entitlement and not a legal right.

common description of wholesale is that wholesale is aimed towards other businesses and not private consumers, as is the case in retail (Olberg & Jordfald, 2000:42).

Retail is defined as enterprises selling new and used goods in the enterprise's own name and at its own cost, from a fixed location or a regular shop. The goods are usually so-called "fast moving consumer goods" (FMCGs). Examples of FMCGs are electronic, clothing, furniture and grocery stores (SSB, 2007).

The wholesale and retail trades are a significant part of Norway's economy. From 1970 to 1995 the number of employees in the wholesale and retail industry has more than doubled.⁶ Wages have grown more compared with the rise in prices on FMCGs⁷, thus allowing each person to consume more than previously. As demand for FMCGs is increasing, the wholesale and retail trade have a unique position of development: Through global networks, firms are able to export and import goods more cheaply and more efficiently. Goods move more easily across borders, partly as a result of the European Economic Area (EEA) agreement in collaboration with the European Union (EU). As merchandise becomes more available, and each person consumes more of it, the position of a few corporations becomes stronger as they control a large share of the market. In Norway, four corporations have between them over 80 percent of the market share⁸ in retail.

Unionization and tariff coverage in the wholesale and retail trade

The number of employees organised in unions is lower in the private sector than the public sector. In 1998, 43% of the employees in the private sector were organised in unions (Olberg & Jordfald, 2000). The degree of organisation is even lower in the wholesale and retail trades than the mean rate of unionisation in the private sector. In 1998, 20% of employees in wholesale and 25% of employees in retail said they were organised in a union (Neergard, 1998). From 1983 to 1997, the unionisation rate rose by about 7% in

⁶ Number of employees: National accounts figures, 1996 from Statistics Norway (SSB).

⁷ A recent survey shows that wages increased more than prices for merchandise and services (Dine Penger, No.8, 2008)

⁸ The companies are (percent of market share in brackets): The Norges Group (28.4%), The Haakon Group (21.9%), Forbrukersamvirket (Cooperative Society) (21.3%), Rema (10.6%).

Norway, which is high compared to the rate of employment for the same period (Andresen, 1997).

“Within the different industries, it is in wholesale where we find the lowest amount of tariff agreements. In retail, on the other hand, 63% of the employees said their wages were negotiated in a tariff agreement” (Olberg & Jordfald, 2000:66). An investigation of the use of tariff agreements shows that there are more people employed under such agreements than the number of employees organised in unions, with 60% in retail and 40% in wholesale perceiving themselves to be covered by tariff agreements in 1998 (Olberg & Jordfald, 2000:67). There is, however, uncertainty concerning the amount of employees covered by the tariff agreements, which might vary due to several factors. One factor is that employees might believe they are covered by a tariff agreement while they are really not. The coverage of tariff agreements is often based on questionnaires asking employees how they perceive wages to be set. On the other hand, the importance of tariff agreements might be greater than first assumed: employers in organisations which are normally not covered by tariff agreements might use tariff agreements in an informal way to set wage levels for their firm. I base my understanding of the degree of organisation in the wholesale and retail trade on Olberg and Jordfald (2000) and Neergaard (1998). Those investigations are based on material from the workforce investigation (in Norwegian: *Arbeidskraftsundersøkelsen*), which uses a questionnaire asking respondents to indicate how they perceive wages are set for them.

In the wholesale and retail trade, there is likely to be a lower amount of unionisation compared to many other industries. There are, however, many employees who are covered by tariff agreements. When it comes to wage bargaining structure, I will treat this separately in Chapter Two.

1.3 Research questions and objective

The objective of this thesis is to examine the relationship between output-related payment systems and wage levels, and discover the individual characteristics of workers in output-related occupations. In order to achieve this, two broad themes or research questions are in focus:

1. "What is the effect of a bonus on wage levels?"
2. "What are the individual characteristics of the recipients of bonus payments compared to non-bonus recipients?"

First, I will investigate the effect of paying a bonus on wage levels. Do employees paid under output-related payment systems receive higher hourly mean wages? In pursuing this research question, I take an employee perspective and look at whether bonus systems are more profitable for the employee than straight salary. I must assume that this payment system is in essence more profitable for the employer, as the employer offers the agreement in the first place.⁹ I emphasise objective factors related to risk. It is important to address the risk employee face when rewarded under such output-based systems. But it is also important to keep in mind that I am here not able to look at any factors related to the individual, except from the descriptive statistics I have on wage components. In other words, I am not able to say anything concerning preferences or feelings the individual might have towards such systems. When drawing on the existing literature and considering employee distribution and wage gains made under variable wage systems compared to straight salary, this might provide some insight into what the benefits from such systems might be. Second, I investigate differences between bonus receivers and non-bonus receivers in terms of their characteristics, such as gender, and of structural identifications, such as demographic features, size of firm and trade.

Introduction to research design

The first two research questions are clearly of a descriptive nature, indicated by the use of "what" (as opposed to a more explorative "how"; see, for example, Yin, 1984). I do, in other words, expect a bonus to have a different impact on wage levels than straight salary. The research design will be descriptive, taking a quantitative approach in the analysis. Addressing the first question will give us a general impression of the usefulness of a bonus, whereas addressing the second question will increase our understanding of the characteristics of variable pay systems where a bonus is used.

⁹ Here, we assume the employer is "rational" and acting as an "economic man" as described by for instance by John Stuart Mill in 1874.

Relevancy of the research questions

The research questions or themes are relevant and interesting because they create awareness of flexible wage formations. Are wages becoming more variable? Can variable wages increase a firm's flexibility, and if so, have there been any changes throughout the years investigated in this thesis? Second, the research questions shed light on the organisation of employees and their pay formations. In recent debates in the media there has been a focus on the development of variable wages and how an increase in bonus payments might lead to changes in, for instance, rates of unionisation. Here, we investigate what the effect a bonus have on wage levels and compare this to the wage level for straight salary and how the effect can be different for various characteristics, as for example gender. In addition, we look at why it may be necessary for some firms to be able to reward differently (i.e. why it is sufficient in some firms to have a straight salary, while others are better of paying a variable wage).

This thesis contributes to exciting knowledge by using unique data providing extensive information regarding the wholesale and retail trade which has never before been used. The analysis of the data will be discussed in light of a theoretical framework which, to the best of my knowledge, has not been used for the purpose of investigating variable wages in the wholesale and retail trade in Norway.

1.4 Thesis outline

The remainders of the thesis are organised as follows: Chapter Two lays the groundwork for the empirical study by setting out the theoretical and empirical frameworks and developing hypotheses based on this. Chapter Three presents the methodology adopted in this study and the data set analysed in the thesis. Chapter Four presents the results of the data analysis, while Chapter Five discusses the results in light of the theoretical and empirical frameworks and the research questions. Chapter Six presents the conclusions reached, drawing out the policy implications, and makes suggestions for future research.

2 Theoretical and empirical frameworks

In this chapter, the theoretical and empirical frameworks of the thesis will be outlined. Two main theoretical perspectives are presented: the *Principal-Agent* theory and the theory of *flexible firms*, with the focus on the *financial flexibility* of firms. In addition to these two theories, I will also emphasise some theoretical viewpoints from theories of innovation and entrepreneurship, as such theories might help us to better understand the differences between motivational factors for given pay systems in various firms.

With regards to the Principal-Agent theory, the focus will be on the work of Petersen (1993a). With regards to the theory of the flexible firm, I will elaborate on Atkinson's (1984) framework. When looking at the issue of financial flexibility in previous research in the case of Norway, I will highlight the theoretical perspectives adopted by studies of the Norwegian labour market, mainly those by Olberg (1990, 1995) and Langeland (1995, 1999).

2.1 Principal – Agent theory

In this section, an overview of the Principal-Agent theory will be given. First I give a description of the theory and its main components. Then I explain why the theory is important to this thesis and finally discuss how the theory can be applied in the labour market.

Hypothesis used in the analysis are derived based on the theoretical and empirical framework, and will be mentioned in context of the frame work.

In the employer-employee relationship, the principal is usually the employer and the agent is the employee. The challenge of the principal is to design a contract that maximises the principal's use of the surplus when the contract is completed. One way of maximising the use of the surplus is for the principal to ensure that he benefits from the work done by the agent. This means that the agent is able to receive an in advance agreed upon level of the surplus of his work. The principal, however, also receives a share of the agent's work. This requires that the work done by the agent is observable by the principal. If the work or

achievement of the work is not observable it can not be contracted for (Bragelien, 2001). Petersen (1993a) defines Principal-Agent relationships as follows:

...a Principal-Agent relationship arises when a principal contracts with an agent to perform some tasks on behalf of the principal. In executing the tasks, the agent chooses an action. The action, in turn, has certain consequences that are an outcome, and the outcome affects the welfare of both the principal and the agent (Petersen, 1993a:277).

The use of Principal-Agent theory can be traced back to the 1930s. Berle and Means (1932) and Coase (1937) can be viewed as pioneers in agency theory. The theory was put forward to explain dilemmas that could appear in contractual behaviour between two parties, i.e. the principal and the agent. Many of the research questions relating to the Principal-Agent theory are concerned with how individuals interact with organisations in some form or other. Principal-Agent theory can be placed within the tradition of rational choice (Collins, 1994:121-181). However, placing the Principal-Agent model under circumstances of strict rationality should be done carefully. For the purpose of this thesis, I extend my understanding of the Principal-Agent model and look at circumstances where neither the principal nor the agent act solely based on the neoclassical economic understanding of rationality.

Early work on proving empirical significance of the Principal-Agent theory was done on insurance contracts. Insurance contracts provided empirical data regarding the contractual pay-off between a principal and an agent, or in the case of insurance contracts between the insurance company and the individual buying insurance (Spence & Zeckhauser, 1971; Ross, 1973). Later, Principal-Agent theory was found to be very useful in explaining employment contracts in terms of how an employer (principal) can motivate an employee (agent) by applying different criteria for awarding wage components. Theoretical implications of Principal-Agent theory are still being researched and developed (see, for example, Milgrom & Roberts, 1992).

Why is the Principal-Agent theory of interest to this thesis?

The theory is particularly interesting because it describes the incomplete or *asymmetrical* information that might arise – and are found in most – employer-employee relationships. The aspect of incomplete information suggests a problem for the employer, a problem that might be overcome by providing appropriate motivation for the employee to perform work following the employer's criteria. Arguably, it is in the absence of strong formal requirements employees will follow an informal systems, based on a set of norms developed by the "community of employees" (Lysgaard, 1985). This may be a problem to the employer if these norms do not match the employer's definition of what is in the best interest of the firm. It is therefore desirable for the employer to have information on the performance of each employee in order to ensure that they do what is desired by the employer. However, to have extensive information regarding an employee's performance may be impossible.

The wholesale and retail trade seem to be ones where there is a relatively high level of variable wage receivers. I assume from the definition of wholesale and retail that there is a need to motivate employees who work in occupations with a strong focus on selling. Sales are likely to create competition among firms, with the competitive element largely motivated by which firm of all those competing for sales makes a profit from sales. Therefore it will also be necessary for a company to recruit motivated sales staff and use economical means of motivating them to achieve desirable sales targets. It is the economic motivation created by variable wages which is of interest in this thesis.

The Model

There are five central elements describing the Principal-Agent model: (1) Type of agent, (2) Agents self-interest, (3) Random factors, (4) Outcome and (5) Asymmetrical information. Regarding asymmetrical information, I discuss central elements of information where *asymmetrical information* is the main category and *moral hazard* and *free-riders* are sub-categories for explaining the information problem. These five elements will be presented next.

Type of agent

The type of agent may vary. Type may refer to personality or individual characteristics of the agent. The agent may be careful vs. careless, trustworthy vs. untrustworthy, completing tasks fast vs. working slowly, reliable vs. unreliable and so forth. For instance, when visiting a dealership for cars (agent), the customer (principal) would like the dealership to be both reliable and trustworthy. One will expect the right amount of service and reliability about one's purchase. If the dealership does not appear to be trustworthy, the principal might look for a different agent. Similar situations arise in many other Principal-Agent relationships, for instance, doctor-patient, teacher-student, entrepreneur-investor. A person may be a principal in one situation and an agent in another. In many cases, what might influence the choice of the principal could be recommendations or personal references.

Agent's self-interest

Individual preferences of the agent might influence the outcome of the situation.

An incentive structure such as splitting the surplus and ownership among employees is expected to lead to a rise in productivity and identification with the firm on the employee side (Langeland 1999:121).

Individual preferences can be what make the agent decide on his or her own level of effort in a situation. The level of desired effort is often contractually agreed to in advance, by the principal and the agent. Normally, the principal lays down the terms or conditions for the agent, as the principal is the contractor. However, after the contractual agreement has been made, it is hard for the principal to measure anything but the outcome. For this reason, the agent may choose less effort than first agreed to in the contract. The rationality behind this, for instance in an employer-employee relationship, is that it will be costly for the agent to exercise more effort than necessary. Therefore the agent needs the right motivation in order to bring the interests of employer and employee closer together.

Random factors

Random factors might affect the outcome of any situation. Such factors are beyond the control of principal and agent. For instance, the sale of ice cream might change due to weather conditions. During warm summers, more people will buy ice cream, while during cold and dark winters, there are fewer people buying ice cream. Ice cream sales will also depend on the effort of the seller: the design of an advertisement and his reputation might determine the trustworthiness of the seller, as well as the quality of the product, and its supply and demand in the market. In particular in the case of consumer products that are not essential (for instance, television sets and computers versus milk and bread), random factors might have a large impact on sales.

When there are random factors involved, there is also a greater risk for the agent. The agent should be rewarded for taking risk. If the agent were not rewarded for extra risk, there would be no need for a variable wage component, and straight salary would be better for the agent. If base wage plus bonus is lower than straight salary, base wage plus bonus only benefits the employer. This proposition leads me to investigate the following hypothesis:

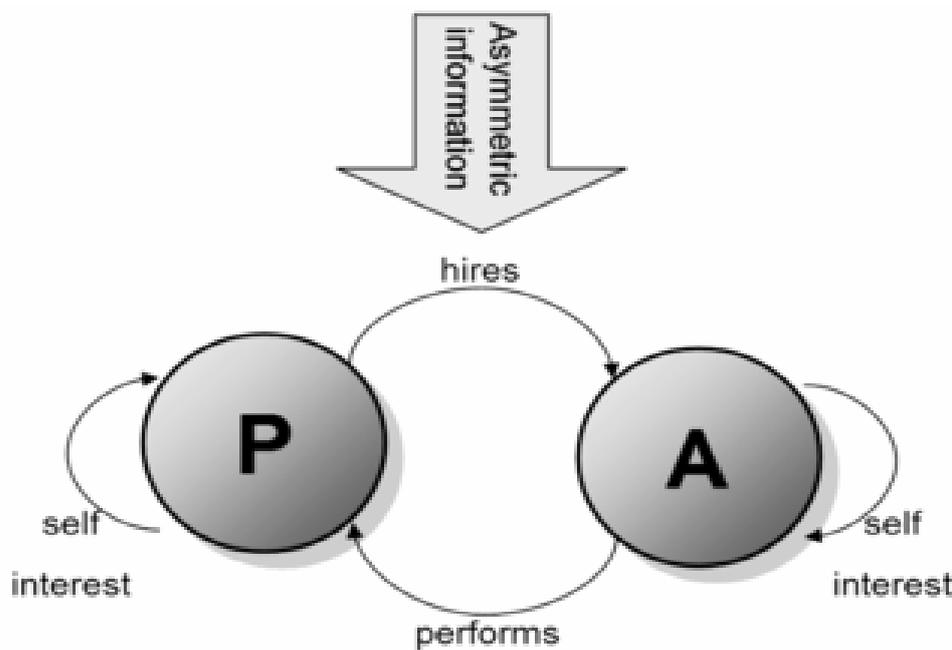
Hypothesis 1 (H1): *Employees who receive a base wage plus bonus have higher hourly pay than employees on straight salary.*

Outcome

Outcome is the result of individual characteristics, individual preferences and random events. The outcome, or the results created by the agent, is usually observable to both the principal and the agent, and it is measurable. Examples of observable outcome can be number of sales made by a salesperson, amount of fish caught, number of patients visited and so forth. In other words, both quality and quantity can be measured to some extent. However, quantity can be viewed as the easiest part to measure. When the principal wants to ensure quality in the work, there are several difficulties of observation. And these difficulties are often based on information.

In Figure 2.1, the Principal-Agent model is shown. “P” symbolises the principal and “A” symbolises the agent.

Figure 2.1: The Principal-Agent model¹⁰



Information

Information is crucial for understanding the decision-making process of employers and employees. Based on the available information, principal and agent can decide whether they wish to engage in the employer-employee relationship. The information problem relates to studies in transactions (i.e. wage) where one party has more or better information than the other.

One of the main challenges for the Principal-Agent theory is control over information, more specifically, the principal’s ability to monitor the effort of the agent between the point at which the contractual relation is determined and the point at which the outcome has become observable. Here, I will discuss some of the information problems and possible

¹⁰ Figure from wikipedia.org. Based on the agency theory of Principal-Agent relationships.

ways of overcoming them. First, I introduce the information problem in a general sense, and then I focus on three aspects of the information problem; *asymmetrical information*, *moral hazard* and *the free rider problem*. Asymmetrical information addresses the general problem of information in the Principal-Agent relationship. Moral hazard describes an aspect of asymmetrical information which might be encountered if the employee's morals are low. I will here look at moral hazard as a problem encountered under individual Principal-Agent relations. Individual Principal-Agent relations is in contrast to "group schemes". The free rider problem describes a second aspect of asymmetrical information that might occur when group bonuses are given (i.e. the use of group schemes). Asymmetrical information is most likely the case for many of the employer-employee relationship in the data studied in this thesis. Thus, we will most likely be observing both the problem of moral hazard and the free rider problem.

Asymmetrical information

The distribution of information can be described as asymmetrical if both parties do not have access to the same information, or one party has information which the other party does not have at all. The unbalanced possession of information creates an imbalance in the relationship between the two parties, and when there is imbalance, one of the parties might be relatively worse off than if the information was symmetrical (i.e. both parties share the same information). In the employer-employee relationship the employer can be relatively worse off by paying the employee for work that was not performed according to the criteria set by the employer. In situations where the employee is relatively worse off, the employee might not receive a wage lower than what he could have been expecting paid a straight salary. The employee perspective should, however, be regarded as less problematic in the Principal-Agent theory. I will explain the situation where the employer is relatively worse off in more detail under moral hazard. The information asymmetry is not only connected to information, but also action. There are two types of asymmetrical information (Arrow, 1985): *hidden action* and *hidden information*.

Hidden action addresses the difficulties for the principal of observing the agent's behaviour. This is a problem because the payment process is usually constructed in such a way as to motivate the agent to put in more effort if the agent wants higher pay. If the agent does not perform according to the agreed wage criteria, the foundation for setting the

wage is incorrect. Another aspect of the hidden action problem is that it might contribute to unfair payment methods between various agents. If, for instance, agent A were to receive 100 NOK hourly pay while exercising 50% effort, and agent B were to receive 100 NOK hourly pay while exercising 75% effort, agent B would be relatively worse off than agent A although the hourly pay rate is the same for both agents.

In the case of hidden information, unlike the above, the principal and agent is *symmetrically* informed at the time they enter into the contractual agreement. However, after entering into the agreement, the agent acquires more information (his hidden information). “*The agent in the hidden information model observes the random factors influencing the outcome before choosing her action*” (Petersen, 1993:279). In other words, hidden information describes a possible situation where the agent has information regarding the environment. The information held by the agent also makes the agreement between principal and agent less stable as the agent makes decisions based on information held only by the agent. “*More complicated Principal-Agent relations arise when not only is the principal unable to monitor the agent, but also the agent possesses information about his environment, (...), which the principal does not*” (Grossman & Hart, 1983:180). The hidden information model thus suggests that the agent may alter his behaviour after the contractual agreement has been laid.

Moral hazard

Moral hazard relates to individual pay schemes where an agent chooses to do less work than the principal’s target rate. This is referred to as the *moral hazard problem* (Holmström, 2003). In some cases, moral hazard is used as being equivalent to the problem of asymmetrical information in a broader sense. Nevertheless, one important difference between the more general term of asymmetric information and moral hazard is that in the case of moral hazard the agent may choose to behave differently if the agent does not bear the consequences of its action. An example of this can be if the level of pay is pre-determined to the outcome of the situation, i.e. pay is not dependent on the success of the agent. In other words, the agent does not bear the consequences of poor decision making or achieving less than what is desirable by the principal. This issue is often set in connection to the moral of the agent. Straight salary might be viewed as an example of a situation where the level of pay is pre-determined to the outcome. Moral hazard can thus also be

viewed as a greater problem when paid a straight salary than a variable wage, as a high level of variable wage might limit the problem of moral hazard. Further, moral hazard is connected to a problem of observation: “*The source of this moral hazard, or incentive problem, is an asymmetry of information among individuals that results because individual action cannot be observed and hence contracted upon*” (Holmström, 2003:126). This raises the question as to what extent the principal is able to have control over what the agent does.

In order for the principal to contract the agent’s performance, there has to be an outcome which can be observed. As there are several problems encountered under various forms of information, there is neither a system of total control nor a system devoid of any control. A system based on trust is one possible solution to the problem; however, in order to rely on trust it would be necessary for all agents to have strong morals. And yet, the principal would still need to be able to observe the trustworthiness of the agents.

A problem of observation relates to the *monitoring problem*. Monitoring is a source of information and might help the principal ensure that the quantity and quality of work are performed optimally according to the principal’s preferences. The possibilities for the principal to monitor the agent are subject to change under different circumstances. Such circumstances can be dependent on whether the employee does or does not have a fixed location of work (i.e. whether he has to travel to work). If the employee does not have a fixed location of work, this might impact the measurability of how work is performed. One way of monitoring employees is to hire supervisors. By having a sufficient number of supervisors, the principal may be better prepared to create the correct incentives, in terms of pay, for the agent. Another possibility is to influence the internal norm system within the firm, which can be done by creating group commission schemes. However, such schemes are also subject to information loss, potentially leading to the free rider problem.

