Saara Vaahtoniemi

Money, Merits and Gender

Essays on wage differentials

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TIIVISTELMÄ

Rahoitusalan työntekijöille maksetaan noin 20 prosenttia korkeampaa palkkaa kuin samankaltaisille työntekijöille muilla palvelualoilla. Tämä rahoitusalan palkkapreemio on suurempi miehille, ja sukupuolten välinen ero palkkapreemiossa kasvaa sitä suuremmaksi, mitä korkeammassa kohdassa palkkajakaumaa katsomme eroa. Tämä kertoo lasikattoilmiöstä rahoitusalalla.

Naisten osuus johtotason tehtävissä on kasvanut yli ajan. Kirjallisuudessa on osoitettu, että naiset voivat kasvattaa ylennyksen saamisen todennäköisyyttään korkeakoulutuksen kautta. Näytän, että korkeakoulutus tosiaankin kasvattaa tätä todennäköisyyttä, mutta kokonaisuudessaan miesten todennäköisyys ylennyksen saamiseen korkeakoulutuksen osalta on suurempi kuin naisten. Samoin yrityskohtaisen inhimillisen pääoman kartuttamisella on positiivinen vaikutus sekä miesten että naisten todennäköisyyteen saada ylennys, mutta miehille tämä vaikutus on suurempi. Palkankorotukset ylennyksen yhteydessä ovat suurempia miehille.

Palkkaeroja tutkitaan myös eri pankkityyppien välillä. Voittoja maksimoivissa liikepankeissa maksetaan korkeampaa palkkaa kuin sidosryhmäpankeissa, kuten osuus- ja säästöpankeissa. Toisaalta palkkahajonta on pienempää sidosryhmäpankeissa.

Avainsanat: Palkkaerot, rahoitusalan palkkapreemio, sukupuolten välinen palkkaero

ABSTRACT

Workers in finance are paid about 20 percent higher wages than similar workers in other fields. This finance wage premium is larger for men than it is for women, and the gender difference in this premium becomes greater towards the top end of the wage distribution, indicative of a glass ceiling effect in finance.

The share of women managers in finance has increased over time. The literature has shown that women can increase their probability of promotion through higher education. I show that indeed higher education increases the probability of promotion of women, however, the effect of higher education on the probability of promotion is larger for men than it is for women. Similarly, I show that firm specific human capital has a larger effect on men's promotion probability than women's. I show that wage increases upon promotion are smaller for women than they are for men.

Wage differentials between workers in banks with different ownership structures are studied. I show that workers in profit-maximizing shareholder banks are paid more than workers in stakeholder banks, such as cooperative or savings banks. Wage dispersion on the other hand is lower in stakeholder banks.

Keywords: Wage differentials, finance wage premium, gender wage gap

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In Suomussalmi,

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CONTENTS

LIST OF PUBLICATIONS

The dissertation is based on the following three essays:

(I) The finance wage premium: Finnish evidence from a gender perspective, Saara Vaahtoniemi. Published in Labour, 2021, 35, 412– 431.

(II) Gender differences in career outcomes: Evidence from Finnish workers in finance, Saara Vaahtoniemi

(III) Bank type and wages: Cooperative, Savings and Commercial banks, Panu Kalmi and Saara Vaahtoniemi

AUTHOR'S CONTRIBUTION

Publication I: "The finance wage premium: Finnish evidence from a gender perspective"

Sole author

Publication II: "Gender differences in career outcomes: Evidence from Finnish workers in finance"

Sole author

Publication III: "Bank type and wages: Cooperative, Savings and Commercial banks"

Coauthored with Panu Kalmi. Saara Vaahtoniemi: managing the data, data analysis, methodology, editing of the article and the text, main author of the sections 5-8. Panu Kalmi: data analysis, methodology, main author of the sections 1-4.

1 INTRODUCTION

This dissertation studies wage differentials and career outcomes in finance. The focus is on workers in banks and insurance companies.

Firstly, the matter is approached by examining the extent of the finance wage premium in Finland. I show that workers in finance are paid about 20 percent higher wages than similar workers in other fields in the service sector. I find large gender differences in the magnitude of the wage premium.

Second, the focus is turned on the factors affecting promotions in finance. I find that women face a higher threshold in getting promoted to manager level than men do. Wage increases upon promotion are smaller for women.

Finally, the wages of workers in different bank types are studied. The Finnish banking sector consists of shareholder banks, whose objective is to maximize profits, and stakeholder banks, that instead maximize the consumer surplus of their customers. The results show that pay in shareholder banks is higher, but wages and bonuses are more evenly distributed across all hierarchy levels in stakeholder banks.

1.1 Theoretical background

The essays in this article lean on theories related to labor market outcomes of workers. Schooling has played a large role in labor market outcomes in the economics theory on the issue. On the one hand, the human capital theory shows that education increases individuals' ability. Through education, individuals accumulate human capital which is rewarded in the labor market in higher wages.

Education is an investment that often takes several years before it pays off for the individual through higher salaries. Women on average spend more time outside the labor market, often due to larger responsibilities at the home. Thus as making educational choices, it has been traditionally argued that women may not wish to spend so much time on education and acquire as much human capital, if they expect to not use it and instead stay at home. This can be seen as one channel though which women and men are tracked into different occupations before even entering the labor market.

On the other hand, the essays build on the theory of signalling one's ability through schooling. There exists asymmetrical information in the labor market, where employers are not able to observe which applicants are of high ability. The signaling theory (Spence, 1973) assumes that employers learn about the worker's ability through observing the level of education the applicants have obtained. The workers

that have obtained a degree of a certain level signal that they are talented. Workers with low ability will not have completed a degree, because it would be too costly for them. Individuals with high ability take less effort to complete a degree and hence the completion of a degree can be interpreted as a signal of high ability of the worker to the employer.

Another central theoretical aspect of the essays are wage differentials. Compensating wage differentials can arise for example in a situation when a worker takes on a hazardous job and receives a premium for doing this potentially dangerous job. The logic behind the premium is that the worker would not accept a more hazardous job if they would not receive extra pay for carrying the risk. This theory of compensating wage differentials goes back to Adam Smith and his classic work The wealth of nations from 1776.

Compensating wage differentials could partially explain some of the gender wage gap. If, say, on average men are more likely to take on a risky job to receive higher pay than women are, then this would lead to men having higher wages on average.

When direct evidence on different pay for the same job for women and men is found, it can be said to be due to discrimination. However, this kind of evidence is difficult to pinpoint, because it is hard to tell how similar job tasks certain job titles include in practice. These could differ significantly even within the same firm, as well as between firms.

1.2 Why finance?

The finance industry in Finland provides an intriguing setting to investigate these issues. Finance is a high-paid field and the majority of workers in finance are women. However, the majority of women work in clerical level positions, while men are a majority at the manager positions. This kind of occupational segregation is higher in Finland than it is in many other high-income countries and it is particularly evident in finance.

The size of the finance industry in Finland is smaller than the EU-average, and the number of workers in finance has been decreasing since the 1990's (for a description on the developments of the finance industry in Finland from the 1990's to the early 2000's see eg. Alhonsuo, Pesola, and Toivanen (2006)). Traditionally, the reasons given for the small size of the finance industry have been the fairly small amount of financial wealth that the Finnish population has accumulated.

The focus on the wages in finance have resulted in a large body of literature in the aftermath of the financial crisis of 2008. The interest in the pay of finance workers

in particular stems from the literature trying to find reasons that lead to the financial crisis. One of these explanations is that the incentives of workers in finance could have been organized in a way that increased risk taking, and therefore would have lead to excessive risk taking on a systemic level. For instance, Crotty (2009) shows that financial innovation created instability in the system after deregulation.

Oyer (2008) on the other hand shows that the time of graduation affects the life cycle earnings of finance workers. The graduates that land a Wall Street job upon graduation are likely to work there longer and accumulate large lifetime incomes, while the chances for getting a Wall Street job in the first place are lower in a recession.

The finance industry has been shown to contribute to the growth in top incomes. For instance, Lemieux and Riddell (2015) show that finance is behind the growth of top incomes in Canada.

Furthermore, Philippon and Reshef (2012) have showed that finance has increasingly attracted talent more so than other fields. Gupta and Hacamo (2019) have showed more specifically that finance attracts talented engineers away from other sectors to work in finance. These findings have raised the question of whether it is socially optimal that the brightest students are attracted to finance (Baumol, 1996).

Another strand of literature on finance workers examines the finance wage premium. Philippon and Reshef (2012) show that in the United States, the relative pay in finance compared to the rest of the private sector has greatly increased after deregulation. They show that finance has become more skill-intensive and highly paid starting from the 1980's. A similar increase in pay and skill level in finance was found in the years leading up to the Great Depression in the 1930's. The authors argue that the deregulation of finance attracted creative, high-skill workers into finance, who were pushed away during times of high regulation.

While Philippon and Reshef (2012) focus on the workers in finance in the United States, Lindley and McIntosh (2017) provide evidence of the finance wage premium in the United Kingdom. Boustanifar, Grant, and Reshef (2018) on the other hand provide an international comparison of the magnitude of the finance wage premium. Bell and Van Reenen (2010) study the finance wage differential associated with different parts of the wage distribution.

Much of the above research on finance wages is on the United States, as well as the United Kingdom, that has had a large banking center for Europe. The wages of finance workers are higher in these countries than they are in Finland, and there has been research on a possible 'brain drain' from other countries into high-paid positions in finance (Boustanifar et al., 2018). Finland on the other hand is a country with a much more compressed wage structure. The essays in this thesis provide insight of how the finance wage premium and other dynamics play out in a Nordic

welfare state.

1.3 Gender wage differentials

The majority of workers in Finnish banks and insurance companies are women. The share of women in finance is close to 75 percent. Since finance is a high-paid field, persisting gender wage differentials in finance are reflected in the overall gender wage gap. This thesis shows that in Finland, a country regarded to be amongst the ones with a very high level of overall equality, there are large gender differences in pay in finance.

There have been many reasons offered in the literature on why women's wages lag behind of those of men's and why women are promoted. When it comes to promotions, women have been observed to apply for promotions less frequently than men, (see eg. Bosquet, Combes, and García-Peñalosa (2019) for academic economists and Hospido, Laeven, and Lamo (2020) for central bankers).

Goldin (2014) has shown that in fields where the skill sets across all workers is fairly similar, such as pharmacies or veterinarians, the workload is more evenly shared and the gender wage gap is consequentially smaller. This way the workplace does not hinge on any one person that is irreplaceable. In these fields, pay dispersion is lower. Gender differentials in pay are on the other hand shown to be larger in fields where this irreplaceability plays a role. Finance is shown to be one of these types of fields.

Even though Finland is considered a country with a high level of gender equality, the labor market in Finland is segregated into jobs more typical for women and those more typical for men.[1] This occupational segregation begins at the choices of education that men and women make, which then lead to different professions, as was described in section 1.1. This occupational segregation can be clearly observed in finance. The majority of workers in finance are women, and the majority of women in finance work at clerical level. Men in finance, on the other hand, work more often at manager level positions, while the gender distribution at expert level is close to 50-50.

A big reason behind gender differentials in pay are related to care duties outside of work life. The effect of family leaves on the career paths and labor market attachment of young adults in Finland is studied by Kuitto, Salonen, and Helmdag (2019). Especially, the authors focus on the effect of career breaks from parental leaves on the early career. They find a large gender wage gap of around 30 percent, which is mostly due to longer parental leaves of mothers. It has been shown by Kleven,

[1] See eg. Albrecht, Björklund, and Vroman (2003) and Dolado, Felgueroso, and Jimeno (2001)

Landais, and Søgaard (2019) that the 'child penalty' brings about 20 percent lower wages for women in Denmark, a similar Nordic country as Finland. Also, Manning and Swaffield (2008) show that women who do not have children also earn less than similar men, such that it could be the sole expectation of having a career break in the future that could negatively affect the wages of women. This would be part of the unexplained part of the wage gap, amounting to discrimination.

1.4 Shareholder and stakeholder banks

In Finland, the banking industry consists of profit maximizing shareholder banks, and of stakeholder banks, such as cooperative and savings banks, that maximize the consumer surplus of their customers. Investigating the wage differentials between shareholder and stakeholder banks contributes to the literature on wage differentials in non-profit versus for-profit organizations.

A strand of literature comparing the wages of for-profit versus not-for-profit firms (Preston, 1989) argues that non-profit workers are willing to accept a lower wage in return for the possibility to contribute to positive social externalities. This issue is carried over to banking in Bailly, Chapelle, and Prouteau (2017), who find that banking cooperatives in France pay lower wages to their employees than shareholder banks do, but the cooperatives reduce the difference by higher wage equity.

The findings of the final essay of this thesis examines these wage differentials between the different types of banks operating in the Finnish banking market. Base wages in shareholder banks are found higher than in stakeholder banks, analogous to the findings of Bailly et al. (2017).

Furthermore, Bell and Van Reenen (2014) show that bonuses are in a large part behind the growth of incomes in finance. In Finland, it is commercial banks that pay the highest bonuses and base wages within finance. Stakeholder banks, that is, cooperative and savings banks, pay lower base wages than commercial banks do. However, cooperative banks pay bonuses at all hierarchy levels at similar frequencies. In commercial banks, the bonus payouts are concentrated at the top manager level.

1.5 Structure of the introduction

The rest of this introduction is organized as follows. Section 2 describes the central methods used to tackle the questions presented in the essays, and describes the data used in the essays. Section 3 provides a summary of each essay. Finally, section 4

concludes. The complete essays are given in their own sections after that.

2 METHODOLOGY AND DATA

This dissertation uses the methods of empirical microeconometrics to investigate the research questions. I take advantage of Finnish registry data in panel form, where I can follow workers at individual level from year to year. Each of the essays provides their own, more detailed section on the empirical method used. This section gives a brief summary of the data and the central methods used.

2.1 Data

I use wage data obtained from the Confederation of Finnish Industries (EK), which is the central organization that represents the employer organizations of Finnish industries. The data is collected for the purposes of collective wage bargaining between the employer organizations and trade unions of each industry.

The data covers about half of the entire Finnish private sector, and 96 percent of the firms are small and medium enterprises. The yearly wage survey sent out to the firms by the EK has a high response rate, since firms are obliged to respond to the survey with few exceptions. The data is highly reliable, since it is based on the administrative records of the firms.

The EK wage data is divided into three main sectors: production workers, non-production workers, and service sector workers. The data used in this thesis takes advantage of the service sector workers' data, where the finance workers, that is, workers in banks, insurance companies, and such, are found.

The service sector data include over 4,4 million person-year observations. The share of women in the service sector is 66 percent, and that in finance is 74.7 percent. The EK data covers practically all Finnish banks and insurance companies. 18.8 percent of the service sector workers are workers in finance.

The data is well suited to investigate questions related to wage differentials. It provides detailed information on the demographics of the workers, including their gender, age, seniority at the firm, their educational background, to name a few. The data is panel data, where I can follow individual workers and their careers over time. Furthermore, the data provides information on the base wages of workers, and it reports bonuses and provisions paid to the workers separately.

The data include information on the workers job titles. This feature is utilized especially in essay 2, where I investigate gender differences in promotions. The good thing about job titles is that we can assume that they are very similar both within and between banks. On the flip side, however, we cannot be sure of this. Tasks with

workers holding the same job title could be different. When thinking of the traditional sense of discrimination we cannot be directly sure that if we observe a wage differential between men and women in the same job title that it would definitely refer to discrimination.

2.2 Methods

To investigate the associations of different factors on an individual's wage, I take advantage of wage regressions.[2] This framework uses a simple pooled OLS (Ordinary Least Squares) model to investigate the associations of the independent variables on logarithmic wages. In this framework, I show in the first essay that working in finance is positively associated with the worker's wages.

Because the pooled OLS model described above cannot account for the individuals' ability, the finance coefficient may be biased upwards simply because workers with higher ability are self selecting into finance. To tackle this well-known issue in the literature, I use the individual fixed effects (FE) model to control for these time-invariant individual level differences of finance and non-finance workers.

The pooled OLS as well as the individual FE method gives the coefficients for the variables studied on the worker's wage on the average. To look at associations of the variables at different points of the wage distribution, I turn to quantile regressions. This method allows for looking at the association of a variable on wages at say the very top or the bottom of the wage distribution. For instance, in the first essay of this dissertation, the positive association with wages from working in finance is found to be larger at the top of the wage distribution.

To investigate the probability of a worker receiving a promotion, I use logit and linear probability models (LPM). This allows me to investigate the factors associated with the probability of getting promoted. For example, the second essay shows that the sign of the variable female is negative on the probability of receiving a manager promotion.

A standard way to investigate wage differentials between two groups is the Oaxaca decomposition analysis.[3] I use this method in the third essay to study the differences in the characteristics of workers in shareholder versus stakeholder banks.

[2] see eg. Mincer (1974).

[3] See Oaxaca and Ransom (1994) and Neumark (1988); Jenn (2008) gives a practical overview on how to execute the method in Stata

3 SUMMARIES OF THE ESSAYS

The summaries of the essays are given in this section. Each of the essays looks at pay in finance from different perspectives.

The first essay focuses on the finance wage premium and the gender difference in that premium. It shows that finance workers get paid around 20 percent higher wages than similar workers in the rest of the service sector, and that this premium is largest for men at the top of the wage distribution.

The second essay looks at gender differences in promotions within finance. It shows that both women and men can increase their probability of promotion through higher education and firm specific human capital, however, these factors have a larger effect on the promotion probability of men. Women face a higher threshold in getting promoted to top manager than they do in progressing on their careers otherwise.

Finally, the third essay investigates wage differentials between shareholder and stakeholder banks. The essay shows that profit-maximizing shareholder banks pay higher base wages than stakeholder banks do. Pay distribution within banks is on the other hand more evenly distributed in stakeholder banks.

I. The finance wage premium: Finnish evidence from a gender perspective

This essay contributes to the literature on the finance wage premium. It shows that workers in finance receive a wage premium of about 20 percent compared to similar workers outside finance. The finance premium is found to be smaller than in the US or the UK. This is to be expected, since the wage distribution is more compressed in Finland.

This essay further provides evidence on the gender differences in the finance wage premium. The wage premium is larger for men and becomes considerably larger towards the top end of the wage distribution. Men at the top of the finance wage distribution claim the highest premiums. Women have progressed to manager positions over time, but their wages have not caught up with men's. The gender differences in pay stem for a large part from the occupational segregation, which is found also at manager level. Women work in managerial positions that are not paid as much. Men are more often found as managers of investments teams, whereas women are more often managers of marketing teams.

Large gender differences in pay in the top income fields contribute to the overall gender wage gap. The observed gender differences in the finance wage premium become larger as moving towards the top of the finance wage distribution. Women in finance earn less than men do at all hierarchy levels. The gender differences in pay are largest at top positions in finance.

Over time, women in finance have progressed to manager level positions. In the early 1990's, the share of women managers in finance was only about 15 percent, whereas by 2014 the share of female managers had increased to 45 percent. However, the rise in managerial women's pay has not caught up with that of manager men.

Prior research (Bell & Van Reenen, 2014) has shown that bonuses play a large part in contributing to the finance wage premium. The differences in pay between men and women in finance seems to stem to some extent from differences in the amount of bonuses paid out to workers. For instance, this essay shows that female experts make on average smaller bonuses than clerical level men do.

The reasons for why women's wages lag behind those of men are likely due to multiple reasons. Occupational segregation is high in Finland. Thus, the differences in educational choices already lead the path of men and women on to different job opportunities. Much of the overall difference in the gender gap in pay in finance stems from the fact that the majority of women in finance work in clerical level jobs. However, the gender difference in the wage premium at the top becomes increasingly larger the higher we move up on the wage distribution, which is indicative of a glass ceiling effect in finance.

The literature has given some explanations on why pay is lower for women than it is for men in higher positions. It has been shown that in high-skill occupations, leaves from the work force are a significant factor contributing to the gender wage gap. This phenomenon is likely at play here as well. Even though the share of women at manager level has increased, women managers are more often found in lower paid manager positions than men. If women are expected to have longer leaves from the workplace due to family reasons, they may be tracked into or end up with less demanding managerial jobs, that are subsequently also paid less.

II. Gender differences in career outcomes: Evidence from Finnish workers in finance

The share of women in manager positions in finance was found to have greatly increased over time in the first essay. This essay in turn looks at the factors affecting the probability of promotions in finance. The literature on the invisibility hypothe-

sis put forth by Milgrom and Oster (1987) suggest that women benefit from higher education when it comes to promotions. Empirical evidence by Cassidy, DeVaro, and Kauhanen (2016) confirms this with a Finnish sample of white-collar manufacturing workers, where the majority of the workers are men.

