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How Is Wage Pay in the Financial Sector in the Netherlands?

An Empirical Study on the Wage Premium and Gender Inequality in the Dutch Financial Sector

Name student: Ziru Xu
Student ID number: 427990

Supervisor: Robert Dur
Second assessor: Bauke Visser

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Abstract:

We used a longitudinal dataset collected for Dutch households since 2008 to study the financial sector pay as compared with other non-financial sectors in the Netherlands. With the fixed effects model and the OLS equations, we found that there is no wage premium in the Dutch financial sector after controlling for individual characteristics. Moreover, the gender pay gap generally exists in the Netherlands; there is no significant difference in the gender gap between the Dutch financial sector and the Dutch non-financial sector. Findings of several studies were documented to help explain the differences in the findings of financial sector pay in the Netherlands relative to those in the other countries.

Introduction

There is often public concern that working in the financial sector receives massive advantages in the wage payment. Specifically, people believe that those who work in the financial sector get higher wages and bonuses than those who work in other sectors with similar observable characteristics, for instance, gender, age, education. Over the past decades, the OECD countries suffered from increasing income inequality (OECD,2015). Compared with other sectors, the consistently higher increase in the wages of the financial sector, especially for those elite financial workers, is believed as a significant cause for the income inequality (Denk, 2015).

High bonuses in the financial sector seem to be partially held responsible for the financial crisis ten years ago. In a review of the financial crisis, Tuner (2009) points out that illusory profits generated by irrational exuberance pushing the asset prices to irrationally high levels would cause management taking further risks, as their bonuses are decided based on those profits. According to Tuner, the compensation structure in the financial sector played an essential role in the financial crisis. However, one shall not blame disadvantages of the compensation structure in the financial sector for causing income inequality if the wage differences for employees in the financial sectors can be explained by differences in levels of educations or professions. Moreover, Gregg at al., (2012) finds that the cash-plus-bonus pay-performance sensitivity of financial firms is not systematically higher than in other sectors. Thus, it is unlikely that incentives structures should be accounted for the financial

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crisis. Still, the high compensation in the financial sector persists with many debates on itself. It is more considered as a moral outrage since it would be unfair if bankers get better paid with bearing few costs of the downside.

Concerning these questions, many researchers tried to find out whether there is a wage premium in the financial sector. Denk (2015) finds that around 20% of the top 1% of earners are made up of workers from the financial sector. Moreover, a wage premium generally exists in the financial sector in most of the OECD countries. While the UK has the second largest wage premium in the financial sector among OECD countries, the wage premium in the financial sector in the Netherlands is around -0.5%. This finding suggests that there seems to be no wage premium in the financial sector in the Netherlands.

Apart from Denk's work, few studies discuss this wage premium in the financial sector for the Netherlands. Notably, the financial sector is a significant component of the GDP of the Netherlands. Mainly the Dutch banking sector is one of the largest in Europe and has a ratio of banking assets to the GDP of 365% in 2016. While there are many studies related to the financial sector pay done for other OECD countries, there are few works of literature studying on wage payment in the financial sector of the Netherlands. Thus, this paper focuses on the financial sector in the Netherlands, aiming to find out the features of the wage determination in the Dutch financial sector. Specifically, we would like to know whether there is a wage premium and moreover whether there is a gender pay gap in the financial sector in the Netherlands.

Hence, the research question of this paper is:

How is the wage payment for the workers in the financial sector compared with other sectors in the Netherlands?

The main findings of this paper are as follows: using panel data from 2013 to 2017 collected from Dutch households and the fixed effects model, we find that there seems to be no wage premium in the financial sector in the Netherlands after controlling for individual characteristics (i.e., gender, age, education). Furthermore, we investigate the wage

differential between men and women with similar characteristics for both the financial and non-financial sector. The results indicate that the gender pay gap generally exists in all sector in the Netherlands. However, the gender pay gap is not significantly different between the financial sector and the non-financial sector.

The rest of this paper is organized as follows: Section II introduces the theoretical framework of this paper and defines relevant concepts and includes a review of current literature within this field. Then data and methodology are presented in section III, and section IV reports the results. Section V gives interpretation and discussion of results. Finally, section VI concludes.