The free rider problem

The free rider problem relates to group commission schemes. The problem is best illustrated by describing situations where some team members (i.e. employees) put in less effort than other members of the team, and still reap the same benefits as the other team members. It is possible for the group to achieve the same goals even if some individuals do

not contribute to the collective good. This, however, may induce more effort from those who contributed in the first place. The free rider problem is thus only found in group commission schemes (i.e. teams of employees). The free-rider problem “*may, however, be overcome by the construction of appropriate target rates, where a high wage is received by every team member if the production target is reached, and otherwise a low wage if the target rate is not reached*” (Petersen, 1993a:287).

So far we have seen that by using common sense, we will most likely overcome many of the information problems, especially through solutions related to observation and monitoring. Also, empirical studies give support to the importance of the monitoring effect on employee effort, as shown in a study done at Vauxhall Motors Ltd, which suggested team-based arrangements to eliminate the free rider problem (Pearson, 1960). Vauxhall Motors Ltd had created a competitive environment where each group of employees was supervised and given detailed information as to what level their production was at for each week of production. The assumption was that if one member did not perform, his peers or supervisor would tell him. Each unproductive employee would reduce the group’s eligibility for a higher bonus as a group commission scheme was used. The solution to the problem of free riders was to hire managers to monitor each group of employees and to constantly inform the group of employees on how to achieve their group bonus (Pearson, 1960). This way, the managers would inform the groups of employee’s on how they were doing in order to achieve the target rate, and the employees in the group would ensure that all the member of this group performed according to the target rate. By doing so, the managers did not have to monitor each employee, only the group of employees.

I have now defined the boundaries of the Principal-Agent model. There are several aspects to be considered in the employer-employee relationship. One of the main aspects is information: The employer (principal) constantly needs to focus on whether the correct incentives are given in order to overcome the various information problems. Incentives relate, in particular, to creating the appropriate target rates. Another way of solving the information problem is by hiring managers to monitor the employees. A third possibility, which has not yet been discussed, is the selection effect in occupations. It is possible that there is some sort of selection process at work in the recruitment of employees into various occupations. This recruitment process might be based on employee preferences for

entering a particular occupation as well as employer preferences for a particular “type” of employee.

The selection effect in occupations

The recruitment practice of the employer, and the distribution of employees into occupations, is important to discuss as it is common to identify particularly female and male dominated occupations. Selection effects and sorting are correlated with the element of information in the Principal-Agent model as discussed in this chapter. Therefore, the hypothesis I propose in this section can be viewed as testing elements of Principal-Agent relationships.

To some extent, an occupational group which is female or male dominated may also reflect employer attitudes towards recruitment practices, favouring one gender over another (Petersen & Snartland, 2004). There is complete sex segregation in output-related pay systems if all men are in pay-for-performance occupations or establishments, and all females are in non-output related pay systems. Meyersson-Milgrom, Petersen and Snartland (2001) find that occupational sex segregation explains more of the wage gap in Norway and Sweden than in the U.S. In other words, it is between occupational groups that the largest wage differentials are found, and not within. It is therefore reasonable to assume that if females are paid lower hourly wages in output-related pay systems, the gender wage gap can be due to different recruitment practices in occupations. To find out how gender is allocated with regards to different pay systems, I will test how the ratio of females and males receiving variable wages is distributed in the wholesale and retail trade. We already know that the wholesale trade is male dominated while there are more females employed in retail than males, and it is also more common for males than females to receive variable wages (NOU, 1997). What is not known is how large the difference between female and male distribution in straight salary and variable wages are. I propose the following hypothesis in order to investigate the distribution of males and females into different pay systems in the wholesale and retail trade:

Hypothesis 2 (H2): *How large is the difference between males and females receiving variable wages in the wholesale and retail trade?*

When establishing the male/female ratio in an output-related wage system, we can ask (a) what is the size of the differences between males and females when males and females work in occupations where variable wages are paid; and (b) how large is employees' gain when receiving variable wages than when paid a straight salary. Further, we might investigate the assumption that females receive a significantly lower hourly base wage plus bonus compared to males by proposing the following hypothesis:

Hypothesis 3 (H3): *Females receive a significantly lower base wage plus bonus than males.*

After establishing the variations in the male/female ratio of employees in occupations paying output-related wages, and investigating the size of the difference between males and females, the next step to gain some further insight into how employees are sorted into given occupations might be to observe a characteristic such as distribution on educational level for the two groups (straight salary receivers and variable wage). Based on the Principal-Agent model, the employer knows that motivation is necessary to achieve the desired effort from the employee. But do employers have the same need to monitor all employees? Is it possible that some employees are more likely to have higher morals than others? I assume that people in output-related pay systems have a higher hourly income than those who are paid a straight salary. Normally, comparisons within the pay system of straight salary show a linear relationship between hourly wage and educational level. We can therefore assume that higher education leads to higher wages. If variable wage recipients are paid more than the ones paid a straight salary, the relationship of pay level might also induce that the group of variable wage recipients also are in different education groups than the recipients of straight salary. In the wholesale and retail trade the relationship of education and wage may, on the other hand, be the other way around, i.e. a high variable wage might be correlated with low education. Why might this be so? One viewpoint would attribute this to the monitoring principle, as described above in this chapter. An employee with high education can be said to be less *risky* in terms of moral hazard as the principal can observe the outcome of the agent's former results from attaining education. The characteristics observable to the principal on the agent's past performance might indicate what *type* of person the agent is. One question the principal might ask is whether the agent motivated for working or need motivation. This viewpoint thus also supports the position that an agent with low education is possibly a greater risk as

the principal can not observe any characteristics regarding the performance or achievements of the agent. In other words, a high level of education may be consistent with a low risk of moral hazard, even when paid a straight salary. More broadly, I suggest that it is more common to find low education correlated with a variable wage rather than high education. The reason for this is that agents with high education do not need to be motivated or observed through variable wage systems and are therefore also more likely to be paid a straight salary. I therefore propose the following hypothesis:

Hypothesis 4 (H4): *Recipients of variable wages are distributed differently in education than the recipients of straight salary.*

2.2 The flexible firm

This section is organised as follows: First, I will discuss Atkinson's (1984) different forms of flexibility; second, I will explain why this is relevant to this thesis; and third, I will introduce some aspects of the "dual focus" of exploration and exploitation that firms are meant to have, based on the management literature.¹¹

By *flexibility* I mean the ability of firms to adapt to changes in the market. In order to allow rapid changes to take place within the organisation, and being able to compete, firms need *variable expenses*. Variable expenses allow the firm to channel cash flow to where it is needed at various times. The firm's equity thus becomes flexible. From a sociological point of view, there are three main explanations regarding the development, use and variations of economical incentives, which relate to changes in the expenses and how money is put to use in a firm: (1) governmental framework (i.e. legislation and taxation), (2) structural changes (i.e. trade and job structure, education level and technology), and (3) changes in the organisation of the labour market (i.e. new organisational structures within and between firms, new strategies for work organisation) (Langeland, 1995:102). These three explanations are all important as each partly explains variations between firms and development over the years. It is therefore helpful to keep these explanations in mind when addressing "drives" for financial flexibility.

Why are theories of the flexible firm important to this thesis?

Theories of the flexible firm are important to this thesis as flexibility might explain why firms organise wages differently, and why wage components are interesting in the first place from an employer perspective. Financial flexibility can explain the purpose of variable wages, and might provide solid grounds for explaining the use of wage components in Norway, as the theory emphasises behavioural pattern for the firm and why it is necessary for a firm to have a high degree of financial flexibility in order to meet, for instance, competition from other firms. Financial flexibility is especially important for a firm as it indicates the level of variable costs a firm is able to cut when expenses are too high. There is especially one field where structural changes have been investigated, namely industrial sociology. One important study done in industrial sociology in Norway is in the

¹¹ Of all the managerial literature I will focus on entrepreneurial literature, in particular the works of J.G. March (1991) and his dual focus of the firm.

“community of employees” (Lysgaard, 1985). One of the main problems in this empirical investigation is the employees’ ability to protect themselves from becoming a mere instrument of production in the technical-economical system. An example of this might be if variable wages only consisted of the bonus wage component and the employees therefore were dependent on maintaining a high level of effort at all times or else their wages would face drastic decreases. However, this setting is rarely ever found in Norway, as there almost always is a base wage component in addition to the variable bonus.

The model

Atkinson’s (1984) theory of the flexible firm aims to explain differences in organisational behaviour on the basis of changes to, in particular, demand side factors. Atkinson (1984) categorises the flexible patterns in a firm by three main types of flexibility, namely *numerical flexibility*, *functional flexibility* and *financial flexibility*. It is, however, important to discuss both numerical and functional flexibility as these forms of flexibility are the ones which form the basis for financial flexibility. A well-developed firm, in terms of production and management, creates opportunities and sustainable advantages for the firm based on a differentiated way of production. “*The customers demand a highly differentiated product and demand is more rapidly changing compared to earlier*” (Olberg, 1995:8). The theory of the flexible firm builds on the declining patterns of Fordism and Taylorism in production and management (Olberg, 1995). Thus to achieve a sustainable advantage when competing with other firms in terms of creating differentiated products and facing demands in the market, financial flexibility is necessary.

Numerical flexibility

Numerical flexibility refers to a situation where a company makes quantitative adjustments when facing market demands (i.e. varying number of employees and hours worked). In order to achieve flexibility, firms hire part-time workers and workers with a flexible work schedule (i.e. work nights, weekends and so forth). By doing so, a company is more able to adapt to sudden changes in supply- and demand-side factors. Numerically flexible employees are characterised by having a loose connection to the firm. In other words, numerically flexible employees are expendable and easily replaced by the firm.

For the purpose of achieving my main research objective, I postulate a hypothesis based on changes to the number of employees receiving variable wages. The number of employees is in general likely to increase in the wholesale and retail trades. It will therefore yield more accurate results to see if the number of employees receiving variable wage increases as a proportion of the number of employees in the trade, that is, if the ratio of variable wage receivers changes relative to the number of employees receiving straight salary.

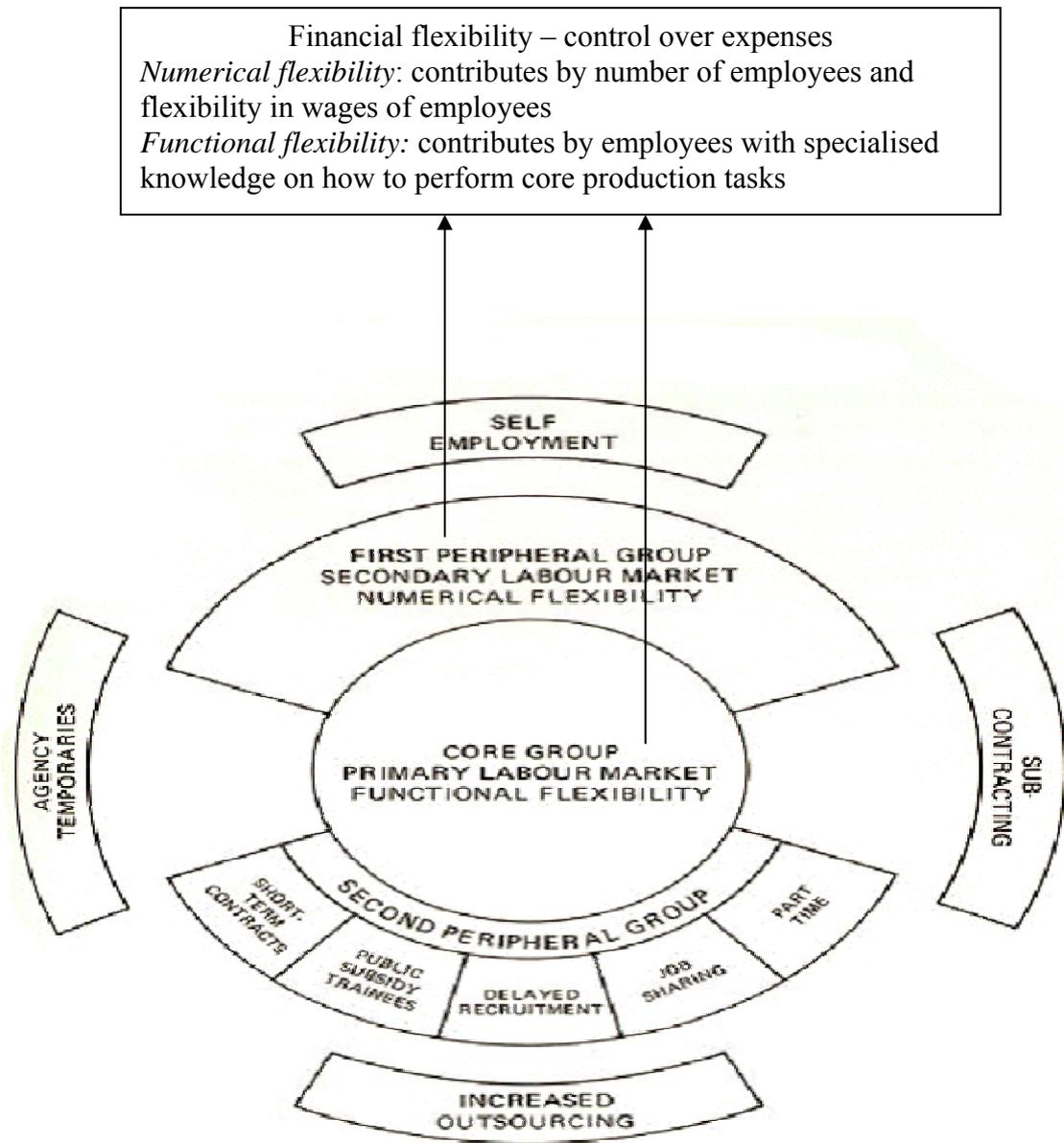
Hypothesis 5 (H5): *The number of employees receiving variable wages increases over time.*

Functional flexibility

Functional flexibility refers to non-expendable employees. One reason for employees not to be expendable could be that they possess specific knowledge about the production process of the firm. The functional flexible employees are a core group who are able to introduce new processes into current structures. Another important aspect of functional flexibility is the ability to inform and train new personnel (i.e. often personnel defined as the numerical flexible group of employees) in work tasks. The functional flexible group makes the process run smoothly over time. A study done by Statistics Norway in 1998¹² showed that 57% of the workers had changed work tasks, 54% got new leaders, 48% met stricter demands at work, 33% changed the hours they worked and the wage system under which they worked, and 25% got a new position within their firm. It is therefore reasonable to assume that employees defined to be in the group of functional flexible workers are necessary in order to implement and make such changes adaptable in the firm. Figure 2.2 presents Atkinson's (1984) model of the flexible firm.

¹² The SSB report is referenced in NOU 1999, Vol. 34.

Figure 2.2: Labour market structures under conditions of the flexible accumulation



Source: Curson, 1986:151

Financial flexibility

The model in Figure 2.2 shows how numerical and functional flexibility can influence financial flexibility within the firm. Here, I will first elaborate on some of the basic concepts of financial flexibility, explaining the above model in greater detail. Then I will look further into three aspects that might influence financial flexibility: (1) size of firm, (2) geographical differences in competition, (3) wage bargaining in the private sector and (4) policies

Financial flexibility in a firm can be defined as the ability to adjust to rapid changes in the market. One way of increasing this flexibility is by the ability to cut cost when necessary and channel the flow of money to areas that generate the most revenue. Fixed costs cannot easily be cut. Seen from the perspective of a firm's ability to be prepared for rapid changes in the market and face competition better, it is rational for a firm to have its proportion of variable costs as high as possible. One of the largest costs for a firm is the one of paying wages. The cost of paying wages varies by the number of employees and the amount of pay per employee. This is however, not unproblematic, as unions often seem to be reluctant towards variable wages, although it does not include firing employees or failing to pay what has been promised. However, a main distinction between two types of variable wages needs to be made: (1) bonus based on completing sales (i.e. the employee knows how much bonus he will get and when to get it, i.e. when the sale is made final), and (2) profit sharing/firm ownership. Both types reflect an aspect of financial flexibility.

International tendencies show that in countries in the E.U. and in the U.S., the use of variable wage components is widespread, and the growth of using such payment schemes was particularly strong in the mid 1980s. Several reasons are given in the literature for this increase in the number of individuals paid in output-related pay schemes: increasing global competition, structural and technological changes, political regulations and new forms of labour organisation and management. In England and the U.S, tax benefits motivate employers to use variable wages (Langeland, 1995:230). In France, legislation ensures profit sharing among employees in companies with more than 50 employees, and France is also the E.U. country where it is fairly common with the use of bonuses. In Norway, an overview of the use of different pay schemes or financial incentives has yet to be made. Surveys show that straight salary is what is most used both by firms and employers. This

indicates that the bonus arrangement is something the average firm and employee are somewhat resistant to (Langeland, 1995:112). A low rate of output-related pay systems can in general be explained by the lack of incentives for employers to use such structures. Therefore it can be said to be up to the individual firm to decide whether they will benefit from having variable wages or not. In the wholesale trade variable wages are particularly common, based on the definition of wholesale and retail (SSB, 2007). This does, however, also induce that if for any reason sales should drop more than expected in a given period, the firm need to compensate the decrease in income from a decrease in expenses.

Size of firm

“Flexibility is a key mechanism to control investment dynamics, which arise because of the irreversibility of real and financial decisions and the uncertainty related to them” (Lindström & Hasmati, 2004:3). The data used in this study allows to observe if the distribution of variable wages is different from straight salary in various sizes of firms. One reason for why it might be interesting to investigate differences in sizes of firms is due to that it might reveal information regarding the issue of how firm use bonuses not only as a motivational factor but as a mean of observation. In a firm with few employees, the contribution made by each employee can be said to be observable to the employer. In larger firms, it will be harder to monitor each employee. Therefore I will assume that larger firms observe their employees less, and that the bonus might increase as the need to monitor employees goes up. *“The incidence of variable pay schemes varies according to a number of characteristics of the employing organisations concerned. Size seems to be an important characteristic: the larger the organisation, the more frequent the incidence of variable pay”* (European Industrial Observatory on-line, 2001). The base wage component does not necessarily increase on the basis of the same criteria as the bonus component. If the base wage component varies with size of firm, this might be due to the economic situation of firms, where those with better placed also pay higher wages. Research has shown that larger companies also have a higher income profile than small and medium sized companies, and large firms are therefore also more eligible to pay their employees higher wages than smaller companies (Boye & Kinserdal, 1992; Cosh & Hughes, 1994).

From the perspective of a small company, for instance a start-up company, it would be rational to have variable wages in order to increase firm flexibility. Variable wages make it

possible to have a low base wage followed by a high bonus. Whether the bonus component leads to high or low pay will be determined by the criteria for receiving the bonus.

Structuring a variable wage according to specific criteria makes more sense for small firms as it allows for a very high degree of financial flexibility. In other words, the employees may receive a low wage when revenue is low (usually in an early phase of a firm), but if the firm succeed in increasing their firm's revenue and grow larger, the employees are likely to receive a base wage plus bonus that is higher than what they would receive if paid a straight salary.

According to March (1991), a firm faces the constant difficulty of balancing *exploitation* and *exploration* activities, as illustrated in Figure 2.3. Further, exploitation and exploration is referred to as the “dual focus” of the firm, as it describes differences in organisational structures between firms and the processes firms focus on. When applying March's exploitation versus exploration framework to the effect of a firm's size on wages, the theory suggests that smaller companies implement flexible payment schemes in order to be the drive for firm expansion through motivating to innovative processes. This is because smaller companies will be more likely to focus on exploration as they have fewer opportunities to benefit from economies of scale and scope, for example. One of the prerequisites of exploitation activities is financial efficiency and keeping transaction costs low (see, for example, Coase (1937) and Williamson (1975)). Small firms cannot achieve this efficiency through economies of scale and scope, and thus they have to be more flexible in their financial reward system, despite a higher total transaction cost. Figure 2.3 presents March's (1991) interpretation of the dual focus that firms must have in their operations.

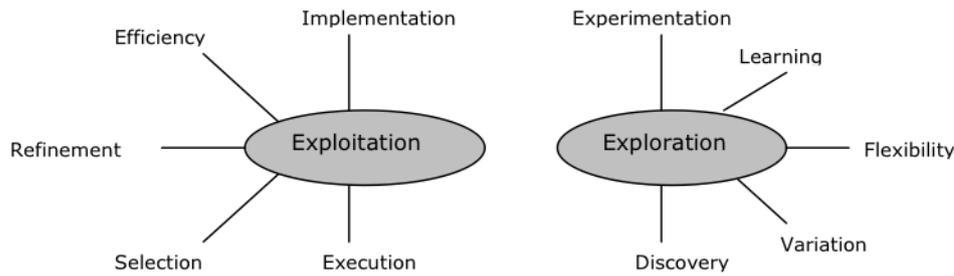
The “dual focus” of exploitation and exploration that firms are meant to have can also be related to differences between small and large firms, where large firms are the ones which “exploit” while small firms “explore”. In the introduction I emphasised a trend in the development of the retail trade, where the small local firms disappear and national chains with many employees emerge. One problem that arises is whether the focus of the firms investigated in this thesis is more influenced by exploitation than exploration.