This essay shows that women face a higher threshold in being promoted up to manager level than in progressing on their careers otherwise. The essay reveals that the probability of getting promoted to a manager position is smaller for women than it is for men. Women on the other hand are promoted to expert from the clerical level more often than men are, but the share of men promoted to expert is large given how small the share of men in clerical level is to begin with. However, when looking at career moves in general, defined as a job title change accompanied by a wage increase, the negative female association turns positive.

Women benefit from having a graduate level degree in getting promoted. This is also true for men. The total association of higher education with the probability of promotion is, however, larger for men. This points to the direction that women do benefit from higher education when it comes to promotions, but this association from higher education is still larger for men than it is for women.

The literature (Frederiksen & Kato, 2018) has shown that having experienced multiple different job titles, or roles, within the firm increases one's chances of getting promoted as manager. Promotions within the firm are most common in the sample studied, therefore highlighting the meaning of accumulating firm specific human capital through job rotation within the firm when it comes to promotions. In this essay, I further investigate whether there are differences between men and women in the probability of promotion from having experienced more roles within the firm. The results show that both men and women increase their probability of manager promotion with more firm-specific human capital, but for men this association is consistently larger than it is for women.

The highest pay in finance is concentrated to men. Even though the share of women at manager level in finance has increased greatly within the last 30 years, the wages of women have not caught up with those of men. This essay shows that wage increases upon promotion are smaller for women than they are for men across all hierarchy levels, thus further contributing to the findings of lower pay of women at manager level.

III. Bank type and wages: Cooperative, savings and commercial banks

This essay asks whether bank ownership type has an effect on the pay of workers in the different bank types. In prior literature, differences in lending behavior (Ferri,

Kalmi, & Kerola, 2014) and performance (Iannotta, Nocera, & Sironi, 2007) between different bank types have been found, however, there has been little evidence on the wage differentials in different types of banks. There is a strand of literature examining wage differentials in for-profit and nonprofit firms, where differences in the wage setting of the two types of firms are found. Bailly et al. (2017) look at wage differentials in French cooperatives versus conventional firms, and extend the analysis further into cooperative versus profit-maximizing banks.

In the literature, for-profit firms are shown to have higher wages than their nonprofit counterparts.[4] Workers in nonprofits are argued to accept lower pay, because they get part of their utility from serving a cause.

This essay shows analogously that profit-maximizing shareholder banks pay more to their workers than stakeholder banks do, whose objective is to maximize the consumer surplus of their customers. On the other hand, pay in stakeholder banks is more evenly distributed than in shareholder banks.

Shareholder banks pay higher wages and bonuses to their workers than stakeholder banks do. However, the frequency of bonus payments is higher in stakeholder banks. In cooperative banks, bonuses are paid evenly at all hierarchy levels, whereas in commercial banks bonuses are much more concentrated to the manager level.

The decomposition of the wage gap reveals that the unexplained part of the wage gap is positive, meaning that stakeholder banks pay more to their employees than would be expected solely based on their observable characteristics. This result is in line with Bailly et al. (2017). The factors that are found to contribute to the positive unexplained component are having more seniority at the firm, being a woman, living in the capital city region and the size of the bank.

[4] see eg. Leete (2000)

4 CONCLUSIONS

Workers in finance are paid more than similar workers in other fields, but this finance wage premium is mainly claimed by men on the top of the hierarchy. Even though the share of women in manager positions in finance has increased, their pay has not caught up with that of men.

Job segregation in finance is high, so that over 80 percent of clerical level workers are women. Fewer women are promoted, since many of the clerical level jobs lack a natural promotions path up to higher positions.

Women work at lower paid managerial positions than men do. The managerial tasks women hold in finance could be such that they are more easily transferred to another worker taking over for the time of a possible longer leave from the work place, such as a maternity leave. Flexible hours are also important to keep the work and family life in balance. Goldin (2014) has shown that for jobs that are not so dependent on any one single person taking care of the tasks, such as veterinaries or pharmacists, the gender wage gap is smaller. The findings in this thesis thus add to the evidence that finance remains such a field where tasks are not easily transferable, resulting with women working in less demanding managerial positions. This is seen as the main component in the remaining gender wage gap in the literature.

Bonuses have been shown to contribute to the finance wage premium. Bonus payments are paid out more frequently and distributed more evenly across the different hierarchy levels in stakeholder banks than in shareholder banks. The decomposition analysis of the wage gap showed that workers in stakeholder banks get rewarded for their characteristics more so than what could be based solely on their characteristics. The share of women is higher in stakeholder banks than it is in shareholder banks, with the share of women being 84 percent in the former and 77 percent in the latter.

Essay 3 further showed that contrary to the effects overall, experts and professionals in cooperative banks get paid more than in commercial banks. It could be that women are sorted into working in cooperative banks, where wage dispersion within the bank is lower to start with than in commercial banks.

One of the conclusions drawn in essay 3 is that stakeholder banks may attract workers who place a high value on wage equity, and would therefore be willing to accept lower pay in exchange for higher wage equity. In light of the findings in this dissertation as well as prior literature, it may well be that some women are sorting into working in stakeholder banks because of the views of the ownership type system of stakeholder banks being seen as promoting more equality.

Bonuses are also tied to the gender wage differential in finance. Goldin (2014) has

argued that finance and some other fields, such as law, require their employees to work odd hours. If we are to assume that bonuses are paid for a job well done, it would be the type of workers that can meet these requirements successfully that would be rewarded by bonuses. This would make it harder for workers with obligations to the family life schedules, more often resting on the shoulders of women, to respond to these work requirements. This is regarded as one of the channels behind the large gender differences in pay within finance.

The literature (Bertrand, Goldin, & Katz, 2010); (Goldin, 2014) has shown that the type of work indeed matters in determining how large the remaining gender wage gap is. Specifically, finance and law are fields that have long hours, and being on-call with short notice is common in these fields. I found that in finance, the gender differences in pay are large when looking at the bonuses paid to workers, where for instance, the bonuses of clerical level men were larger than those of expert women's.

It will be the interest of a new strand of literature on how the COVID-19 pandemic may impact the flexibility of the job tasks in finance and law, when much of this work has been done remotely during the pandemic. It remains to be seen whether this kind of shift in the way work is organized will have an impact on the gender wage gap within finance and overall.

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ORIGINAL ARTICLE

The finance wage premium: Finnish evidence from a gender perspective

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Abstract

The growth in finance wages has contributed to the increase in top incomes over the last decades. The finance wage premium has been studied from various viewpoints in recent years, however, not from the gender perspective. Studies have shown that the gender wage gap tends to increase at top incomes. As finance wages are increasing and if the benefits of working in finance are mostly claimed by men, the overall gender wage gap will persist. Using Finnish registry data from 1990 to 2014, this paper shows that the finance wage premium differs considerably between men and women. Overall, the finance premium has increased over time. The premium of men is larger than that of women at all hierarchy levels. Women at manager and expert positions in finance get a premium, but not at clerical level. Men on the other hand receive a premium at all hierarchy levels. The negative female effect is larger at higher points of the wage distribution, indicative of a glass ceiling effect. For men, the premium has increased especially at the top of the wage distribution.

JEL CLASSIFICATION
J13; J16

1 | INTRODUCTION

There has been a growing body of literature showing the increase in finance wages since the 1980s, including Philippon and Reshef (2012), Lindley and McIntosh (2017) and Boustanifar et al. (2017). The rising wages in finance have been shown to explain a large share of the growth in top incomes in many countries, such as Canada by Lemieux and Riddell (2015) and the United Kingdom by Bell and Van Reenen (2014). Internationally, finance is regarded to be a top-income field. Prior research has shown (Bertrand et al., 2010) that towards the top of the income distribution, the gender wage gap tends to increase, and fewer women are found in the top-income brackets. Furthermore, Fortin et al. (2016) have shown that the missing women from the top of the income distribution explain a large part of the overall gender wage gap.

According to Blau and Kahn (2017), the gender wage gap has declined more slowly at the top of the wage distribution compared with the middle or the bottom of the distribution. The authors show that in high-skill occupations, shorter hours and leaves from the workforce are significant factors in the gender wage gap. Albrecht et al. (2003) find a glass ceiling in Sweden, meaning that the gender wage gap increases significantly towards the top of the wage distribution. A possible explanation offered for this in the literature is that women may either choose or in other ways end up with less demanding jobs because of family leave policies. The arrival of children affects women's careers differently than men's. Kleven et al. (2019) have shown that there is a 'child penalty' on wages for women in Denmark of about 20 per cent. The analysis here cannot account for the arrival of children due to lack of data; however, the glass ceiling effect is investigated in the context of quantile regressions, where the finance wage premium is studied at different points of the wage distribution. If the wage premium of women at the top of the wage distribution is much smaller than that of men, the results would point to the existence of a glass ceiling within finance.

The wages in finance have been researched from various viewpoints in recent years. The role of talent in the high wages in finance has been studied by Célérier and Valleé (2019), who show that in France, finance workers are paid higher returns on talent. The results of Böhm et al. (2018) suggest that finance workers in Sweden capture rising rents over time. The finance wage premium has been further studied from the point of view of business cycles by Oyer (2008) as well as Axelson and Bond (2015), and at various points of the wage distribution by Bell and Van Reenen (2010). However, little has been said on the gender differences in the finance wage premium.

This paper fills this gap in the literature by providing evidence on the differences in the finance wage premium between men and women using Finnish registry data from the private sector in services for the years 1990 to 2014. The wage premium is measured as the effect on wages when a worker is employed in finance. Overall, the finance wage premium has been growing over time. However, the finance premium of women is smaller than that of men and the difference in the magnitude of the premium between men and women becomes the largest at manager-level positions. For men, the finance premium has increased after the global financial crisis, particularly at the very top of the finance wage distribution. However, this paper observes the high top-end wage premium for men only, suggesting that in finance where the majority of workers are women, the high and rising wage premium is claimed primarily by men. Women in finance also earn a premium compared with women in the rest of the private sector in services, but only at expert and manager positions. Women have been able to progress up to a certain level, but at the top of the wage distribution, the difference in the premium between men and women becomes larger. Over time, however, the negative effect on wages for women has somewhat decreased at the higher quantiles, while the wage premium of men has increased.

Overall, the effect of working in finance is found to be positive over time and throughout the wage distribution in the Nordic setting, where the wage structure is more compressed[1] than in many other

countries. The finance wage premium documented in Finland is found to be lower than that in the UK shown by Lindley and McIntosh (2017). In an international comparison of the finance wage premium, Boustanifar et al. (2017) show that the premium in Finland is internationally fairly low, while the finance industry in Finland is nevertheless shown to be relatively skill-intensive.

Bell and Van Reenen (2014) show that the growth in bonuses of finance workers explains a large part of the wage growth in the top end of the wage distribution of finance workers. After the global financial crisis in 2008, there have been concerns for a possible conflict of interest of finance workers maximizing their short-term bonuses and hence taking too much risk, possibly even being one of the reasons leading to the financial crisis of 2008.[2]

Furthermore, Bell and Van Reenen (2010) provide evidence supporting Rosen's 'superstar effect' (Rosen, 1981) being behind the extreme finance sector wage growth in the United Kingdom. The superstar effect first presented by Rosen (1981) is described as the wage effects in the top of some field, where a small number of workers earn large incomes. While this paper cannot directly document such superstar effects in the case of the Finnish finance sector, the results do, however, show that the largest premiums are claimed by men at the very top of the finance wage distribution.

The rest of the paper is organized as follows. Section 2 describes the data, and the gender composition and development of finance wages is described in Section 3. The empirical approach is introduced in Section 4 and 5 reports and discusses the results. Section 6 concludes.

2 | DATA

The data are drawn from a large, linked employer–employee panel of firms in the private sector in Finland. The data are collected for the purposes of central wage negotiations by the Confederation of Finnish Industries (EK), which is the central organization of Finnish employer associations. Minimum wage levels and minimum wage increases are set by negotiations between the central organizations of employers and trade unions for each industry. These minimums are binding for each industry; however, there is no upper limit set by the negotiations. In practice, this means that the wages set by the collective bargaining system are universally binding, so that workers that are not members of the union are also covered by the wages set at the collective level. Asplund (2007) as well as Vartiainen (1998) give a detailed description of the wage-setting process through the bargaining system in Finland.

The data collected by EK are based on the firm administrative records, which results in reliable, accurate data. EK-affiliated firms are of all sizes, representing about half of the entire Finnish private sector. Of the EK-affiliated firms, 96 per cent are small and medium enterprises. The member firms are obliged to respond to the annual wage survey. This gives nearly a 100 per cent response rate, whereas only the smallest firms in some special fields are exempt from the response obligation.

The complete EK data consist of production workers, non-production workers and service sector workers. The data collected from these different sectors vary slightly. The analysis in this paper is restricted to workers in the service sector, where the employer organization for the finance and insurance sector belongs to.[3]

The service sector wage survey is conducted in October each year.[4] It includes all workers in the member companies, excluding the chief executive officer, workers who are owners of the company or are working there because of their family relations, workers abroad, workers on study leave or family leave, sabbatical or sick leave, and workers who have not for some other reason had any wage income during October. The data include both monthly wage earners and hourly paid workers, as well as part-time workers, fixed term workers and trainees.

The service sector data consist of over 4,4 million person-year observations, of which 66 per cent are women. The high share of women is explained by occupational segregation by gender. Traditionally, the jobs that men and women do differ and the more common jobs of women are in the service sector as opposed to manufacturing being dominated by male workers. Over the years from 1990 to 2014, the number of individual persons is 655,983 and individual firms is 9801. Of the total workers in services, 18.8 per cent are workers in finance, according to their main occupational classification code. The data include practically all banks and insurance companies in Finland, but not all of the smallest of service sector firms would be covered in the EK survey, which explains the seemingly large share of finance workers. The share of women in finance is 75.2 per cent.

Table 1 reports the descriptive statistics. The total monthly wages are real monthly wages in 2010 Euros. They include fixed monthly pay, bonuses, provisions, other supplementary payments and performance-related pay. Age and seniority are expressed in years. The variable female is an indicator variable which takes the value 1 if the individual is female and 0 otherwise. Similarly, capital area is an indicator variable taking the value 1 if the worker lives in the capital city area of Finland and 0 otherwise.

Secondary education, BA and GRAD are education-level dummies indicating the highest education level of the individuals has obtained. The Finnish education system went through a degree reform in 2005, and the polytechnic education system was gradually introduced in the beginning of the 1990s. Böckerman et al. (2009) give a description of the polytechnic reform and the Finnish education system in general, while Kalenius (2017) describes what needs to be taken into consideration when comparing higher education levels of workers in Finland when the time span covers the polytechnic education system reform. Thus, the degrees listed in the data are not directly comparable over the years. However, when divided into the three major educational background indicators, they give the level of education the worker has completed. The GRAD group includes workers with a graduate-level

TABLE 1 Summary statistics, 1990–2014

	Finance workers			**Non-finance workers**		
	All	**Women**	**Men**	**All**	**Women**	**Men**
Total monthly wage	3010.9	2580.7	4316.2	2271.6	2018.6	2775.3
	(1788.1)	(1090.5)	(2650.5)	(1259.7)	(984.4)	(1560.5)
Age	43.3	43.8	41.8	39.3	39.6	38.6
	(9.97)	(9.88)	(10.07)	(11.77)	(11.95)	(11.36)
Seniority	14.9	16.11	11.6	8.8	8.9	8.6
	(11.13)	(11.35)	(9.73)	(8.77)	(8.82)	(8.65)
Female, %	75.2			66.5		
Capital region, %	56.7	52.4	69.9	51.5	48.7	57.1
Secondary education, %	59.4	64.7	43.3	53.6	54.6	51.7
BA, %	27.5	26.1	31.5	22.1	23.1	20.1
GRAD, %	9.8	5.4	23.0	8.9	7.3	12.2
Observations	973,633	732,291	241,342	4,200,466	2,795,609	1,404,857

Note: Descriptive statistics. Standard deviations in parentheses. Total monthly wage is expressed in 2010 Euros and includes the regular wage and bonuses. Age and seniority are expressed in years. Female is a dummy variable taking the value 1 if the individual is female and 0 otherwise. Capital area is a dummy variable taking the value 1 if the individual lives in the capital city area of Finland, and 0 otherwise. Education categories are dummy variables indicating the individual's highest degree.

degree, such as a master's degree or a doctorate degree. The category BA includes workers with an undergraduate degree, including the polytechnic degrees, and the final category includes workers with less than an undergraduate degree, such as a high school diploma or similar level vocational training.

The EK service sector data are suited well for the purposes of this paper. It includes detailed information on the worker's job titles and occupation. Finance workers are defined as workers whose main occupation listed in the data belongs to the finance or insurance companies.[5] The sample is further restricted to include only full-time workers whose age is between 18 and 65 years. In finance, 5 per cent of the workers are part-time workers, while in the rest of the private sector in services, the share of part timers is 16 per cent. Full-time workers are defined as workers whose regular working hours are more than 30 h per week. This definition remains the same throughout the sample years. Furthermore, the data report the hierarchy level of all the workers in finance. This classification thus allows to investigate the finance premium associated with different hierarchy levels.

3 | GENDER DIFFERENCES IN FINANCE

There are some differences in the observed variables between men and women in finance. For instance, the education level of men is on average higher than that of women in finance. Table 1 shows that the share of men in finance with a graduate-level degree is 23 per cent, while for women, the share is only 5.4 per cent. The share of workers who have a bachelor level degree is more even between the two genders, where that of men is 31.5 per cent and for women it is 26.1 per cent. The share of women with secondary-level education on the other hand is higher. These differences are reflected in the job types that men and women hold in finance, which is thus also reflected in the wages of these jobs. Furthermore, there are somewhat more men working in the capital region of Finland, where the wages are higher. However, women are on average a bit older than men in finance and have longer careers than men.

Figure 1 plots the average wages in finance and non-finance over the sample years from 1990 to 2014. The measure of wages is the monthly wages of workers in 2010 Euros. The wages reported are total wages, which include bonuses and other additional payments on top of the fixed pay. As can be seen, on average the wages in finance are higher than in the rest of the service sector. However, the wages of women in finance are remarkably lower than that of men, especially so in finance. The wages of women in finance are at a similar level as that of men in non-finance.

The rough graph of Figure 1 masks the differences stemming from the fact that there are more women in clerical level jobs in finance than there are men, which will obviously have an impact on the average wages of men and women, whereas clerical workers are paid less than managers. Occupational segregation has been shown to be higher in Finland than it is in some other European countries or in the United States.[6] This occupational segregation is thus reflected in the average wage differences between the two genders in finance, when more women are working at clerical level and men are a majority at manager level. However, Albrecht et al. (2003) highlight that in the context of the glass ceiling effect, occupational segregation cannot be seen as an explanation for the effect itself but rather it is a form in which the glass ceiling effect takes place.

Figure 2 shows the gender composition within the different hierarchy levels within finance. Overall, the share of women in finance is high. It has declined slightly from 76 per cent in 1990 to 69 per cent in 2014. In other Scandinavian countries, the gender distribution within finance is more even. What is notable is that the vast majority of women in finance work at clerical level jobs, reflective of the strong occupational segregation. The share of women at clerical level jobs in finance has remained high, at above 80 per cent, throughout the sample years. The share of women versus men

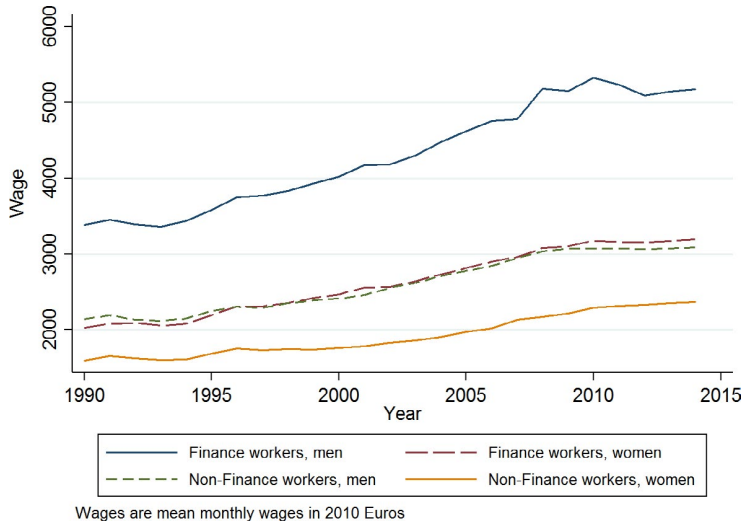

FIGURE 1 Mean wages of finance and non-finance workers, 1990–2014

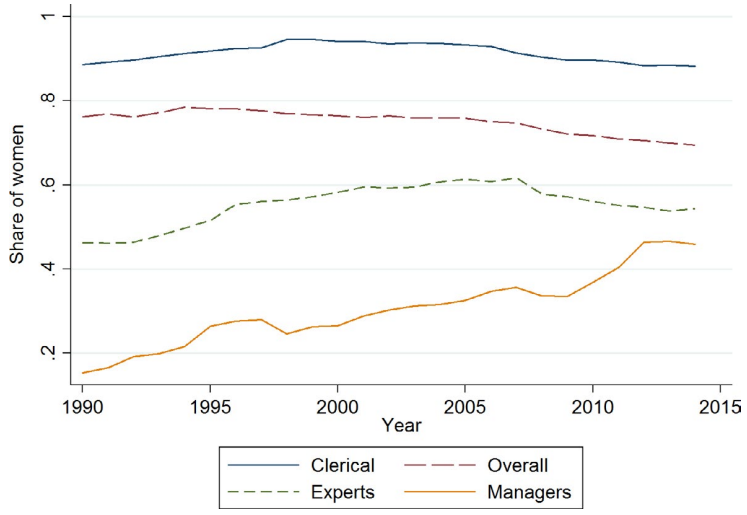

FIGURE 2 Share of women in finance, 1990–2014

at the expert level is more evenly distributed and has increased steadily from 46 per cent in 1990 to 54 per cent by 2014. The largest increase in the share of women has been at the manager level. The share of women in manager-level positions has greatly increased from around 15 per cent in 1990 up to 45 per cent by 2014.