II. Theoretical Framework

2.1 Human capital Theory

Wage premium in the financial sector, as defined in the paper by Denk (2015), is the case when financial institutions pay workers significantly higher wages that employees with similar observable characteristics (for example, education, age, gender, or experience) receive in other sectors. According to this definition, there is a premise that employees who have similar individual characteristics are assumed to be compensated at similar levels regardless of the sectors they work in. In other words, the raw differences in wages could be mostly attributed to the differences in individual characteristics. One of the relevant theories is the contemporary human capital theory in explaining what determines the wages of workers.

The central idea of the human capital theory is that earnings in the labor market rely on the employees' information and skills (Kleinsorge et al., 2018). Acquiring new information and skills can generate greater economic value with an increase in the productivity of the workers, however, which is also costly for the workers.

Before the formation of the human capital theory, Adam Smith brought up some elements which helped develop this theory. From his point of view, the quality of worker skill was at the central place for economic progress. Furthermore, workers should be compensated by increased wages when they were to carry the costs of obtaining new skills, which is an

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assumption that still holds in human capital theory. Acquiring new skills is usually achieved through the investment in education. Therefore, the costs of direct investment and the foregone working opportunities need to be compensated later at the labor market. With this respect, the wages of workers are believed to be positively correlated with the years of schooling. Besides the years of schooling, there are a variety of other characteristics as part of human capital investments, which include training, experience and also some inherent personal traits such as attitudes towards work (Acemoglu,1999). Starting from this, researchers try to model the relationship between these characteristics and the wage payment. One of the most famous models was from Mincer (1974). He developed a model to explain the wage by taking both experience and education into consideration, which is known as Mincer earnings function.

The Mincer earning function reads as follows:

$$\ln w = f(s, x) = \ln w_0 + \rho s + \beta_1 x + \beta_2 x^2 \ (1)$$

Where w represents the earnings; w_0 is the intercept where the earnings of people with no education and no experience are derived; s is the years of schooling; x is the years of labor market experience. ρ, $\beta1$ and $\beta2$ are coefficients to be interpreted as the returns to the two factors.

Many researchers conducted empirical studies on the wage determination and wage inequality using models developed from the Mincer Earnings Equation. More characteristics are included other than education and experience to explain the wage determination. Discrimination is often considered as one influential factor for the wage determination; thereinto gender discrimination is usually a factor for explaining wage differentials in labor market. Blinder (1974) finds after using regressions to decompose the raw wage differential, and there is still around 54.4% wage differential existing between white males and white females. What is more, Carruth et al. (2004) form several hypotheses to reconcile the cross-sector wage differentials with the competitive market benchmark, such as differences in the work environment and some unobserved features of employees. Later in his report discussing financial sector pay in the OECD countries, Denk estimates the ordinary least square (OLS)

equation by adding more control variables (age, gender, employees in the firm and type of financial control.etc.) to Mincer's original model.

The determination of the wage in this paper is mainly inspired by Mincer earnings equation and the work of Denk (2015). By using the fixed effects model and OLS equation, this paper studies how the employees in the financial sector get paid as compared with workers in other sectors within the Netherlands. Specifically, the paper tries to answer the question by investigating whether there is a wage premium in the financial sector in the Netherlands, and if so, how significant the wage differential is. In order to answer the central question, three hypotheses are developed and explained in the next subsection.

2.2 Hypotheses

As mentioned before, three hypotheses are formed to answer the research question:

Hypothesis 1: There is no wage premium in the financial sector in the Netherlands.

Wage premium in the financial sector, as defined previously, is the significant wage differences that exist between workers from the financial sector and workers with similar observable characteristics from other sectors. As for the definition of the financial sector, it primarily includes a variety of firms that provide customers with financial services. Banks, real estate, insurance companies are all included in the financial sector.

Denk (2015) reports that the average wage premium in Europe is approximately 28% with a considerable variation across countries. Notably, the wage premium is positive in all European countries except the Netherlands. This finding means that the raw percentage wage difference between average earnings in finance and other sectors seems to be adequately explained by the difference in individual characteristics. In other words, the fact that workers in the financial sector get higher wages on average is merely because, for instance, the average education level in the financial sector might be higher. To test this result and further confirm the finding of Denk, we generate the first hypothesis.

The natural logarithm of the average hourly income, measured continuously in euros, will be used as the dependent variable in each hypothesis. Several groups of categorical variables

will be controlled. The first hypothesis will be tested by finding out whether there is a significant negative parameter or not between the financial sector and the other sectors.

Hypothesis 2: Men have significantly higher hourly income than women with similar characteristics in both the financial sector and the non-financial sector in the Netherlands.