Exploration is connected to experimentation, learning, flexibility, variation and discovery. Such exploration is characteristic of smaller firms that aim to grow larger. Our knowledge

of the development of firms in the wholesale and retail trades and March's (1991) notion of the "dual focus" that firms should have suggest that the wholesale trade is less dominated by "exploration" and more by "exploitation". Atkinson's (1984) *flexible firm* thesis leads me to suggest two types of financial flexibility – one which relates to *exploration* and one which relates to *exploitation*. The first type of flexibility adequately describes the financial flexibility found in small firms (hereafter referred to as *financial flexibility of small firms*). Small firms' financial flexibility is characterised by a need to motivate employees. When there are few employees in a firm, they might even agree to have a low base wage. If they work hard so that the firm, is able to grow and increase its revenue, the bonus payment might be significantly larger than what they would otherwise receive. In other words, they are compensated for the risk of accepting a lower base wage if the firm succeeds.

Exploitation is characterised by implementation, efficiency, refinement, selection and execution. The concept is a suitable tool for describing established firms or what often are larger firms in the case of the wholesale and retail trades. However, the concept needs to be extended as the notion of flexibility needs to be included in the exploitation model. The second type of financial flexibility is the one found in large firms (hereafter called *financial flexibility of large firms*). The financial flexibility of large firms has a different purpose from the flexibility found in the exploration model, which was said to characterise small firms. What is similar is that both forms of financial flexibility require a firm to have variable costs. But in the case of large firms flexibility may be viewed as requiring the monitoring of employees in order to align the individual preferences with the ones of the firm, rather than as aiming to motivate employees based on their personal preferences for achieving desirable goals.

Figure 2.3: The dual focus of firms



Source: March, J.G., 1991

When considering the dual focus of firms, firms use different incentives in different development stages and variable wages can be used to monitor and motivate employees.

I have now discussed the significance of a firm's size and considered several aspects that might influence the patterns of wage formation in small and large size firms. Variable wages create financial flexibility in a firm's expenditure. Applying March's (1991) theory of the dual focus of firms, it seems that there is a greater focus on exploitation than on exploration in the retail and wholesale trades. It seems to make sense for larger firms to pay higher variable wages than smaller firms, because large firms seem to have a more efficient use of monitoring in order to ensure efficiency, implementation and execution of new tasks. This proposition leads to investigate the following hypothesis:

Hypothesis 6 (H6): *Large firms pay higher variable wages than firms with few employees.*

When investigating hypothesis 6, I will also consider the effect of size of firm on straight salary in order to be able to say something about differences between straight salary and variable wages. Another issue that will be considered is to what extent variable pay is really relevant for investigating differences in the size of firms and how the use of bonuses varies with size of firms. One problem with discussing the size of a bonus and its impact on the hourly wage is whether the size of a bonus is likely to have an impact on the financial flexibility of firms; how large does individual bonuses need to be in order to have a theoretical impact on the flexibility of a firm?

One possible solution to the problem of the size of a bonus might be to compare bonus (i.e. bonus measured as a percentage of hourly salary) with the development of the general wage growth. If, for instance, a bonus is 10% of the hourly pay while annual wage growth is 4%, one could then make the assumption that individual bonus is of a significant size. In this study, I will consider a bonus below 4% of hourly pay as indicating a low level of financial flexibility, a bonus of 4% as indicating a medium level of financial flexibility, and a bonus above 4% as indicating a high level of financial flexibility. In a study done on national wage levels and the yearly development in wage growth, Hansen and Skoglund (2003) finds that mean wages grew by an annual of 8.5% in 1980-89 and 4.6% in 1990-2002. However, when adjusting for real wage growth (adjusted for inflation) the annual numbers were only 0.6% in 1980-89 and 2.1% in 1990-2002 in Norway (Hansen & Skoglund, 2003:45).

I have now argued there may be differences in wages based on a firm's size, and that this may partly be explained by a different focus (i.e. financial flexibility of small firms vs. financial flexibility of large firms). Also, the competitive environment of firms of different sizes might be a factor that leads to differences in wage levels. Another important factor that might influence the wage level of a firm is the geographical region in which it is operating.

Geographical differences in competition

Different regions have different competitive environments, and the importance of regions has been focused on intensely (NOU, 2004 vol. 19 "*Sustainable Regions*").¹³ Arguably, there is a close link between competition and financial flexibility as competition defines many of a firm's actions. An example of competition can be if two firms strive for the same customer base within a region. According to principles of fairness (Høgsnes, 1994:178) one might assume that unions push for "equal wage for equal work". This would induce that employees in the same occupations pay the same wages across regions. On the other hand, differences between regions are common in terms of pay (Barth & Dale-Olsen, 2003). Competition within regions may lead to financial flexibility being of variable importance in different regions. Financial flexibility depends on the needs of the firm. Thus, variable wages, as a form of financial flexibility, might vary across regions.

¹³ Title translated by author.

Even though occupations may fall into the same categories in different regions, variations in how occupations are rewarded might tell us something about the flexibility with which firms and individual employees approach the setting of wages. There is thus reason to believe that there are variations in the distribution of variable pay between regions within the same occupations, and these variations are also the case for straight salary. However, if there are differences between variable wages and straight salary within the same regions and in the same occupation this might contradict the principles of fairness. I propose the following hypothesis:

Hypothesis 7 (H7): *Employees receiving base wage plus bonus earn higher wages compared with those who receive straight salary when working in the same occupation, and in the same region.*

Wage bargaining in the private sector and employer flexibility

Here, I will briefly introduce some general elements of wage bargaining. In addition, I will present how wage bargaining can increase employer flexibility. It is of essence to know something about wage bargaining in order to discuss how wages develop both within a single year and over time. Policies and employer motivation for pursuing wage levels is important to understand when addressing the relationship of both wages in general and the flexibility created in wage systems.

For most of the private sector, wage setting is the result of a two-stage process. First, central negotiations at industry or the national confederation establish a minimum increase. Second, the negotiations are followed by local firm-level bargaining. This is referred to as decentralised bargaining. The local negotiations adjust the wage levels above the minimum, set by central negotiations. In the private sector, wage levels at the local firm-level bargaining are often decided by the firm;

A major difference between the role of more decentralized negotiations in the public and private sector is that in the private industries the parties are relatively free to determine the level of local wage growth, based mainly on productivity changes and the 'pay ability' of the firm. (Longva and Høgsnes 2001:153).

Historically, it is the employers in Norway, and not the government, who have encouraged centralised wage setting. And centralised wage bargaining is the most important form of wage setting in the private sector of Norway (Bowman, 2002). Bowman (2002) investigates an alternative hypothesis proposed by Iversen (1999); decentralized wage bargaining (i.e. local negotiations) is necessary in order to raise firm flexibility. This is, however, not the case in Norway, according to Bowman (2002), as it is more important to avoid tendencies of inflation in the economy. It is assumed that an extensive use of decentralised wage bargaining might lead to inflation: if wages rise drastically for some groups compare to others, tendencies of inflation might occur. One important aspect of preventing inflation from happen is to have moderate wage growth. And this is why it is argued by some that the persistence of centralised wage setting is the effect of a cross-class coalition of the employers in Norway.

Longva and Høgsnes (2001) argue in favour of something I will characterise as centralised decentralisation when it comes to wage bargaining. Centralised decentralisation suggests that the wage bargaining structure induce a high degree of flexibility, allowing decentralised wage bargaining when necessary and otherwise centralised bargaining. This can also be said to be a more flexible solution to the firms, as it will allow firms to decide wage levels based on their own ability to set terms for employee wages. Policy changes can lead to changes in wages and how these are negotiated and distributed. The policy changes will thus also influence the flexibility of the firm.

Policy development

There are three main stages of political influence affecting how wage levels are set, for the years investigated in this thesis. The first period was from 1980-1986, and is characterised by little to no interference with the wage negotiations. In 1986, there was a deep economic crisis in Norway. The crisis was probably caused by an overheated economy following the liberal period from 1986 with high wage growth (Longva & Høgsnes, 2001:148) and a large fall in the price of raw oil (NOU, 1995). Mainly as a result of this, the economy became more unstable. Secondly, in 1988-89, an important decision by the wage board was that there should be a “ceiling” on the local wage drift (in Norwegian: *Kronetaket*). In relative terms, a policy of this kind will most likely reduce the wage growth of the highest paid and increase the growth of the lowest paid. From 1990 and to the mid 90s, the central

negotiations was characterised by a moderate wage policies. The moderate line was based on the period of 1988-89, but formally institutionalised by the Solidarity Alternative in 1993. The Solidarity Alternative can be viewed as a form of centralised decentralisation as mention by Longva and Høgsnes (2001).

The Solidarity Alternative aimed to reduce rates of unemployment. Central element of the Solidarity Alternative was to have; (1) a solidaristic wage policy (i.e. suggesting moderate wage growth), (2) an active labour market policy (i.e. low unemployment), and (3) to increase competition with economies abroad through income political objectives (NOU, 1998; Longva & Høgsnes, 2001). There was considerable political consensus among the parties in the labour market regarding continuing centralised wage negotiation. The Solidarity Alternative suggested lower relative income growth for high income groups, and higher relative income growth for low income groups, so that most employees would benefit from the general development of wages. By pursuing a policy of moderate wage growth, Norway would decrease its rate of unemployment and be better equipped for foreign competition. If more people were employed, exports would increase and imports decrease (NOU, 2000). In order to see how wage bargaining and policies such as the solidarity alternative may have influenced the development and the use of bonuses, I propose the following hypothesis;

Hypothesis 8 (H8): *Relative differences in the bonus component are equal among the variable wage receivers over time.*

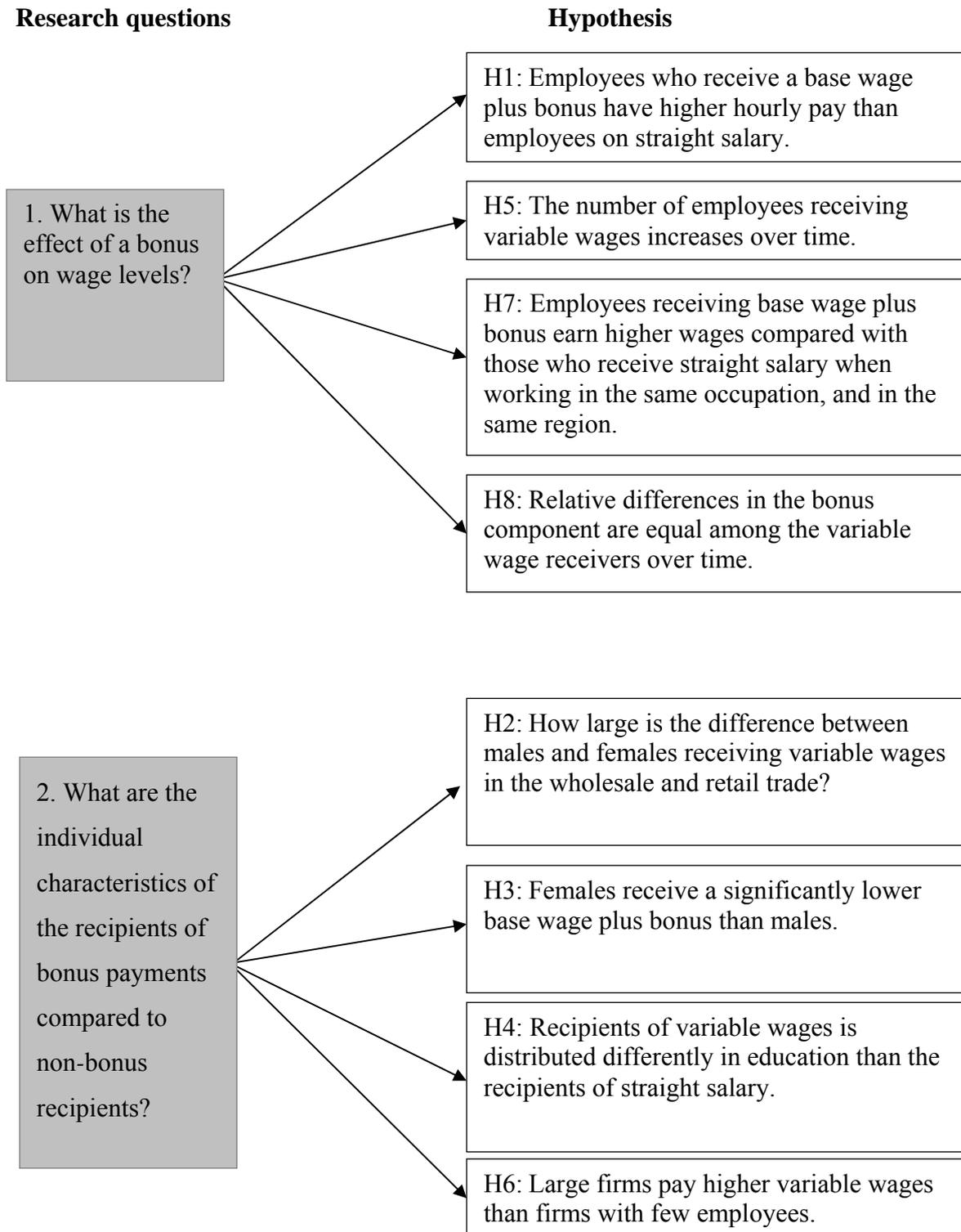
The investigation of relative differences should indicate if the distribution of bonus has changed for the recipients of the bonus. Such a change in distribution could be the effect of one of two factors: (1) The employees who previously received a high bonus are now receiving a lower bonus relative to those who previously received a low bonus indicating that moderate wage development have distributed the size of bonus “downwards”; (2) the employees who previously received a high bonus are now receiving a lower bonus relative to those who previously received a low bonus due to an increase in the amount of pay given as bonus. This presupposes that the amount of bonuses available for employees increase in the trades rather than a shift in how these bonuses is distributed between different segments.

In Figure 2.4, the hypotheses postulated in this chapter is summarised and their relations to the two research questions stated in the introduction.

To sum up, I have now elaborated on Principal-Agent models and financial flexibility for the firm. On the basis of theory and previous research eight hypothesis has been formulated and will be investigated/discussed, and make further comparisons with the data. The hypotheses will be investigated/discussed in Chapter Four, with two exceptions. The hypothesis related to education (H4), and the hypothesis related to the gender distribution in output-related pay systems (H2) will be investigated in Chapter Three.

In Chapter Three, I will introduce the data and consider the methodology used in the analyses.

Figure 2.4: Connection between hypotheses and research questions



3 Data and methodology

In this chapter I will first give an overview of the data, which variables have been used and explain why they have been selected. Data loss was experienced for three of the years. This will also be discussed here. In addition, I will give a detailed description of the variables and how they have been made operational. Second, I will discuss limitations to the data, and finally, I will describe the methodology used in this thesis.

3.1 Description of the data

I have been fortunate to be a part of the project “Inclusion of women, ethnic minorities and seniors in work life: recruitment, occupations, pay and career course”, an on-going research project at the Department of Sociology and Human Geography at the University of Oslo in collaboration with the Department of Sociology at the University of California, Berkeley. During this project I have had access to raw data collected by Statistics Norway (SSB) on individuals working in retail and wholesale trade in Norway. The time span of the data is fourteen years, from 1983 to 1996. A total of 246 196 people were observed for at least one year. However, due to leaving and entering in the trades, the number of people is lower within a year than the total of unique individuals registered. There are more than 950 000 observation-years (obs-years)¹⁴ in the data. Each individual is followed for about 4 years on an average. The variation in the number of individuals observed yearly is probably caused by people leaving and entering wholesale and retail.

In this thesis, analysis is limited to full-time workers between the ages of 20 and 67 years. Full-time workers are defined as individuals working 35-40 hours a week. The reason for excluding part-time employees is that they are a very small group in the data (numbering only 949 individuals). By restricting the pool of observations to people working full-time *and* receiving a bonus, an additional 185 360 observation-years are lost. The remaining 769 478 observation-years are the population of full-time workers. The bonus group accounts for 19% of the population, comprised of 73% men and 27% women. All individuals in this group received a bonus in at least one year of the 14 year-long time period, but with large variations according to trade and gender: it is males in wholesale who are the largest group of bonus recipients in these data.

¹⁴ Observation-year refers to the total sum of individual-observations throughout the period of 1983-1996. The number of obs-years is thus higher than the amount of individuals observed for each year.

Two main groups are being compared: (1) all full-time employees between the age of 20 and 67 years *receiving straight salary*, and (2) all full-time employees between the age of 20 and 67 years *receiving base wage plus bonus*. The two groups are thus mutually exclusive within a single year. However, it is not unlikely that individuals might have received a straight salary in some years, and a base wage plus bonus in other years.

The data contain a wide range of individuals employed in different occupations and establishments. The total number of occupations was 104¹⁵ and the total number of establishments 30 240 during the 14 years. For each year, the number of occupational groups and establishments will vary from the total as definition of occupations and institutional framework changes throughout the period. Investigations done in this thesis looks at the three levels of analyses; population, occupation and establishment. The levels will all be explained in detail later in this Chapter.

The sample is not limited to a specific part of Norway; instead, all of Norway's municipalities are represented, as there is extensive information regarding the wholesale and retail trades. Due to changes in how the data is reported it is not possible to single out municipalities after 1988. In 1988, there was a change in the municipality coding¹⁶ for the wholesale and retail trade. In order to overcome the issue of changes in definition of municipalities, regions based on the location of the municipalities has been created. The definition of the regions follows the standard of Statistics Norway, and will be further elaborated on in the description of the region variable. For employees in the wholesale and retail trades, the wage statistics cover all establishments in these industries with few exceptions.

The analysis carried out are based on the hourly earnings for each wage component, i.e. straight salary, base wage and bonus. In addition, *irregular earnings* (i.e. compensation for working more than the regular hours) are reported. No information was available about the number of extra hours worked. Although *benefits*, comprising compensation given to the employee in the form of a free cell phone, company car, etc., are also reported in the data, these and irregular earning components are left out of the analysis. This was done because

¹⁵ For the 104 occupations, there are never more than 94 occupations within a year. The reason for this is that changes in the definition of occupational codes occurred before and after 1990, done by the SSB.

¹⁶ Information retrieved from SSB.

of difficulties in calculating an hourly wage to represent irregular earnings and benefits. When excluding irregular earnings and benefits, the results are likely to better describe differences in hourly wages as it is not possible to estimate the individual return in terms of hourly earnings (Nielsen, Høgsnes & Petersen, 2004). In other words, it is assumed that irregular earnings and benefits would cause negative interference in the analysis.

For most of the analysis, I use the logarithm of the hourly wage component, with one exception, i.e. in Figure 4.1, where absolute monthly bonus payments are reported. Where absolute wages are reported, the wage components will be adjusted according to the consumer price index (CPI). The CPI calculations used in this thesis are based on the mean annual CPI development, as reported by Statistics Norway.

Comment on data loss

There are data losses for three of the years in this investigation. These three years are 1993, 1994 and 1996. The data loss consists of about 30% for each of these years. As a consequence, there are also fewer registered establishments for these years. It is uncertain what has caused the observations to be lost. As these observations were not found in the raw data, it is most likely due to human error in providing these. The data loss does not however, seem to be systematic, i.e. regions, females and males, recipients of bonus and non recipients are all observed for the years in question. And when analysing wage differentials within these years they follow the trend from previous years and 1995. Analyses have still been performed in these years, as the sample is still large. Results do not seem to deviate from previous years. However, when analysing *number of employees/firms* using the variable wage component, there is strong reason to believe that these estimates will be either too low or too high for these years, where the latter is most likely the case. Interpretation of results for these years should therefore be handled with care. Furthermore, in this Chapter, notification will be given to the years and observations here referred.

Definition of variables

In this section, a thorough explanation of the different variables that are used and how they are constructed will be given. Here, the dependent, independent and control variables are introduced. Descriptive statistics will also be given for some of the variables.

Dependent Variables

Four main dependent variables are used: (1) hourly straight salary, (2) hourly base wage, (3) hourly bonus and (4) hourly base wage plus bonus. The reason for measuring all wage components as hourly wage is to observe the wage differentials in the best possible way. As I have defined full-time employees as those working 35-40 hours a week, variations in weekly work schedule would have resulted in interference in the analysis if I had analysed monthly wage instead of hourly pay.

1. Hourly straight salary (tlohn): The data provide information regarding the monthly salary and the number of hours worked, which allows us to calculate the hourly wages.

For the remaining variables, the wage components are constructed based on the same principle as *tlohn*, the difference being the hourly pay the variable aims at (i.e. dependent variable 1, 2, 3 or 4).

2. Hourly base wage (bwage): Hourly base wage is specific only for the group receiving a bonus. The hourly base wage refers to the agreed payment, before any bonus is calculated. The base wage is reported according to the same principles as the hourly straight salary in the data.

3. Hourly bonus (tbonus): Hourly bonus refers to the bonus payment received. The bonus component is variable, i.e. not agreed to in advance, as is the case for the hourly base wage. The bonus is reported as 1/12 of the sum for each year, thus giving a monthly bonus payment in the data. This is the foundation used to calculate the hourly pay received from the bonus component.

4. Hourly base wage plus bonus (bwage_b): This variable is a combination of the two previous variables, components 2 and 3. Component 4 consists of a fixed part (base wage) and the variable wage component (bonus). The variable can be viewed as equal to the straight salary as it is the total hourly wage component for the bonus receivers.

Wage components 1 and 4 are mutually exclusive. Wage component 4 is, however, decomposed into two smaller measures: base wage (component 2) and bonus (component 3).

Table 3.1 shows the distribution of employees in the wholesale and retail trades receiving straight salary and variable wages. Gender distribution is also shown. In the wholesale and retail trades, 81% of employees received a straight salary while 19% received variable wages throughout the period 1983 to 1996. It is in wholesale where the differences in the number of variable wage receivers are found. While only 2% of the females ever received a bonus, 11% of the males received a bonus. Comparing the number of variable wage receivers in retail shows that there are no differences. However, there are generally more employees in wholesale than in retail and wholesale is also a male dominated trade. Table 3.1 answers the second hypothesis H2: *How large is the difference between males and females receiving variable wages in the wholesale and retail trades?* In wholesale, 11% of the males is a recipient of bonus, while only 2% are females. This is a 9 percentage point difference between gender. In retail, a bonus is received by 3% by both gender when comparing the total of the wholesale and retail trade.