The focus is turned next into the gender differences in pay within the hierarchy levels. Figure 3 plots the wages of finance workers at the three different hierarchy levels, differentiating by gender. The largest increase in wages has been at the manager level; however, the rise in the wages of manager men has been more steep than that of manager women. At the expert level, there have also been quite large increases in the average monthly wages over time. At the clerical level, the increase in finance wages has been more moderate. On average, the wages of men are higher than women's at all of the

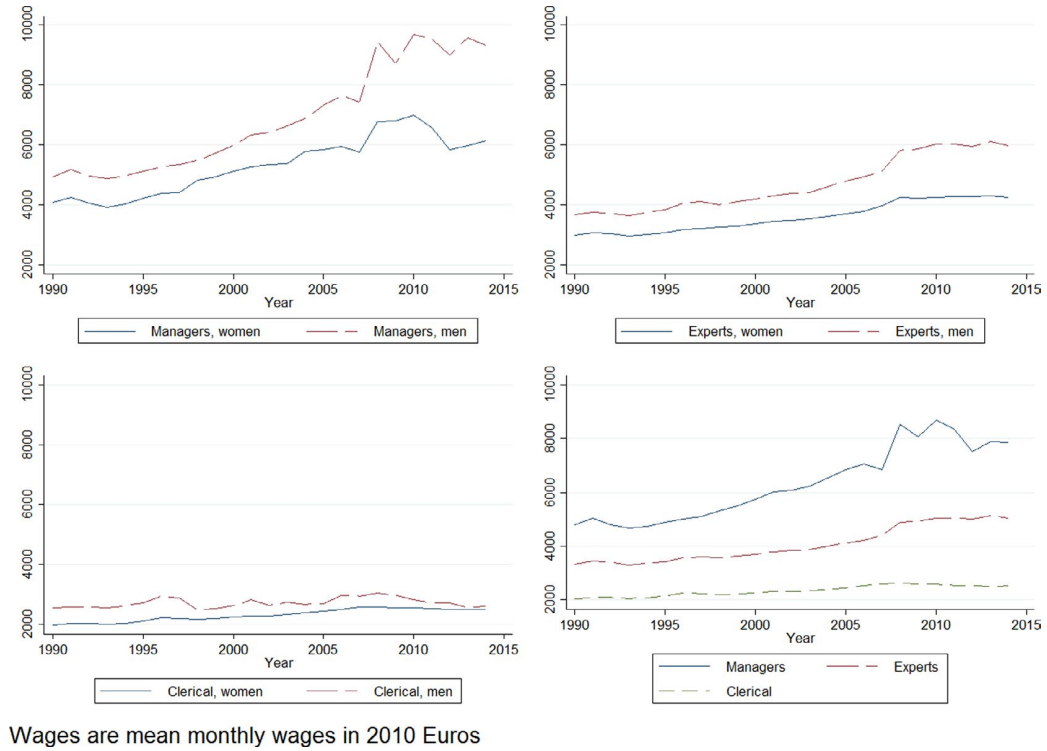

FIGURE 3 Wages of finance workers at different hierarchy levels

three hierarchy levels. The difference between the wages of men and women is the largest at the manager level. At the expert level, the share of men and women is around 50–50; therefore, the differences in the wages of men and women at the expert level can be seen as quite substantial.

The monthly wages depicted above include bonuses and provisions. Bell and van Reenen (2014) have showed that bonuses account for a large share of the growth of finance worker pay. Therefore, it is of interest to also look at the gender differences in bonus payments on their own. Figure 4 shows how the payments of these bonuses and provisions have developed over time. The depicted bonuses are reported as monthly bonuses such that annual bonuses are converted into monthly amounts.

Figure 4 reveals large differences in the amount of bonuses paid to women and men at the different hierarchy levels. The magnitude of bonus payments has started to increase in the late 1990s, mostly at the manager and expert levels. The gender differences in bonus payments are quite substantial. For instance, the bonuses paid to men at the expert level are on similar levels or in some years even higher than those of women at the manager level. The bonuses of expert women have increased in a steady, although slower, pace than those of expert men. There are considerable gender differences also at the clerical level. The bonuses of men have increased and stayed at a higher level than women's starting from about 2007. What is quite remarkable is that the bonuses of men at clerical level exceed the bonuses of women at expert level from the year 2006 on.

The data thus show that the wages in finance have increased at all hierarchy levels, but the wages of women are lower than men's at all levels. This is most striking at the manager level, where the share of women is close to 50 per cent by the end of the sample years. The increase in the share of women at manager level has not resulted in women catching up with men when it comes to pay. On average,

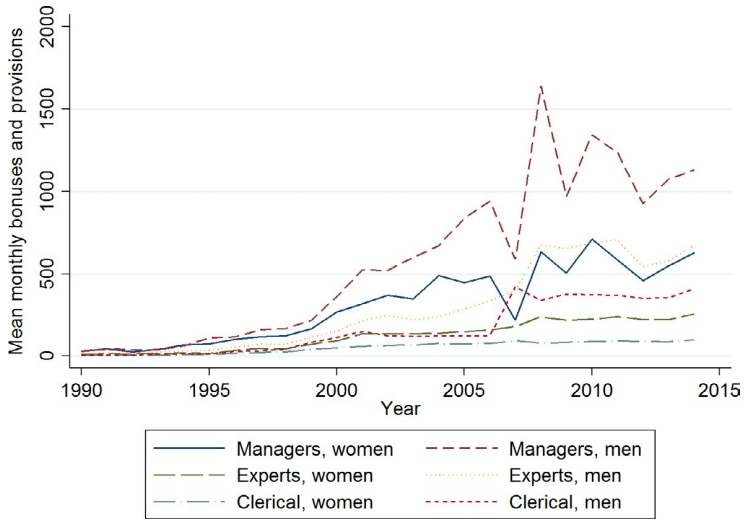

FIGURE 4 Monthly bonuses and provisions, 1990–2014.

the difference between men's wages in manager-level positions versus those of women's has increased over time. In 1990, this gender difference in average monthly pay at manager level was 848 Euros, whereas by 2014 it had increased up to 3193 Euros.

4 | EMPIRICAL APPROACH

The finance wage premium is measured as the effect on the wages of a worker who is employed in the finance sector. A natural way to investigate this wage differential is in the framework of Mincerian (Mincer, 1974) wage regressions, which estimate the effect of the explanatory variables on wages.

A similar approach is used by Lindley and MacIntosh (2017) and Bell and Van Reenen (2010) to estimate the finance wage differential in the United Kingdom. This type of approach is also used in other areas in labour economics, of which a classic example is Freeman (1984), studying the effects of labour union membership on wages.

First, the finance wage premium is estimated at the mean by OLS and individual fixed effects approaches. The focus is on the overall finance wage premium, as well as the premium of men versus women, and the wage premium associated with the hierarchy levels. Next, the attention is focused on the wage premium associated at different points on the wage distribution using quantile regression.

4.1 | OLS and fixed effects

The starting point is to estimate the finance wage differential through wage regressions augmented by a finance indicator. This dummy thus captures the effect of working in finance. The workers in finance earn a wage premium, if the coefficient of the finance indicator is positive.

The following wage equation is estimated with a simple pooled OLS model

$$\ln\left(y_{it}\right) = \alpha + \beta \text{Finance}_{it} + \mathbf{X_{it}}\boldsymbol{\delta} + \varepsilon_{it}, \tag{1}$$

where the dependent variable y is the log of monthly wages of worker i at year t. The wages are real 2010 wages, consisting of both the fixed part of wages and of the part that may vary from month to month, such as bonuses and provisions.

The set of explanatory variables in addition to the finance worker dummy are age and its square, job tenure and its square, firm size, female dummy, capital area dummy, education level categories and year dummies.

The simple OLS model of equation (1) cannot account for individual-level characteristics that are unobserved, often referred to as the worker's ability. This unaccounted ability may bias the OLS estimates upwards, whereas there is no direct control variable to measure the worker innate ability. In the OLS framework, the obtained finance coefficient could be higher simply because these finance workers are more talented and thus get paid higher wages, leading to a large, positive effect on wages for working in finance. This upward bias of the OLS estimates is a well-known problem in the literature, and there have been various ways to account for it, depending on the aim of the study.[7]

In the case of the finance wage differential, this problem can be addressed by estimating equation (1) by the individual fixed effects model (FE) to control for individual level unobserved factors that do not vary over time. This results in the following equation,

$$\ln\left(y_{it}\right) = \alpha_i + \beta \text{Finance}_{it} + \mathbf{X_{it}}\boldsymbol{\delta} + \boldsymbol{\gamma_t} + \varepsilon_t, \tag{2}$$

where γ_t captures the year effects. The terms α_i together with ε_t form the composite error term, where α_i captures the unobserved, time invariant individual characteristics which are wiped away in the FE estimation. The term α_i thus includes the unobserved ability of the workers. The term ε_t is the time-varying part of the error term. It is reasonable to assume that workers differ by their level of ability and that this has an effect on the individual wages. In the FE framework, the ability of workers is assumed not to vary over time; hence, the ability measure α_i in equation (2) does not have the time subscript t.

The coefficient β of the finance worker dummy captures the finance wage premium. The FE model controls for the ability of workers so that the time-invariant part of worker's unobserved attributes is taken into account. Thus, comparing the magnitude of the coefficients obtained from the OLS versus the FE estimation, we can get an idea of how large of a part these constant individual-level attributes can explain the finance wage premium that is first estimated by the standard OLS approach.

4.2 | Quantile regression

In the OLS and FE approaches described above, the effects of the regressors are estimated as average effects. When the dependent variable is continuous, a natural path is to expand the focus from the average effects to the impact of the regressors at different points of the distribution of the dependent variable. The estimates of quantile regression first introduced by Koenker and Bassett (1978) thus capture the changes in the shape of the conditional wage distribution that the OLS and FE methods cannot account for.

The quantile regression method is a useful tool to investigate how the wage premium looks like at different points of the wage distribution. The approach is also used in Lindley and McIntosh (2017) and Bell and Van Reenen (2010) to investigate the finance wage premium associated with different quantiles of the earning distribution. It has been used in other contexts, such as investigating the pay gap in Finland between the public and private sectors in Maczulskij and Pehkonen (2011), and in Asplund (2010) to examine wage dispersion in the Finnish private sector.

The qth quantile of wages y conditional on the regressors $\mathbf{x}$ is defined as the probability that y given $\mathbf{x}$ is smaller or equal to $x_i\beta_q$

$$q = Pr[y \mid \mathbf{x} \leq x_i\beta_q] = F_{y|\mathbf{x}}\left(x_i\beta_q\right), \tag{3}$$

where $F_{y|x}\left(x_i\beta_q\right)$ is the conditional distribution function of wages y given the regressors. From this, it follows that

$$F^{-1}_{y|\mathbf{x}}(q) = x_i\beta_q, \tag{4}$$

where $F^{-1}_{y|\mathbf{x}}(q)$ is the conditional quantile function of wages y given the regressors x. As shown by Koenker and Basset (1978) for the case of linear regression[8], β_q can be estimated by minimizing the following optimization problem with respect to β_q

$$\widehat{\beta}_q = arg\,min \sum_{i:y \geq x_i'\beta}^{N} q\left|y_i - x_i\beta_q\right| + \sum_{i:y < x_i'\beta}^{N} (1-q)\left|y_i - x_i\beta_q\right|. \tag{5}$$

The dependent variable y is the natural logarithm of wages, so the estimated coefficients β_q for the finance worker dummy are interpreted as the effect on wages of working in finance at q different quantiles of the conditional wage distribution. The q quantiles investigated are the 10th, 25th, 50th, 75th, 90th and the 99th quantile.

The quantile regression approach gives a more detailed understanding of how the wage premium changes throughout the wage distribution. Turning to this method allows us to answer questions related to the size of the wage premium at different points of the conditional wage distribution, which is essential in addressing the existence of a glass ceiling effect in finance.

5 | RESULTS

The starting point of the empirical analysis is to estimate magnitude of the overall finance wage premium. Table 2 shows the results of the pooled OLS and FE models in columns (1) and (2), respectively. The results show that the coefficients for the finance dummy are very close to each other, where the individual fixed effects coefficient is only slightly smaller than the one obtained in the OLS model.

The OLS results of column (1) in Table 2 show that the finance worker coefficient is 0.246, while the individual fixed effects in column (2) gives a slightly lower coefficient of 0.242. Compared to the OLS coefficient, the individual FE finance worker coefficient does not fall much, indicating that only a very small part of the wage differential can be explained by the individual characteristics of workers. Column (1) thus suggests that workers in finance earn on average 27.4 per cent[9] higher monthly wages relative to workers in the rest of the private sector in services. The corresponding finance coefficient obtained from the FE model in column (2) gives a finance wage premium of 26.7 per cent.

The fact that the finance wage premium persists in the FE model and is of similar magnitude as in the OLS approach can be seen as a surprising result. The OLS coefficient is expected to be larger than the respective FE coefficient if the unobserved characteristics are correlated with working in finance. The FE model addresses this ability bias that might bias the OLS coefficients upwards by wiping

TABLE 2 Pooled OLS and Individual Fixed effects estimations

	(1)	(2)
	OLS	**FE**
Finance	0.242***	0.237***
	(0.001)	(0.004)
Female	−0.275***	
	(0.001)	
Age	0.098***	0.076***
	(0.000)	(0.004)
Age squared	−0.001***	−0.001***
	(0.000)	(0.000)
Seniority	0.012***	0.002***
	(0.000)	(0.000)
Seniority squared	−0.0002***	−0.00003***
	(0.000)	(0.000)
Capital region	0.132***	0.031***
	(0.001)	(0.001)
BA	0.259***	0.115***
	(0.001)	(0.001)
GRAD	0.531***	0.294***
	(0.002)	(0.003)
Observations	517,4098	517,4098
R^2	0.403	0.238

Note: Dependent variable is the log of total monthly wages of individuals. Cluster-robust standard errors in parentheses, clustered by individual level.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

away all the time-invariant individual characteristics, including the worker's innate ability. However, a positive wage differential of the same magnitude still remains after controlling for these unobserved individual characteristics. The very small difference between the OLS and the FE coefficients means that for Finnish finance workers, the individual, time-invariant characteristics such as ability are not correlated with working in finance. This is unlike in the UK reported by Lindley and McIntosh (2017), where the OLS method gives a larger finance wage premium than the FE approach does.

This result points to the direction that there is a finance wage premium that cannot be explained by the workers in finance being more talented than their peers in other fields. Thus, this result points towards the findings of Böhm et al. (2018), who showed that in Sweden, finance workers are capturing rents. In comparison with the UK, the finance premium found here is smaller, yet it persists after controlling for the unobserved ability.

The coefficients of the education indicators decrease in the FE framework compared with the OLS framework. This means that the unobserved ability biases the effect of education upwards in the OLS approach, such that the unobserved time-invariant characteristics such as ability are correlated with the education-level dummies. The fact that this does not happen to the finance indicator coefficient gives us evidence of a persisting finance wage premium of the magnitude of around 27 per cent compared with the rest of the service sector. The finance premium does not seem to stem from more

talented workers sorting into finance, but instead the finance premium is present even after controlling for unobserved ability. Hence, it cannot be concluded that the finance wage premium would be explained solely by having more talented and skilled workers being drawn to the finance sector, whereas individual, unobserved characteristics of workers do not seem to explain the finance premium.

However, looking at this finance premium over time in Tables 3 and 4 reveals that the coefficients of the OLS and the individual FE models produce differing coefficients for different time periods. For instance, in the years 1990 to 1999 the OLS model produces a finance premium of 26.2 per cent, while that obtained from the FE model gives a premium of 13.9 per cent. Thus, in the 1990s the role of talent or unobserved ability can explain a larger part of the finance premium, meaning that there has been individual sorting into finance in the 1990s. However, this effect vanishes for the years 2000 to 2008 preceding the global financial crisis, when the FE finance coefficient actually exceeds the magnitude of the OLS coefficient. After the crisis in 2009 to 2014, the FE estimation again gives a smaller finance premium of 21.2 per cent compared with 30.2 per cent by the OLS estimation.

The overall estimates of the finance wage premium of Table 2 thus mask this variation over time. It can be seen that in the 1990s, finance has attracted more talented workers and that explains a part of the finance wage premium. However, this effect is mitigated in the years leading up to the financial crisis and comes back after the crisis.

The above analysis captures the general effect of working in finance, where the differences stemming from gender or hierarchy level are not visible. To be able to address these questions, the finance wage premium is next estimated so that these aspects are taken into consideration. Within finance, there are many kinds of jobs, so looking more closely into the differences in the finance premium associated with the manager-, expert- and clerical-level positions reveals whether the magnitude of the premium varies between these groups. These and the gender differences within these hierarchy levels are addressed in Table 3, by first interacting the female dummy with the overall finance dummy and then with the finance hierarchy-level dummies.

Table 3 shows that the overall effect on wages from working in finance has increased over time. The largest premiums come from the manager level, and overall this manager-level finance premium has also increased over time. The interactions of the hierarchy-level dummies with the female dummy show that the effect of working in finance as a manager gives the highest premium for women as well, although the magnitude of that is much smaller compared with men. The difference between the manager and expert coefficients is very small for women, meaning that the additional effect on wages for women working at manager level in finance does not have a much larger effect on wages than it does at the expert level.

Overall, the largest finance wage premium is associated with workers at the top of the hierarchy at manager-level positions, as can be seen from column (3) of Table 3. The effect of being a manager in finance is found to be 96.8 per cent, meaning that managers in finance earn almost double of that what workers in the rest of the service sector do. The coefficient for experts and professionals in finance is also large, giving 51 per cent higher wages than the rest of the service sector. Finance workers at the clerical level also earn a premium of 18.6 per cent relative to the rest of the service sector.

The main effect from being a woman brings a negative impact on wages of over 20 per cent, which exceeds the positive effect on wages from working in finance. The interaction of the finance dummy with the female dummy also yields a negative coefficient, meaning that the additional effect of being a woman in finance decreases the finance wage premium. The interaction of female with finance brings a smaller negative effect than the main female effect, meaning that working in finance is still on average beneficial for women, where the negative impact of gender on wages is smaller than in non-finance. This negative impact on wages of around 10 per cent has remained fairly stable over time. However, working as a manager or an expert in finance brings a much larger, positive main finance

TABLE 3 Pooled OLS regressions

	All years				1990–1999		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Finance	0.242***	0.317***			0.233***	0.314***	
	(0.001)	(0.003)			(0.002)	(0.003)	
Female	−0.275***	−0.259***	−0.259***	−0.267***	−0.298***	−0.269***	−0.274***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Finance × Female		−0.104***				−0.108***	
		(0.003)				(0.004)	
Finance Managers			0.677***	0.642***			0.649***
			(0.004)	(0.005)			(0.005)
Finance Experts			0.412***	0.359***			0.415***
			(0.002)	(0.003)			(0.003)
Finance Clerical			0.171***	0.137***			0.195***
			(0.001)	(0.003)			(0.001)
Finance Managers × Female				0.110***			
				(0.008)			
Finance Experts × Female				0.102***			
				(0.004)			
Finance Clerical × Female				0.042***			
				(0.003)			
Observations	5,174,098	5,174,098	5,174,098	5,174,098	1,373,858	1,373,858	1,373,858
R^2	0.403	0.404	0.414	0.415	0.379	0.380	0.396

Note: Dependent variable is the log of total monthly wages of individuals. Cluster-robust standard errors in parentheses, clustered by individual level. All regressions include age and its square, seniority and its square, capital region dummy, education, and year controls.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

effect on wages than the negative impact from being a woman, although this positive finance effect does not exceed the negative female effect at the clerical level.