Although there are not many studies on the wage payment in the financial sector in the Netherlands, we can find many studies on wage inequality regarding the gender pay gap. In the Global Gender Gap Report (2013), it shows that the gender gap generally exists around the world concerning four areas, namely, education, health, politics, and economy. Moreover, the Netherlands was ranked 11 in the EU when compared to the gender pay gap with other European countries. In 2012, European Commission's Eurostat agency pointed out that the unadjusted gender pay gap in the Netherlands was about 1% higher than the EU average gender pay gap. According to the World Economic Forum, the gender pay gap in the Netherlands keeps contracting over these years but at speed slower than other countries. As can be seen that the gender wage gap did exist in the Netherlands, it is still not clear that whether the financial sector constitutes a part of it or not. Thus, this paper forms the second hypothesis by assuming that the gender pay gap exists not only in the other sectors, but also exists in the financial sector in the Netherlands.

Hypothesis 3: The gender pay gap in the financial sector is significantly higher than that in the non-financial sector.

We establish the third hypothesis under the acceptance of the second one. In other words, the gender pay gap exists in both the financial sector and the nonfinancial sector. Statistics Netherlands shows that the gender wage gap in the Netherlands without adjusting for individual characteristics is shown to differ across the industry (CBS, 2014). The financial sector is said to have the most substantial pay gap between men and women with 29%. By studying the financial sector in the US, Lin and Neely (2017) find that a higher wage premium is earned by women than men in low-wage financial jobs, but elite men take nearly all the wage increases in high finance. At the same time, the wage increases in high finance are usually quite large compared with low-financial jobs. This finding might indicate why in

many researches there is such a substantial difference between the gender wage gap in the financial sector and other sectors. In this sense, this paper also aims to answer the central question by looking at how the gender pay gap in the financial sector would be as compared with other sectors if the gender pay gap exists in both the financial sector and the non-financial sector in the Netherlands.

III. Data and Methodology

3.1 LISS Panel

The LISS panel (Longitudinal Internet Studies for the Social sciences) is used to measure the financial pay differential in the Netherlands and answer the research question. The LISS panel data has been collected every year since October 2007 by inviting Dutch citizens registered as panel members to complete online questionnaires. 4500 households are participating in the questionnaires, comprising about 7000 individuals, and all the members were selected based on a true probability sample of households taken from the population registered by Statistics Netherlands. The study follows the changes in living conditions, working, and values of the panel members.

This paper uses data from different years from different purposes. First, Data from 2009 to 2017 is retrieved to depict the patterns of the changes in average hourly income over these years for sectors. By this means, it can roughly show how the average hourly income in the financial sector differs from that in other sectors over time. Second, to test the first hypothesis, panel data from 2013 to 2017 is used. The reason why data from only the last five years is used is to keep the relatively adequate sample. As more years of data are included, balancing the panel variable will remove more observations because some individuals do not necessarily participate in the study every year. Finally, cross-section data from 2017 is used for the second and third hypothesis. Besides, note that the LISS Core study covers eight different questionnaires, ranging from Health, Work and Schooling to Religion and Ethnicity. For this study, the data is generated by merging the questionnaire of Working and Schooling

and the dataset including the background information of the panel members and then matching the two data sets according to the number of household member encrypted.

3.2 Dealing with Data

The data available for use includes approximately 2000 individuals each year after several processes. First, unmatched observations are dropped out after merging two datasets. Moreover, since the paper focuses on employees in the financial sector, self-employed, freelancers and retired people are removed based on the answers provided by the interviewees. Questions regarding whether one performs paid work or not are asked twice in different places of the questionnaire, which is to avoid the situation where observations misunderstand the questions and ensure the accuracy and consistency of the answers. Thus, we only select the observations which provided the same answers to both questions. Besides, observations with missing values related to the dependent and independent variables are removed, further reducing the number of the sample.

As mentioned before, this paper uses panel data from the last five years for the first hypothesis. Thus, cross-section data from 2013 to 2017 are combined into one dataset. Only individuals who have participated in the study for five times remain after the balancing, resulting in a sample comprising of 675 observations over five years.

3.3 Methodology

3.3.1 Fixed Effects Model

As mentioned in the previous section, the fixed effects model and OLS regression will be used to test hypotheses and answer the research question, that is, how the wage in the financial sector in the Netherlands is paid as compared with other sectors.