Table 3.1: Distribution on payment system, for all, by sex. 1983-1996.

	Straight salary		Variable wage		Total
	Male	Female	Male	Female	
Wholesale (%)	34	11	11	2	58
N (obs-year)	322 697	106 478	104 782	23 587	557 544
	Straight salary		Variable wage		
	Male	Female	Male	Female	
Retail (%)	17	19	3	3	42
N (obs-year)	160 865	179 496	29 515	27 572	397 294
Total					100
N (obs-year)					954 838

Note: Total number of observation for all years (1983-1996) is set at 100%

The logarithm (logits) of hourly wage components: All of the four wage components, as described above, have been transformed into logits. There are several reasons for transforming the variables into logits. First, the transformation into logits may reduce the danger of skewed distribution and extreme values. This is due to the fact that logits make the distribution more even. Second, logits may make the models more theoretically satisfactory. The effect of the wage component is expressed in a percentage. When

expressed in a percentage, differences are also more internationally comparable (Ringdal, 2001:419).

For the purpose of this thesis, the transformation into logits makes the yearly variations in wage components more predictable and easier to work with since the wage components are not adjusted for the CPI in the original data set.

Independent variables

Region: The size of regional differences in pay components is investigated in this variable. I distinguish between the five main trade regions, as defined by SSB. The regional codes refer to the following areas; 1= Eastern region (Østfold, Akershus, Oslo, Hedmark, Oppland), 2= Southern region (Buskerud, Vestfold, Telemark, Aust-Agder, Vest-Agder), 3= Western region (Rogaland, Hordaland, Sogn og Fjordane), 4= Middle region (Møre and Romsdal, Sør-Trøndelag, Nord-Trøndelag) and 5= Northern region (Nordland, Troms, Finnmark, Svalbard and Jan Mayen).

There are large differences between observation-years in the different regions. Regions 1 and 2 have more or less the same number of observations, and regions 3 and 4 are also similar. In region 5 there are fewer observations, indicating that there are fewer employees in region 5 than, for instance, in region 1. Nevertheless, the variations in observations in regions will not influence the analysis since the observations mirror the true picture of employees in the various regions. Logically it makes sense that there are variations in the number of employees by region as there are also variations in the number of people living in the various regions.

Table 3.2: Distribution in Regions

Region	N (obs-year)	Share (%)
1	273 257	29
2	278 567	29
3	179 889	19
4	185 712	19
5	37 391	4
Total (obs-years)	954 838	100

Sector: The variable divides the trades investigated: (1) wholesale trade and (2) retail trade. The reason for grouping the variable in the analysis is that they are different in both wage

composition and gender distribution. The sector variable will allow us to separate the effect of wholesale and retail, in order to see whether there are any differences or not.

Table 3.3: Distribution of Sector

Sector	N (obs-years)	Share %
1	557 544	58
2	397 294	42
Total (obs-years)	954 838	100

Size of firm: In order to look at differences in the size of companies, this variable counts the number of employees working in firms of equal size for each year (column 1). Column 2 refers to the number of employees in firms of a certain size; column 3 gives the number of observations for each level of firm size; and column 4 gives the total distribution of the number of observations for each level of firm size.

Table 3.4: Number of employees in firms of different size

1	2	3	4
Firm size code	N. Employees	N (obs-years)	Share (%)
1	1-5	221 103	23
2	6-9	198 065	21
3	10-19	182 920	19
4	20-49	195 604	20
5	50-802	157 146	17
N (obs-years)		954 838	100

Sex: Separating male and female individuals. Male is coded 0 and female is coded 1. When including the gender variable in the regression, we are able to detect gender differences. Also, we are able to detect whether there is co-variation in the wage components or not. Table 3.5 shows that the number of female observations ranges from 33.8% to 36.6% between years. Note that there is data loss for the years of 1993, 1994 and 1996 as previously described.

Table 3.5: Gender distribution by year (1983-1996)

	1	2	3	4
Year	Male	Female	Total (N)	Share female (%)
1983	47 083	24 034	71 117	33,8
1984	46 712	23 983	70 695	33,9
1985	47 620	25 190	72 810	34,6
1986	48 082	26 210	74 292	35,3
1987	50 070	28 051	78 121	35,9
1988	47 955	27 676	75 631	36,6
1989	47 534	27 029	74 563	36,3
1990	45 950	25 210	71 160	35,4
1991	44 971	24 500	69 471	35,3
1992	44 887	25 005	69 892	35,8
1993	29 554	16 600	46 154	36
1994	32 156	17 904	50 060	35,8
1995	47 349	24 696	72 045	34,3
1996	38 706	20 121	58 827	34,2
N (obs-years)	618629	336209	954838	35,21

Note: (1) Male (N), (2) Female (N), (3) Total (N), (4) Female ratio as a percentage of males. The total number of unique individuals shown in the table is 246 196. For each year N=the number of employees within that year. The N total (bottom line) is observation-years. The total number of unique individuals is 246 196 in the table. For each year N=the number of employees within that single year. The N total (bottom line) is observation-years.

Control Variables

Education: The educational variable is hierarchical and grouped in six dummy variables: 1=primary and secondary school, 2=upper secondary school, *started*, 3=upper secondary school, *finished*, 4=upper secondary school, *extension*, 5=Bachelor, 6=Masters and higher. These are the six major groups as seen in Tables 3.6, 3.7 and 3.8. Table 3.6 shows the distribution in education for individuals in both pay systems (e.g. straight salary and base wage plus bonus). Table 3.7 shows the distribution of those receiving straight salary and Table 3.8 the distribution for those receiving base wage plus bonus.

The educational variable is coded into larger categories, focusing on those who have only primary and secondary school. The reason for focusing on these forms of educations is that these are the educational levels most commonly found for the cohorts working in the trades investigated. The educational variable measures the individual's highest education for the year in question. Furthermore, since the variable operates with a *sliding* scale, it shows the highest level of education attained for the specific year investigated.

Table 3.6: Educational distribution for those receiving straight salary, base wage and bonus. In three selected years. 1983, 1990 and 1996.

	1983			1990			1996		
	N	%	% female	N	%	% female	N	%	% female
Compulsory School		28,2			22,2			17,8	
1 <i>Primary & Secondary School</i>	20029	28,2	36,3	15781	22,2	36,2	10446	17,8	35,0
Upper Secondary School		64,3			67,0			67,6	
2 Started	33247	46,7	37,8	29484	41,4	39,0	21786	37,0	37,8
3 Finished	11065	15,6	25,6	15931	22,4	33,2	15733	26,7	31,9
4 Extension	1433	2,0	40,4	2253	3,2	36,8	2260		32,6
Bachelor		6,6			9,5			13,2	
5 All	4711	6,6	16,3	6783	9,5	25,8	7746	13,2	30,0
Masters and higher		0,9			1,3			1,5	
6 All	632	0,9	20,3	928	1,3	23,2	856	1,5	24,3
Sum	71117	100		71160	100		58827	100	

Table 3.7: Educational distribution for those receiving straight salary. In three selected years. 1983, 1990 and 1996.

	1983			1990			1996		
	N	%	% female	N	%	% female	N	%	% female
Compulsory School		28,5			22,5			17,2	
1 <i>Primary & Secondary School</i>	16337	28,5	38,7	13306	22,5	38,2	7135	17,2	36,4
Upper Secondary School		64,0			66,8			67,8	
2 Started	26522	46,3	40,3	24510	41,4	41,1	15205	36,7	39,4
3 Finished	8963	15,7	27,3	13201	22,3	35,0	11186	27,0	33,4
4 Extension	1174	2,1	41,1	1864	3,1	39,6	1662		33,9
Bachelor		6,5			9,4			13,4	
5 All	3738	6,5	17,6	5549	9,4	27,1	5556	13,4	32,0
Masters and higher		0,9			1,4			1,6	
6 All	529	0,9	20,6	817	1,4	24,4	648	1,6	24,5
Sum	57263	100		59247	100		41392	100	

Table 3.8: Educational distribution for those receiving base wage plus bonus. In three selected years. 1983, 1990 and 1996.

	1983			1990			1996		
	N	%	% female	N	%	% female	N	%	% female
Compulsory School		27,9			21,5			19,5	
1 <i>Primary & Secondary School</i>	3890	27,9	26,2	2575	21,5	25,6	3411	19,5	32,2
Upper Secondary School		64,3			67,2			66,8	
2 Started	6501	46,6	27,3	4926	41,2	28,7	6539	37,4	34,1
3 Finished	2202	15,8	18,7	2730	22,8	24,2	4547	26,0	28,2
4 Extension	259	1,9	37,1	389	3,3	23,9	598		29,1
Bachelor		7,1			10,3			12,5	
5 All	983	7,1	11,3	1234	10,3	19,7	2190	12,5	25,0
Masters and higher		0,7			0,9			1,2	
6 All	103	0,7	16,6	111	0,9	14,4	208	1,2	23,4
sum	13938	100		11965	100		17493	100	

Table 3.6 shows that the majority of the employees in the wholesale and retail trades have compulsory and upper secondary school education for the selected years. When doing a separate analysis for the sub-categories of those receiving straight salary (Table 3.7) and those receiving a bonus (Table 3.8), the same tendencies are shown for both groups. The wholesale and retail trades are characterised by a low level of education. These findings might indicate that education is not of great importance in order to describe differences between straight salary and variable wage recipients, as there are relatively few employees with a high level of education in the wholesale and retail trade (Table 3.8). Educations might, however, have an effect on the amount of bonus received. Thus we need educations as a control variable. Regarding the fourth hypothesis (H4) sounding: *recipients of variable wages are distributed differently in education than the recipients of straight salary*, no support was found for the hypothesis that bonus receivers have different education compared to non-receivers. When analysing the three separate groups (Table 3.6, 3.7 and 3.8) the weight of education is on compulsory and upper secondary school. It is also worth commenting that there are relatively few employees who holds a higher degree of education (i.e. bachelors and above).

Experience: An experience variable has been constructed in order to measure the correlation between bonus level and experience. *Experience* is constructed as age minus years in school. For each year, this is calculated by the age for the specific year, and the highest attained education for that specific year. Finally, seven years were subtracted. The equation can be written as follows: (experience = age - education - 7). Experience is then a sliding scale, starting at “zero”. The number 7, in the equation, was chosen as this is the year one starts school. In the experience variable, “zero” indicates the year the individual leaves compulsory school. Beyond that, years of education are also subtracted in the experience variable. For each year of work experience, the experience variable rises by 1. Experience was chosen as a control variable because it is assumed to be better than age.

Experience Squared: This variable is constructed by multiplying experience, (i.e. experience*experience). It is necessary to have variables of this sort as it is reasonable to assume that the payoff from experience is not necessarily linear. A significant experience squared term will indicate that experience is curvilinear. The payoff increases with experience up to a certain point, after which it decreases. In other words, it is unlikely to assume that the extra effect of experience has unlimited gains in an individuals career.

I provide some average values of the experience variable, in Table 3.9, for three selected years. As the table indicate, there is a slightly higher level of experience for the recipients of base wage plus a bonus than straight salary. This indicates that the recipients of base wage plus a bonus has more experience from work than the recipients of straight salary. The level of experience rise for both pay systems towards the end of the period. This might be caused by that the individual in the wholesale and retail trade are older in 1996 than 1983.

Table 3.9: Average experience for recipients of straight salary and base wage plus a bonus. In 1983, 1990 and 1996

Year	Straight salary	Base wage plus a bonus
1983	22.2	23.8
1990	22.9	24.2
1996	24	26.3

Levels of analysis

Here, I will introduce the three levels of analysis: (1) the population level, (2) the establishment level and (3) the occupational level. But first I will briefly explain why I did not use a fourth possible level of analysis available in these data.

There is also a fourth level available in the data which is commonly used for looking at differences for people employed in the same occupation and in the same establishment. For the purpose of my analysis, the occupation-establishment (occ-est) level has not been used. The reason for not using the occupation-establishment level is due to inconsistency in the rationality of how this level would apply to my research questions in reality. The interpretation of the occupation-establishment level data, in the case of my analysis, would be that employees who work in the same occupation and the same establishment are paid on unequal pay systems (i.e. both straight salary and variable wages in the same occupation-establishment unit). Two reasons for why this is not likely will be provided: Firstly, wages are usually connected to the occupation rather than the establishment; there may be variations between establishments, but the main settlements, in terms of wage centralised negotiation, are different for different occupational groups. Secondly, the data do not provide direct information regarding the agreement between employer and

employee. This means that it is not possible to know for sure whether those who are in the same occupation-establishment unit, and not receive a bonus, are in fact not promised a bonus in the first place. The wage for those who is “promised” a bonus would then be lower than it otherwise should as they are only paid the base wage component and not the bonus component. The whole idea behind a bonus is to provide incentives so that employees will perform better. It is of course not claimed that all employees who engage in such a system will reach the target rate of the system in which they are employed. Thus, there is the possibility of having a contract paying a variable wage, but not a bonus every year. However, there have been studies which have found differences in occupation-establishment units in terms of pay systems. One such study was done in a wide array of industries in Norway (Petersen & Snartland, 2004) and another study was done in Finland (Meyersson-Milgrom, Petersen & Aspelund, 2002).

Population Level

Analyses done at the population level account for all individuals across the data set. At the population level no information is provided about which occupation or establishment individuals work in. Each individual is compared to other individuals in the general population. A separate analysis for the various wage components and straight salary will be carried out.

Establishment Level

The establishment level is a grouping variable for establishments. The grouping variable allows controlling for the establishment in which the employee works. As shown in Table 3.10, the number of establishments where a variable wage component bonus is found increases over the years. A bonus is thus becoming more often represented in the data as the years are analysed. In 1983, only 21% of the companies were registered using bonus. The number of establishments providing an output-based wage system was fairly stable in the period of 1983 to 1992. In 1993, however, there was a sudden increase in the number of establishments offering an output-related pay system. In 1993 to 1996 the number of establishments, where a bonus is found, increases by 9%. This is in contrast to the period of 1983 to 1992, where the increase is a mere 1%. One possible explanation for this much more rapid growth after 1993 might be the implementation of a new policy for the period – the Solidarity Alternative (see Chapter Two). As these policies opted for moderate wage growth, there may have been incentives created for differentiating wages by the use of a

bonus in some groups and not in others. This might imply that employers took a different course, in terms of wage levels, than the intended effect of the policy. Note that there is data loss for the years of 1993, 1994 and 1996 as described earlier.

Table 3.10: Total number of companies by year.

Year	All Establishments	Bonus Establishments	% Bonus Establishment
1983	14 102	2963	21
1984	13 897	2951	21
1985	13 865	2904	21
1986	13634	2763	20
1987	13 867	2647	19
1988	13 401	2706	20
1989	13 506	2620	19
1990	10 434	2270	22
1991	10 326	2339	23
1992	10 786	2408	22
1993	5488	1413	26
1994	5959	1479	25
1995	10 870	3194	29
1996	8619	2681	33

The Occupational Level

The occupational level grouping variable controls for the occupational group in which the employee works. There are a total of 104 unique occupations, ranging from 90 to 94 each year. As Table 3.11 shows, almost all occupations contain at least one or more observations where individuals receive the variable wage component, i.e. a bonus. All 104 groups were analysed individually although it might seem reasonable to aggregate the occupational variable, which would have meant creating smaller groups. The reason for not doing so is that previous research shows the same effect for analysing with all groups in contrast to dummy variables for larger groups of occupation (Petersen, Snartland, Becken & Olsen, 1997).

Table 3.11: Total number of occupations by year

Year	All Occupations	Bonus Occupations	Share Bonus Occupations (%)
1983	90	87	97
1984	90	87	97
1985	91	88	97
1986	90	86	96
1987	93	89	96
1988	93	90	97
1989	92	89	97
1990	93	91	98
1991	93	88	95
1992	93	88	95
1993	93	90	97
1994	93	90	97
1995	93	93	100
1996	94	92	98

3.2 Methodology

In this section an elaboration on panel data and explanation of the methodology used to obtain the results reported in Chapter Four are presented.

Analysing Panel Data

Here, I will elaborate on panel data, how they are structured and why panel data are especially well suited for a comparison of wages. Panel data, also referred to in the literature as longitudinal or cross-sectional time series data describes multiple levels (i.e. individuals, firms and occupation units) over time, where each unit is observed for one or more points in time. Therefore, observations in panel data involve two dimensions, *cross-sectional* (i.e. individual observations) and *time series* dimensions (i.e. multiple observation years) (Hsiao, 2003). Petersen (2004) provides a thorough introduction to the subject:

Panel data arise from a variety of processes, including quarterly data on economic results, bi-annual election data, and marital life histories. Their central feature is that one records at regular intervals the state each individual in the panel occupies, with some units observed at two or more points in time (Petersen, 2004a:331).

Cross-sectional information lets us describe differences between individuals. *Time series information*, or within-subject estimations, gives us information regarding individual variation over time. The data are unique in the way they are structured, since they allow us to follow units over time. Our data is, however, unbalanced, meaning that each unit is not necessarily observed for more than one year, due to natural variations in the labour market as, for instance, people leaving or entering the wholesale and retail trades, it would give a biased impression of the selection if one were to analyse only those who stayed in the wholesale and retail trade for the whole time-period. The unbalanced nature of the data does not mean our estimates will become less valuable. In fact, panel data allows us to control the dependent variable even for unobserved heterogeneity, when heterogeneity is constant over time. This is also referred to *fixed effect*¹⁷ analysis.

To sum up, panel studies are “*the culmination of a trend that dates back to the 1960s and has quickened over the last two decades*” (Halaby, 2004:507). When analysing such data structures, we have a unique opportunity to do both cross-sectional and time-series estimations. Especially when looking at variations in a large-scale study, panel data provides unique analyses across all levels of analysis.

Model Description

Here I will elaborate on our models of analysis. There are three main models described here; ordinary least square (OLS) and percentiles. Also, fixed effects analysis will be explained and the equation used when analysing with fixed effect models can be viewed as an extension of the equation for the OLS model.

Ordinary Least Square Regression Models

OLS regression models are the method used in this study to analyse differences in wage components. For instance, the question is asked whether regression will allow us to isolate the effect of bonus on base wage. The review of previous research shows that most estimates on wages are done using OLS. In addition I will extend the OLS analysis to include fixed effect models analysing at the establishment and occupational level in addition to the population level. The equation of fixed effect models will therefore be

¹⁷ Fixed effect models will be introduced later in this chapter.

introduced in this Section. However, the fixed effect approach will be discussed later in this Chapter under the Section *fixed effect versus random effects*.

This thesis will provide estimates on wages and wage differentials using both cross sectional and time series analyses. In the below models $\ln W_{i,t}$ is the dependent variable (i.e. the four different specification of hourly wages) observed for individual $i=(1\dots,N)$ at time $t=(1983-1996)$. The vector of the coefficients is β , x_{it} is a vector of the measured variable and α_i is the individual effect. $\epsilon_{i,t}$ is the error term. I will use three different specifications of this equation, one for each level of analysis. The first model is used at the population level, the second at the establishment level and the third at the occupational level:

$$(1) \quad \ln W_{i,t} = x_{it}\beta + \alpha_i + \epsilon_{i,t}$$

$$(2) \quad \ln W_{i,t} = x_{it}\beta + \alpha_i + \eta^e + \epsilon_{i,t}$$

$$(3) \quad \ln W_{i,t} = x_{it}\beta + \alpha_i + \eta^o + \epsilon_{i,t}$$

η^e and η^o are vectors of parameters capturing fixed effects of establishment and occupational units. In equation (2) and (3), the error term $\epsilon_{i,t}$ includes a dummy variable x_{it} for each person i and then estimates the effect of $\ln W_{i,t}$. For each level of analysis, the upper level variable is set to the level in which the investigations are done. For example, when investigating employees who work in the same establishment, the establishment variable will be the upper level variable sorting the groups of establishments, i.e. it is possible to measure the within-establishment effect on individual wages. Each establishment or occupational group is then represented in the fixed effect models by dummy variables, reporting the average values within occupations or establishments. Control variables for education, experience and experience squared has also been modelled. However, since my main concern is the differences for variable wage receivers and straight salary, coefficients for control variables is not reported.

In addition, a significance test will be implemented in order to test whether there are significant differences and how large the differences are between straight salary and variable wages (i.e. straight salary*variable, where *variable* is a dummy capturing the effect of the recipients of variable wages compared to recipients of a straight salary) at the occupational level (Table 4.8), and between men and women at all levels of analysis (Table 4.10).

Interpretation of regression models

First, since logistic regression is used for the purpose of most of the analysis, the constant does not give any meaning in logistic regression models. I will explain what the constant refers to, but the coefficient for the constant will not be reported. Second, results from logistic regression can in many cases be interpreted as a percentage increase in the dependent variable for each level of increase of the independent variable. The percentage increase is found by the following formula: coefficient * 100. If the coefficient is above 0.15, the formula can give an incorrect interpretation of the estimates (Petersen, 2004b). A better formula to give correct estimates for coefficients above 0.15 is: $100[\exp(b)-1]$. The interpretation is, however, different for dummy variables. In order to interpret the dummy-variables correctly, it is necessary to use the $\exp(b)$ formula (Ringdal, 2001:421). The formula is not used on all tables in this thesis. For some cases it is sufficient to look at the size of the coefficients in comparison to others. However, when results are discussed in percent, or percentage points, such transformations are made when necessary to the substantial interpretation.