The interactions of the female dummy with the finance hierarchy-level dummies show how the impact on wages for women at all hierarchy levels is much smaller than it is for men. The positive effect of working in finance still exceeds the negative impact of being a woman at all but the clerical level. At the manager level, women get a finance wage premium of 62.4 per cent, while men get a premium of 90 per cent. At expert level, the premium for women is 21.4 per cent and for men it is 43.2, while at the clerical level, the impact is a negative −8.4 per cent, and for men a premium of 14.7 per cent.

Over time, the finance premium of men has grown at all but the clerical level, where it has decreased slightly. At the manager level for men in 2009–14, the finance premium is 113.8 per cent, at the expert level 50.2 per cent and at the clerical level 14.1 per cent. For women at the manager level, the finance wage premium has also increased over time from 56.2 per cent in 1990–99 up to 69.3 per cent in 2009–14. However, this interaction of female with the finance manager dummy is not statistically significant in column (16) of Table 3. The wage premium for expert women has grown from 21

	2000–2008				2009–2012			
(8)	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
	0.242***	0.300***			0.264***	0.338***		
	(0.002)	(0.004)			(0.002)	(0.004)		
−0.290***	−0.286***	−0.275***	−0.272***	−0.282***	−0.246***	−0.235***	−0.234***	−0.237***
(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
		−0.078***				−0.105***		
		(0.004)				(0.004)		
0.613***			0.665***	0.622***			0.762***	0.760***
(0.005)			(0.006)	(0.007)			(0.007)	(0.009)
0.350***			0.395***	0.325***			0.430***	0.407***
(0.004)			(0.003)	(0.004)			(0.003)	(0.004)
0.147***			0.165***	0.115***			0.149***	0.132***
(0.004)			(0.001)	(0.004)			(0.002)	(0.005)
0.123***				0.123***				0.004
(0.010)				(0.011)				(0.013)
0.131***				0.128***				0.043***
(0.005)				(0.005)				(0.005)
0.058***				0.060***				0.020***
(0.004)				(0.005)				(0.005)
1,373,858	1,999,201	1,999,201	1,999,201	1,999,201	1,801,039	1,801,039	1,801,039	1,801,039
0.397	0.415	0.415	0.423	0.423	0.367	0.368	0.379	0.379

per cent to 23.7 but the negative effect on wages for women at clerical level in finance has remained stable between −8 and −10 per cent over time.

The fixed effects model cannot identify the gender wage gap; however, it can be used to investigate whether the finance premium is different within people switching into and out of finance by gender. Thus, Table 4 shows the individual fixed effects results from interacting the female dummy with the finance indicator, and how it has changed over time.

Overall, the individual fixed effects model gives a finance premium of 20.8 per cent for men, while that for women obtained from the interaction gives a smaller premium of 7.3 per cent. For both men and women, the finance premium is the largest in the years leading up to the financial crisis in 2000 to 2008, after which it somewhat decreases for both. In the years 2009 to 2014, the finance premium from these FE estimations for men was 16.3 per cent while that for women was 6.3 per cent, while in the years before the crisis it was 20.9 per cent for men and 15.7 per cent for women.

The analysis so far has concentrated on differences on the average, where distributional effects are not accounted for. The distributional analysis is important in addressing the questions regarding the

TABLE 4 Individual Fixed effects estimations

	All years		**1990–1999**		**2000–2008**		**2009–2014**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Finance	0.237***	0.189***	0.130***	0.064***	0.290***	0.190***	0.192***	0.151***
	(0.004)	(0.007)	(0.009)	(0.014)	(0.008)	(0.012)	(0.008)	(0.011)
Finance × Female		0.070***		0.098***		0.146***		0.066***
		(0.008)		(0.018)		(0.016)		(0.015)
Observations	517,4098	517,4098	1,373,858	1,373,858	1,999,201	1,999,201	1,801,039	1,801,039
R^2	0.238	0.238	0.105	0.105	0.131	0.131	0.035	0.035

Note: Dependent variable is the log of total monthly wages of individuals. Cluster-robust standard errors in parentheses, clustered by individual level. All regressions include age and its square, seniority and its square, capital region and education dummies.

*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

glass ceiling. To be able to analyse the finance premium at different points of the wage distribution to see whether the finance wage premium of women is smaller at the top, the focus is next turned to quantile regressions. Table 5 reports the results of the quantile regressions presented in equation (5). Columns (1)–(6) show the finance worker coefficient at the lowest 10th quantile of the wage distribution up to the 99th quantile, respectively.

The main effect of being a female worker is found to be increasingly negative at higher quantiles of the wage distribution. Similarly, the interaction of being a woman worker in finance also yields negative coefficients throughout the wage distribution, and this interaction also becomes increasingly negative towards the top of the wage distribution. The difference in the effect becomes largest at the top 99th quantile, where the finance wage premium of men is 43.2 per cent, whereas the effect of working in finance at the top for women has a negative effect of −20.9 per cent on wages. In other words, at the very top of the wage distribution, the negative female effect exceeds the positive finance effect for women. Women at the top incomes in finance are still better off in terms of wages than women in non-finance. The negative effect on wages at the very top 99th quantile for women in finance is −19 per cent, while for women in non-finance it is −38.8 per cent.

Table 6 reports the results of the quantile regressions with the sample split into three time categories. It can be seen that over time, the finance wage premium is consistently the largest at the very top of the wage distribution. Column (6) shows that the effect of working in finance gives a large premium on a workers wage and that this premium has been increasing. The interaction of being a woman in finance at the top of the wage distribution on the other hand has become more negative over time. The negative main female effect and the negative interaction imply that for women, the negative effects on wages at the top exceed the positive finance effect. Men at the top 99th quantile earn a finance premium of 68.7 per cent during the years from 2008–2014, while the effect on wages for women in finance during the same years is −16.9 per cent. The premium of men has grown over time, from 29.3 per cent in the 1990s to 38.8 per cent during the early 2000s. For women, some progress has happened, even though the negative female effect has remained larger than the positive finance effect. The negative effect has become smaller, where in the 1990s it was −24 per cent and −23.6 per cent in 2000–08.

The positive finance effect exceeds the negative female effects at the very bottom of the wage distribution, at the 50th quantile and below. However, over time this finance premium at the bottom of the distribution turns negative, although only very slightly so, already at the 25th quantile.

TABLE 5 Quantile regressions, the finance wage premium

	(1) 10th	**(2) 25th**	**(3) 50th**	**(4) 75th**	**(5) 90th**	**(6) 99th**
Finance worker	0.317***	0.305***	0.316***	0.312***	0.295***	0.359***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)
Female	−0.242***	−0.212***	−0.217***	−0.275***	−0.335***	−0.383***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)
Finance worker × Female	−0.044***	−0.078***	−0.123***	−0.149***	−0.142***	−0.211***
	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)
Observations	5,174,098	5,174,098	5,174,098	5,174,098	5,174,098	5,174,098

Note: The dependent variable is the total monthly wages of individuals, including performance-related pay. In addition to the finance worker dummy, the regressions include controls for education levels, gender, capital area, age and its square, seniority and its square and year dummies.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

TABLE 6 Quantile regressions over time

	(1) 10th	(2) 25th	(3) 50th	(4) 75th	(5) 90th	(6) 99th
1990–1999						
Finance worker	0.352***	0.344***	0.375***	0.343***	0.277***	0.257***
	(0.004)	(0.002)	(0.001)	(0.001)	(0.002)	(0.006)
Female	−0.260***	−0.203***	−0.204***	−0.291***	−0.384***	−0.404***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Finance worker × Female	−0.028***	−0.079***	−0.155***	−0.168***	−0.117***	−0.128***
	(0.005)	(0.002)	(0.001)	(0.002)	(0.002)	(0.006)
Observations	1,373,858	1,373,858	1,373,858	1,373,858	1,373,858	1,373,858
2000–2008						
Finance worker	0.297***	0.290***	0.288***	0.282***	0.261***	0.328***
	(0.004)	(0.002)	(0.001)	(0.002)	(0.002)	(0.006)
Female	−0.244***	−0.227***	−0.239***	−0.293***	−0.350***	−0.402***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Finance worker × Female	−0.026***	−0.068***	−0.092***	−0.114***	−0.104***	−0.195***
	(0.005)	(0.003)	(0.002)	(0.002)	(0.003)	(0.007)
Observations	1,999,201	1,999,201	1,999,201	1,999,201	1,999,201	1,999,201
2009–2014						
Finance worker	0.284***	0.273***	0.264***	0.281***	0.323***	0.523***
	(0.005)	(0.002)	(0.001)	(0.002)	(0.002)	(0.007)
Female	−0.225***	−0.192***	−0.200***	−0.247***	−0.287***	−0.346***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Finance worker × Female	−0.047***	−0.094***	−0.118***	−0.141***	−0.184***	−0.358***
	(0.005)	(0.003)	(0.002)	(0.002)	(0.003)	(0.008)
Observations	1,801,039	1,801,039	1,801,039	1,801,039	1,801,039	1,801,039

Note: The dependent variable is the total monthly wages of individuals, including performance-related pay. In addition to the finance worker dummy, the regressions include controls for education levels, gender, capital area, age and its square, seniority and its square, and year dummies.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Together, the findings of the quantile regressions give support to the glass ceiling effect in finance. The difference in the effect of working in finance between men and women is found to become larger as moving to the top of the wage distribution.

6 | CONCLUSIONS

This paper has investigated the finance wage premium from the gender perspective. As finance is a top-income field, large gender differences in pay within finance can contribute to the overall gender wage gap. Women in finance make smaller wages than men do, and this holds at all hierarchy levels.

The finance wage premium has increased over time, particularly for men at manager-level positions. The wage premium of female managers and experts in finance has also increased over time; however, they are still significantly smaller than those of men's.

Women working in finance at manager or expert positions get a wage premium, whereas the effect on wages for women working in finance at the clerical level has a negative impact on wages. These results are based on estimations on the average. The quantile regressions reveal that women at the bottom of the wage distribution actually receive a premium, although a very small one, from working in finance. As moving towards the top of the wage distribution, the effect on working in finance becomes increasingly negative for women.

The additional effect of being a woman in finance becomes negative from the 50th percentile towards the top of the wage distribution. This finding showing that there seems to be a glass ceiling in finance is in line with the findings of Albrecht et al. (2003), who showed a significant glass ceiling effect in Sweden. Over time, a similar pattern emerges, however, the female finance interaction gives a negative, although small, effect on wages already at the 25th percentile from the year 2000 on. The negative effect on wages for women in finance has nevertheless become slightly smaller over time at the higher quantiles of the wage distribution, however, at the same time the finance premium of men has increased significantly.

The reason why the finance wage premium of women is smaller than men's could be due to many things. First, occupational segregation in Finland is higher than in the United States or in many other European countries, so that the majority of women in finance work at clerical level, where wages are lower. Occupational segregation, however, cannot be used as an complete explanation for the wage differentials, whereas occupation and wage are jointly determined.

Second, the explanation for larger wage differentials at the top incomes could be linked to the glass ceiling effect. The occupational segregation can thus be seen as a form in which the glass ceiling takes place. This paper found large wage differences at the manager level. It could be that the positions that men hold at manager level include more responsibility or are more demanding in other ways than the positions that women hold, and the differences in the finance premium could be stemming from these differences in the type of managerial positions that women and men hold. As Blau and Kahn (2017) have shown, in high-skill occupations, such as managers in finance studied here, leaves from the workforce play a significant role in the gender wage gap. Therefore, this could be leading into women being tracked into less demanding, and hence also lower paid, managerial positions, and through this channel affecting the wage differentials.

The share of women at manager level has increased during the sample years, but the wages of women have not reached the same levels as men's. An explanation for such a glass ceiling effect could be that the family leave policies could encourage women to not take on so demanding jobs or career paths, or that women are expected to not want more demanding jobs if they are expected to be more involved in the family instead of being career-oriented, as has been suggested to be in Sweden by

Albrecht et al. (2003). Third, the arrival of children has been shown to have large, negative impacts on the wages of women that are likely to be at play also in Finland.

To be able to better understand the progress of women in finance, closer research on the gender differences in career paths and promotions is left as future research.

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ENDNOTES

[1] In Finland, a large share of workers is members of labour unions, and the wage structure is in general more compressed partly due to centralized wage bargaining between labour unions and employer organizations. See Vartiainen (1998) for a detailed description of the wage bargaining system in the Finnish labour market.

[2] However, the empirical results on this concern are somewhat ambiguous. Some studies point to the instability created by financial innovation following deregulation (Crotty, 2009). On the other hand, Falhenbrach and Stultz (2011) have shown that in the United States, CEO incentives cannot be blamed for the crisis.

[3] The member employer associations included in the wage survey for the service sector are from the following fields: Vocational adult education centres, Pharmacy sector, Special Branches (which includes experts and workers in managerial positions in the fields of culture, administration, communications and well-being), Commercial Sector, Facilities Services sector, Hotel and restaurant sector, Forest centres, Guidance and information sector, Plant nursery and Horticultural sector, Teaching sector, Finance and insurance sector, Social security and Health services, IT services, Labor hiring services, Road transport, Golfing sector, Ski centres and Musicians.

[4] Up to 1994, the survey was conducted in August. For certain sectors, such as seasonal ski centre or golfing sector workers, the wage survey is conducted in February and between June and August, respectively.

[5] The main occupational groups listed in the data are as follows: Banks, managers; Banks: experts; Banks, clerical; Insurance, managers; Insurance: experts; Insurance, clerical; Insurance, trainees.

[6] See, eg., Dolado et al. (2001) for a comparison between the United States and the European Union and Meyersson Milgrom et al. (2001) for Sweden.

[7] For example, when investigating the effect of schooling on wages, researches often turn to instrumental variables regression (e.g. Card, 1994) or samples of twins (e.g. Krueger and Ashenfelter, 1992).

[8] The quantile regression applies even without the assumption of the conditional quantile function being linear. See Koenker (2005) and Angrist et al. (2006), who show that the linear quantile regression approximates the nonparametric estimates of the conditional quantile function.

[9] When the dependent variable is logarithmic, the percentage change in a dummy variable is calculated as $\left(e^{\beta} - 1\right) * 100$

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Gender differences in career outcomes: Evidence from Finnish workers in finance

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Abstract

Although Finland is a country with a high level of overall gender equality, job segregation between men and women remains high. This is particularly evident in finance, where the positions that women and men hold are quite different: Over 80 percent of workers in clerical level jobs are women, whereas about 70 percent of the managers are men. This paper estimates the differences between men and women on the probability of receiving a promotion. Prior research has shown that graduate level education can alleviate the invisibility of women when it comes to promotions. I show that higher education is positively associated with the probability of women being promoted to manager level, but the magnitude of the association is smaller than it is for men. Women have more mobility between jobs within the same level and up to expert positions, whereas men are more often promoted to manager. The gender differences in promotions may well be due to occupational segregation: Women have fewer possibilities to get promoted up to the manager level, because there does not exist a natural promotion path up from the clerical level, where women are a majority. Women are a majority in the promotions up from clerical level to the expert level, but men represent a large share of these promotions relative to their small share at clerical level to begin with. Average wages as well as wage increases from job title changes are found to be larger for men than they are for women at all hierarchy levels.

JEL classification: J16, J24, J31
Keywords: Promotions, Gender differences, Wage increase upon promotion

1 Introduction

This paper studies the differences between men and women in their career progression in the finance industry in Finland. Occupational segregation in Finland is high, and this

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segregation of jobs typical to men and typical to women is very apparent in finance. Over the years 1990-2014, on average 85.5 percent of the workers at the clerical level are women, while 71.1 percent of the managers are men. At the expert level, the share of women is about 50 percent.

Prior research has shown (Clemens, 2012) that some jobs are more set up for promotions in the first place. Due to occupational segregation observed in the finance industry, the majority of women are found in the clerical level, from where it is harder to move up on the career ladder because of the lack of natural promotions paths. Schooling requirements for certain higher level jobs make it even harder to receive a promotion for a candidate who has not completed the degree required. Occupational segregation between men and women is at least in part rooted in differences in choices of education. For instance, Kauhanen and Napari (2015) show that men enter the labor market in higher hierarchical positions than women do largely due to their differing educational backgrounds.

In this paper, I show that women get promoted to expert level more often than men do. However, relative to the very small share of men at clerical level, they are over represented in promotions up to expert level. It could thus be that certain positions at the clerical level are more suitable for receiving a promotion in the first place, and the rest of clerical level jobs lack a natural promotions path up to expert level.

The Finnish setting provides a particularly interesting subject to address the gender differences in career outcomes and wages, since Finland is a Nordic country reported among the countries performing highly in overall gender equality and has a high labor force participation rate of women (OECD, 2022). In finance, the wages are higher than in other fields (see eg. Vaahtoniemi, 2021; Ravaska, 2018). The highest incomes in finance are naturally claimed at the top manager as well as expert and professional level positions. However, even though about three quarters of the workers in the Finnish finance sector are women, the top positions are mostly held by men. These gender differences in hierarchy levels are largely rooted in educational choices, which then lead to the high level of gendered job segregation in the labor market.

Job segregation has been shown to be higher in Finland than it is in other European countries or in the United States (Dolado, Felgueroso, & Jimeno, 2001). Over time, however, the share of women in manager positions has become larger. In Finland, the share of women working at manager level in finance has increased from about 15 percent in 1990 up to 45 percent by 2014 (Vaahtoniemi, 2021), showing that over time the job segregation has become less severe at the manager level.

The literature suggests that women can be 'invisible' when considering candidates for promotions.[1] A way for women to alleviate this invisibility has been shown to be through higher education. It is argued that men may be able to signal their ability for promotion

[1]See eg. Milgrom and Oster (1987) for theory and Cassidy, DeVaro and Kauhanen (2016) for empirical evidence on the matter.

through other, perhaps more informal channels.

The majority of promotions in finance happen within firms. Career moves between firms are not very frequent, highlighting the importance of internal labor markets. This paper looks into possible gender differences in the number of jobs experienced in the firm and whether they have a differing outcome for men and women. I show that women tend to move between different jobs at the same level, while for men the probability of promotion to manager is larger. The association of having held more jobs within the firm with the probability of promotion is positive for both men and women, but the magnitude of this association is larger for men.

I show that being a woman is negatively associated with the probability of promotion to both expert and manager positions. However, when I look at a more looser definition of promotion, that is, defined as a job title change accompanied with a wage increase, the female coefficient becomes positive. Furthermore, the role of higher education for women is found to be statistically highly significant in expert promotions, but less so for manager promotions. Undergraduate level education is positively associated with getting a promotion to the expert level. What comes to the wage increases that accompany promotions, they are shown to be larger for men at all hierarchy levels.

The rest of the paper is organized as follows. Section 2 reviews the literature, and section 3 describes the data used in the analysis, and looks more closely into the Finnish finance sector and the gender differences in wages of finance workers. Section 4 presents the empirical approach used to investigate the factors affecting the promotion probabilities of women and men, and section 5 presents and discusses the results. Finally, section 6 concludes.

2 Literature

There is a long strand of literature spanning over multiple decades studying discrimination (Becker, 1957) and its role in promotions. The flatter career profiles of women have been studied in the literature by for example Phelps (1972) and Coate and Loury (1993). Reasons for the smaller share of women being promoted to higher positions in the job hierarchy have been modeled theoretically by Milgrom and Oster (1987), who develop a model of invisibles in the promotions pool. This section goes over the literature first on promotion differences between men and women, and then the gender differences in earnings.

2.1 Gender differences in promotions

The theoretical literature has offered explanations on why women may not be visible for future employers when firms are considering new hires. The invisibility hypothesis introduced by Milgrom and Oster (1987) explains why some workers remain 'invisible' to future employers. In this framework, the employer learns about their worker's ability over time, which is private information to the employer. If the employer decides to promote a productive worker, other firms learn that the promoted worker is a high-ability individual. This gives motivation for other firms to try to poach this worker. Thus, the original firm must pay a premium to keep the worker.

To avoid paying this premium to the worker, the original employer may choose not to promote the high-ability worker. However, workers who can signal their ability in other ways do get promoted. Milgrom and Oster (1987) argue that men have more efficient informal signalling networks compared to women, leading to more men being promoted than women. The more recent empirical results of Cassidy, DeVaro, and Kauhanen (2016) from the Finnish private sector provide evidence of the invisibility hypothesis regarding women, showing that graduate level education can alleviate the invisibility of women. This means that women can increase their probability of promotion through higher education. In this essay, I show that graduate level education increases the probability of promotion to manager for both women and men, but the magnitude of this association is larger for men.