To test the first hypothesis, namely, whether there is wage premium in the financial sector in the Netherlands, the following individual fixed effects model is used:

$$Y_{it} = c + \alpha X_{it} + \beta FINANC_{it} + \sigma_i + u_{it} \qquad (2)$$

This equation is similar to the model applied in the work of Denk (2015), which allows the hourly wage to be determined by a couple of categorical variables. However, it uses panel data and eliminate unobserved individual time-invariant effects.

On the left-hand side of this equation, Y_{it} is the dependent variable, representing the natural logarithm of imputed personal hourly income for individual i at year t, measured continuously in euros.[1] This transformation helps reduce the skew and interpret the wage premium in exact percentage.

On the right-hand side, there are several groups of control variables. Parameter c is the constant term. X is the vector which includes control variables such as age and its square, gender, profession, the average working hours per week and education. Age is a continuous variable. Age and its square are usually regarded as another way to represent the working experience (Lindley& Mcintosh, 2017). Furthermore, we control the professions of individuals. There are nine different positions, from engineer to farm worker (Table 1). The first category of the profession is the reference variable. Another control variable is the average working hours per week. The average weekly working hours are divided into nine groups (Table 2), where group nine is the reference variable. Note that when generating the variable of the hourly income for every individual, effects the working load on wage are already controlled to some degrees via dividing the monthly income by average working hours. However, there could be an overtime premium where the more hours the employee works, more possibly he or she would receive compensation, rewards at a higher rate than the regular rate. Thus, a positive correlation between the number of working hours and the wage is expected. Moreover, as discussed before, education as an important factor influencing the wage payment is also controlled in this equation. Table 3 shows the six different education levels in the Netherlands, where the education level of the primary school is the reference variable.

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[1] The imputed hourly income is generated by diving the imputed personal monthly income by estimated monthly working hours. Monthly working is estimated by multiplying the self-reported average working hours by 4.5. To avoid implausible results, the imputed monthly income is calculated for observations whose net income is available and gross income is not. The procedure of the imputation can be found at https://www.dataarchive.lissdata.nl/study_units/view/32.

$FINANCr_{it}$ indicates the sector where the individual works for at time t. It equals one when the worker is from the financial sector and equals to zero otherwise. In the data, the individuals also specify which sector they work in, and there are fifteen sectors in total (Table 4). Therefore, we run another regression in addition to the previous one, with each non-financial sector included as a dummy variable and the financial sector as the reference variable. By this means, we aim to decompose the wage differences between the financial sector and the others.

What is more, σ_i stands for the individual-specific effect. Finally, u_{it} is the error term; α and β are the parameters to be interpreted for variables covered in the vector and the sectors where employees work, respectively.

Using panel data and the fixed effects model mentioned above can help us reduce unobserved individual time-invariant effects and omitted variable bias. Omitted variable bias occurs when there are some variables correlated to the regressors and influencing the dependent variable not controlled. For instance, unobserved characteristics of individual heterogeneity such as some inherent personal traits vary across individuals but are time-invariant. The fixed effects model can eliminate the effects and correct for bias. On the other hand, the random effects model is another method to eliminate time-invariant effects. The major difference between the random effects model and the fixed effects model is the following assumption. For the random effects model, it is assumed that the individual-specific effects are uncorrelated with the other regressors, which is a rather strong assumption in most cases. Thus, the Breusch-Pagan Lagrange multiplier test and Hausman test are conducted to help choose the model. The results suggest that the fixed effects model is more appropriate than pooled OLS and the random effects model.

3.3.2 OLS Equation

The second hypothesis discusses the gender pay in two subsamples, namely, employees from the financial sector and employees from other sectors, using cross-section data from 2017. We also divide the observations into two groups. One is the financial sector group, and the other is the non-financial one, by combing other sectors in the dataset. Here the fixed effects

model is not applicable as our main interested variable is gender, which is time-invariant in most of the cases.

$$Y_i = c + \alpha Age + \beta Age\_square_i + \gamma Pro_j + \delta female_i + \mu(Hours\_per\_week)_i + \theta(Education)_i \tag{3}$$

Where sectors are not included as control variables in this case; c is the constant term. Similar to the model used in the first hypothesis, age and its square are two control variables in this equation. Pro_j relates to the individual's profession. For the financial sector, there are five categories of the professions (Table 5), where the higher academic or independent profession is the reference variable. What is more, the variable of our interest is represented by $female_i$; it equals one when the individual is female and equals to zero when the individual is male. Also, $Hours\_per\_week$ relates to the average working hours per week as before, however, here we control it concerning the continuous variable. Finally, $Education$ represents the education level for each observation. Table 6 lists the five education levels for the financial sector, where the intermediate secondary education is the reference variable.