Percentiles

Percentiles are well established when comparing wage differentials among groups (Barth, Schöne & Torp, 2004). A percentile is the value of a variable below which an observation is found. An example is provided by measuring the hourly bonus received by those in the lower 10%, extracted from the total observation in the data (i.e. 0-100 %). When including this in the time-variant analyses, it will allow us to say something about the development of each percentile measured, providing us with information regarding hypothesis (H8):

Relative differences in the bonus component are equal among the variable wage receivers over time. I will illustrate the range from 10 to 90 percentiles of bonus receivers. This will give especially good indications of differences between the low and high bonus receiver

groups. The 90/10 model will show the distribution of the upper 10% compared to the lower 10% over the time periods, thus providing us with a measurement of within-year estimates for the distribution ratio between, for instance, the high and low receiver percentiles in the population. More specifically, I will here use percentiles to see how the development of the distribution in various percentiles has changed.

Percentiles will also be used in the assessment of analysing risk. I will analyse the distribution of employees in output-based reward systems earning higher hourly wages than the lowest 10 percentile and the average percentile (i.e. percentile 50).

Fixed effects versus random effects

In order to better understand why fixed effect analyses are used in this thesis, an explanations of both fixed effects- and random effect models will be introduced. Random and fixed models are used frequently in the hierarchical linear modelling literature (Petersen, 2004a; Hsiao, 2003). The models are especially important when analysing panel data. Random effects are also often referred to as “variance component” models. The distinction between these two models is confusing and used in a wide spectrum of modelling within social sciences. This is also why random and fixed models are addressed here. A way to determine whether to do a fixed or a random effect analysis is by analysing the coefficients by a Hausman test, which tests the null hypothesis that the coefficients estimated by the random effect estimator are the same as the ones estimated by the fixed effect estimator. If the coefficients estimated are not significant (P-value larger than 0.05), one can safely use random effects. However, if the coefficients estimated are significant, only fixed effect analysis can be used. For the purpose of this thesis, a Hausman test has been performed, and found some of the models to be significant. Thus, fixed effect models are better to analyse on the models in this thesis. One possible limitation to only using a fixed effect model and not a random effect model can be if the researcher wishes to go beyond available data and generalise to a larger part of society, a random effect analysis might be applied, as the random effect analysis draws on random choice from the data. However, since this model draws on random choices, it is also less powerful than the fixed effect model. As the data used in this thesis provide extensive information in the retail and wholesale trades there is no need to generalise in order to give estimates that describes the wholesale and retail trade sufficiently.

For the articles reviewed in this thesis, fixed effects are used more commonly when analysing wages. A fixed effect analysis can be used when one wants to look at the effect of different bonus levels (i.e. low, medium, high), controlling for unobserved heterogeneity, when heterogeneity is constant over time. A typical example of a time constant variable can be the year, the region or the size of a firm. When analysing at multiple levels, the researcher is then able to see what the effects are in the data at various level of analysis such as the establishment and occupational level. The fixed effect model controls for omitted variables that differ between cases but are constant over time (i.e. gender and region). By implementing dummy variables for establishment and occupational units, the models are able to describe variance within the units specified. If one for instance is analysing at the occupational level, the dummies implemented by the model will group the different occupational units estimating the effect within the occupation units. One is then able to compare, for instance, wage differential between recipients of variable wage and recipients of straight salary at the occupational controlling of unobserved heterogeneity.

Why have different estimators?

Several models, reporting different estimators, have been introduced; OLS, percentiles and the fixed effect model. One might ask what is the purpose of having several estimators? Estimates will not become more correct or necessarily better if one estimator is chosen over another. The different estimators report on different aspects of the data. Therefore a estimator is not necessarily better than the other. When we analyse using OLS, this might be appropriate when questions are asked at the population level. However, when we ask questions concerning the occupation or establishment level, fixed effect models may be better. In other words, the model chosen depends on the research question asked.

3.3 Problems and data limitations

Here, problems and limitations to our data-analysis will briefly be discussed. In the introduction to this Chapter, the problem of data loss was introduced, and this should be kept in mind for the result concerning the years in question. Second, the range of the data in this study covers a limited number of years. Even though the data studied in this thesis range from 1983 to 1996 and can be viewed as exceptionally good, I can not know for sure if the development of the bonus is a historical trend, or just the result of seasonal

adjustments for longer time periods. Further, the way the analysis is constructed might draw a different picture now, compared to the situation if variables and analysis had been constructed differently.

Limitations when using logarithm of wages on development between years

When transforming wages within a year to logits, the logits respond to the variations among the wage level in the fiscal year. In other words, the wages have not been adjusted for CPI in the data, and this might cause a concern when analysing multiple years as wages do not have any “real value¹⁸” between years. However, if wages are not adjusted for CPI before the transformation into logits, the year to year variations will be higher than what is actually the case due to differences in real value. This problem can be overcome in two ways. First, a denotation can be inserted into the logit transformation, so that for each year the logits will be adjusted for CPI. If one is to do an analysis where the development over years is what is being analysed, it is necessary to use such a denotation. Second, if a single year analysis is done, one can simply transform the wage term to logits for the year in question.

If one wishes to compare variations within a year, rather than between years, both approaches are fine. An example of such a comparison might be comparing males and females within a year, running a logistic regression for several years singling out the effect of gender over the years. The females will then be compared to the wage level for each year, thus not creating unusually high values, in terms of wages, when not adjusted for CPI.

Limitations to analysing bonus

I am not able to separate the bonus paid under different performance systems. This is partly due to how information about wage components is gathered by Statistics Norway, and partly to the way reports are made by establishments. The value creation in the firm is not observable. As a consequence it is not possible to observe the actual effect bonuses have on the firm performance. Second, in these data there is no distinction made between individual or team performance, profit sharing and executive bonus. However, as I am looking at the retail and wholesale trades, I can assume that sales commission will be a significant part of our data. Third, categories of who receives a bonus and who does not are

¹⁸ By real value, I here refer to adjusted CPI numbers.

based on payments made in that year. It could be desirable to have information regarding the agreement between employer and employee, as this would tell us whether it is common to have an agreement where a bonus is likely to be received by the employee, but for some reason, bonus is not paid.

Difficulties when measuring risk

Risk can be subjective. The subjective meaning of risk can be dependent on economic factors not observable in the data. For instance, a stable personal economy might induce some to face higher risk, as those will have limited downside risk of receiving a pay that is lower than expected.

For the purpose of this thesis I suggest ways of analysing risk in the data of this study. These methods should be looked upon as a grounded theory approach, suggesting how to think and analyse risk. There might, however, be several other methods and approaches to analysing risk. Especially qualitative methods and collecting data regarding attitudes towards work should be regarded as important when investigating these matters.

Omitted variable bias

For two of the analyses carried out there is a risk of omitted variable bias. Omitted variable bias might be encountered if the “right” variable is not included in the analysis. When analysing regions and firm size, I am omitting the region with the highest wages and the establishments with the largest number of employees. The results might therefore give a biased impression. However, this is a general statistical problem and not a particular problem for the data used in this thesis.

3.4 Summary

In this chapter I have elaborated on the data and methodology. I have described levels of analysis and variables and how the variables have been constructed to do the analysis.

I have found that the proportion of people being paid a straight salary is much greater than the proportion of workers receiving variable pay. One out of five workers receives a bonus. Further, gender differences also seem to play an important role. Education, on the other hand, does not seem to be so important for the bonus aspect. This suggests that when analysing variable wage components, ways of analysis and thinking about the issues might deviate from ordinary wage studies. The reasons for this might be a high level of individual

negotiation, variations in individual performance (as pay-for-performance suggest), employer motivation for designing such output-related contracts and the fact that straight salary and variable wages are likely to have different purposes due to deviance in their “motivus”, or how the wage components structure incentive behaviour for both individuals and organisations.

In Chapter Four, I will present the main analysis.

4 Analysis

This chapter presents the analysis. Its main purpose is to discuss the characteristics of the bonus receivers and discuss what ratio of the total outcome of the employee the bonus accounts for on an hourly basis. Table 4.1 will also provide the average monthly bonus payments for employees. Here, the effect of variables on the different pays systems will be analysed.

Firstly, I will illustrate the differences between payment systems through the use of figures and tables, emphasising the average monthly bonus and the bonus share of hourly wages for the period of 1983-1996. Secondly, I will do ordinary least square (OLS) regressions on the logarithm of the payment systems. Thirdly, I will do fixed effect analysis controlling establishment and occupational level data for variations in various firm size and regional differences. Finally, I analyse the difference in pay for base wage plus a bonus receivers when compared to straight salary at population, establishment and occupational levels.

This chapter is organised based on the two research themes as introduced in Chapter 1: (1) the effect of bonuses on wage levels; and (2) the individual characteristics of bonus receivers. In addition, this chapter will examine the first theme in detail, through a discussion of the risk aspect of receiving variable wages compared to straight salary; are employees rewarded for risk?

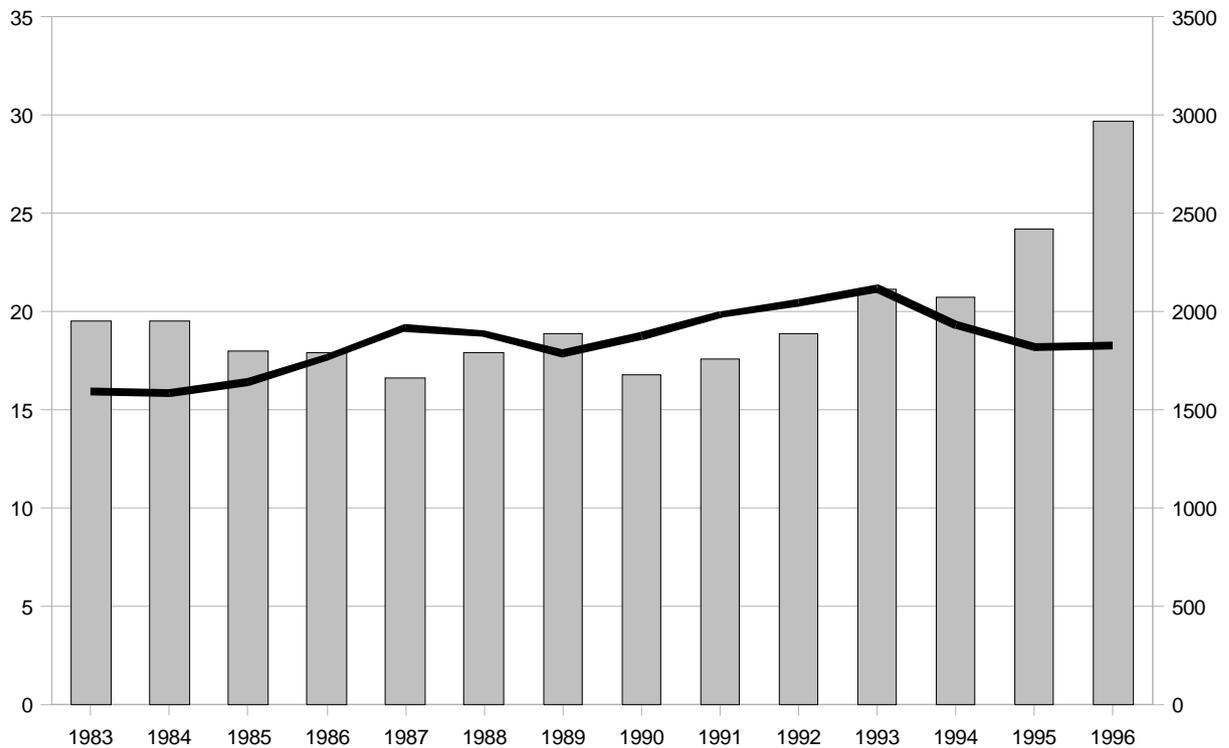
4.1 The effect of bonus on wage levels

In this section I will investigate how much the bonus component is increasing in size and how large the increase is in share of output-based employee wages versus non output-based employee wages in the wholesale and retail trade.

Bonus development

In Figure 4.1 the development of the bonus size and the number of individuals on these payment schemes are compared over time. Between 1983 and 1996, an increasing number of people received bonus. The average size of bonuses paid, measured on a monthly basis, has also increased during the same period.

Figure 4.1: Share of fulltime employees receiving bonus (gray bars, measured as percent of the total number of employees in the trades) and average monthly bonus payment (black line, measured as NOK).



Note: The monthly bonus is measured in NOK. The value is converted to 1990 prices for all years. The consumer price index is based on numbers from SSB regarding yearly price increase. 1983-1990 = 51,9 % price increase, and 1990-1996 = 13,9 % price increase.

In Figure 4.1, the grey bars indicate the percentage of the employees in the wholesale and retail trade that received a bonus for the specific years. There are large variations among the years. For the period 1983-1989, the number of people diminishes until 1987. After 1987, the numbers rise again until 1989. In 1990, the number of people is lower than the year before. However, for each year after 1990, the number of employees receiving a variable wage rises, with the exception of 1994. More people are receiving a bonus at the end of the period than at the beginning. Answering our fifth hypothesis (H5), investigating whether *the number of employees receiving variable wages increases over time*, Figure 4.1 shows that this hypothesis is supported. The number of employees, measured as a share of the total number of employees in the wholesale and retail trades, shows yearly variations and increases over time.

The black line indicates the monthly bonus payment measured in NOK. Base wage is excluded. The monthly bonus payment varies from 1590 NOK in 1983 to 1827 NOK in

1996, measured in 1990 NOK. This is a 13% increase. From 1989 to 1993, the largest growth in average monthly bonus payments is detected. Two important factors of receiving bonuses are based on profit sharing and sales commission. Both factors are dependent on the general economic development. Moreover, the economic development is dependent on finance politics (i.e. governmental spending for stabilising economic conjunctures). Profit sharing is dependent on the sum available for sharing (i.e. firm profit) and sales commission is dependent on the willingness of customer to buy merchandise (i.e. random factors). Therefore, bonuses can also partly be dependent on the gross domestic product (GDP). In 1988 and 1989 the level of monthly bonus is decreasing indicating the effect of the “wage ceiling” (Longva & Høgsnes, 2001). The period of 1990-93 is characterised by an expansive finance politic in Norway, while in the period of 1994-96 the finance politics was non-expansive, and the effect of monthly bonus payments vary according to the policy changes. In addition, to decrease inflation in Norway was one of the main aims of the Employment Commission Board of 1992 (Johansen & Eika, 2000), indicating that wage growth should be lower than the previous period. However, for the bonus component to be affected, it is not necessarily sufficient with a policy change as the bonus component also is dependent on the effort spent by employees and the economic performance of the firm. From our theoretical framework, we have also discussed that employers have an interest in keeping inflation low (Bowman, 2002). Thus it is likely to assume that firm revenue dropped in the same period and employer motivation to decrease the wage growth was present. In other words, the drop in monthly bonus payments for the periods is not likely due to less effort spent producing by employees, or solely on policy changes, but employers’ persistence for regulating these wage levels. What regulates the level of bonus might thus be consistent with three factors; (1) policy change, (2) employer motivation for setting wage levels (i.e. firm revenue) and (3) employee effort.

The variations in average monthly bonus and percentage of employees receiving a bonus seem to vary proportionally. As more people are receivers, the average monthly bonus received decreases.

Descriptive statistics for the wage components

Table 4.1 gives the mean and standard deviation of each of the wage components. The table is based on hourly earnings. Workers in output-related wage systems earned 106.7 NOK per hour in 1983. In the table below I can see that they had a growth in hourly wages of 20.6% including both base wage and variable wages. Thus, the ones receiving straight salary had a higher hourly wage growth (26.9%) in the time-period. Yet, they also had a comparatively lower hourly wage in total. Also interesting to note, when looking at the bonus component separately from base wage (column 2 and 3), I also find that the variable wage has a higher percentage growth per hour compared to base wage.

The standard deviation of base wage plus a bonus is somewhat higher than for straight salary, 21.4 vs. 16.7 in 1983 and 45.1 vs. 33.8 in 1996, reflecting higher wage dispersion among the output-related payment systems compared to the non-output related payment systems. An interesting observation is the standard deviation of the bonus wage component (Table 4.1, column 3). Here, the standard deviation is high compared to the mean hourly bonus, indicating that the distribution of bonuses has a higher variance than the remaining wage components. This supports the first hypothesis (H1): *employees who receive a base wage plus bonus have higher hourly pay than employees on straight salary*. Receivers of base wage plus a bonus have higher hourly pay compared to straight salary receivers in the data. However, the standard deviation is also large, indicating a higher level of uncertainty for the wage components when compared to straight salary.

For the purpose of comparing the share of bonus measured as percent of the hourly pay with the annual wage growth, as discussed in Chapter Two, we may also calculate the mean annual wage growth for the two pay systems. For straight salary, when can divided the annual wage growth by years of observation in order to get a measure on the average annual wage growth for the period; for recipients of straight salary (26.9/14) 1.9%, and for variable wages (20.6/14) 1.5%, adjusted for CPI (1996 prices). As already elaborated on, Hansen and Skoglund (2003) found for the period of 1990-2002, the annual wage growth in Norway was 2.1% when adjusted for CPI.

Table 4.1: Hourly wage and wage component distribution of 1) Straight salary, 2) Base wage, 3) Bonus and 4) Base salary plus bonus, in hourly wages, for two selected years. 1983 and 1996. Adjusted for CPI (1996 prices)

	1			2			3			4		
Year	1983	1996	Change (%)									
Mean	90,6	115	26,9	96,7	116,1	20,1	10,2	12,6	23,5	106,7	128,7	20,6
S.D.	16,7	33,8		18,2	35		10,1	20,5		21,4	45,1	
N	57260	41381		13857	17446		13857	17446		13857	17446	

Table 4.2 below sums up the differences between 1) straight salary and base wage and 2) straight salary and base wage plus a bonus. The base wage component was 6.7% higher than straight salary in 1983 and 1% higher than straight salary in 1996. In contrast, the base wage plus a bonus was 17.8% higher in 1983 and 11.9% higher in 1996 than straight salary. As a result, base wage and straight salary has become more similar to each other over the years. The same trend is the case for base wage plus a bonus and straight salary. However, here the differences are larger and the bonus component contributes to the differences. In other words, there is a substantial pay off from receiving a bonus as compared to a straight salary.

There is support for the idea that straight salary and base wage have developed to become more similar over the years. The variation in mean differences between straight salary and base wage plus a bonus can largely be explained by the bonus wage component alone and not base wage. As the differentials between straight salary and base wage plus a bonus have become more similar, the wage gains for straight salary have had a higher growth rate than for base wages. The most reasonable explanation for the development was mentioned in Chapter Two. Wages are negotiated based on raise in NOK, and not in percentage. Moreover, the fact that wage increase is given as NOK can be one factor leading to a higher growth rate in straight salary as compared to variable wages. As straight salary receivers have lower mean wages compare to variable wage receivers, this development between straight salary and base wage plus a bonus is a fine example of how moderate wage growth influence the relationship where relative wages grow more for the lower income groups.

Table 4.2: Differences in development between 1) straight salary and base wage 2) straight salary and base wage plus bonus. 1983 and 1996.

Year	1	2
1983	6.7 %	17.8 %
1996	1 %	11.9 %

Note: Based on table 4.1. Calculations compare hourly wage of straight salary and base wage (column 1) for 1983 and 1996 and compare straight salary and base wage plus a bonus (column 2) for 1983 and 1996.

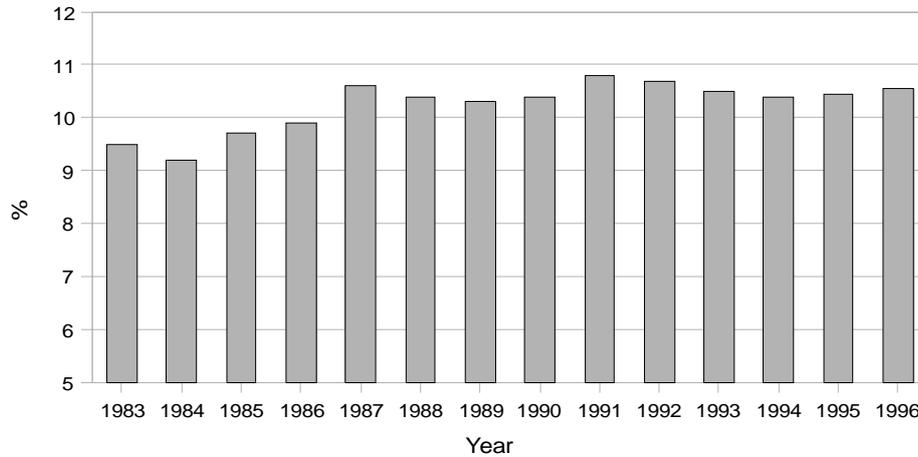
I have now seen that the average monthly bonus payments have increased and that there is an increase in number of receivers of bonuses in the wholesale and retail trades. Next, I will investigate whether the significance of the bonus has increased in terms of hourly salary for the employees paid on an output based payment system.

How much does bonus account for of the monthly income?

Figure 4.2 demonstrates the effect of the bonus on the hourly wage for the recipients of bonuses from 1983 to 1996. When comparing 1983 to 1996, there is a one percentage point increase in the significance of the bonus as part of the hourly earnings.

The yearly development of the bonus varies between 9.5 % (Figure, 4.2: year 1983) to 10.8 % (Figure, 4.2: year 1991) measured on the hourly wage for the employees with a bonus. Within this range, the level of bonus is stable when measuring hourly bonus income. It can be concluded that the growth of the bonus is proportional to the growth of base wage. Thus, there are only small indications of the positive development of the bonus, measured on total wages, for the employees receiving bonus. In our model (as described in Figure 4.2), the average is accounted for. Considering a bonus to be about 10% of the hourly wage, this is rather high when considering the financial flexibility of a firm. In chapter two we defined a reasonable level of wage growth to be about 4% each year and that the 4% level can be regarded as a level identifying a medium level of financial flexibility. Thus, when the level is 10% in the data, financial flexibility is high in the wholesale and retail trade.