The literature shows that women and men start their careers at different positions. Kauhanen and Napari (2015) show that men enter the labor market at higher levels to begin with, and get promoted with a larger probability than women do. The authors show with Finnish white-collar manufacturing workers data that a large part of the difference in women and men's starting positions stems from different educational backgrounds.

Gibbons and Waldman (1999) have shown that workers who had higher wages early in their careers received a promotion later on much faster than their counterparts starting

at lower wages. Clemens (2012) on the other hand further examines career fast-tracks, and finds that workers are promoted from certain positions much more frequently than from others, meaning that some jobs are more tuned for promotions than others.

A large share of women in the sample studied in this paper are working at clerical level jobs. Golan (2005) assumes that output in lower level jobs is independent of ability, meaning that lower level jobs are often routine, and thus cannot be influenced by the workers ability. Thus it would be hard for a worker to et promoted, if they cannot express their ability through their job tasks. This would further decrease the probabilities of low level workers to get promoted in the first place.

Another way for workers to increase their probability of getting a manager promotion has been shown to be through accumulating firm-specific human capital by experiencing multiple jobs within the firm. This kind of job rotation within the firm has been empirically shown to increase the probability of getting promoted to manager position by Frederiksen and Kato (2018).

As Frederiksen and Kato (2017) point out, the positive link between getting a top management position and job rotation within the firm could also be interpreted differently. The authors acknowledge that the observed job moves could in fact be promotions, and thus the worker could be simply moving up the career ladder towards a top manager position, thus naturally increasing the probability of promotion to manager. On the other hand, it could also be taken as evidence of the workers ability, meaning that more talented workers get promoted to the top jobs. Ultimately, the authors provide further evidence in support of their original interpretation of top position appointments and firm-specific human capital.

In the literature, multiple reasons have been given on why women are not as likely to be promoted as men. For instance, De Paola, Ponzo, and Scoppa (2017) study Italian academics and find that women are not as likely to apply for promotions due to lack of self confidence and risk-aversion. On the other hand, there are studies showing no gender differences in promotion probabilities, such as McDowell, Singell Jr, and Ziliak (2001), in the economics profession in the United States.

Both Frederiksen and Kato (2018) and Cassidy et al. (2016) find that formal graduate level education increases the probability of promotion. Frederiksen and Kato (2018) focus on the appointments to the top manager positions, and show that the breadth of firm-specific human capital increases the odds of getting appointed. Cassidy et al. (2016) further show that graduate level education alleviates the effect of invisibility for women, thus making women with a graduate degree more 'visible' for employers. However, Cassidy et al. (2016) point out that their results are based on a sample of workers consisting mostly of engineers, where the majority of workers are men.

Similarly, the gender differences in promotions in the Finnish metalworkers industry

is reviewed by Pekkarinen and Vartiainen (2006), where women are also a minority. The authors find that women face a higher threshold for receiving a promotion than men do, which is supported by a higher rate of quitters among women. It could thus be that the role of higher education for women could be more important when it comes to promotions when there are few women in the sample to begin with. In finance studied here, women on the other hand are a majority, however, concentrated at the lower level jobs.

2.2 Gender differences in earnings

One reason behind gender wage differentials given in the literature is job segregation into jobs typical for men and those for women, where the jobs typical to women for instance require less schooling and are hence also lower paid than the typical jobs for men. This kind of job segregation into "women's jobs" and "men's jobs" being behind the wage gap have been investigated for example by Ransom and Oaxaca (2005). However, the authors point out that it is difficult to measure exactly how much of this kind of job segregation is voluntary and how much of it is due to discrimination of some kind, whether related to direct discrimination or indirect discrimination, resulting from for example barriers of entry to certain schooling or jobs for women.

Altonji and Blank (1999) give a review on the literature on wage differentials. The wage gap between men and women has converged over time, yet differences still remain. Traditionally, economists have focused on explanations for these from educational choices affecting the type of jobs workers get. Kauhanen (2017) gives a summary on the literature of the main areas researched for the causes of the gender wage gap, separating studies focusing on the differences in job assignments and promotions. The main reasons Kauhanen (2017) lists for men's and women's differing career profiles are career interruptions, educational choices, hours worked, preferences and personality traits, and discrimination.

Bertrand, Goldin, and Katz (2010) on the other hand have shown that the wages of women and men with an MBA degree have diverged after ten years in the labor market. The reasons the authors give for this are that women face large income losses from career breaks, mostly related to having children. After having children, women tend to have less weekly working hours, thus further contributing to the gender wage gap.

Bertrand, Goldin, and Katz (2010) showed in their analysis that hours worked is an important factor in contributing to the gender wage gap. The authors show that the relationship between hours worked and pay increases are not linear: Putting in more hours of work increases pay more than the unit increase based on the number of extra hours. They show that this further increases the pay difference between men and women, since women often have longer career brakes due to having children, and are also more likely to work part-time or shorter hours when taking care of children. In Finland, however, the family leave practices are different than in the United States, but they could play a role

on women's life cycle earnings. Kleven, Landais, and Søgaard (2019) have shown that in the long run, the gender wage gap in Denmark, a Nordic country similar to Finland, is around 20 percent due to the arrival of children. However, Manning and Swaffield (2008) show that women who do not have children also earn less than men with similar backgrounds. This points to the direction that the mere expectation of women having family commitments in the future can also be detrimental to their career progression.

Bertrand, Goldin and Katz (2010) also bring up the fact that the gender mix could affect the differences in the wage gap. Fields and Wolff (1995) show in their analysis that about 15 percent of the wage gap can be explained by this difference in the gender distribution across industries. In the Finnish metal workers sample studied in Pekkarinen and Vartiainen (2006), the share of women is 22 percent, whereas in finance investigated in this paper, the share of women is over 70 percent. This paper thus further contributes to the literature in examining the wage differentials in a field with a female majority.

3 Data

The data is drawn from a large, comprehensive data set of in the Finnish private sector, covering the years from 1990 to 2014. The data is collected by the Confederation of Finnish Industries (EK), which is the central organization of Finnish employer associations. The data is collected for the purposes of central wage negotiations between employer organizations and trade unions representing different industries.

The wage survey is conducted each year in October. All firms are obligated to reply, excluding only the smallest of firms, leading to a very high response rate. Furthermore, the data is based on the administrative records of the firms, which results in accurate data. The data includes demographic information on the workers, such as age, educational background, and work experience in years. The survey includes all workers, except the chief executive officer, and workers that have not for some reason had any wage income during the month of October.

The data is well suited for the purposes of this paper, since it allows me to follow individual workers over time through a unique worker identification number. The panel structure thus allows me to follow the promotions and career moves of the workers over the sample period. A drawback of the EK data is that it does not provide data on the workers' family backgrounds, such as whether the worker has a spouse or children.[2]

The complete EK data consists of wage data for production workers, non-production workers and service sector workers. The analysis in this paper uses the service sector data, focusing on finance workers. For the service sector workers, the data reports a three-level hierarchy position. The levels of hierarchy include clerical workers, experts and professionals, and at the top the manager positions. The analysis in this paper includes only finance workers, since the hierarchy levels are consistently available for all finance workers and comparable within the same industry, and the job titles have similar tasks across different firms in finance.

It is possible that job titles within each hierarchy could differ in different firms. In the EK survey, the job titles are guided to be classified in the hierarchy levels through common instructions, so that this kind of differences between firms are assumed to not be of large significance when looking at the hierarchy levels.

3.1 The finance industry

The finance industry consists of workers mainly in banks and insurance companies. Banks and insurance companies have also workers such as restaurant staff, janitors, and cleaning

[2]These factors have been shown to play an important role in the career outcomes and the gender wage gap. For example Ravaska (2018) shows with Finnish data that the income of the spouse has an effect on the probability of being in the top of the income distribution. Bertrand, Golding and Katz (2010) also bring up the possibility that the spouse's higher earnings could allow their partner to stay at home.

Table 1: Summary statistics

	Full Sample		Men		Women	
	Mean	SD	Mean	SD	Mean	SD
Total monthly wage, Euros	3104.4	1788.40	4399.7	2627.41	2657.9	1069.42
No. of job titles	2.6	1.53	2.5	1.55	2.6	1.52
Manager promotion, %	0.6		1.3		0.3	
Expert promotion, %	1.6		2.2		1.4	
Job title change, %	8.9		9.2		8.9	
Demographics						
Female, %	74.4					
Capital Area, %	57		70		53	
Age, years	42.9	9.68	41.7	9.80	43.3	9.60
Seniority, years	14.8	10.88	11.7	9.59	15.9	11.09
Education level categories, %						
Secondary level education	61		44		66	
BA	29		32		28	
GRAD	10		24		6	
Job hierarchy levels, %						
Managers	6		17		2	
Experts and professionals	22		42		15	
Clerical	72		41		83	
Observations	896 583		229 821		666 762	

Note: Descriptive statistics. Total monthly wage is expressed in 2010 Euros and includes the regular base wage and bonuses. Manager promotion is a dummy variable taking the value 1 if a worker moves up to the manager level, and 0 otherwise. Expert promotion takes the value 1 if a worker moves up to the expert level, and 0 otherwise. Job title change is a dummy variable taking the value 1 when a worker changes their job title and at the same time receives a wage increase, and 0 otherwise. Number of job titles refers to the amount of job titles held within the firm. Age and seniority at the firm are expressed in years. Female is a dummy variable taking the value 1 if the individual is female and 0 otherwise. Capital area is a dummy variable taking the value 1 if the individual lives in the capital city area of Finland, and 0 otherwise. Education categories are dummy variables indicating the individual's highest obtained degree. Job hierarchy dummies indicate the level of the worker's occupation.

Table 2: Mean earnings at different hierarchy levels by gender

	Men	Women
Hierarchy level		
Clerical workers	3206.8	2370.8
	(1279.4)	(543.1)
	14.5%	85.5%
Experts and professionals	4732.1	3866.2
	(2426.9)	(1295.9)
	49.8%	50.2%
Managers	6580.6	5688.4
	(3699.6)	(2552.4)
	71.1%	28.9%

Note: The reported earnings are mean monthly earnings in 2010 Euros. Standard deviations in parentheses. The percentages give the share of men and women in each job hierarchy level.

service workers on their payrolls, although in this study these workers are excluded in the analysis.

The sample is restricted to full-time workers between the age of 18 to 65 years. Part-time work in finance is not very common, however, the amount of part-time women is slightly higher than part-time men. 4.7 percent of women in finance work part-time, while of men 2.2 percent work part-time. Overall, the share of part-time workers is low (4.1 percent), thus the sample is restricted solely to full-time workers. It is interesting to note that in the non-finance service sector, the share of part-time workers is much higher, 15.9 percent. In the non-finance service sector, the differences between men and women working part-time is much larger than in finance. Of the non-finance workers, 18.9 percent of women work part-time, while 9.8 percent of men are part-timers.

The sample includes 501 firms over the years 1990 to 2014 and 78 345 individual workers. There are 896 583 person-year observations, of which 74.4 percent are women. Table 1 reports the summary statistics. The total monthly wage is expressed in 2010 Euros. It includes the regular monthly wage and bonuses and provisions added on top of the base wage.

Promotions are defined as a move from one job hierarchy level to the next, and the variable promotion shows the share of workers receiving a promotion. The job hierarchy categories report the share of workers in the clerical, expert and professional, or manager level positions. The number of job titles held within the firm are similar for both men and women. The seniority at the firm is slightly higher for women than it is for men.

The education level of the workers is categorized into three groups: secondary level, BA degree holders, and graduate level degree holders. The educational degrees reported

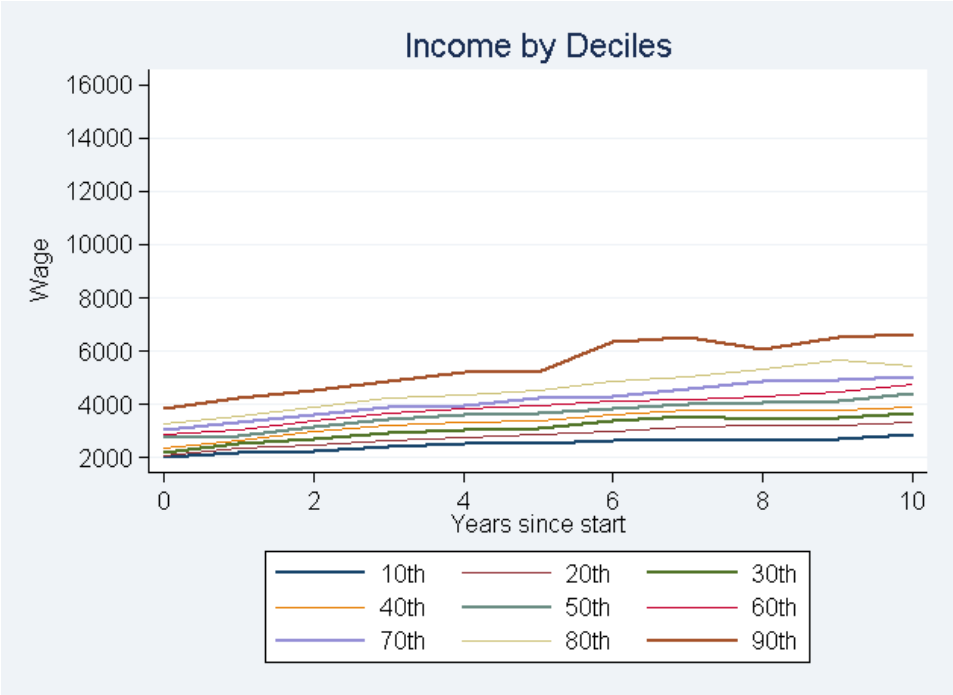
Table 3: Roles experienced within the firm by gender

	Men		Women	
Number of Roles	Monthly wage	N	Monthly wage	N
1 Role	4122.6	69,232	2499.5	156,451
	(2346.3)	30.7%	(946.1)	69.3%
2 Roles	4409.7	63,940	2565.1	204,316
	(2545.8)	23.8%	(939.4)	76.2%
3 Roles	4482.3	43,910	2718.8	140,129
	(2544.3)	23.9%	(1023.0)	76.1%
4 Roles	4674.1	25,237	2809.2	81,723
	(2661.3)	23.6%	(1145.6)	76.4%
5 Roles	4756.1	12,280	2923.2	40,683
	(2512.8)	23.2%	(1236.9)	76.8%
6 Roles	5087.6	6,597	3124.0	19,555
	(4290.3)	25.2%	(1610.7)	74.8%
7 Roles	5523.8	3,141	3209.4	8,337
	(5071.1)	27.4%	(1569.2)	72.6%
8 Roles	5269.7	1,307	3280.2	4,081
	(2668.2)	24.3%	(1696.4)	74.7%
9 or more	5026.5	863	3607.3	2,701
	(2669.5)	24.2%	(1770.7)	75.8%

Note: The reported earnings are mean monthly earnings in 2010 Euros. Standard deviations in parentheses. The percentages give the share of men and women in each category.

in the data are not directly comparable over time, since the Finnish education system has been through changes over the sample period. There was a degree reform starting in 2005, and the polytechnic education system was introduced gradually in the early 1990's.[3] Thus, these reforms must be taken into consideration when comparing the educational levels of workers. For this reason, the obtained degrees are grouped into the three categories. The graduate level group includes degrees equivalent to a master's or a doctorate degree, while the BA group includes degrees equivalent to an undergraduate degree, including the polytechnic degrees. Finally, the lowest educational background category includes those with mandatory secondary level schooling, as well as vocational training and high school diplomas.

Figure 1: Women



Note: The reported earnings are mean monthly earnings of women in 2010 Euros, including bonuses and provisions. The sample for the figure only includes workers who have entered the firm at age 23-28, and have a graduate level degree in finance, statistics, economics or similar. The data covers the years from 2002-2014.

3.2 Gender differences in earnings and promotion rates

The summary statistics table 1 shows that the mean wage of men is much higher than that of women's. These differences in the mean wages are mostly driven by the large amount of women at the clerical level jobs, where pay is lower. From the summary statistics in table 1 we can see that 83 percent of women are working at the clerical level jobs, while only 2 percent of women hold a job at the top manager level. On the other hand, 17 percent of men are in the manager level category, and less than half of the men in finance, 41 percent, hold clerical level jobs.

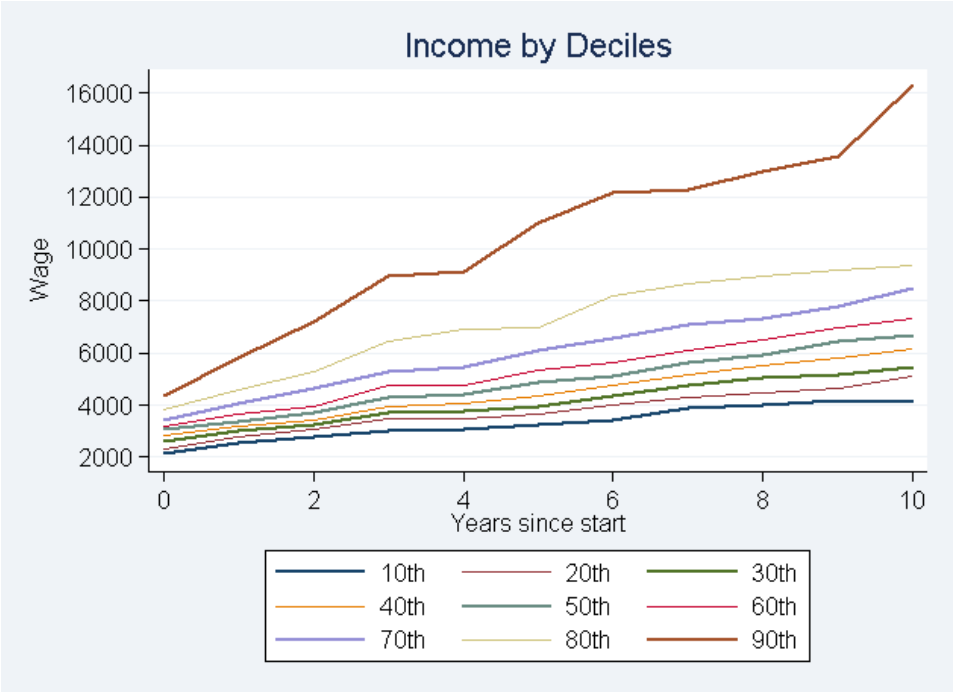
Table 2 reports the mean monthly wages of men and women in finance, categorized by the hierarchy levels. We can see that at all three levels, the mean wages of women are lower than those of men. Table 2 also shows that of the workers at the clerical level jobs, only 14.5 percent are men, while at the experts and professional level, the share of men

[3]Böckerman, Hämäläinen, and Uusitalo (2009) give a detailed description of the introduction of the polytechnic education system, as well as the Finnish higher education system in general.

and women are roughly equal. Of the workers at manager level positions, men represent 71.1 percent, while the share of women is 28.9 percent.

Table 3 reports the mean wages separately for men and women, by the number of job titles they have held within the firm. Again, throughout the number of roles, the mean wage for women is lower in all cases than it is for men. The share of women that have had one job title in the firm is 69.3 percent, and the share of men is 30.6 percent. These shares remain roughly the same as in the overall sample, such that about three quarters of the workers are women.

Figure 2: Men



Note: The reported earnings are mean monthly earnings of men in 2010 Euros, including bonuses and provisions. The sample for the figure only includes workers who have entered the firm at age 23-28, and have a graduate level degree in finance, statistics, economics or similar. The data covers the years from 2002-2014.

In the spirit of Manning and Swaffield (2008), the attention turns next to the differences in the wages of men and women at different points of the wage distribution. Figures 1 and 2 plot the mean wages at each decile of the wage distribution. The x-axis shows the years since the worker started at the firm. To narrow the sample further to make sure we are comparing similar workers, the figures only include workers that have entered the firm at age 23-28, and have graduate level schooling in finance, statistics, economics, or

Table 4: Promotion rates

	Clerical to Expert	Clerical to Manager	Expert to Manager
N	14 277	823	4 379
Share of total, %	72.5	4.2	22.2
of which men, %	34.9	55.5	57.8
of which women, %	65.1	44.5	42.2

Note: Shares of promotions from different hierarchy levels to expert and manager positions.

similar. Since there have been some changes in the higher level degrees and data classification, figures 1 and 2 only include data starting from the year 2002. The wages are in 2010 Euros and they include all provisions and possible bonuses, adjusted to represent monthly wages by EK.