The same model is also used to run the regression for the group of the non-financial sectors.

3.3.3 OLS with Interaction Term

For hypothesis 3, an interaction term is used to test if the width of gender wage gap depends on the sectors where the individuals work or not.

$$Y_i = c + \alpha Age\_Categories_i + \beta Age\_square_i + \gamma Pro_j + \delta female_i + \varphi Finacial + \lambda Financial * Female + \mu(Hours\_per\_week)_i + \theta(Education)_i \tag{4}$$

Independent variables except for the age categories, the financial dummy, and the interaction term are the same with those control variables in equation (3). Table 7 shows the categories of ages. The first age category is the reference variable in this case. When $Financial$ equals one, it means that the worker is from the financial sector; otherwise, the worker is from other sectors. The interaction term between gender and sector tries to account for the effect of working in the financial sector as compared with working in other sectors on the gender pay gap.

IV. Results

In this section, the main findings of this study are reported.

4.1 Comparison of Average Hourly Income

Before testing the hypotheses, we are interested in the wage pay level in the financial sector when comparing them with other sectors in the Netherlands over the past years. Therefore, we calculated the average hourly income for each year from 2009 to 2017 for every sector listed in table 3 except the mining sector, which was because according to the data, no one worked in that sector for the year 2015.
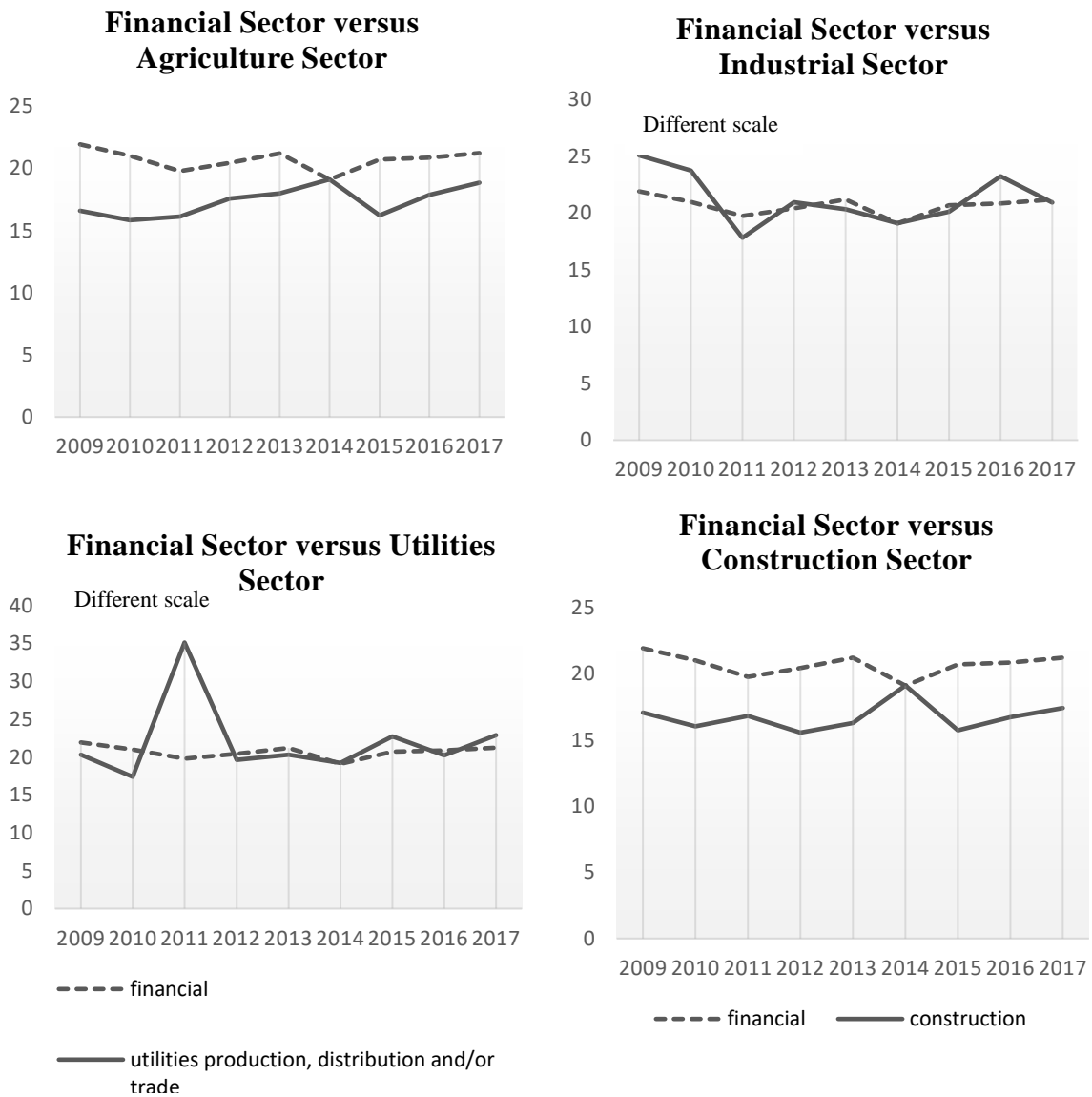
Figure 1 presents comparisons between the average hourly income of the financial sector and that of every other sector for each year from 2009 to 2017.