Figure 4.2: Average hourly bonus; share measured in percentage of hourly pay for the ones whom receive bonus in wholesale and retail. 1983 - 1996



There are, however, large variations between groups of variable wage receivers, and so analyses of percentiles at the population level will be done next.

High bonus pay for a declining group

In the data, only 19.2% of the population receives a bonus. If I look further into the group of bonus receivers, I find additional differences when comparing the relative differences between the ones who received the highest and lowest bonuses in the population within years.

In Table 4.3, the ratios of the lowest 10 percentile and the highest 10 percentiles are compared. This is referred to as the 90/10 ratio. There is a strong decline in the 90/10 ratio over the years, with few exceptions. Indicating a distributional shift among the highest and lowest 10 percentiles of the size of the bonus distributed within the group of variable wage workers over the years. In 1983, the 90/10 rate was 63.7%, in 1995 52.9% while 39% in 1996. This indicates a shift where the low receiver groups receive a higher bonus, increasing by year, relative to those who received a high bonus in 1983. In 1986, there is a particularly high drop in the 90/10 percentile compared to the previous and following year. The reason for this is most likely due to the economic crisis that occurred that year. It is likely to assume that many of the bonuses was based on combined agreements, by which the employee share in profit on the basis of how well the company is doing, were affected by the crisis in 1986. It is then observable how the economic development can influence a variable wage.

Table 4.3: Average monthly bonus payments distributed between two percentiles; p10 and p90. 1983 to 1996

Year	90/10 rate
1983	63,7
1984	66,4
1985	62,5
1986	44,3
1987	50,3
1988	51,7
1989	51,3
1990	58,6
1991	50,1
1992	42,9
1993	36,7
1994	33,4
1995	52,9
1996	39,0

Table 4.4, represents all full-time employees receiving a bonus in two selected years; 1983 and 1996. Further, the table shows the size of various average hourly bonus payments in nine percentiles. The distributions on percentiles indicate size of the bonus distributed on nine bonus receiver groups (i.e. percentile 1-9). For instance, in 1983 0.9% of the total bonus was distributed among the 10 percentiles receiving less than 10% of the total amount of bonuses paid for that year in the retail and wholesale trade. It is important to note that the estimates are relative and only give meaning when compared to other ratios. The employees earning the highest hourly bonus have declined the most (i.e. percentile nine). Some of the decline in the top 10 percentiles is due to an increase in the groups receiving the lowest amount of hourly bonus. Percentiles 2-4 are the ones with the highest gains when comparing the two periods. In other words, the size of the bonus is becoming stronger throughout the whole population over the years. Moreover, the increase can be viewed as strengthening of economical incentives. Less bonus are distributed to the highest 10 percentiles, where the highest 10 percentiles distribute downwards with the highest growth in the lower percentiles. This confirms the assumptions from Figure 4.1, thus our hypothesis (H8) is not supported, saying *relative differences in the bonus component are equal among the variable wage receivers over time*. In other words, either there is a distribution from the higher receiver categories to the lower, or the total amount of bonus payment is increasing in the wholesale and retail trade where the employees who receive

least in the first place increase their relative position in terms of size of bonus payment measured on the hourly wage. It is more likely that the total amount of bonus payments increase as the number of employees paid on output related wage systems is increasing in share of the population.

Table 4.4: Average hourly bonus pay; nine percentiles. 1983 and 1996

	1983	1996
All fulltime employees receiving bonus		
Percentile 1	0.9	1.3
Percentile 2	1.4	2.5
Percentile 3	2.9	3.4
Percentile 4	4	4.6
Percentile 5	5.8	6.2
Percentile 6	8	8.8
Percentile 7	12.6	12.7
Percentile 8	20.9	20.7
Percentile 9	43.5	39.8
Total	100	100

So far, size of bonus payments and how these are distributed in the wholesale and retail trades in the period 1983-1996 has been analysed. Further, analyses of bonus payments and the characteristics of the recipient will be analysed.

4.2 Characteristics of bonus recipients

Our second research question was to discover some characteristics of the group of bonus receivers in the data. In particular, this section will investigate how bonuses are distributed within trade and among gender, type of firms and geographical differences. Attention will also be given to differences between variable wage recipients versus the recipients of straight salary and gender differences. First, the gender effect on wage components and straight salary is analysed. Second, analyses of differences between wholesale and retail. Third, analyses of the effect of size of firm and wages are done. Finally, analyses of differences between variable wages versus straight salary when employed in the same occupations and in the same region. The two first analyses is done by using OLS, while the third applies the fixed effect model on the establishment level and the fourth applies fixed effect models on the occupational level.

How is bonus distributed between genders?

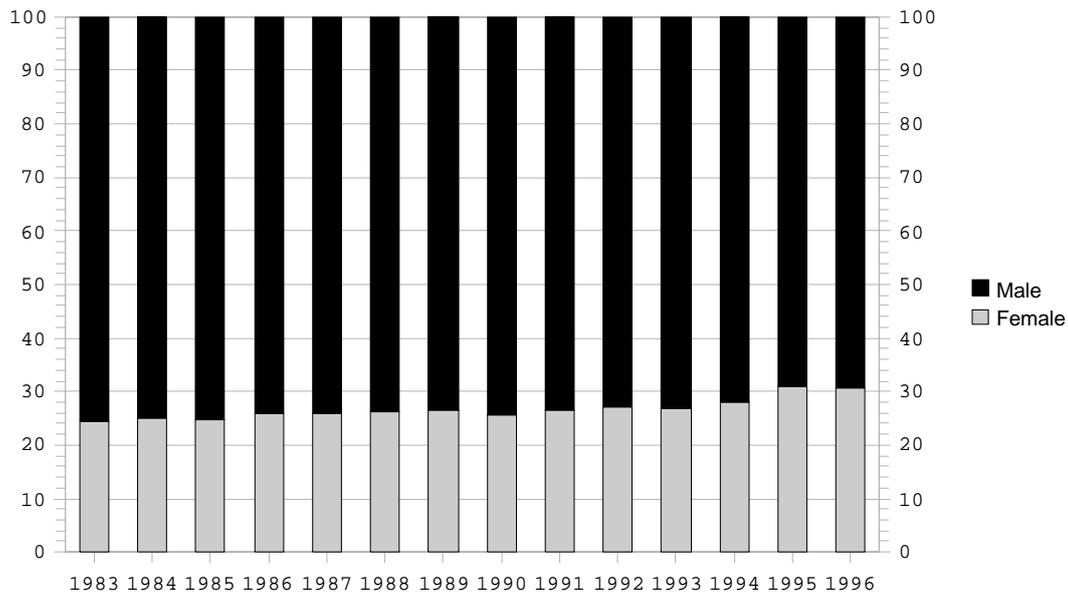
Here I will look at the difference in gender for the bonus distribution. First, I will discuss the involvement of females in output related pay systems emphasising the yearly development. Second, I use ordinary least square models to investigate the difference in size of variable wages and straight salary between genders.

The inclusion of females in output related occupations

In Figure 4.3, the male/female ratio of bonus receivers is shown, measured as a percentage, for the years of 1983-1996. The share of female bonus receivers has increased in the period. The number of women receiving bonuses compared to men receiving bonuses is steadily increasing over the years. While 25 % females received bonuses in 1983, 31 % receive bonuses in 1996. In other words, more females are recruited into occupations where output related wage systems are used. This may indicate that policies that aim at lowering the gender wage gap have had an effect, and in particular after 1993. In recent years, several programs¹⁹ have been deployed in order to recruit more females into occupations where bonuses are used. One of the main arguments behind using bonuses is to motivate females into taking jobs that are dominated by males, or traditionally viewed as male dominated occupations.

¹⁹ One such program aimed at recruiting females to occupations where there are high wages is FUTURE, which is the product of the Finance Sector Union. The ability to receive a bonus is in particular emphasised as a characteristics of a high-income occupation by the Finance Sector Union representatives. Employers, for instance, the Norwegian School of Economics and Administration (NHH), has focused in particular on offering a bonus to females who are recruited into their occupations. In other words, the promise of a bonus might be used as an argument to recruit females into occupations that are male dominated.

Figure 4.3: Male/Female ratio of bonus receivers in percentage. 1983 - 1996



Is the development in gender differences the same for variable wages and straight salary?

Here, I will investigate the development and variations of base wage plus a bonus, its components and straight salary, and see how they develop over time between males and females. As more females are hired into output-related pay systems, the pay difference among males and females is increasing, indicating that the occupations females are recruited into are not where there are high gains in terms of variable wages. Table 4.5 show the results of regression analysis comparing female wages with male wages in four wage components: (1) straight salary; (2) base wage; (3) bonus; and (4) base wage plus a bonus.

For the straight salary receivers, the gap between female wages and male wages is decreasing (column 1) over the 14 year period. The same trend is observed for females being paid base wages. The decrease is, however, smaller when compared to the decline in the straight salary component. When investigating the bonus component (column 3), the gap between female wages and male wages is not decreasing as much as the other wage components, with an exception of the final years (1992-95). In the base wage plus a bonus component (column 4), the gap between female wages and male wages is decreasing. The decrease is smaller and inequality larger when compared to the straight salary component for female ratio. Changes in the base wage plus a bonus component is thus in contrast to the one of base wages. In other words, it is the bonus component that ‘slows down’ the decrease in the wage gap among sexes for the variable wage component, base wage plus a

bonus. Here, our third hypothesis (H3) is supported: *females receive a significantly lower base wage plus bonus than males* when controlled for education, experience and experience squared. The gender wage gap is larger in base wage plus a bonus than the straight salary. What is interesting is that the gender differences in the base wage component are in fact lower than gender differences in straight salary. It is the bonus component that contributes towards gender inequality in variable wages. Therefore, we ask the question: what reasons can explain the gender differences in bonuses?

There are at least two possible explanations important to address in answering this question. Firstly, the criteria for receiving a bonus might be better adapted to males than females. One reason supporting this claim is that the number of females who are employed in occupations where output related wages are paid will be very few compared to males. In particular, if the bonus aims at the individual performance, as in contrasts to team-based or profit sharing, it is not unlikely that collaboration and sense of unity will be undermined in the workplace. In addition, this may affect females in particular, as they are relatively few.²⁰ Secondly, wage level is dependent on wage negotiation settlements. For the case of Norway, it is common to have both central and local negotiation. From the table below we can assume that the central negotiations are quite effective, as the gender wage gap is decreasing for straight salary and relatively low for the base wage component compared to straight salary. Much of the negotiation for straight salary and base wage is likely to happen by tariff agreement at the central level and local level. This also includes the level of bonuses, in particularly the provision made from sales. However, when bonuses are based on combined agreements there can be much more room for individual based negotiations (i.e. negotiations that is not bound by tariff agreements) according to company performance. A recent study from Sweden shows that females are poorer negotiators of wages than males. In addition, some of the explanation for this is connected to a stereotypical conception tied to masculine and feminine characteristics: men are seen as good negotiators as they are strong, decisive and self-assertive. Women are seen as bad

²⁰ In an online forum where females discussed their view of a bonus in the workplace, a member had the following to say: *'If the bonus is purely attached to individual effort, the result may be too much competing within a department. Some people are selfish and not willing to help others if they only get measured on individual effort. This may quickly create a lot of dissatisfaction and a bad working environment! Where I am now, I do not receive bonus, but my salary today is higher than when I was earning bonus. I would rather opt for a high base wage and a small bonus, than the other way round. And I would like to have a say in what criteria form the basis of the bonus so that I am not measured on unrealistic or purely individual targets.'* Source: Online forum discussion in the magazine *Kvinneguiden* from member 'Catzy' (Read date 06.11.07).

negotiators as they are concessive, emotional and overly focused on relationships. In psychology, ‘stereotype threat’ refers to the phenomenon in which groups that are expected to do poorly will perform poorly on assignments when based on stereotypical perception are expected to do perform less well. This is what the Swedish study confirms in terms of male and female differences in terms of outcome of wage negotiation (Gustafsson, 2008). Due to stereotypical perceptions females may therefore have a weaker position than males when it comes to negotiating these wages with an employer. The characteristics associated by the stereotypic perception may also make females less “desirable” in some occupations as for instance sales positions where negotiating for terms with customers is a “desirable” skill in the occupational category.

In conclusion, the development in variable wages and straight salary is not equal among genders. Gender differences in variable wages are increasing, due to the bonus component, while gender differences are decreasing for straight salary. Explanations for this might be due to the fact that criteria for bonuses better aims males and stereotypical perception of gender that disadvantages the females in individual wage negotiations.

Table 4.5: Female hourly wage compared to male wages for straight salary and in the three wage components. Log hourly wage of; 1) Straight Salary, 2) Base Wage, 3) Bonus, 4) Base Salary plus bonus. 14 years. Controlled for education, experience and experience squared. Coefficients for male, education and experience is not reported. 1983 - 1996.

Year	1	Std.err	2	Std.err	3	Std.err	4	Std.err
1983	-0,184	0,002	-0,144	0,005	-0,683	0,027	-0,195	0,005
1984	-0,188	0,002	-0,147	0,005	-0,647	0,027	-0,193	0,005
1985	-0,191	0,002	-0,145	0,005	-0,640	0,028	-0,193	0,005
1986	-0,187	0,002	-0,136	0,005	-0,653	0,027	-0,193	0,005
1987	-0,198	0,002	-0,146	0,005	-0,633	0,027	-0,201	0,005
1988	-0,196	0,002	-0,141	0,005	-0,634	0,026	-0,199	0,005
1989	-0,182	0,002	-0,136	0,005	-0,640	0,027	-0,187	0,005
1990	-0,163	0,002	-0,123	0,005	-0,699	0,028	-0,182	0,005
1991	-0,156	0,002	-0,109	0,005	-0,664	0,028	-0,168	0,005
1992	-0,152	0,002	-0,104	0,005	-0,605	0,026	-0,166	0,005
1993	-0,143	0,002	-0,097	0,006	-0,556	0,031	-0,161	0,006
1994	-0,138	0,002	-0,097	0,006	-0,560	0,030	-0,157	0,006
1995	-0,123	0,002	-0,112	0,004	-0,596	0,028	-0,177	0,004
1996	-0,124	0,002	-0,110	0,004	-0,667	0,022	-0,166	0,004

Note: N (obs-years) Column 1= 769 478; Column 2, 3 and 4= 183 360

How is bonus distributed between the wholesale and retail trade?

Wage differentials between wholesale and retail are important to emphasise, as it tells us something about organisational structure in wholesale and retail. It is not unlikely that the average employees in wholesale has more responsibility and therefore also have higher wages. It is in wholesale where we find the highest frequency of output-related pay schemes, but we do not know if there are significant differences in hourly pay between the two trades and between straight salary and variable wage. Moreover, the size of differences in pay is what I will look further into here, as it may tell us something about differences in incentive structures and how these are allocated between wholesale and retail. In order to obtain these results, controls for education and experience will be performed.

Evidence from Table 4.6 shows that wage levels in wholesale is considerably larger than for retail. There are considerably more people employed in wholesale than retail who receive variable wages. One reason for this is due to the occupations that are performed in the two trades. The concept of variable wage aims at enhancing efficiency and performance, and it is likely that there are fewer occupations that aim at enhancing efficiency and performance in retail. One example of a typical occupation in retail is the cashier of a grocery store. Their performance is more dependent on the hours spent at the store, than their effort in serving the cash register quickly. A common occupation in wholesale is a travelling salesperson. Here, the salesperson is measured by achieving a high sales rate, rather than the amount of hours spent trying to sell. Therefore, a wage that encourages achieving a higher sales rate is more applicable. The wage levels in wholesale might be higher due to occupations that demand for more responsibility and other factors such as increasing employee motivation in wholesale.

For straight salary receivers (column 1), the wage gap between the retail and wholesale trades is decreasing. The penalty for straight salary receivers in retail is thus decreasing compared to straight salary in wholesale.

The opposite is observed for the variable wage component (column 4). Here there is an increase in wage differentials among retail and wholesale, where employees in wholesale are paid a higher hourly wage. The difference is partly due to increase in the base wage component (column 2) and partly due to increase in the bonus component (column 4).

What is in particularly interesting is that when comparing straight salary to base wage plus a bonus, the differences between wholesale and retail used to be larger for the employees who received a straight salary compared to the employees who receive base wage plus a bonus. In other words, differences between wholesale and retail used to be lower for the employees receiving output based wages when comparing wholesale to retail. The shift occurred in 1988, the very same year as the “wage ceiling” was executed. From this evidence we may say that the “wage ceiling” had opposite effect on straight salary than for the variable wage. The aim of the “wage ceiling” was to reduce wage growth in order to compensate for inflation.

Table 4.6: Retail ratio compared to wholesale for straight salary and in three wage components. Log hourly wage of; 1) Straight Salary, 2) Base Wage, 3) Bonus, 4) Base Salary plus bonus. Controlled for education, experience and experience squared. Coefficients for male, education and experience is not reported. 1983-1996.

Year	1	Std.err	2	Std.err	3	Std.err	4	Std.err
1983	-0,247	0,002	-0,188	0,005	-0,538	0,025	-0,209	0,005
1984	-0,258	0,002	-0,192	0,005	-0,574	0,025	-0,216	0,005
1985	-0,260	0,002	-0,211	0,005	-0,497	0,026	-0,229	0,005
1986	-0,245	0,002	-0,197	0,005	-0,496	0,026	-0,226	0,005
1987	-0,236	0,002	-0,198	0,005	-0,397	0,027	-0,221	0,005
1988	-0,234	0,002	-0,209	0,005	-0,509	0,026	-0,242	0,005
1989	-0,220	0,002	-0,196	0,005	-0,615	0,027	-0,229	0,006
1990	-0,212	0,002	-0,198	0,006	-0,582	0,028	-0,226	0,006
1991	-0,204	0,002	-0,197	0,006	-0,654	0,028	-0,242	0,006
1992	-0,209	0,002	-0,187	0,005	-0,458	0,027	-0,226	0,006
1993	-0,203	0,003	-0,163	0,007	-0,423	0,033	-0,213	0,007
1994	-0,204	0,003	-0,173	0,006	-0,368	0,032	-0,211	0,006
1995	-0,181	0,002	-0,208	0,004	-0,843	0,022	-0,258	0,005
1996	-0,182	0,002	-0,216	0,004	-0,671	0,023	-0,248	0,005

Note: N (obs-years) Column 1= 769 478; Column 2, 3 and 4= 183 360

How are wages allocated at different levels of firm size?

In order to address the question of the effect of wages on size of firm, fixed effects analysis at the firm level will be used. In addition to observe the importance of variable wages and size of firm, two periods will be analysed as this will tell us the development in the importance and significance over time. The two periods investigated are; (1) 1983-89 and (2) 1990-96.

Table 4.7 show variations in the size of firm, and how this impacts the hourly pay straight salary and the three variable wage components. The various firm size levels are compared to large companies (the baseline is firms with more than 50 employees). There are two interesting findings in the table. First, when looking at the period of 1983-89 there are a linear for straight salary (column 1), base wage (column 2) and base wage plus a bonus (column 4). This indicates that larger firms also pay higher salary. Second, when comparing the two time periods, the effect from the first period disappears. The various sizes of firms have thus become more eligible to pay wages closer to what large companies are paying. For straight salary, there is a positive effect working in other sizes of firms than large in 1990-96. The differences in size of firm and straight salary is, however, small. This suggests that there are only small to no wage gains between different sizes of firms for straight salary in the period of 1990-96. For base wage plus a bonus (column 4), there are still larger wage gains when employed in large companies compared to small, but there is no linear relationship. However, when analysing the bonus wage component (column 3) a linear relationship still appear with one exception; firm size 1 and 2 are similar.

Our sixth hypothesis (H6) thus finds partly support; *large firms pay higher variable wages than firms with few employees*. The effect is valid for straight salary and base wage plus a bonus in the first period. In the second period the hypothesis only find support for base wage plus a bonus. From this I might formulate the question; why does there seem to be a shift in the straight salary and base wage, but not in terms of the bonus component over time?

From our theoretical framework research supporting that wage levels increase by firm size was discussed. The reason why base wage plus a bonus and the bonus component in particular, differs from straight salary in the second period is perhaps due to that bonuses differ somewhat from straight salaries and base wages; one difference is that variable wages seem to be influenced by central negotiations to a lesser extent than straight salary. It is assumed that employers will *control* the local wage development in the private sector. And the control exercised by the employer can arguably be higher for variable wages than straight salary as the outcome of variable wage is more a result of direct relationship between the employer and employee. Moreover, variable wages differs from straight salary between the two periods as the relationship of *financial flexibility of large firms* and

financial flexibility for small firms does not change. Indicating that larger firms are dependent on a higher degree of flexibility than small firms.

Table 4.7: The within effect of firm size on the logarithm of hourly wage for straight salary and in three wage components. 1) Straight salary, 2) base wage, 3) bonus, 4) base wage plus a bonus. Two periods; 1983-1989 and 1990-1996. Establishment fixed effects. Standard error in brackets.

	1983-1989				1990-1996			
	1	2	3	4	1	2	3	4
Firm Size*								
1	-0,131 (0,005)	-0,242 (0,011)	-0,258 (0,043)	-0,254 (0,011)	0,044 (0,005)	-0,032** (0,011)	-0,217 (0,048)	-0,055 (0,011)
2	-0,128 (0,005)	-0,231 (0,010)	-0,281 (0,038)	-0,243 (0,010)	0,026 (0,004)	-0,042 (0,009)	-0,218 (0,041)	-0,064 (0,010)
3	-0,100 (0,005)	-0,194 (0,009)	-0,286 (0,033)	-0,208 (0,009)	0,022 (0,004)	-0,011NF (0,008)	-0,115** (0,035)	-0,028 (0,008)
4	-0,073 (0,004)	-0,144 (0,007)	-0,226 (0,026)	-0,154 (0,007)	0,019 (0,003)	-0,000NF (0,006)	-0,080** (0,027)	-0,09NF (0,006)
sigma_u	0,256	0,289	1,314	0,300	0,194	0,227	1,284	0,234
sigma_e	0,251	0,242	0,908	0,251	0,215	0,218	0,976	0,225
rho	0,509	0,588	0,677	0,588	0,448	0,521	0,634	0,519
N (establishment)	23623	6623	6623	6623	17103	6349	6349	6349

Note: *Omitted variable is firm size 5 where employees>50.