From figures 1 and 2 we can see that the wages of men rise much faster and climb much higher than those of women's. After ten years at the firm, the wages of women at the top decile group correspond to the level of men at the 40th decile. However, these figures do not account for the possible career brakes of workers, but even still the differences observed are large. In the years following the entrance to the firm, the wages of women at all income deciles increase much slower than those of men's.

To investigate the flows of workers getting promoted, table 4 shows the promotion rates of men and women from one hierarchy level to the next. We can see that the majority of promotions in the sample are promotions from the clerical level up to the expert level. Women represent a majority of this types of promotions, the share of women being 65.1 percent. However, at the clerical level, the share of women is over 80 percent. Therefore men have multiple promotions to the expert level from the clerical level than women do relative to the small share of men in the clerical level group.

It is argued in the literature (eg. Golan, 2005; Clemens, 2012) that certain jobs do not have a natural promotions path, these jobs usually being the lowest level jobs in the hierarchy. Here it seems that some positions in the clerical level are suited to promotions up to expert level, and that this happens relatively often. Overall, the share of men and women at the expert level is equally distributed, and the share of women has increased over time to above 60 percent. I the mid-2000's the share of women at expert level has decreased slightly, but still remains at around 50 percent. (Vaahtoniemi, 2021) The larger absolute number of promotions of women from clerical to expert level is supportive of these developments.

Moves from clerical level to the manager level are rare, at only 4.2 percent of all promotions, as would be expected. Promotions to manager level from the expert level

on the other hand represent 22.2 present of all promotions. Here, men are at a slight majority compared to women, with 57.8 percent of the manager promotions from expert level being men and 42.2 percent women.

4 Empirical approach

This section presents the empirical strategy to capture the gender differences in the factors associated with the probability of promotion. Following both Cassidy et al. (2016) and Frederiksen and Kato (2018), I use logit estimation method to determine factors behind the probability of promotion.[4] The dependent variable in the analysis is the binary variable promotion, determining whether a worker is promoted or not. I look at three different definitions for promotion, the first being promotion from the clerical level to expert, the second to the manager level, and third a more loose definition of promotion, defined as a job title change accompanied by a wage increase.

In the analysis, the dependent variable for expert promotions is defined as those moves directly up from the clerical level. For the manager promotions, promotion is defined to be the moves up to the manager level only, regardless of whether it is a move up to the manager level directly from the clerical level or from the experts and professional level, although moves directly up from the clerical level are negligible.

Most of the promotions in the sample happen within firms. Since moves between firms are very rare, the analysis focuses on promotions in general and does not distinguish between promotions between or within firms.

Promotions are separately investigated as moves from one job title to another, where this move at the same time brings a wage increase for the worker. Not all of these types of moves are necessarily promotions in the traditional sense. They are nevertheless addressed, since many of these job title changes can be interpreted as promotions that are not captured as an official promotion, defined as a larger career move from one of the the rough three-tier hierarchy level to the next. This measure of promotion as a job title change accompanied by a wage increase thus allows to investigate differences in the career profiles of men and women who do not necessarily get promoted to the very top of the hierarchy, but may progress on their careers by changing their job title and gain from it in higher wages.

The baseline logit model used in the estimations is of the following form

$$Prob(Promotion_{it} = 1|\mathbf{X}) = \Lambda(\alpha + \mathbf{X_{it}^{'}}\beta), \tag{1}$$

where $\Lambda(.)$ is the logistic distributed cumulative distribution function of the probability of promotion of worker i at year t. The independent variables $\mathbf{X}$ include age and its square, seniority at the firm and its square, an indicator variable on whether the worker lives in the capital city area, and education level categories for secondary, BA, and graduate level education. The independent variables are measured in period t-1, since the

[4]Cassidy et al. (2016) use a similar approach as here, but their focus is on a multinomial logit model, thus exploring the differences of promotions within and between firms, and lateral moves between firms.

factors affecting promotion decisions in one year would be affected by characteristics in the previous period. To investigate interaction effects of education and the female dummy, the model is further estimated with the linear probability model.

The interest in the model lies in the coefficients of the female dummy and the education controls. Positive and significant coefficients from higher education levels would thus indicate that the higher education the worker has, the higher the probability of promotion becomes. According to the invisibility hypothesis, the coefficient for the highest level education for women is to be positive and significant, providing evidence that women can signal their ability through education, and alleviate their invisibility.

To be able to investigate the difference in the role of education for men and women in getting a promotion, equation (1) is estimated with the linear probability model. I interact the educational background dummies with the female dummy, which then gives separately the coefficient for the female dummy in the probability of promotion, the coefficient of the educational attainment, and the coefficient for the interaction of the two.

To investigate the gender differences in the association of the role of job rotation within the firm with top manager promotions, I add the number of job titles held within the firm in to the analysis. In this case, the outcome variable is the probability of promotion to the top manager level in the hierarchy. I look at how the probability of promotion is associated with the number of job titles the worker has held within the firm following Frederiksen and Kato (2018). Equation (1) is augmented by the roles experienced in the firm as follows

$$Prob(Promotion_{it} = 1|\mathbf{X}) = \Lambda(\alpha + \mathbf{Roles_{it}}'\gamma + \mathbf{X_{it}}'\beta), \tag{2}$$

where the $\mathbf{Roles_{it}}$ is a vector of dummy variables indicating the number of job titles held within the firm, and $\mathbf{X_{it}}$ includes the same controls as in equation (1). In this case, the focus is only on manager promotions.

Frederiksen and Kato (2018) have shown that for internal job markets, the breadth of human capital gained by job rotation within the firm has a positive effect on the probability of gaining an appointment to a top management position. Again, these roles dummies are interacted with the female dummy in the linear probability model framework to investigate the gender difference in the magnitude of breadth of obtained human capital within the firm.

Finally, to investigate the differences in wage changes between men and women from receiving a promotion. I estimate a pooled OLS regression capturing the change in the wage as follows,

$$y_{t+1} - y_t = \alpha + \delta Promotion + \mathbf{X_{it}}'\beta + e, \tag{3}$$

where $y_{t+1} - y_t$ is the difference of the wages between year t+1 and year t, and the $\mathbf{X_{it}}$

include the controls for age and its square, seniority at the firm and its square, capital region, education and year dummies. The variable Promotion thus captures the effect of the promotion on the wage change. The variable promotion in this case is defined as any move from one hierarchy level to the next. The analysis is carried out separately at different hierarchy levels.

5 Results

The results of the logit estimations are presented in table 5. Column (1) gives the results for expert promotions, column (2) for manager promotions and column (3) for the job title change that brings a wage incerase. The reported figures are marginal effects produced by the logit model. They show whether the association of the independent variables with the promotion outcome is positive or negative.

The female dummy is negatively associated with the probability of both expert and manager promotions. For job title change with a wage increase, this association becomes positive. This could indicate that women are more likely to progress on their careers otherwise than receiving promotions to the higher steps on the career hierarchy. The education controls are positively associated with promotion in all cases but the graduate level education for expert promotions, although this association is not statistically significant.

Table 6 reports the results from the LPM estimations. Again, the female dummy is negatively associated with promotion to expert and manager level, but positively associated with job title change. When comparing the results of the logit model in table 5 and LPM in table 6, we can see that the marginal effects from the logit model are very close to the coefficients produced by the LPM.

The results of table 6 show that the interaction of the female dummy with the graduate level dummy gives a positive coefficient in all specifications, although for job title changes this association is statistically insignificant. This means that the interaction of being a woman with a graduate degree increases the probability of promotion, compared to men with a graduate degree. This can be seen as evidence of education alleviating the invisibility of women. However, the coefficient is highly statistically significant only for expert promotions. The significance level of this association for manager promotions is only 10%. Taken together with the negative female main coefficient, the overall probability of women with a graduate degree being promoted to manager still falls behind of the main coefficient of graduate degree holding men being promoted to manager level. For expert promotions, the interactions of the female dummy with the education controls bring positive and significant coefficients, indicating a better chance for promotions from clerical to expert level for women with higher education.

For the looser definition of promotion, the GRAD female interaction is also positive but statistically insignificant. Even though the main female coefficient in this case is positive, the main coefficient of graduate educated men is larger than the total is for women.

The coefficients of the interactions of the female dummy with the BA dummy on the other hand give negative and statistically significant interaction coefficients for both manager and job title change definitions of promotion. However, for expert promotions, the interaction coefficient is positive. This can be taken as evidence that undergraduate

Table 5: Probability of Promotion, Logit estimations

	Expert promotion	Manager promotion	Job title change
	(1)	(2)	(3)
Female	-0.005***	-0.007***	0.005***
	(0.000)	(0.000)	(0.001)
L.Age	0.000	0.001***	-0.002***
	(0.000)	(0.000)	(0.000)
L.Seniority	-0.001***	-0.000	-0.003***
	(0.000)	(0.000)	(0.000)
L.Capital Area	0.003***	-0.003***	-0.005***
	(0.000)	(0.000)	(0.001)
L.BA	0.005***	0.007***	0.010***
	(0.000)	(0.000)	(0.001)
L.GRAD	-0.000	0.012***	0.023***
	(0.001)	(0.000)	(0.001)
Observations	758803	758803	758803

Note: Dependent variable is the binary variable determining promotion to expert in column (1), to manager in column (2) and determining a job title change with a wage increase in column (3). Cluster-robust standard errors in parentheses, clustered by individual level. Reference group for the education category is the secondary level education category. All regressions include a quadratic for age and seniority, and year controls. All explanatory variables measured in period t-1. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01.

level schooling is not enough to alleviate the invisibility of women in getting manager promotions, but it is associated positively with getting promoted to expert level.

The main coefficient for graduate schooling gives negative coefficients for the expert promotion specifications, while for the other two specifications the coefficients are positive. Bachelor level schooling on the other hand is positively associated with getting promoted from the clerical to the expert level. These directions of the associations of schooling with promotions are also observed in the logit estimations of table 5.

Taken together the results of tables 5 and 6 thus show that graduate level education can alleviate the invisibility of women, but the magnitude of these associations still leaves women behind of men in terms of probability of getting promoted. However, women seem to benefit from having undergraduate level schooling in getting a promotion from the clerical level to the expert level. Men with a graduate degree get promoted to manager with a higher probability than equivalent women do.

The interest is next turned to the gender differences in the accumulation of firm-specific human capital through having held different job titles in the firm. To investigate whether job rotation within the firm has different associations on the probability of promotion for men and for women, I estimate regressions including the number of job titles held within the firm as presented in equation (2).

Table 6: Probability of Promotion, LPM estimations

	Expert promotion		Manager promotion		Job title change	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.006***	-0.011***	-0.008***	-0.008***	0.005***	0.009***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
L.Age	-0.001***	-0.001***	0.001***	0.001***	-0.003***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.Seniority	-0.001***	-0.001***	-0.000***	-0.000***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.Capital Area	0.003***	0.003***	-0.003***	-0.003***	-0.006***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
L.BA	0.005***	0.000	0.006***	0.007***	0.009***	0.019***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)
L.GRAD	-0.001*	-0.011***	0.019***	0.018***	0.024***	0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
L.BA × Female		0.006***		-0.001**		-0.014***
		(0.001)		(0.001)		(0.002)
L.GRAD × Female		0.019***		0.002*		0.001
		(0.001)		(0.001)		(0.003)
Observations	758803	758803	758803	758803	758803	758803

Note: Dependent variable is the binary variable determining promotion to expert in columns (1) and (2), to manager in columns (3) and (4) and determining a job title change with a wage increase in columns (5) and (6). Cluster-robust standard errors in parentheses, clustered by individual level. Reference group for the education category is the secondary level education category. All regressions include a quadratic for age and seniority, and year controls. All explanatory variables measured in period t-1. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01.

Table 7: Probability of Promotion, Logit and LPM estimations

	All workers			Secondary	BA	GRAD
	Logit	LPM	LPM	LPM	LPM	LPM
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.007***	-0.009***	0.001***	-0.001***	-0.000	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
2 roles	0.013***	0.004***	0.010***	0.007***	0.009***	0.018***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
× Female			-0.008***	-0.006***	-0.007***	-0.004**
			(0.001)	(0.001)	(0.001)	(0.002)
3 roles	0.016***	0.007***	0.016***	0.012***	0.014***	0.028***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
× Female			-0.013***	-0.011***	-0.010***	-0.003
			(0.001)	(0.001)	(0.001)	(0.002)
4 roles	0.019***	0.011***	0.025***	0.019***	0.021***	0.043***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)
× Female			-0.019***	-0.016***	-0.014***	-0.008**
			(0.001)	(0.002)	(0.002)	(0.004)
5 roles	0.021***	0.016***	0.032***	0.024***	0.032***	0.049***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.005)
× Female			-0.023***	-0.019***	-0.019***	-0.004
			(0.002)	(0.002)	(0.003)	(0.005)
6 roles	0.023***	0.021***	0.036***	0.026***	0.035***	0.055***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.005)
× Female			-0.021***	-0.018***	-0.014***	-0.004
			(0.002)	(0.004)	(0.004)	(0.007)
7 roles	0.025***	0.028***	0.049***	0.041***	0.049***	0.065***
	(0.001)	(0.002)	(0.004)	(0.007)	(0.007)	(0.007)
× Female			-0.030***	-0.029***	-0.022***	-0.006
			(0.004)	(0.007)	(0.007)	(0.011)
8 roles	0.025***	0.028***	0.046***	0.032***	0.052***	0.057***
	(0.001)	(0.002)	(0.005)	(0.009)	(0.009)	(0.008)
× Female			-0.024***	-0.020**	-0.023**	0.008
			(0.006)	(0.010)	(0.010)	(0.016)
9 or more	0.028***	0.038***	0.049***	0.019***	0.055***	0.088***
	(0.001)	(0.003)	(0.006)	(0.007)	(0.012)	(0.008)
× Female			-0.016**	-0.004	-0.006	-0.012
			(0.008)	(0.008)	(0.014)	(0.013)
Observations	758803	758803	758803	446688	231917	80198

Note: Dependent variable is the binary variable determining promotion to the top manager level. Cluster-robust standard errors in parentheses, clustered by individual level. Reference group for the roles categories is having experienced one role within the firm. All regressions include age and its square, seniority and its square, capital region and year controls. All explanatory variables measured in period t-1. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01.

Table 8: Wage change upon promotion, Pooled OLS estimations

	All workers		Managers		Experts		Clerical	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Promotion	219.695***	396.115***	550.172***	629.777***	313.414***	400.550***	96.656***	187.137***
	(3.332)	(9.775)	(21.568)	(29.975)	(6.991)	(13.835)	(1.615)	(7.484)
Female	-51.990***	-27.008***	-21.953**	9.664	-31.651***	-11.086***	-34.379***	-25.864***
	(1.538)	(1.470)	(9.258)	(8.827)	(2.893)	(2.783)	(1.441)	(1.493)
Promotion								
X Female		-242.855***		-210.120***		-153.516***		-105.644***
		(9.749)		(35.877)		(14.567)		(7.429)
Observations	758803	758803	48499	48499	169504	169504	540800	540800
R^2	0.040	0.043	0.044	0.044	0.053	0.054	0.054	0.056

Note: Dependent variable is the change in wages from year t to year t+1. Cluster-robust standard errors in parentheses, clustered by individual level. All regressions include controls for age and its square, seniority at the firm and its square, capital region, education and year dummies. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01.

Table 7 reports the results. Column (1) of table 7 reports the marginal effects of the logit model, and the rest are coefficients from the LPM.

Columns (1) and (2) show that the probability of promotion increases in the number of job titles held within the firm. The number of job titles held are added in the regressions as categorical variables, with the reference category being the case for the worker having had only one position within the firm. Since there are such large differences in the educational backgrounds of the workers, the sample is also split into three by the educational level categories in columns (4)-(6) of table 7.

Column (3) reports the results of the interactions with the female dummy with all of the roles categories, representing the number of job titles held within the firm. The interaction gives negative coefficients with all of the categories, meaning that this type of job rotation within the firm doesn't seem to increase women's promotion probability as much as they do for men.

For workers that hold a secondary level degree, the roles interaction with the female dummy produces increasingly negative coefficients. The same holds for workers with a BA level degree, however, at 9 roles or more, this effect becomes statistically insignificant. For women with a graduate degree, the association from the interaction remains negative but the coefficients are smaller than for secondary of BA degree holders. This means that women with a graduate degree benefit more from having experienced multiple roles in the firm than women in the other education groups. However, the statistical significance of these coefficients is in many cases weaker than in the former two educational groups. The coefficients for women are in all cases lower than those of men's, meaning that men seem to benefit more from having experienced more roles in the firm than women do, when it

comes to the probability of being promoted to the top manager level.

Table 8 shows the results of the pooled OLS regressions according to equation (3). It shows the changes in wage level due to promotion, defined as a move from one job title to another. The results are also estimated separately by hierarchical category.

The table shows that in all categories, men earn more from job title changes than women do. The wage increases from a job title change are naturally highest at the manager level, suggesting a 630 Euro increase to monthly wages for men, and a 419 Euro increase for women. At the experts and professionals level, where the gender distribution is close to 50-50, the wage increases with a job title change are larger for men than they are for women. The wage increase declines to 187 and 56 Euros for the clerical level worker men and women, respectively.

6 Conclusion

The analysis shows that women move more often between jobs within the same hierarchy level, while men more often have promotions up to the next hierarchy level, particularly to the manager level. Higher education is positively associated with the probability of promotion to the manager level for women, but the magnitude of this effect is found to be larger for men.

Based on the results it seems that women are getting promoted from the clerical level up to expert level, but they face a higher threshold in getting a manager promotion. This is manifested also in the gender distributions of each hierarchy level: at the expert level, the share of women is about 50 percent, while at the manager level women represent on average less than 30 percent. At clerical level women are a majority at 85 percent.

The difference between men and women getting promoted could be rooted in this occupational segregation, which is on a high level to begin with. There is no reasonable channel for promotions from the clerical level all the way up to manager level. Promotions from clerical level to the expert level on the other hand represent the majority of promotions observed in the sample. Of those promoted to the expert level, the majority, 65 percent, are actually women. However, relative to the share of men at clerical level (14.5%), the share of men promoted up to expert is large (34.9%).

It could thus be that there are certain positions at the clerical level that are tuned for promotions, as argued by Clemens (2012), who studied career fast-track positions from the point of view of occupational segregation. Similarly Golan (2005) shows the lack of a natural promotions path from certain low-level jobs. A part of the clerical level jobs could be so-called "women's jobs", where the potential for promotion is low due to lower educational background requirements, as observed by Ransom and Oaxaca (2005). Other clerical level jobs could on the other hand be more tuned for promotion, and perhaps have some higher educational background requirements, such as a bachelor's degree.

Undergraduate level schooling was found to be positively associated with promotion up from the clerical to the expert level. Women represent a large part of promotions up from the clerical to expert level, and having an undergraduate degree is positively associated with this promotion. Therefore it could be that the clerical level jobs from which the workers get promoted from are ones that require an undergraduate degree. Since the share of women and men at expert level has been quite equal throughout the sample years, it seems like women in finance have reached that level when it comes to equality, but face a higher threshold in getting promoted up to manager. The share of women at manager level has increased over the years, but the wages of women still lag behind of those of men's, especially at the manager level.

When considering gender differences in firm specific human capital, the analysis showed that men benefit more from having experienced multiple roles within the firm. This is

associated with a larger probability of manager promotion for men than it is for women.

In sum, it looks like women, who represent a majority of workers in finance, have traditionally been working at the clerical level, while men have held the manager positions. Already in the early 1990's however, the share of women at expert level has been close to 50 percent. There are multiple promotions up from the clerical up to the expert level, and women get promoted frequently up to expert. Men on the other hand represent a larger share of these promotions than would be expected based on their small share at the clerical level. During the years from 1990 to 2014, the share of women has risen greatly also at the manager level. However, women seem to face a higher threshold in getting promoted to manager than men do, and therefore the share of women at manager level has not increased as much as it has at the expert level. Furthermore, when looking at wages, men hold the highest paying jobs in finance and also receive larger pay increases upon promotion than women do. In short, although the share of women at manager level has increased since the early 1990's, women are on average less likely to get promoted to manager than men are, receive lower wage increases upon promotion, and hold lower paying manager positions than men do.