The dashed line represents the financial sector, and the solid line relates to a different sector in different graphs. The average hourly income in the financial sector is relatively stable over the past nine years. As we can see from the figure, the average hourly income in the financial sector reaches its highest point in 2009 with around 21.93 euros per hour; while the average hourly wage is lowest at around 19.11 euros per hour in 2014.

When comparing the average hourly income in the financial sector with others, we can find that the average hourly wage is generally higher in the financial sector than most of the other sectors. For instance, there is a relatively considerable difference in the average hourly wage between the financial sector and the construction sector, the retail trade sector, and the catering sector. Moreover, the employees from the financial sector receive slightly higher hourly wage on average than those from the agriculture sector, the transport, storage and communication sector, the health and welfare sector and the environmental services sector. However, differences in the average hourly income are comparatively small between the financial sector and the industrial sector, the utility sector, the business services sector and the education sector. Notably, the only sector where the average hourly income is higher than the financial sector in each year from 2009 to 2017 is the government services sector. However, the difference is relatively small as the graph suggests.

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Figure 1. Comparison of Average Hourly Income Between the Financial Sector and Other Sectors 2009-2017

Financial Sector versus Agriculture Sector

Financial Sector versus Industrial Sector

Different scale

Financial Sector versus Utilities Sector

Different scale

- - - - financial

——— utilities production, distribution and/or trade

Financial Sector versus Construction Sector

- - - - financial   ——— construction

Financial Sector versus Retail Trade Sector

- - - - financial ——— retail trade

Financial Sector versus Catering Sector

- - - - financial ——— catering
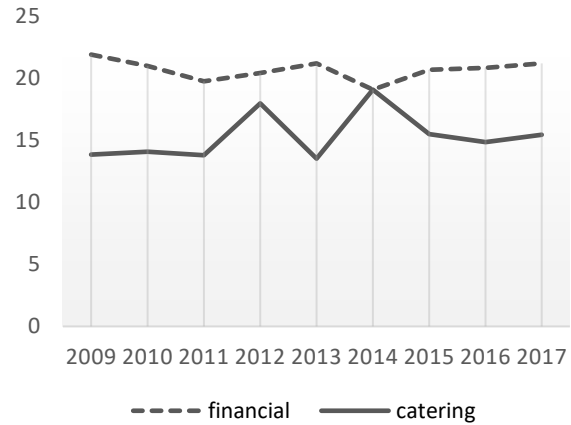
Financial Sector versus Transport Sector

- - - - financial

——— transport, storage and communication
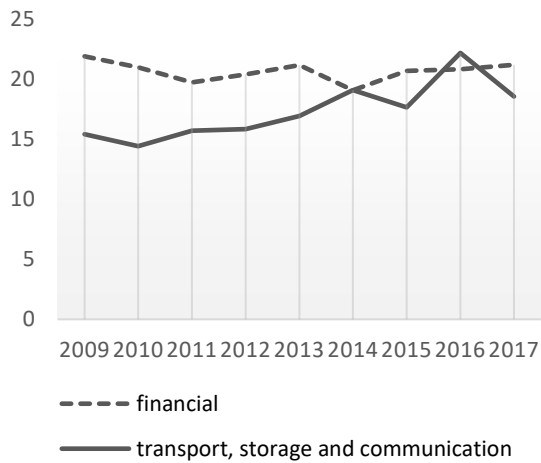
Financial Sector versus Business Serivces Sector