**Significant at 5% level. NF= not significant. N=246 196, N (obs-years)=954 838.

Is there a wage gain for output-related pay systems versus non-output pay systems when employed in the same occupation and in the same region?

Table 4.8 shows occupational level variations. The table shows variations from the baseline category, for two periods (1983-89 and 1990-96) for the workers receiving straight salary (Panel A) and the employees receiving variable wages (Panel B). The baseline category is *eastern part* of Norway (region 1). The bonus/penalty for the workers who receive variable wages is shown by a significance test (i.e. whether variable wage is significantly different from straight salary or not when working in the same occupation and in the same region) in *Panel B*.

The table is interpreted as follows; for straight salary receivers, *Panel A*, region 2 has 9.3% lower hourly wages than the baseline category (eastern region) in 1983 to 1989. In 1990 to 1996, the differences are 2.5%. The coefficients indicate the difference in straight salary

received for that specific region, when compared to the baseline category. The gain for the variable wage receivers (Panel B) is an additional 1% in region 2 for the same period when employed in the same occupation. Differences are rather small. In the second period (1990-96), there are no differences between straight salary and variable wages in region 2.

For the remaining regions, clearly the baseline category is where hourly wages are higher. Wages seem to be particularly increasing in region 5 (northern parts) between the two periods. The bonus/penalty for the variable wage receivers is significantly different for many regions. One interesting observation is that in region 3 (1990-96) and region 5 (1983-89 and 1990-96) there is a penalty for the variable wage receiver, while for the remaining region there is a positive effect. The reason for this would require further research as there is not an obvious interpretation.

Substantively, the initial differential in wages between regions is expected because of two reasons. Firstly, low inequality in wage levels within a region contribute towards balance in the internal labour market. Different regions can experience forms of economic shock. Economic shock can be both positive (i.e. the discovery of natural resources) and negative (i.e. drop in value of exported merchandise). The balance in the internal labour market for various regions is believed to contain the levels of unemployment rates. Under such circumstances, the wage flexibility between regions contributes towards development in the unemployment rates and keeping the unemployment rates low. In the long run, wage flexibility between regions is connected to the establishment of firms and the number of people living in that region. If the cost of workers is low in a region, one can in the long run expect more firms to establish in the area as employees are cheaper than other regions. Further, when more firms are established the competition will increase between firms for employees and increase wages. Moreover, when wages increase in a region, more people would want to live there because of higher wages. Secondly, differences between regions, in terms of pay, are because there is difference in living expenses between regions (Barth & Dale-Olsen, 2003:108).

Our seventh hypothesis (H7) thus only finds partly support, saying that *employees receiving base wage plus bonus earn higher wages compared with those who receive straight salary when working in the same occupation, and in the same region*. When testing the assumption of variable wages being significantly higher when compared to

straight salary for employees in the same region, there is little to no support for the assumption is found; the variable wage levels show little discrepancy from the general wage level for that region

Table 4.8: The within occupational effect of regional difference in occupations on the logarithm of hourly wage in two wage formations: 1) Straight Salary, 2) Base Salary plus bonus. And in two time periods; 1983-1989 and 1990-1996. Occupation fixed effect analysis. Standard error in brackets.

	1983-1989	1990-1996	
Panel A: Straight Salary			
Region 2	-0,093 (0,001)	-0,025 (0,001)	
Region 3	-0,074 (0,001)	-0,069 (0,001)	
Region 4	-0,021 (0,001)	-0,088 (0,001)	
Region 5	-0,191 (0,002)	-0,027 (0,002)	
Variable Wage	0,082 (0,001)	0,096 (0,001)	
Panel B: Penalty/Bonus for variable wages			
Region 2	0,010 (0,002)	0,001 (0,002)	NF
Region 3	0,001 NF (0,002)	-0,017 (0,002)	
Region 4	0,002 NF (0,003)	0,012 (0,002)	
Region 5	-0,024 (0,005)	-0,041 (0,004)	
sigma_u	0,241	0,210	
sigma_e	0,234	0,183	
Rho	0,516	0,568	

Note: Omitted variable is region 1: eastern part of Norway. NF= not significant at 5% level. N=246 196, N (obs-years)=954 838.

4.3 Are employees rewarded for risk?

Our theoretical framework shows that risk and pay is correlated, and we have seen that there are higher average wages for the ones paid on output-related pays systems. Here, the distribution for the size of wage for variable wage- and straight salary recipients will be further addressed through looking at how many of the employees are distributed lower than

the average for the population segment (i.e. percentile distribution). Second, analysis of the gain for males and females at the population, establishment and occupational level will be done for two time periods; (1) 1983-89 and (2) 1990-96.

Pay systems and distribution on pay levels

In Table 4.9, *panel A* we see that 97.6% have higher hourly earnings of the workers in the output-related pay systems in the period of 1983-1989 and 96.9% in 1990-96 when comparing the lower ten percentile of the hourly wage for those paid in non-output versus output-related pay systems. This indicates a slight increase in risk for receiving a lower pay when receiving pay based on output-related pay systems compared to the non-output related system. However, the likelihood of receiving a lower hourly pay compared to straight salary receivers is very low in the first place.

In *panel B*, variable wage receivers still have a higher probability of receiving an hourly pay that exceeds the hourly pay for those receiving straight salary. Even though the share of employees receiving higher wages still favours the variable wage receivers, the percentage of variable wage receivers who do not earn lower have now shrunk to 71.7% in 1983-89 and 68.8% in 1990-96.

Based on the evidence in Table 4.9, one may argue that wages under output-related wage systems contain some amount of uncertainty. They often fall below the wages of straight salary workers in the same occupation. Similar evidence, analysing occupation-establishment units, was found for Norway 1990 (Petersen & Snartland, 2004) and Finland in 1996 (Meyersson-Milgrom *et al.*, 2002). However, the risk of receiving a lower hourly salary in the bottom ten percentiles is low. Only 2.4% of the variable wage receiver receives a lower wage. This indicates that when assuming risk, they are often rewarded by a higher hourly pay.

Table 4.9: Percent of workers on output-related payment systems for whom the wage is lower than the lowest 10 percentile and the average percentile of non-output related employees. 1983-1989 and 1990-1996.

Panel A: Bottom 10 percentiles	Year	
	1983-1989	1990-1996
Not Lower	97,6	96,9
Lower	2,4	3,1
Sum	100	100
N (obs-years)	93 099	92 261

Panel B: Average percentiles		
Not Lower	71,7	68,8
Lower	28,3	31,2
Sum	100	100
N (obs-years)	93 099	92 261

Note: only the recipients of variable wages are in the table. For each year (1983-1996), the number of recipients of variable wage has been sorted based on having higher (i.e. not lower) or lower than the ones receiving a straight salary. The results shown here is average for the period of 1983-89 and 1990-96.

How large is the difference in hourly pay for female and male recipients of variable wage workers when comparing to straight salary?

In Table 4.10, the effect of variable wages in comparison to the mean male wage when paid a straight salary is analysed. The analysis shows the development in wage for three levels (population, establishment and occupation) and in two periods: 1983-89 and 1990-96. Separate analysis for each year was done, but is here presented as the average for the for the periods. The constant refers to average hourly male wage paid a straight salary. The table report the effect for males who earn variable wages (*male, variable*), the female ratio compared to males paid a straight salary (*female*) and the extra effect for females receiving a variable wage (*female, variable*). In order to estimate the difference between male and females who receive variable wages, the following calculations have been made (*Female, variable: ratio of male variable*).

Variable wages for males

There are no variations for male variable wages at the population level between the two periods compared to the straight salary employees. This indicates that the gain for receiving variable wages does not change between the 1983-89 and 1990-96 at the

population level. When examining the establishment and occupational level, the gains are increasing for males. This means that there is a positive effect for males receiving variable wage compared to males receiving a straight salary. The variable wages for males are increasing over time when comparing to male recipients of straight salary.

Comparing the ratio of male- and female variable wage

As the evidence from Table 4.10 shows, the differences between male and female variable wages become smaller between the two periods. Furthermore, the differences decrease when moving from population to establishment level. When females are employed in the same occupation as males, there is only a 6% difference in 1983-1989 and 3% difference in 1990 to 1996 in the hourly pay, indicating that even though females in general receive a lower hourly variable wage than males, the differences diminishes when they are employed in the same establishment and when they are employed in the same occupation as males. This suggests that differences in hourly salary between men and female is connected to differences in the occupation in which individual is employed.

Table 4.10: Hourly wages on 1) population, 2) establishment and 3) occupation level, for male variable wage receivers, and the female variable wage ratio of the male variable wage ratio of earnings. Exp(b) values reported. For two time periods, panel A (1983-1989) and panel B (1990-1996). Controlled for education, experience and experience squared.

Panel A (1983-1989)	1. Population	2. Establishment	3. Occupation
Male, variable	0,11	0,03	0,07
Female	-0,13	-0,08	-0,05
Female, variable	-0,01	-0,02	-0,01
Female, variable: ratio of male variable ¹	-0,14	-0,10	-0,06
Panel B (1990-1996)			
Male, variable	0,11	0,06	0,09
Female	-0,09	-0,07	-0,02
Female, variable	-0,02	-0,02	-0,01
Female, variable: ratio of male variable ¹	-0,11	-0,09	-0,03

Note: (1) The *female, variable ratio of male, variable* is found by the following calculations: (female) + (female, variable). N=246 196, N(obs-years)=954 838

4.4 Summary

In this chapter, the effects of straight salary and variable wages has been analysed at different levels. Similarities and inequalities have been discovered. In Table 4.11 below, a

brief summary of our hypothesis and results are given. In addition, possible biases for some of the estimations done in this thesis are mentioned.

The bonus wage component is a significant proportion of the total remuneration for the variable wage receivers. However, it does not increase much at the population level for the periods in which these investigations were completed. An interesting observation is the decline in total monthly bonus payments as the number of recipient seem to rise. This might indicate that the total share of wages used for the purpose of the bonus component is increasing.

There are large differences in gender distribution of wages, and in particular for the bonus wage component. While differences among gender are decreasing for straight salary and base wage, there are only small tendencies for decline in the bonus component. In other words, the gender pay gap in base wage plus a bonus is decreasing at a slower rate because of the continuous differences in the bonus pay component.

I also find lower wages in retail compared to wholesale. Wage differences between trades decrease for straight salary recipients while it increases for variable wage recipients. This might be interpreted as changes to both political changes, organisational changes and changes in the competitive environment of the firm.

The size of the firm is important when looking at wage differentials. Support for the assumption regarding the ability of large companies to pay higher wages compared to smaller firms was found. The significance of large companies' ability to pay higher wages seems, however, to decrease when looking at the effect in two periods. In the later period, there seems to be less variation among small and large firms, indicating that smaller firms are better equipped for paying higher wages compared to earlier.

Regional differences can also be seen as indicator for the organisational and competitive environment of the firm. When investigating the difference in hourly pay for variable wage and straight salary receivers within regions, and in the same occupation, there seems to be less significant differences among the hourly wages of the two pay systems. In Chapter 5, I will discuss some of our results from a more theoretical point of view and develop models

for describing the connection between our theoretical framework and the analysis performed in this chapter.

Table 4.11: Summary of findings. Hypothesis 1-8.

	Hypothesis	Findings	Possible bias & Comments
H1	Employees who receive a base wage plus bonus have higher hourly pay than employees on straight salary.	Supported. Bonus receivers earn on average around 15 NOK more per hour (see table 4.1).	Selection bias: Variable wages could be more common in jobs where pay is in general higher.
H2	How large is the difference between males and females receiving variable wages in the wholesale and retail trade?	Gender distribution on wage system as share of the total: Wholesale: 9% males, 2% females. Retail: 3% males, 3% females (see table 3.1).	Selection bias: Wholesale is male dominated, compared to retail, this is also where most receive variable wages. When females are hired into the same occupations as males, differences in variable wage decline.
H3	Females receive a significantly lower base wage plus bonus than males.	Supported. Females have on average lower base wage plus a bonus than to males. Females have in particular lower bonuses than males (see table 4.5).	Selection bias in occupation. Females may not apply for certain occupations or employers may choose not to hire females into certain occupations.
H4	Recipients of variable wages are distributed differently in education than the recipients of straight salary.	Partly falsified. Looking at three random years in the sample (1983, 1990 and 1996) there were small differences between the two groups in terms of education (see table 3.6, 3.7 and 3.8).	Unclear connection between variable wage and education.
H5	The number of employees receiving variable wages increases over time.	Some supported. Number of variable wage receivers varies each year. After 1993, the tendency is increasing number of variable wage receivers (see figure 4.1).	Possibility that economic conjunctures impact number of bonus receivers positively: People who have performance based contracts (but did not receive any bonus in bad times) start to receive bonus?
H6	Large firms pay higher variable wages than firms with few employees.	Partly supported. In 1983-1989, firm size impact wage size negatively, i.e. smaller firm – lower wages. In 1990-1996 same trends occur, however the differences are declining (table 4.7).	Omitted variable bias. Significance of firm size decline over the time-period.
H7	Employees receiving base wage plus bonus earn higher wages compared with those who receive straight salary when working in the same occupation, and in the same region.	Not supported. No consistent results. In a few cases this hypothesis holds, but the difference between variable wage and straight salary are relatively low (see table 4.8).	Omitted variable bias: The Eastern part of Norway is set as baseline category; this is also the most heavily populated region.
H8	Relative differences in the bonus component are equal among the variable wage receivers over time.	Not supported. There is a shift in distribution. There is relatively less bonus in the higher receiver categories compared to the lower receiver categories (see table 4.3 and 4.4).	The ones receiving the highest bonuses seem to decrease the most when there are economic stagnations in the economy, as in 1986

5 Variable wage development and discussion

In this chapter, I will discuss my research questions and look at these from the perspective of our theoretical framework (i.e. the Principal-Agent theory and financial flexibility). The research questions of this study were:

1. "What is the effect of a bonus on wage levels?"
2. "What are the individual characteristics of the recipients of bonus payments compared to non-bonus recipients?"

The chapter is organised as follows: Firstly, I discuss the relations of the Principal-Agent theory and try to cover some of the problems I found in Chapter 2 and see this in connection to the analyses from Chapter 4. I discuss some of the relevant issues based on a model outlining the macro-economic relations influencing Principal-Agent relationships. Secondly, I develop a model that describes the relationship between the Principal-Agent theory and financial flexibility, to see how these two theories might influence each other and may better describe bonuses as phenomena.

5.1 Describing the use of bonus: Principal-Agent theory

In Figure 5.1, factors influencing bonus in the wholesale and retail trade is outlined. The outcome of a situation in the Principal-Agent model can be said to be the baseline for bonus. *Principal-Agent relationships* arise based on how to share the profit from the outcome. It is in both the principal's and the agent's interest to make the "value" created in the outcome as large as possible in order to achieve higher profit. One way of increasing the outcome is by enhancing efficiency in order to create a larger *volume*. In terms of production, it may be in the principal's best interest, to have a production volume as large as possible if the volume of production is tied to the revenue in the firm. For the agent, on the other hand, to receive a pay as high as possible based on putting in a minimum of effort can be more desirable. In this sense, both parties have their own preferences based on *self-interest*. A problem then arises, the *information* problem. In order to align the agents' preferences with the ones of the principal, the principal seek control over the information.

Economic performance is not only influenced by the firm, and the productivity within the firm. Also the general economic development in the country influence the level of bonus and thus also most likely the economic performance in the firm. Furthermore, the economic development is connected to regional differences as there is discrepancy in the regional wage levels (Barth & Dale-Olsen, 2003).

Information is important for describing differences between the recipients of a bonus and the non-recipients. The bonus is thus connected to type of occupation and the ability to monitor the occupation efficiently in the Principal-Agent setting. One example of this is a relatively large difference between female and males. However, when investigating female and male recipients of bonuses employed in the same occupation, there are smaller gender differences than for the non-recipients. If the ability to monitor is difficult, one explanation for this can be due to asymmetrical information. One way of limiting the information asymmetry is by aligning the preferences of the agent more with the principal – and this may be motivated by a bonus.

From the view of the information principle, one reason why there is a linear trend for the size of variable wages and size of firm might be caused by the monitoring effect, which is the need to monitor employees. As smaller firms becomes more capable of paying the same wages as large firm for straight salary over time, there is still a linear trend for the recipients of base wage and a bonus. From a theoretical point of view, one could expect that the ability to control employees becomes more difficult with more employees employed in a single firm. Thus, the need to motivate is greater and variable wages higher. Conversely, the differences in firm size could also be generated by a larger volume produced in firms with more employees. The volume produced by each employee is observable and the employee will thus receive bonus based on the fixed criteria's agreed to in advance. The employee will therefore know how much to receive and how much to receive. Such criteria for bonus refer to individual or team based arrangements (Lunde & Grini, 2007), and can be said to have a lower level of uncertainty assuming the employee is able to perform based on the criteria of the agreement. Other criteria of bonuses are profit sharing (Lunde & Grini, 2007) and ownership structure in a firm (Langeland, 1995). The bonus payment received from profit sharing and ownership structure is not necessarily directly tied up to the performance of the individual, but to the performance of the firm. Under such circumstance, there is a greater risk of not receiving if the economic

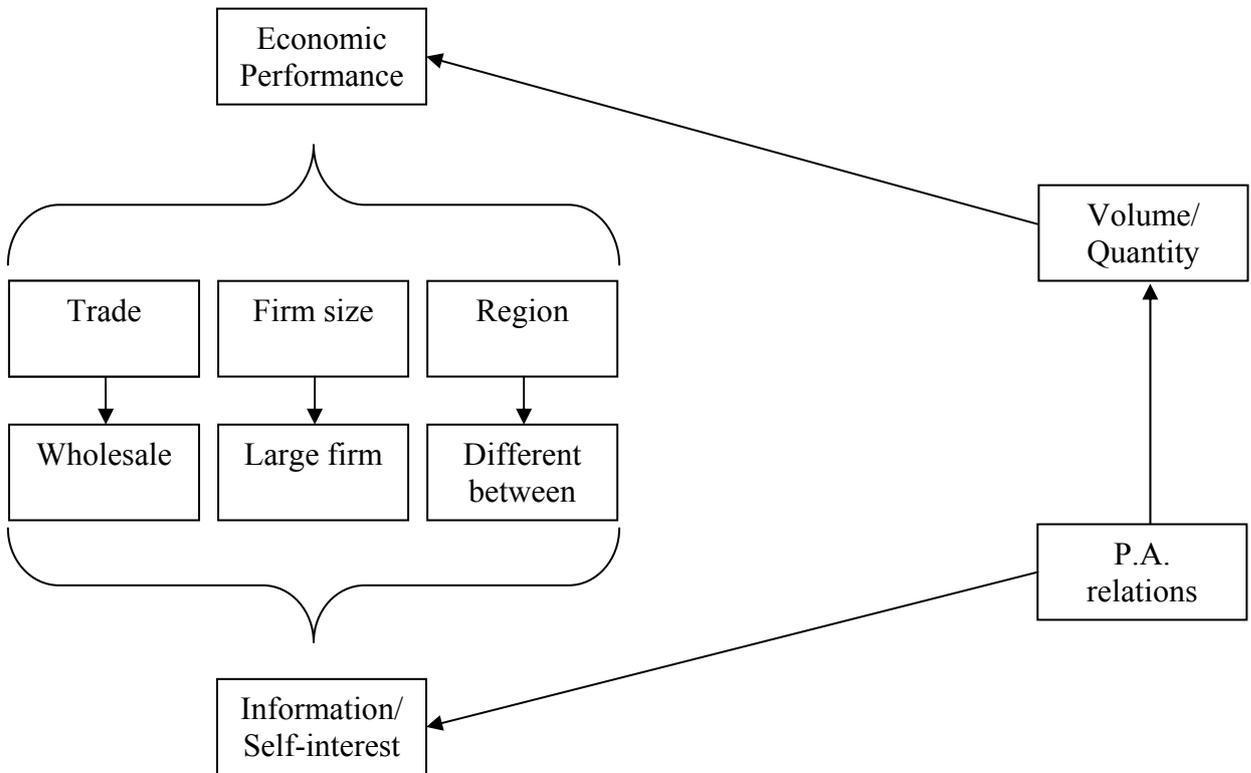
performance within the firm is below the rates set in a year of a period. One could assume that in larger firms, more profit is generated. Hence, this would influence the level of bonus payments and variable wages under such conditions. The level of bonus can be said to be connected to the size of the firm, in particularly through ownership structures as larger firms are assumed to have better economy, and therefore higher ability to pay, when compared to small firms (Boye & Kinserdal, 1992).