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Bank type and wages in Finland: Cooperative, savings and commercial banks

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Abstract

The Finnish banking sector is characterized by the competition between profit-maximizing shareholder banks and stakeholder banks, the latter group consisting of cooperative and savings banks. Even though the banks compete in the same market, there might well be substantial differences in their operations. One interesting issue that has been less studied is whether the wage policies of these two type of banks are similar or different. Competition in the markets for bank employees limits the extent of the wage difference. However, previous literature has shown that there are often pronounced differences in wage setting between for-profit and not-for profit firms. This paper aims to answer whether these hypotheses applied to worker cooperatives and non-profits can explain the wage differences between the different types of banks in Finland. We use data from the Confederation of Finnish Industries that has a rich individual-level data on employee characteristics and their wages. The results indicate that in the Finnish banking sector, commercial banks pay higher base wages as well as bonuses to their employees than cooperative or savings banks do. However, both types of stakeholder banks, especially cooperative banks, pay bonuses much more frequently than shareholder banks. The pay distribution is also much less dispersed in stakeholder banks. In our regression analysis we find that pay in stakeholder banks is lower. The Oaxaca decomposition analysis shows that the unexplained component of the wage differential is positive, so that stakeholder banks actually pay higher wages than what could be expected based on their employee characteristics.

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1 Introduction

This paper investigates the differences between wages in cooperative, savings and commercial banks in Finland. These two types of banks represent two quite competing operational logics in the banking industry: commercial banks are profit-maximizing entities (shareholder banks), whereas cooperative and savings banks are stakeholder banks, that do not maximize profits, but instead the consumer surplus of their customers.[1]

Literatures analyzing the performance (e.g. Iannotta, Nocera, & Sironi, 2007) or their lending behavior (Ferri, Kalmi, & Kerola, 2014) has often found pronounced differences between these two groups. However, there does not appear to be much evidence on the comparative wage policies of these two types of organizations. On the one hand, one would expect these not to be widely different, because all large banks and banking groups in Finland operate in fairly similar markets, especially related to consumer banking but to some extent on corporate banking, although stakeholder banks (especially the smaller groups) have more focus on the SME industries. Because of this similarity in the market they operate and the relatively comprehensive scope of their operations, also the human capital they demand from their employees is likely to be quite similar.

On the other hand, much of the literature comparing shareholder and stakeholder banks find pronounced differences between these two banking groups, so it might well be interesting to look at the issue of wage differences as well. There does not appear to be much previous literature on the wage differences between the stakeholder banks and shareholder banks. There is a small literature on wage differences in non-profit organizations. This literature suggests that non-profit organizations pay lower wages and this difference can be explained by differences in worker motivation. There is an even smaller literature concerning cooperatives, and that is mostly related to worker cooperatives. The empirical literature on cooperatives also seems to point out a wage gap in favour of shareholder firms. Concerning the differences in banking, the evidence in Bailly, Chapelle, and Prouteau (2017) indicates that shareholder banks pay more than cooperative banks, but cooperative banks reduce this difference by paying more to the employee characteristics.

We find differences in the wage policies of the two bank ownership types. First, profit-maximizing shareholder banks pay on average higher wages to their employees than stakeholder banks do. However, the bonuses paid by shareholder banks are more concentrated to the manager level workers, whereas the bonus payouts in stakeholder banks are more

[1] For a review of stakeholder banking organizations, especially cooperative banks, see Fonteyne (2007).

evenly distributed. Furthermore, we find that wage dispersion in stakeholder banks is lower than in shareholder banks.

The paper is structured as follows. In section 2 we review the role of stakeholder banking in the Finnish banking markets. In section 3 we discuss the differences between stakeholder and shareholder banking in general. In section 4 we discuss the possible implications of operational differences on wages, and we also review the previous literature regarding nonprofit and cooperative wage differences with respect to conventional firms. Section 5 presents the data and descriptive statistics. In section 6 we analyze the wage differences in a regression framework. In section 7 we perform the Oaxaca decomposition, which allows us to analyze to what extent wage differences are based on observed characteristics and to what extent in differences in wage policies between shareholder and stakeholder banks. Section 8 concludes.

2 Different types of banking organizations in the Finnish banking markets: A review

In the Finnish banking markets, different types of banking organizations have coexisted for a long time.[2] Savings banks in Finland were modeled according to the Scandinavian and German examples and the first savings banks were formed already in the first half of the 19th century. Credit co-operatives first appeared in Finland at the turn of the 19th and 20th century, and several hundreds of them were founded in the first decades of the 20th century. Their market share grew strongly after the Second World War due to the resettlement programs of Karelian immigrants.

Our data starts from the 1990s that just predates large changes in the Finnish banking landscape. The deregulation of the Finnish banking system took place mostly in the second half of the 1980s. An important feature of this was that borrowing from abroad was liberalized. This ended the era when the central bank had been able to regulate money supply directly and set the average interest rates. A long period of repressed demand for credit ended, the amount of new loans soared, and the economy overheated.

All this ended suddenly in the beginning around 1990 for a number of reasons: collapse of trade with the Soviet Union, a minor recession of trading partners, and the overvaluation of the national currency Markka. The savings bank had (rather uncharacteristically given the typically conservative nature of savings banks) been involved in the lending bonanza and in large corporate loans and overseas investments, and was hit harder by the recession than other banks. The central bank of the Finnish Savings Banks (the SKOP Bank) was taken over by the Bank of Finland in September 1991. The local savings banks continued their operations, until most of them were merged within a single Structure (Savings Bank Finland) in 1993. In 1994, the new entity was sold to the main competitors (at the time cooperative banks, KOP, SYP, Postipankki). A minority of these banks were able to continue their operations independently and they form the backbone of the Finnish Savings Banks today.

Cooperative banks emerged from the depression and banking crisis with much less damage than the savings banks. However, some cooperative banks had also experienced considerable losses and the need for structural reform was apparent. One important change was that they changed the liability structure so that individual banks became jointly liable for the debts of each other, thus following the Dutch Rabobank model. This necessitated a stronger role by the central unit of the bank in the internal operations of the bank.[3] However, a part of the local cooperative banks were opposed to this change

[2]This section is based on seminal histories of savings banks and cooperative banks by Kuusterä (1995); (2002) and the summary article by Kalmi (2012)

[3]Cooperative banks are characterized by a governance model, where the central unit is in turn owned and controlled by the local banks. However, because the local banks may have divergent interests (e.g.

Table 1: Market shares (%) of different bank types

	Cooperative banks	Savings banks	Commercial banks	Postal savings banks	Other
1980	23	28	36	12	1
1995	34	6	42	16	2
2009	36	8	50	n/a	6

Note: Source: Kalmi (2016)

and in the end they formed a competing group of cooperative banks of their own. After 1997, there has been two cooperative banking groups in Finland, the (larger) OP Group and the (smaller) POP Group.

Table 1 summarizes the development of market shares of the different categories of the banks. Before the regulatory changes, savings banks together had a larger market share than cooperative banks, and actually the overall size of the commercial banking sectors (consisting of several banks) was not that much larger than that of savings banks – and if you include the government-owned postal savings banks, then the savings bank sector would have been larger. The savings banks group was the largest banking group in the country at the time in terms of market shares of loans and deposits. However, by mid-1990s a large part of the savings bank sector was wiped out, and the other groups had respectively increased in size. In 1998 the postal savings bank system was privatized and transformed into a commercial bank; this largely explains why commercial banks grew relative to cooperative banks in the first decade of the 2000s. However, in terms of single banking groups, the OP Group overtook Nordea as the largest bank in the Finnish banking market (in terms of loans and deposits, though not assets) in around mid-2000s.

between large and small banks), and because of standard principal-agent problems of managers not being fully accountable to the interest of the owners, the interest of central management and local banks are not fully aligned. On the corporate governance challenges in cooperative banks, see e.g. Cuevas and Fischer (2006) or Jones and Kalmi (2012).

3 Differences between cooperative, commercial and savings banks

There are several important differences between cooperative, savings and commercial banks that may have a bearing to their wage setting. To start with the cooperative banks, they are owned by their members, who are the customers of the bank. Cooperative banks distribute profits only to a limited extent. The distribution of the surplus happens mostly relative to the use of banking services. In cooperative banks, members (who are individual persons, rather than corporations or other legal entities) have the highest decision-making powers. However, since the number of members is large and ownership is dispersed among members, corporate governance in cooperatives has a rather managerial character.

An important feature of cooperative banks in the OP Group is that the network of banks is tight with joint liability, and there is strong guidance from the center. The intervention rights and monitoring by the center actually forms another pillar to complement the monitoring role of the individual members.

Savings banks have traditionally been non-profit banks, but from the 1980s onwards another structure has become prominent, that of joint stock companies owned by foundations. However, the ultimate (and typically sole) ownership by (non-profit) foundations makes them rather different from standard profit-maximizing joint-stock banks, and that still gives a motivation to treat them as a separate category. Savings banks are run on behalf of their customers, especially the depositors. The central aim of the savings banks has traditionally been to promote thrift. That has given them a conservative character.[4]

What is the market niche of cooperative and savings banks and why are they not outcompeted in the markets? Some (e.g. Rasmusen, 1988; Fonteyne, 2007) have argued that cooperative and saving banks have an advantage in earning the trust of their clients – something that may have become more important after the financial crisis of 2008. The reason for this comparative advantage in generating trust is that their not-for-profit structure helps to solve the agency problem between borrowers and depositors. Depositors (or more generally, investors) have fewer reasons to be concerned about the bank behaving opportunistically towards them, because of the lack of the profit motive.

Secondly, cooperative and savings banks do not need to match the rates of return that characterize the conventional joint-stock banks. This may help them to operate in both geographical areas and business lines that do not appear profitable to conventional joint stock banks. For instance, cooperative and joint stock banks are stronger than conventional banks in small towns and rural areas. They are also more focused on traditional banking and lending for households and SMEs, and deposit-taking, rather than

[4]Admittedly, this was not true for the majority of Finnish savings banks or their central unit in the latter half of the 1980s.

investment and corporate banking, compared to profit-maximizing banks.

4 Implications on wage differences

What does this mean in terms of wage differences? Perhaps the first clue is to look at the literature on wage formation in non-profit and cooperative enterprises. There is a relatively established literature on the former, but less so on the latter topic. Concerning the wages of nonprofit firms, one important theoretical point of departure has been the work of Preston (1989). She argued that employees in non-profit firms may be willing to accept lower wages in exchange of the opportunity to contribute to the provision of positive social externalities.

In her empirical analysis, she finds that the wages in nonprofit enterprises are lower than for employees in conventional firms performing similar tasks. Later literature (e.g. Handy & Katz, 1998; Leete, 2000) has framed this in terms of intrinsic vs. extrinsic motivations of employees in the two types of firms. Non-profits seek more intrinsically motivated employees, and having lower extrinsic incentives may improve worker match.

The findings of Handy and Katz (1998) show that non-profits pay less to their managers. This is consistent with the idea that pay differential between conventional firms and non-profits increases when you move upwards in hierarchy. Their model shows that these lower wages are partially compensated by fringe benefits, and suggest that the lower wages attract managers that are more committed to the cause. The output of the managers in both non-profits and for-profits are on similar levels. Leete (2000) finds wages are more equally distributed in non-profits than in conventional enterprises.

There is also more recent literature that has looked into the differences between pay in non-profits and conventional firms. DeVaro and Brookshire (2007) show that conventional firms rely more heavily on promotions as incentive mechanisms than non-profit firms. DeVaro, Maxwell, and Morita (2017) find that the wage difference is due to the fact that nonprofits pay lower wages to employees in higher hierarchical positions, but the wage differential is not statistically different among low-skilled workers. Becchetti, Castriota, and Tortia (2013) find that in a sample of Italian social cooperatives, the wages are higher among employees that have the highest indicators of intrinsic motivation, which they interpret as evidence against the interpretation that intrinsically motivated nonprofit employees "donate" a part of their labor for free. Finally, King and Lewis (2017) find that in a sample of employees in US hospitals, nonprofits actually pay more than for-profit hospitals, somewhat contrary to the general tenor in the literature.

The discussion of wage formation in cooperative organizations has focused largely on worker cooperatives. The canonical models of worker cooperatives following Ward (1958) suggested that worker cooperatives would lead to higher wages than conventional firms, because all surplus is distributed among workers. However, empirical studies (e.g. Bartlett, Cable, Estrin, Jones, & Smith, 1992; Pencavel, Pistaferri, & Schivardi, 2006) have typically found lower wages in cooperative firms. Again, it is somewhat unclear how

portable these results are to banking cooperatives, where customers are the owners, not employees (though employees typically are members as well).

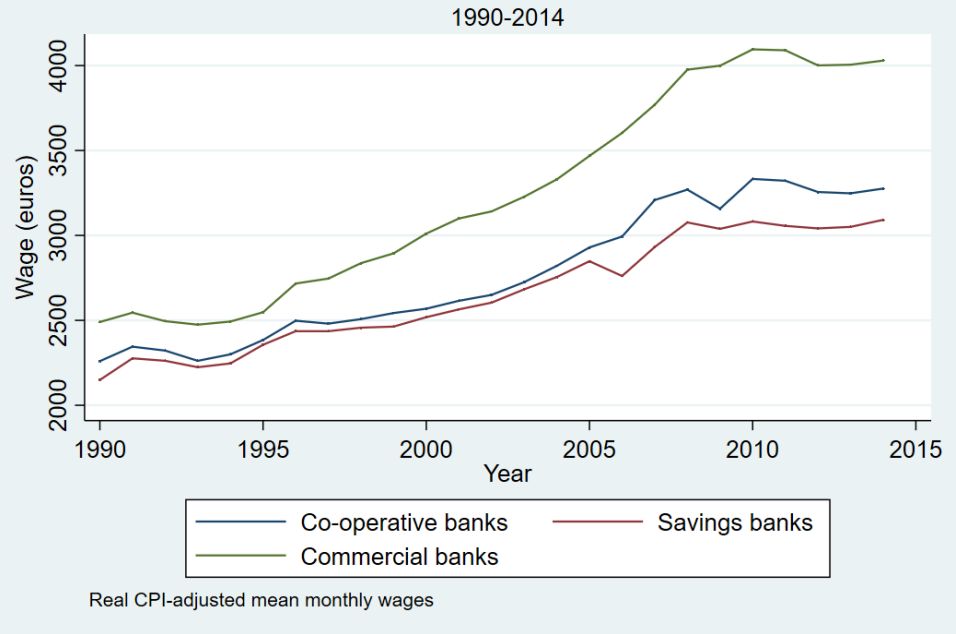
Clemente, Diaz-Foncea, Marcuello, and Sanso-Navarro (2012) have studied the wage differences between the cooperative and conventional firms across sectors using administrative data in Spain. They find that the cooperatives have on average lower wages, but the wage gap depends on the sector and nature of the cooperatives, biggest wage gaps being attributable to worker cooperatives. They also find that the main reasons for differences are related to worker characteristics, but cooperatives remunerate their employees more generously related to these characteristics.

Bailly et al. (2017) use a similar analysis for French firms. They find in general that cooperatives pay more than conventional firms, but in the banking sector conventional firms pay more. Similarly to Clemente et al. (2012) they find that the distribution in favor of conventional firms is attributable to worker characteristics, but cooperatives weaken this impact by paying their workers more than would be expected based solely on these characteristics.

This tendency of cooperative firms to pay more on observed characteristics may be due to their tendency to reduce wage differentials within the firms. This has been argued theoretically by Kremer (1997) and observed empirically by Abramitzky (2008) in Israeli kibbutzim and Burdín (2016) in Uruguyan worker cooperatives. Their argument is that collective decision-making mechanisms within the firms may favor redistribution, which has beneficial insurance effects for individuals, but may lead to adverse employee turnover when undercompensated high-productivity employees quit, and thus undermine the sustainability of cooperatives in the long run.

In sum, there is prior literature both on nonprofit compensation and compensation in worker cooperatives, but it is unclear how this literature carries over to customer owned cooperatives or non-profits in the financial sector. Most of this literature, especially that of worker cooperatives, suggests that cooperative firms pay less than conventional firms, although there are exceptions (Bailly et al. (2017) results for French cooperatives). However, there is very little prior research on the financial sector.

Figure 1: Monthly wages of workers in shareholder and stakeholder banks



Note: The reported earnings are mean monthly earnings of workers in the three different bank types, reported in 2010 Euros.

5 Data

The data is drawn from a large wage data set of workers and firms in the Finnish private sector. It is from the Confederation of Finnish Industries (EK) which is the central business organization representing the employer organizations. Of the EK affiliated firms, 96 percent are small and medium enterprises. The collected wage data is used in central wage negotiations between the employer organizations and trade unions.

The data consists of three sub sectors of workers: production workers, non-production workers and service sector workers. This paper focuses on the subset of service sector workers, where the banking workers are found. EK collects the data each year in October by sending out an inquiry to which the firms are obliged to reply. The firms report the monthly wages among other information from their administrative records, resulting in highly accurate data. The wage inquiry includes all workers in the member companies, excluding the chief executive officer, workers that are owners of the company or are working there because of their family relations, workers abroad, workers on study leave or family leave, sabbatical, or sick leave, and workers who have not had any wage income during October. The data includes both monthly wage earners and hourly paid workers, as well as part-time workers, fixed term workers and trainees. All the wages are reported

Table 2: Summary statistics

	Cooperative Banks		Savings Banks		Commercial Banks	
	Mean	SD	Mean	SD	Mean	SD
Total monthly wage	2752.9	1362.3	2690.5	1094.8	3078.4	1852.4
Age	43.3	9.75	44.5	9.52	43.4	9.4
Seniority	16.1	11.06	14.9	11.05	16.5	10.8
Female	0.84	0.36	0.85	0.35	0.78	0.41
Capital area	0.13	0.33	0.03	0.17	0.53	0.50
Bank size	162.7	201.7	57.4	56.5	5700.4	3029.6
Education categories						
Secondary Educ.	0.62	0.49	0.58	0.49	0.72	0.45
BA	0.31	0.46	0.36	0.48	0.25	0.43
GRAD	0.07	0.26	0.06	0.25	0.10	0.30
Hierarchy levels						
Clerical	0.78	0.41	0.74	0.44	0.72	0.45
Expert	0.18	0.38	0.19	0.39	0.19	0.40
Manager	0.04	0.20	0.06	0.24	0.08	0.28
Observations	169 396		22 377		354 061	
Number of banks	291		39		30	

Note: Descriptive statistics. Total monthly wages are 2010 euros, including bonuses and provisions. Age and seniority are expressed in years. Female is a dummy variable taking the value 1 if the individual is female and 0 otherwise. Capital area is a dummy variable taking the value 1 if the individual lives in the capital city region, and 0 otherwise. Bank size measures the number of workers in the bank. GRAD, BA and Lower are education category dummies, and clerical, expert and manager are hierarchy level dummies.

so that the enclosed wages are compatible to monthly wages.

Banking workers are defined as workers that are employed directly by a bank, however, we exclude some workers performing routine, supportive tasks unrelated to banking.[5] Over the years 1990 to 2014 there are 54 999 unique workers in banks. The banks are grouped into three categories based on their ownership structures: cooperative banks, savings banks and commercial banks. The cooperative banks include 13 363, savings banks 1 801 and commercial banks 39 835 individual workers, respectively.

Although the data is comprehensive, it is not a matched data set with bank performance details, but focuses instead on the worker side. Thus it does not allow us to estimate pay for performance type situations. However, these kind of pay structures are most relevant for CEO's and other top level managers,[6] who are excluded in our data.

[5]These occupations include cleaners, service car drivers, kitchen and restaurant staff, janitors, and tradesmen. These workers are often directly employed by the bank and are thus listed in the data as workers in the bank.

[6]CEO wages are often tied to the performance of the bank, see eg. Benmelech, Kandel, and Veronesi (2010)

Table 3: Monthly wage statistics, 1990-2014

	Cooperative Banks	Savings Banks	Commercial Banks
Wage percentiles			
Mean	2752.9	2690.5	3078.4
Median	2360.5	2337.9	2487.2
25th percentile	2091.5	2090.8	2147.5
75th percentile	2837.7	2804.1	3301.2
Wage dispersion			
Coefficient of variation	0.261	0.326	0.477
Observations	169 396	22 377	353 976

Note: Monthly wages are reported in 2010 Euros, including bonuses and provisions. The coefficient of varitation measures the wage dispersion within the different bank types.

Table 2 reports the descriptive statistics separately for cooperative banks, savings banks and commercial banks. The mean of total monthly wages are reported in 2010 Euros. Clearly, the highest wages are paid for those working in commercial banks. Figure 1 shows the differences between the wages of workers in different bank types over time. We can see that commercial banks have consistently had the highest wages throughout the sample years.

Table 2 shows that there are more commercial banks in the capital area of Finland, where the wages are on average higher than in the rest of the country. The share of workers with the highest educational background is slightly higher for commercial banks than in cooperative and savings banks. The variable bank size measures the number of workers in the bank.

The educational level of the workers are grouped into three categories. The first group includes workers with a graduate level degree, such as a master's degree or a doctorate degree. The category BA includes workers with an undergraduate degree, and the final category includes workers with less than an undergraduate degree, such as a high school diploma or similar level vocational training.