- - - - financial ——— business services
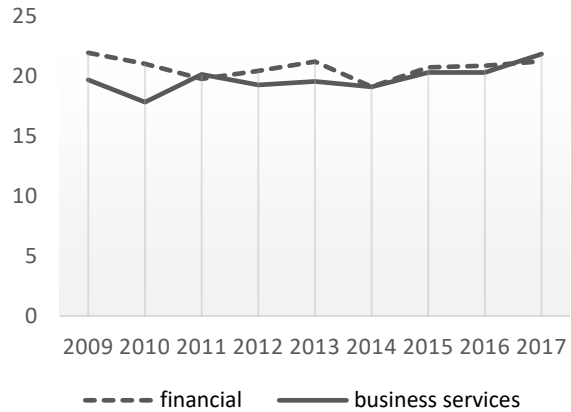
Financial Sector versus Education Sector

- - - - financial ——— education
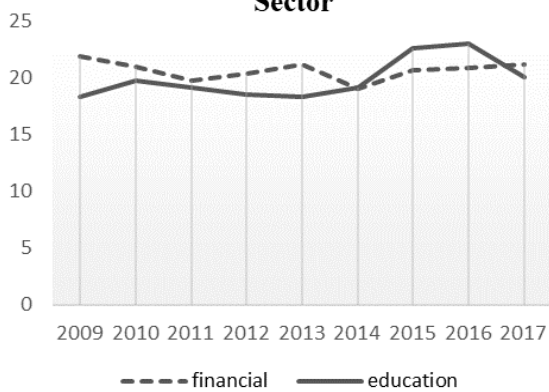
Financial Sector versus Government Services Sector

Different scale

- - - - financial ——— government services

Financial Sector versus Health and Welfare Sector

Financial Sector versus Environment Services Sector
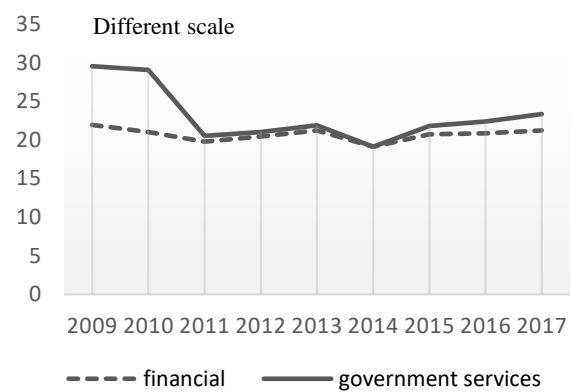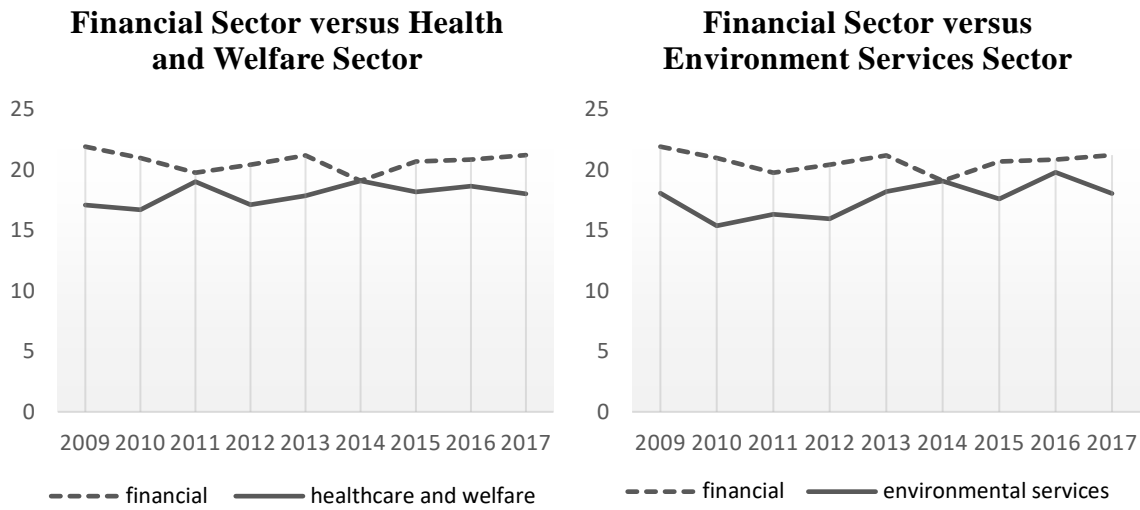
Notes: Figure 1 depicts the changes of the average hourly income from 2009 to 2017 for different sectors. The changes of the average hourly income in the financial sector is added to each graph for comparison. The x axis represents the time period; the y axis indicates how many euros one can earn on average per hour. Note that some graphs have a different scale for the y axis.