Another aspect of information is moral hazard. In the Principal-Agent relationship bonuses limits the problem of moral hazard, as bonuses is incentives to align their self-interest with the ones of the principal. From this point of view, straight salary does not provide incentives to overcome the problem of moral hazard. We might ask, can one limit the problem of moral hazard when paid a straight salary? This would presuppose that the agents have high morals, and we may assume that not all humans hold equally high moral standards: Morality is both hard to define and let alone measure. One must expect that some employees are inclined to exploit trust given them, rather than to honour it, however, this should not indicate that moral hazard necessarily is a larger problem when paid a straight salary as compared to a base wage plus a bonus. Akerlof (1982) finds that in occupations where employees tend to stay only a short while, their level of “production” is higher than for employees who stay in the same occupation over a longer period of time. Further, Akerlof (1982) describes the motivation as a gift exchange between the firm and the employee, as there are no incentives given in order to raise the productivity, other than the “normal” straight salary pay. In the wholesale and retail trade, this thesis finds that the average number of years an individual is occupied is four years. It is thus reason to believe that average individual observed in the wholesale and retail trade is only there for a limit time. Easterlin (2002) elaborate on how employees have higher performance based on *happiness*, without using financial incentives as the use of bonuses. The employee performs above the “average” level as the subjective feeling of happiness, based on achieving results in a job, is more important than financial incentives. Therefore, it must be said that bonus as incentive to overcome the problem of information, an in particularly moral hazard, is not sufficient. There can be many other reasons for why the employee behaves in a certain way. However, in many cases, the use of financial incentives as bonuses limits the problem of moral hazard in the principal-agent relationship. On the other side, it is also possible that the use of financial incentives may decrease the motivation of some employees.

In particular, individual based arrangements might weaken the employee ability to identify with co-workers and the firm. In contrast to the group setting, where employees are dependent on each other for reaching target rates, there will be less dependence on other employees when the bonus is based on individual performance. It is easy to relate to the importance of having helpful and trustworthy co-workers in order to help ease the everyday work life. Having helpful co-workers may also reduce stress and increase productivity of the employee, while a stressful environment might have the opposite effect. It is rational to assume that in a strong coemptive environment the relationship to co-workers can be influenced differently than in an environment where individuals does not have to compete with each other²¹. However, problems in the contractual agreement (i.e. individual or team based, profit sharing or combined agreement) in the principal-agent model is likely to be overcome by “designing” the contractual agreement in a manner that benefits both the principal and agent in the most appropriate way as the Vauxhall Motors Ltd example showed (Pearson, 1960). The terms, or contractual design, should therefore be carefully investigated in order to align the preferences of the agent with the principal, based on what is the desirable outcome of the principal-agent relationship.

²¹ In footnote 18, an example from an online discussion where a female employee was happier now when paid a straight salary than when paid a variable wage.

Figure 5.1: Factors leading to a high bonus in the wholesale and retail trade. Principal-Agent (P.A.) relations.



5.2 Principal-Agent relations and the connection to financial flexibility in firms

In this section, I will look at the Principal-Agent theory and see how the theory can be seen in connection to financial flexibility in a broader perspective. In Figure 5.2, the Principal-Agent relations can be aggregated to affect the financial flexibility of the firm. The model consists of four parts: 1) firm financial flexibility; 2) size of bonus payments; 3) Principal-Agent relations; and 4) factors influencing Principal-Agent relations.

Firm financial flexibility

Financial flexibility explains the effect of variable wages on an aggregated level. And as the model indicates, Principal-Agent relationships are just as dependent on firm financial flexibility as financial flexibility is dependent on Principal-Agent relationships. When the firm is able to have flexible expenses, the ability to restructure and make changes to the firms cash flow increases. The disposable firm wage flexibility again influences the

Principal-Agent relations as it defines much of the arena for creating target rates where a bonus is available to the employee. When looking at the purpose of the bonus payments, as showed in this model, I might raise the question, who does the flexibility in wages serve best? Is it in the interest of the firm, the employee or both the firm and employee?

Financial flexibility for the firm can be crucial in order to met national and international competition and respond more quickly to changes in the product-market. By having variable wages, the aspect of competition can indeed be said to be met. If, under any circumstances, the economy became stagnant, which again might influence the firm's income and expenses, variable wages can therefore be one of the first places a company might free some of the expenses. A firm can downsize the foundation for paying bonus to employees.

The firm benefits from using bonuses by gaining more financial flexibility and the employee benefits from a bonus by a relatively high chance of receiving a higher wage than the straight salary receivers when comparing the same segment and their hourly pay. Productivity is believed to result in a better outcome for both the employer and employee than if there were no such incentives. If there were no benefits from having variable wages, it is not likely that there would have been an increase in number of firms offering variable wages and an increasing number of individuals receiving, as found in the case of the wholesale and retail trade.

The size of bonus payments

The *size of bonus payments* defines the variable part of the pay as bonuses are subject to large variations. The size of financial flexibility in the employees wage is defined in the Principal-Agent relations. As results show in Chapter Four, there are much larger variations within base wage plus bonus, and in particular the bonus component, than straight salary. The sum of bonuses refers to financial flexibility available based on bonus payments. When aggregating the sum of bonus payments (i.e. what consists of the total amount of variable expenses a firm use for bonuses) this is the foundation for firm financial flexibility.

Principal-Agent relationships

Principal-Agent relations are set to explaining interaction at the micro level in the model. Here, agents are measured by criteria set by the principal in order to determine the hourly wage of the agent. There are various factors influencing the employer-employee relationship. In this thesis I found two theoretical aspects to be of interest in terms of what influence the decision making process of the employers: (1) the selection process or self-selection (i.e. why are some employees in an occupation and others not?) and (2) national policies (how policies may influence the practice of employers). In addition, employers also have self-interest in influencing wage levels at a national level in order to ensure flexibility in wages (Bowman, 2002). However, while employers self-interest in influencing flexibility in wages and thus firms can be viewed as “internal” for the employers, the reason for why some individuals are attracted to some occupations and others not and the governmental policies, can be viewed as “external” to the employers. By “external” it is meant factors that can not be influenced by the employers alone.

What the employee gain from the being paid on output related wage systems is the ability to increase the hourly wage higher than those paid a straight salary. However, in order to increase the hourly salary, the employee faces risk. In this thesis, I found the risk to receive a lower wage than those paid a straight salary to be low in both low-paid and average-paid segments of the population when paid in output related pay system. What the employee may gain when paid variable wages, can also be lost. Gains might be connected to risk, as there obviously always will be a higher gain when paid a higher variable wage than a straight salary below the level of variable wage. The risk might be higher for the employee as the risk of not receiving a bonus is present. One example of when an employee does not receive a bonus can be if the performance of the company is low in a certain period and therefore there is no profit to share. When paid a straight salary, the employee is entitled to the wage regardless of the company performance. From this view the risk of, for instance, faulty production is shifted from the firm to the employee.

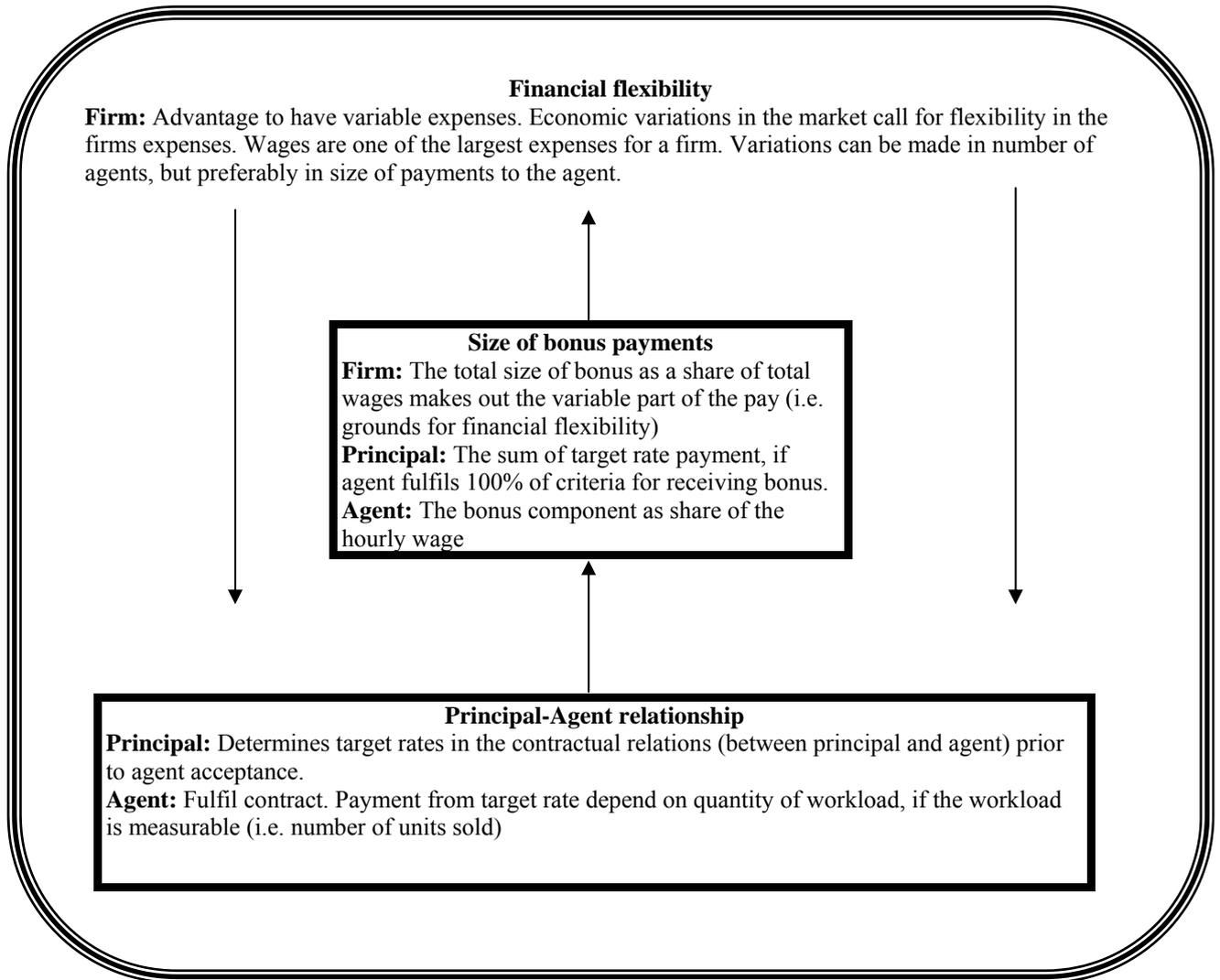
Prerequisites to the model

The model’s second part forms the prerequisites for the model. The *prerequisites to the model* are the governmental framework for flexible structures, and can be viewed as factors influencing Principal-Agent relations. Policies, like the solidarity alternative, aimed at moderate wage growth which potentially would influence the employers’ ability to raise

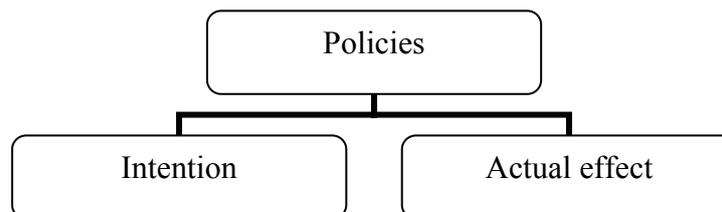
employee wages to a certain level based on the employers' preferences. This assumes that the employers' preferences were not aligned with the intention of the solidarity alternative. As this thesis has demonstrated, both the differences between gender and the differences between trades has risen more when comparing individuals paid on output-related wage systems than individuals paid a straight salary. For straight salary, differences show decrease. From this point of view, a moderate wage policy has the intended effect in straight salary, but not in base wage plus a bonus. Thus, the moderate wage line may be one reason for why there was an increase in the number of employees paid on output related pay systems in particularly after 1992/93.

Figure 5.2: Bonus payments as the link between principal agent theory and firm financial flexibility. (I) Patterns of flexibility. (II) Prerequisites to the model.

I. Pattern of flexibility



II. Prerequisites for patterns of flexibility



I have now elaborated on how the theory of the Principal-Agent model and firm financial flexibility can explain the relationship between employees and firm characteristics. A

framework has been developed for describing the situation. In Chapter 6 conclusions will be drawn and some recommendations for further research will be made.

6 Conclusions and implications for further research

Analysis finally makes clear to researchers what would have been most important to study, if they only had known beforehand

(from Halcolm's Laws of Evaluation Research; Patton, 1990:371).

In this last chapter, I will first discuss how this thesis has contributed to a better understanding of variable wages. I will look at some implications for theory and practice. The implications for practice are mainly recommendations for policy development, and to some extent to business managers. At the end of this chapter, I will provide some suggestions for further research.

6.1 Conclusions from theoretical framework

This thesis has, among other things, demonstrated that variable wages changes the distribution of wages in the wholesale and retail trade. From analysing gender differences and differences between wholesale and retail it seems that straight salary used to be the pay system where differences was larger than in variable wages. However, the variable wage system took over the "role" of continuing differences between gender and in the wholesale and retail trade as policies where aimed towards a moderate system of wage growth. Policies regulating wage levels can thus be said to have the intended effect on straight salary, but not in terms of variable wages.

This study has used the Principal-Agent model and the theory of flexible firms (financial flexibility) as key frameworks for analysing distribution and effect of variable wages. Here, I will first look at what I learned from using the theory of the Principal-Agent model and financial flexibility. Second, I will look at some aspects where the theories did not provide any deeper understanding.

Conclusions

There are strengths and weaknesses connected with the application of these frameworks to studying this phenomenon: the main strengths of the theory of the Principal-Agent model and financial flexibility are to understand the use of the bonus as a mean of reducing

financial risk and increasing financial flexibility in firms. In addition, the model can contribute to the explanation that achieving financial flexibility in wages can lead to a rise in the use of variable wages. Areas, in which theory gives a better understanding of the Principal-Agent framework when applied to this study, include providing reasoning behind the application of incentives and variable wage contracts and the shift of risk from company to employee. I can better understand the motivation of the principal use of the bonus in that the principal:

Firstly, reduce financial risk by having flexibility in wages. Employers have the advantage of cutting wages rapidly if expenses run higher than the revenues. In the wholesale and retail trade, the average bonus measured as share of hourly wage is 10% for the employees in output related systems. Based on annual wage growth, the size of the bonus is a considerable financial adjustment factor for the employers. This means that the bonus is in fact quite effective to regulate the flow of money in firms. *Secondly*, reduce disadvantage of asymmetrical information by screening in which the contract is used to attract agents with the right ‘type’ of attitudes. When an agent is in an output-related pay system, the job has to be performed after the criteria that are set to reach target rates. If the agent fails, the pay will be reduced. *Third*, to reduce the cost of monitoring as agents is motivated to perform after the criteria set in the contract thereby avoiding moral hazard etc). Agents are monitored by their obligations to perform after the target rates. It is therefore less necessary to hire costly supervisors. *Fourth*, provide incentives that motivate employees to perform better. If the bonus arrangement is constructed adequately, the incentive created by the bonus may benefit both the principal and agent. *Finally*, based on self-interest, the agent performs better due to the higher pay received. When target rate is met, and the agent receives a bonus this can also send a signal to other employees. When other co-workers learn about the ability of the rewarded agent this is a social reward.

What the models failed to explain

I discovered a few aspects that these frameworks failed to explain or did not provide deeper understanding of, for example:

Firstly, differences in base wage plus a bonus between genders: why women are less likely to be bonus receivers. Based on the Principal-Agent model, women then would be either a) more risk averse or b) less competent, neither of which I have strong reasons to believe. *Secondly*, why there are higher bonus gains in large firms compared to small. This can be

explained in part by financial flexibility and by the monitoring effect. However, I can look at theoretical and empirical work from innovation/entrepreneurship theories that have looked at how smaller, innovative firms must provide larger opportunities for long term gains (bonus, ownership and stock options). They must do this in order to recruit and maintain competent labour when they cannot compete with the larger firms in terms of offering a high fixed salary (see for example Barzel, 1995; March, 1991; March, 1994; Lambert & Larcker, 2004). From the findings in this thesis, small firms appear to have a lower financial flexibility compare to large. This may also be supported by that the retail trade is heavily dominated by four major corporations, as mentioned in the introduction. In addition, I found a consistent decline in number of establishments over the years, where there are fewer but larger establishments in the market.

6.2 Implications for practice

I provide some very limited implications for practice in terms of recommendations for policy makers and business managers. These are based on general tendencies found in the data on the use of variable wages.

Implications for policy making

Incentives proposing flexibility among employees and employers (firms) leads to innovations, creates revenues and values in both firm as well as society. It is important to consider whether policies create possibilities or limitations when considering how to add value to the company.

The bonus is the one wage component that might be hard to control, in terms of equality, since the bonus provides a high level of local negotiations at the firm level. This means that the wage development may be harder to control by the use of governmental policies. As the outcome of the variable wage is not known in advance by the wage receiver, it is more difficult to negotiate terms in which equality and protection of the individuals is emphasised. Difficulties of organising employees in unions can also be seen as an effect of such pay formations.

In several countries, the use of variable pay schemes seem integrated into policies. In this way, the policies protect some of the variable wage distribution. Guidelines need to be developed for information flow regarding firm bonus and bonuses in the chain of supply to

firms. One way of doing this might be to look at guidelines for how bonuses, in its various forms, are reported today. For instance, to report pay schemes (i.e. straight salary and variable wage) and not just the pay received. It is somewhat unclear what type of contract employees have. Are there groups of employees who are offered to work in an output-related pay system but fails to meet the criteria where a bonus is granted? If so, this might influence pay levels. These examples clearly show there is a lack of guidelines for how to address correctly the issue of distribution and information between the parties in the labour market.

Implications for business managers

I can sum up some of the different aspects of the bonus system that are worth considering for business managers. The information discovered from this thesis can be viewed as suggestions on which aspects to consider when developing future variable payment schemes. I will here present some strengths and weaknesses of using bonus. Some of these are general recommendations and some are direct implications from the research in this thesis.

Strengths

One strength of the bonus is that the wage formation is provides a higher flexibility within the firm. Second, bonuses may make production more efficient. Third, variable wage systems may lower the cost of wage negotiations, as the employee is able to influence his wage. Fourth, the bonus can be viewed as a way to control and therefore reduce the cost of monitoring. Fifth, the subjective sense of employee *happiness* may rise as a bonus is received. A bonus might give a social reward as co-workers see that the firm values the employee skills. Sixth, the bonus may motivate workers to perform the job according to the criteria of the employee, and reduce employer cost of hiring as employees, with desirable characteristics for the occupation in question, might be attracted by the variable pay formation. Finally, if used correctly, the bonus may be a powerful tool for creating high economic value within the firm as it provides the right incentives for improving and making value creation and production more efficient.

Weaknesses

The employees will probably prioritise tasks according to what is defined for reaching the target rate of production. This may suggest that focus is taken away from other important

areas of work. One such example is helping co-workers. Second, if employees receive bonus over a longer period of time, and the bonus suddenly is taken away due to for instance, expense cut in the firm – employees might be dissatisfied as they could have started to rely on bonus as fixed income. Third, bonus can be used as an incentive to get hired in the first place. And the higher the incentive is - the better foundation for recruiting the more desirable employees and motivating people who might be eligible for the job but who would not apply for certain occupations for various reasons. As several firms apply this strategy, the level of bonus might increase for each employee. Resulting in canalising a lower share of the income, by distributing more bonuses to the employee from the firm. Fifth, it is argued by some that bonus works against its purpose. A high bonus is given when times are good and company revenue high. Bonus is not given in times when company profit is low. Thus bonus does not motivate to create higher values in times of recession. Therefore bonus can, under some circumstances, have the opposite effect when it is needed the most. Finally, bonus may ruin or reduce firm value if used wrongly²², as large and unexpected bonus payment from employers to employees may result in levels of firm assets below what originally was planned, and may decrease shareholder value.

6.3 Implications for further research

Towards the end of this thesis, some aspects that should be regarded as important pointers for further research is provided:

Compare across industries

Study other segment in the labour market using panel data and compare with the trade studied in this thesis. Other areas, in particularly in the private sector are useful for comparison analysis, as differences between output related pay systems and straight salary are likely to be larger than in the public sector. It should be regarded as important to map how variable wages is used throughout the economy and the development trends for the case of Norway.

²² On January 28th, 2008, Norway's biggest media group of concerns Schibsted saw their stock value drop by 11.3%. One of the reasons for this was large unexpected bonus payments Schibsted had to make in some of the companies they own (Dagens Næringsliv, Feb 28th, p. 54).

How can bonus be used in recruitment?

Another important aspect can be to look at how bonus can be used for the recruitment of employees, in particular the recruitment of women. As indicated in this paper, stereotypic perception of male and female; good and bad wage negotiators are connected to a stereotypic perception. For the case of these data, occupational categories are connected with bonus. And one possible explanation for why there are fewer females in the occupational group might be because it is less desirable for females to work her. In other words, one possibility for decreasing gender wage inequality can be to offer better incentives for integrating females into certain occupations.

Bonus and firm performance

Compare statistics on bonus with firm financial data to see whether firms that perform better are the ones that pay out the highest total bonuses. Theoretically, using incentives such as bonus should increase the firm output in terms of total revenue to the firm. There seem however, to be lacking evidence on the connection between using economical incentives and how incentives lead to an increase in firm revenue.

In order to have full information regarding establishments and their income profile, one could use the same data as used in this thesis, but in addition have information regarding the revenues for each firm. It would then be possible to address how the use of bonuses are connected to the performance of the firm. Similar studies have been investigated in terms of bonuses given to leaders and firm performance in Norway (see Lismoen, 2006 & Lismoen, 2007).

Bonus and the innovation process in firms

As variable wages seem to have different purposes in small firms than large firms, case study of how economical incentives are used between various sizes of firms. One aspect of this, could be to address the innovative processes, as such processes are the foundation of firm growth and expansion. Central question could then be; does bonuses influence creative and innovative processes within the firm? Are entrepreneurial types more prone to desire such contracts that are high risk (as a form of gambling)? How is variable wages linked with innovation and risk sharing?

Gender and bonus

Differences between genders were not the focus of this thesis, and have thus only provided limited information on the subject. However, when discovering characteristics of the recipients of bonus, females are much less prone to receive a high bonus than males. Based on gender theory, one should continue exploring what might lead females to desire variable wage less, or why females in general receive lower bonuses than males.

7. References

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"All sources used in this thesis has been accounted for"