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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

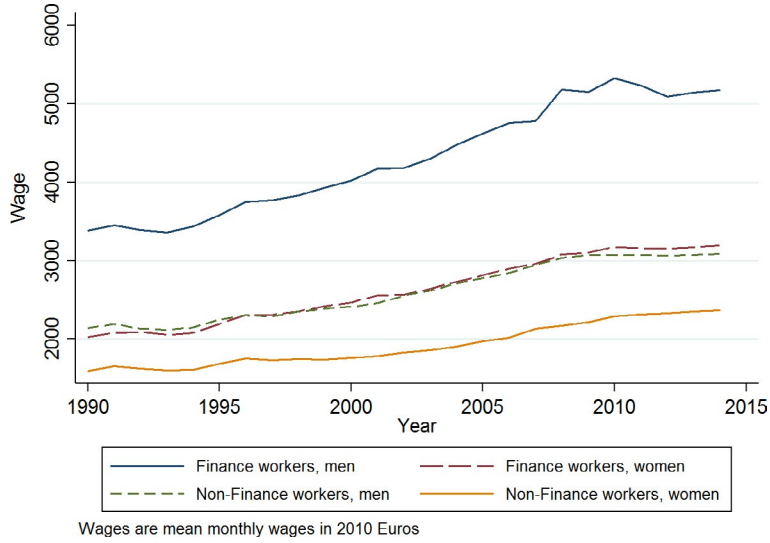

FIGURE 1 Mean wages of finance and non-finance workers, 1990–2014

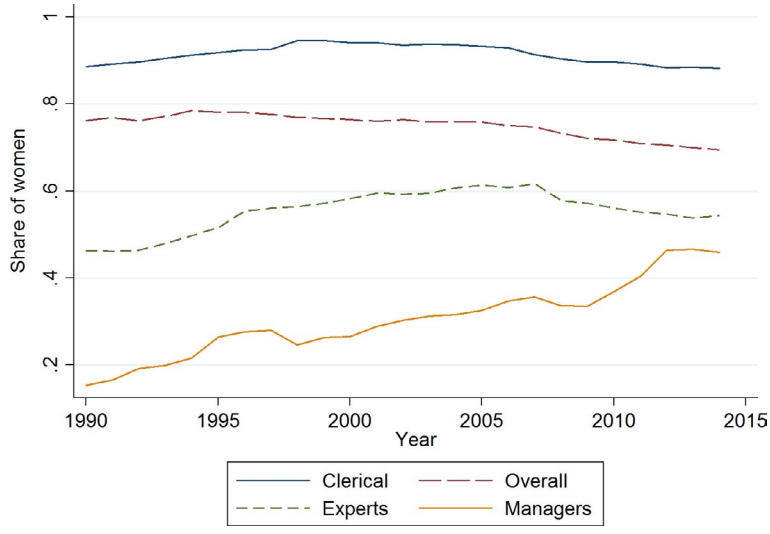

FIGURE 2 Share of women in finance, 1990–2014

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

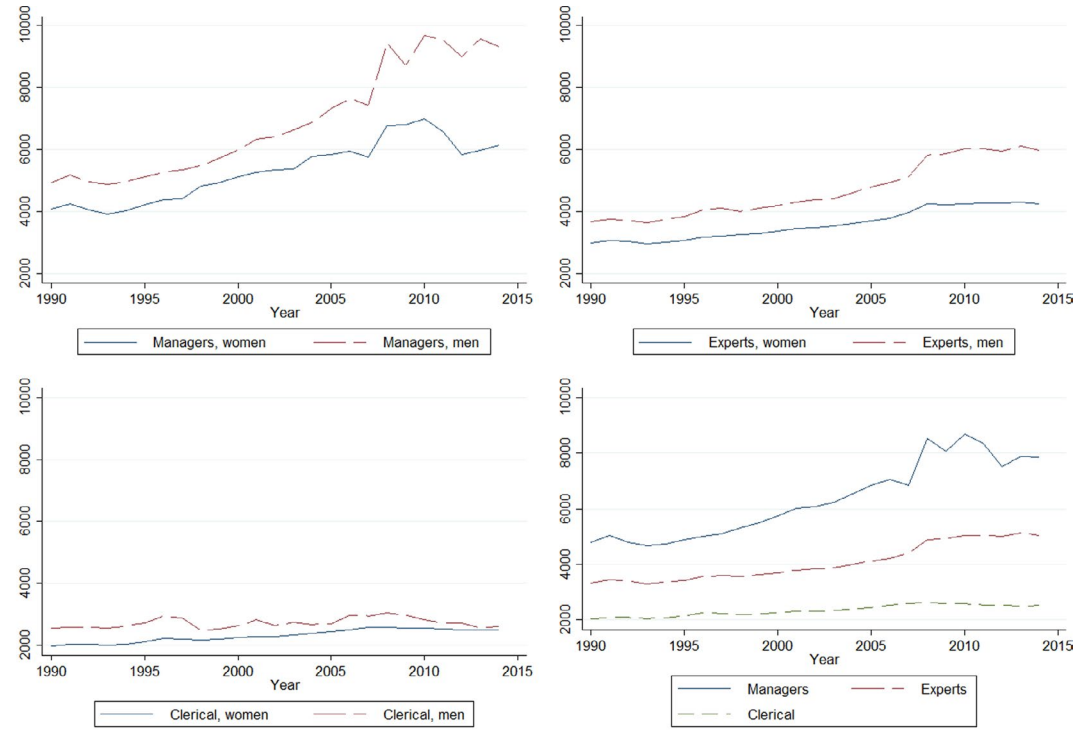

FIGURE 3 Wages of finance workers at different hierarchy levels

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,

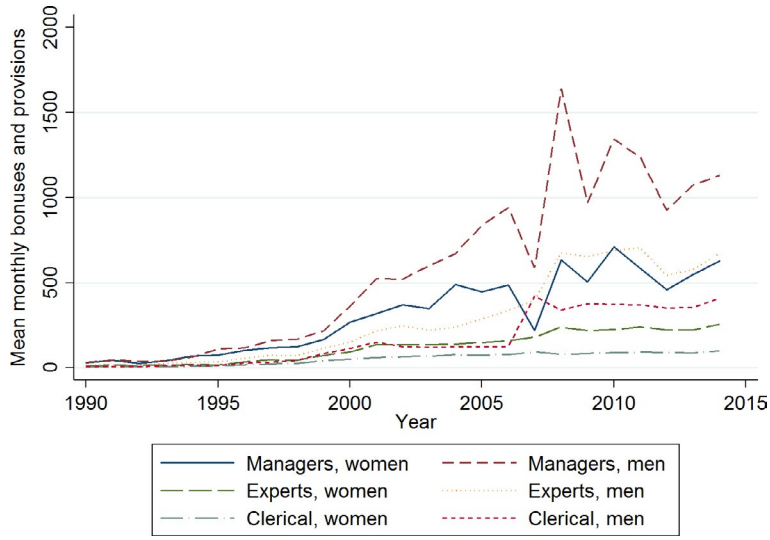

FIGURE 4 Monthly bonuses and provisions, 1990–2014.

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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