In 2002, the education variables collected by EK were changed to be compatible with the classification of Statistics Finland. There was also a major degree reform in Finland in 2005 and the introduction of the polytechnic education system in the beginning of the 1990's.[7] Thus the degrees listed in the data are not directly comparable over the years. However, when divided into the above three major educational background indicators, they give a fairly accurate indication of the level of education the worker has completed.[8]

[7]See Böckerman, Hämäläinen, and Uusitalo (2009) for a description of the polytechnic reform and the Finnish education system in general.

[8]Kalenius (2017) gives a description of what needs to be taken into consideration when comparing

Table 4: Bonuses and provisions, 1990-2014

	Cooperative Banks		Savings Banks		Commercial Banks	
	Mean	SD	Mean	SD	Mean	SD
Hierarchy Levels						
Clerical workers	76.7	64.0	67.0	62.6	105.8	197.5
Experts	147.9	167.2	121.6	145.4	408.1	420.5
Managers	307.4	352.2	273.8	278.8	612.8	474.9
Observations	63 879		5 095		41 949	

Note: Monthly bonuses and provisions expressed in 2010 euros. Excludes workers whose bonus and provision payments are 0.

Table 3 gives more detailed statistics on the wages of workers in each bank type. We can see that the median is below the mean in all cases, indicating a rightward skewed pay distribution, where the high incomes in the top of the pay distribution increase the mean pay. At the different points of the pay distribution reported, the wages in commercial banks are consistently higher than in cooperative or savings banks.

Table 3 further reports the wage dispersion in the three different bank types. The table reports the average of the coefficient of variation first calculated separately for each bank within the different bank types. The coefficient of variation is a good descriptive measure for wage dispersion because it gives us the opportunity to compare the wage dispersion within the bank types even though their means are quite different.

The statistics show that the wage dispersion is clearly the largest in commercial banks. This finding is in line with prior research showing that cooperatives tend to aim for higher wage equity within the organization, hence reducing the wage dispersion.

Furthermore, the data allows for the classification of bank workers into three hierarchical levels: managerial workers, experts or professionals, and clerical workers. This classification is done by occupational groups, which are formed from more detailed occupational titles. For example, the manager group includes managerial workers such as managers of investments, sales and marketing, etc. and similarly for experts in these occupations, who are below the managers in the hierarchy. The job titles of clerical workers are for example sales, secretarial duties, customer service, and supporting tasks, among others.

The data reports annual bonus payments starting from 2002. Before this, the bonuses are reported as a lump sum together with all other wage components, such as provisions. Table 4 reports the average monthly bonus and provision payments for each bank type.

higher education levels of workers in Finland when the time span covers the polytechnic education system reform

Table 5: Frequencies of bonus payments, 2002-2014

	Cooperative Banks		Savings Banks		Commercial Banks	
	N	%	N	%	N	%
Hierarchy Levels						
Clerical workers	42 828	74.4	3 605	39.4	15 511	16.6
Experts	9 491	76.9	1 040	40.3	18 242	39
Managers	2 040	72.9	424	45.4	7 574	55
Total	54 359	74.8%	5 069	40%	41 327	26.9%
Observations	72 697		12 668		153 877	

Note: The number of workers that have received a bonus payment. The columns with % give the share of workers of the total who have received a bonus payment in each category.

There are differences in the amounts of bonus and provision payments between the different types of banks. The bonus payments are clearly the highest at the commercial banks, with the average monthly bonus payments at the manager level being over 600 euros, while in cooperative and savings banks the average is around 300 euros. For both the experts and clerical level workers, the monthly bonus payments are also higher at the commercial banks.

Table 5 shows the frequencies of bonus payments, reported in the data from 2002. Cooperative banks pay bonus payments to 74.8 percent of their employees, with the figure ranging from 72.9 percent to 76.9 percent at all hierarchy levels. Savings banks have similarly even shares of workers receiving bonus payments at all hierarchy levels, at around 40 percent. In commercial banks on the other hand, the bonus payments are mostly given out at the top manager level. 55 percent of managers in commercial banks received a bonus payment, while at the clerical level only 16.6 percent had received a bonus.

6 Bank type and wages

We start with wage regressions following Mincer (1974). We use a simple pooled OLS model to capture differences in the coefficients affecting the wages of workers in the different bank types. The wage equation is of the following form

$$ln(y_i t) = \alpha + \beta \mathbf{X_{it}} + \epsilon_{it}, \tag{1}$$

where the dependent variable is the logarithm of total monthly wages, and coefficients β capture the effects of the explanatory variables X, including age and its square, seniority at the firm and its square, capital area dummy, gender, bank size, educational background indicators, hierarchy levels, and year dummies.

To further estimate the effect of bank type on the wages of workers, the wage equation takes the following form

$$ln(y_i t) = \alpha + \gamma BankType_{it} + \mathbf{X_{it}}\delta + \epsilon_{it}, \tag{2}$$

where again the dependent variable is the logarithm of total monthly wages. The coefficient of interest is γ, which captures the effects of the dummy variables indicating the bank type, thus showing the impact on an individual's wages from working in the bank type in question. The control variables included are the same as above in equation (1). To account for the differences between the type of workers within each bank, equation (2) is also estimated separately for the three hierarchy levels reported in the data: clerical level workers, experts and professionals, and managers.

Table 6 first estimates the model with bank types added in to the regression as dummy variables. The baseline category is commercial banks. The results show that working in cooperative as well as savings banks has a negative association with a worker's wages relative to working in a commercial bank, suggesting that wages in shareholder banks are higher than in the stakeholder banks.

On the other control variables, we observe that the association with having BA level schooling relative to secondary level education brings a positive association with a worker's wages, as does graduate level education. Similarly having a higher position in the hierarchy within the bank also has quite a large effect on positive association with wages, as would be expected.

Table 7 estimates the baseline pooled OLS model for each bank type separately. This allows us to investigate the differences in the explanatory variables between the bank types. The results of table 7 show that both graduate and bachelor level education bring higher wage returns in commercial banks than they do in savings or cooperative banks,

Table 6: OLS, Total wage

	(1)
Age	0.031***
	(0.001)
Age sq. / 100	-0.029***
	(0.001)
Seniority	0.002***
	(0.000)
Seniority sq. / 100	-0.005***
	(0.001)
Female	-0.179***
	(0.003)
Capital Area	0.059***
	(0.002)
ln(Bank size)	0.003***
	(0.001)
Education categories (Ref. Secondary)	
BA	0.059***
	(0.002)
GRAD	0.268***
	(0.004)
Hierarchy levels (Ref. Clerical)	
Experts	0.345***
	(0.002)
Managers	0.636***
	(0.005)
Bank type (Ref. Commercial)	
Co-operative banks	-0.014***
	(0.004)
Savings banks	-0.058***
	(0.004)
Observations	545 554
R^2	0.745

Note: Dependent variable is the log of real monthly wages, including bonuses and provisions. The regression includes year dummies. Cluster-robust standard errors in parentheses, clustered by individual level. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01

Table 7: OLS, Total wage

	(1) Cooperative	(2) Savings	(3) Commercial
Age	0.029***	0.024***	0.033***
	(0.001)	(0.002)	(0.001)
Age sq. / 100	-0.027***	-0.021***	-0.031***
	(0.001)	(0.002)	(0.001)
Seniority	0.005***	0.004***	0.001***
	(0.000)	(0.001)	(0.000)
Seniority sq. / 100	-0.008***	-0.009***	-0.002***
	(0.001)	(0.002)	(0.001)
Female	-0.148***	-0.158***	-0.183***
	(0.005)	(0.013)	(0.004)
Capital Area	0.162***	0.167***	0.006***
	(0.005)	(0.016)	(0.002)
ln(Bank size)	0.016***	0.021***	-0.023***
	(0.001)	(0.003)	(0.001)
Education categories (Ref. Secondary)			
BA	0.040***	0.042***	0.067***
	(0.003)	(0.006)	(0.003)
GRAD	0.242***	0.177***	0.275***
	(0.007)	(0.016)	(0.005)
Hierarchy levels (Ref. Clerical)			
Experts	0.336***	0.288***	0.349***
	(0.004)	(0.010)	(0.003)
Managers	0.636***	0.654***	0.635***
	(0.010)	(0.019)	(0.005)
Observations	169396	22377	353976
R^2	0.783	0.791	0.740

Note: ¡ Dependent variable is the log of real monthly wages, including bonuses and provisions. All regressions include year dummies. Cluster-robust standard errors in parentheses, clustered by individual level. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01

Table 8: OLS, Total wage

	(1) Clerical	(2) Experts	(3) Managers
Age	0.026***	0.053***	0.062***
	(0.000)	(0.002)	(0.004)
Age sq. / 100	-0.025***	-0.050***	-0.057***
	(0.001)	(0.002)	(0.005)
Seniority	0.002***	0.000	-0.001
	(0.000)	(0.001)	(0.001)
Seniority sq. / 100	-0.002***	-0.006***	-0.006*
	(0.000)	(0.002)	(0.003)
Female	-0.162***	-0.198***	-0.196***
	(0.004)	(0.005)	(0.009)
Capital Area	0.026***	0.132***	0.113***
	(0.001)	(0.004)	(0.008)
ln(Bank size)	-0.001**	0.014***	0.009**
	(0.001)	(0.002)	(0.004)
Education categories (Ref. Secondary)			
BA	0.054***	0.074***	0.115***
	(0.002)	(0.005)	(0.009)
GRAD	0.264***	0.258***	0.267***
	(0.007)	(0.006)	(0.011)
Bank type (Ref. Commercial banks)			
Savings banks	-0.068***	-0.047***	-0.086***
	(0.004)	(0.012)	(0.027)
Co-operative banks	-0.039***	0.035***	-0.019
	(0.003)	(0.008)	(0.021)
Observations	404 352	103 129	38 073
R^2	0.419	0.430	0.401

Note: Dependent variable is the log of real monthly wages, including bonuses and provisions. All regressions include year dummies. Cluster-robust standard errors in parentheses, clustered by individual level. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01

Table 9: OLS, Over time

	(1)	(2)	(3)	(4)	(5)
	1990-94	1995-99	2000-04	2005-09	2010-14
Age	0.040***	0.029***	0.032***	0.029***	0.027***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age sq. / 100	-0.042***	-0.029***	-0.030***	-0.026***	-0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Seniority	-0.001***	-0.000	0.000	0.005***	0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Seniority sq. / 100	0.006***	0.003***	0.001	-0.013***	-0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	-0.187***	-0.175***	-0.162***	-0.184***	-0.181***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Capital Area	-0.007***	0.009***	0.076***	0.095***	0.156***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
ln(Bank size)	0.010***	0.003***	0.003***	-0.001	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education categories (Ref. Secondary)					
BA	0.196***	0.245***	0.047***	0.022***	0.021***
	(0.004)	(0.006)	(0.002)	(0.002)	(0.003)
GRAD	0.232***	0.247***	0.219***	0.268***	0.278***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
Hierarchy level (Ref. Clerical)					
Experts	0.306***	0.289***	0.341***	0.343***	0.381***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)
Managers	0.529***	0.548***	0.686***	0.668***	0.726***
	(0.006)	(0.006)	(0.007)	(0.008)	(0.010)
Bank type (Ref. Commercial banks)					
Savings banks	-0.037***	-0.062***	-0.057***	-0.051***	-0.048***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
Co-operative banks	-0.007*	-0.028***	-0.016***	0.005	0.002
	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)
Observations	143 754	120 380	104 643	92 626	84 151
R^2	0.711	0.733	0.749	0.719	0.721

Note: Dependent variable is the log of real monthly wages, including bonuses and provisions. All regressions include year dummies. Cluster-robust standard errors in parentheses, clustered by individual level. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01

however, the differences in the coefficients between the bank types are not so large. The coefficients for the hierarchy levels are similar across all bank types.

The coefficient of the variable measuring the size of the bank (defined as the amount of workers in the bank) gives a negative association with the wage level of the bank for commercial banks. For cooperative and savings banks, this association, on the other hand, is positive. This means that the more workers there are in a commercial bank, the smaller the wage level, whereas for the stakeholder banks the case is the opposite.

Table 8 reports the results of estimating equation (2), showing the results separately for each hierarchy level to account for the different outcomes in wages that may arise from working at different hierarchy levels. Column (2) of table 8 shows that for cooperative banks, working at the expert and professional level shows a positive, although small, association with wages, relative to working in a commercial bank. At all other hierarchy levels, working in a stakeholder bank has a negative association with total monthly wages relative to shareholder banks. However, at the manager level, the negative coefficient of working in a cooperative bank is not statistically significant.

Table 9 shows the results over time. The Finnish banking sector went through large structural changes following the banking crisis of the early 1990's. Thus the observed associations with wages may differ in the 1990's compared to the 2000's.

Throughout the time period, the effect on working in either a cooperative or savings bank has had a negative association with wages relative to working in a commercial bank. The magnitude of the coefficients for both savings and cooperative banks have become larger over time. However, the coefficient for cooperative banks relative to savings banks turns positive from the year 2005, although at the same time it becomes statistically insignificant. Thus the positive wage association from working in a commercial bank relative to a cooperative bank has become statistically insignificant over time.

In other words, the negative wage association from working in savings banks relative to commercial banks has become slightly larger over time. On the other hand, for cooperative banks this association turns positive, although at the same time statistically insignificant, by the mid-2000's. This means that over time, the wage differential between commercial and cooperative banks has become insignificant.

The association of the hierarchy position within the bank has remained rather steady over time. However, for the manager group relative to workers in clerical level positions, the association with wages has somewhat increased over time.

7 Decomposition analysis

We use Oaxaca decomposition analysis[9] to investigate the source of the wage gap between workers in the different bank types. Since the decomposition analysis allows for investigating differences between two groups, the analysis in this case is focused on the differences between shareholder banks (workers in commercial banks) and stakeholder banks (workers in savings and cooperative banks).

The decomposition approach parts the wage gap between the two groups into two components: the explained and the unexplained component. The explained component gives the amount of the wage gap between shareholder banks and stakeholder banks that can be attributed to differences in the characteristics of the workers that are relative for their wages. These include such observable characteristics such as the workers age or work experience, for example.

The unexplained component gives the remaining part of the wage gap. It is thus due to the differences in how the characteristics are rewarded in the labor market.

Following Jann (2008), we examine the two groups, shareholder and stakeholder bank workers, the outcome variable Y depicting their logarithmic wages and a set of control variables, that include for example the worker's education, gender, and work experience, among others. The method shows how much of the mean outcome difference can be accounted for by group differences in the independent variables. The mean outcome difference R is defined as follows:

$$R = E(Y_{sh}) - E(Y_{st}) \tag{3}$$

where $E(Y_{sh})$ is the expected value of log wages for shareholder bank workers and $E(Y_{st})$ is that for workers in stakeholder banks. The linear model for the estimated log wages is of the following form

$$Y_i = X_i^{'}\beta_i + \epsilon_i \tag{4}$$

where X_i is the vector of controls for each of the i groups containing the shareholder bank workers in one group and the stakeholder bank workers in the other, β_i gives the slope parameters and ϵ_i is the error term.

Since $E(\beta_i) = \beta_i$ and $E(\epsilon_i) = 0$, the expected value of the outcome variable Y becomes

$$E(Y_i) = E(X_i^{'}\beta_i + \epsilon_i) = E(X_i^{'}\beta_i) + E(\epsilon_i) = E(X_i)^{'}\beta_i \tag{5}$$

Thus the difference D in the mean outcome between shareholder and stakeholder bank

[9] Oaxaca and Ransom (1994) and Neumark (1988)

workers can be written as

$$D = E(Y_{sh}) - E(Y_{st}) = E(X_{sh})'\beta_{sh} - E(X_{st})'\beta_{st} \tag{6}$$

The literature on these types of wage decompositions assumes that there is a vector of coefficients β^* that can be viewed as a nondiscriminatory vector, which determines the contribution of the differences in the predictors. For instance, wage discrimination can be assumed to have both a downward skewing effect on the disadvantaged group and a upward skewing effect on the advantaged group. As suggested by Neumark (1988), the parameter β^* is obtained from the pooled estimation of log wages on the predictors of both of the groups.

Taking use of this estimated pooled parameter β^*, equation (6) can be rearranged in the following way in order to identify the differences between the two groups arising from the predictors X

$$R = [E(X_{sh}) - E(X_{st})]'\beta^* + [E(X_{sh})'(\beta_{sh} - \beta^*) + E(X_{st})(\beta^* - \beta_{st})] \tag{7}$$

which represents the "two-fold" decomposition written in short as

$$R = Q + U, \tag{8}$$

Where $Q = E[(X_{sh}) - E(X_{st})]'\beta^*$ and $U = E(X_{sh})'(\beta_{sh} - \beta^*) + E(X_{st})(\beta^* - \beta_{st})$. In the above equation, the first part Q thus represents the explained part of the decomposition, while the latter part U gives the unexplained part of the wage gap.

Table 11 shows the results of the decomposition analysis. As shown by Jann (2008), the two-fold decomposition method is computed by using the coefficients from a pooled model over both groups as the reference coefficients. Table 11 shows that the mean of log wages for workers in stakeholder banks is 7.85 and 7.94 for shareholder bank workers, giving a wage gap of 0.085 between the two groups.

Of this wage gap, the explained part Q is -0.16, while the unexplained part U is 0.08. Given that the unexplained part is positive, the results show that stakeholder banks actually pay more to their workers than would be expected based solely on employee characteristics. The positive, unexplained part of the wage gap thus compensates for the differences found in the explained part. This sort of positive unexplained component is also reported by Bailly et al. (2017). The variables that have a positive unexplained contribution to the wage gap are the workers seniority in the firm, being a female, living in the capital city area and the size of the bank.

Table 10: Oaxaca-Blinder decomposition analysis

	Overall	
Cooperative and Savings banks	7.851***	
	(0.001)	
Commercial banks	7.936***	
	(0.001)	
Difference	-0.085***	
	(0.001)	
Explained	-0.164***	
	(0.001)	
Unexplained	0.079***	
	(0.001)	
	Explained	Unexplained
Age	0.002***	-0.197***
	(0.001)	(0.022)
Age sq.	-0.003***	0.102***
	(0.001)	(0.012)
Seniority	-0.003***	0.062***
	(0.000)	(0.003)
Seniority sq.	0.001***	-0.023***
	(0.000)	(0.002)
Female	-0.010***	0.026***
	(0.000)	(0.001)
Capital Area	-0.068***	0.083***
	(0.001)	(0.001)
ln(Bank size)	-0.070***	0.330***
	(0.001)	(0.004)
BA	0.003***	-0.007***
	(0.000)	(0.000)
GRAD	-0.007***	-0.004***
	(0.000)	(0.000)
Experts	-0.005***	-0.004***
	(0.000)	(0.000)
Managers	-0.027***	0.000
	(0.000)	(0.000)
Observations	545554	

Note: Standard errors in parentheses. * p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01

8 Conclusion

We have shown that in the Finnish setting, profit-maximizing shareholder banks pay higher wages to their workers than stakeholder banks do. On average, both the base wages as well as bonuses paid by shareholder banks are higher than in stakeholder banks. However, pay is much less dispersed in stakeholder banks, an observation also found in Bailly et al. (2017).

The bonuses paid by shareholder banks are concentrated to the manager level. The frequency of bonus payments is higher in stakeholder banks, and bonus payments are more evenly distributed throughout the different hierarchy levels in stakeholder banks. However, experts and professionals working in cooperative banks actually get paid more than those in shareholder banks. At the manager level, this association again turns negative but at the same time becomes statistically insignificant. The wage difference for savings banks on the other hand has become larger over time.

Our results showing lower wages in stakeholder banks gives support to Leete's (2000) findings of lower pay in nonprofits. She showed that nonprofit firms pay less to their workers than their for-profit counterparts. The reason for this is explained to be worker motivation, such that workers in nonprofits are said to get part of their utility from serving a cause, therefore being willing to accept lower pay. In an analogous manner, our results can be seen to point to the direction that stakeholder banks compensate for the lower average wage with higher wage equity, which may then attract the type of workers who value this. Over time, however, this overall negative wage effect for cooperative banks has become insignificant.

In their analysis of all industries, Bailly et al. (2017) find pay to be higher in cooperatives than in conventional firms. However, in banking the pay in conventional firms is, like here, found to be higher than in cooperatives. As in Bailly et al. (2017), our decomposition results show that stakeholder banks pay more to their employees than could be based on their observable characteristics. Our decomposition analysis reveals that the unexplained part of the wage gap between shareholder and stakeholder banks is actually positive. This means that when looking at the observable characteristics of workers in stakeholder banks, the workers get paid more than would be expected given these characteristics. Having more seniority at the firm, being a woman, living in the capital city region as well as the size of the bank contribute to the positive unexplained component.

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