The previous section depicts a rough picture of how the average wage pay level evolves over the past nine years in the financial sector within the Netherland. Then we can test the first hypothesis. In the next subsection, results for the first hypothesis are presented.

4.2 Wage Premium in the Financial Sector

Table 8 reports the coefficient of the financial sector in equation (1). All the other control variables are not shown in this table. Note that the results of the pooled OLS model are also included for comparison with the fixed effects model. The rejection or acceptance of this first hypothesis depends on results from the fixed effects model.

The estimated coefficient of the financial sector is significant in the pooled OLS model with 0.117 at 5% significance level. According to the reported result in the pooled OLS model, the average hourly income for individuals with similar characteristics is higher in the financial sector than the other sectors by approximately 11.7%. However, the estimate for the financial sector is negative and insignificant in the fixed effects model. According to the fixed effects model, the result shows that there is no significant difference between the hourly income in the financial sector and the other sectors after we control for some individual

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characteristics. Therefore, based on the finding from the fixed effects model, we would conclude there is no wage premium in the financial sector in the Netherlands.

Table 8 Comparison of the hourly wage differential 2013-2017 Part I

	Ln hourly income	
	Pooled OLS	Fixed Effects Model
	b/se	b/se
Financial	0.117***	-0.083
	(0.02)	(0.07)
Including controls	Yes	Yes
R^2	0.438	0.356
* p<0.05, ** p<0.01, *** p<0.001		

Notes: The dependent variable is the natural logarithm of the average hourly income. Table reports the coefficients of the financial sector estimated by pooled OLS model and the fixed effects model, respectively. The reference variable is the non-financial sector. Control variables are not shown in this table. The standard errors are in parentheses. *significant at the 5% significance level.

As mentioned before, we conducted another regression to analyze the wage differential of each sector relative to the financial sector by adding sector dummies to the equation. Table 9 reports the results. The sectors taken out from this table are those sectors of which the coefficients are significant in neither the pooled OLS model nor the fixed effects model. As can be seen from table 8, the listed sectors in the pooled OLS model all have negative coefficients. Specifically, sectors with significant coefficients at 5% significance level include retail trade, catering, transport, government services, education, healthcare and welfare, environmental services and other sectors.

However, most of the coefficients of the sectors above change signs and become insignificant in the fixed effects model. There seem to be no significant differences between the hourly income of the financial sector and retail trade, transport, government services, education, healthcare and welfare, environmental services and other sectors. The only two significant

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estimates in the fixed effects model are for the industrial production sector and the catering sector, respectively. The coefficient of the industrial production sector changes from -0.024 to 0.220 by using the fixed effects model. This result shows that for similar individuals, the average hourly income of working in the industrial production sector is statistically higher than working in the financial sector in the Netherlands by around 22%. Moreover, workers with similar characteristics from the catering sector receive a higher hourly wage than those from the financial sector by around 42.24%. These estimates are based on people who switched sectors. Specifically, there were no switchers in the mining sector or in the construction sector in the past five years; the agricultural sector and catering sector both had four switchers; five observed switches happened in the utilities production sector and in the financial sector; the industrial production sector had 18 switchers; the retail trade sector had 28 switchers; the transport sector, the business services sector and the government services sector had 11, 43, 40 switchers, respectively; while in the education sector, the health care sector and the environmental services sector, there were fewer switchers in the past five years, which were 20, 19, 14, respectively; the last category which consists of all the other sectors had the highest number of switchers, namely, 49.

In conclusion, as suggested by Table 9, the hourly wage for an individual working in the financial sector does not significantly differ from that for a similar worker from most of the other sectors. However, two sectors seem to have wage premium relative to the financial sector.

Although results of the pooled OLS models in table 8 and table 9 both provided supports for rejecting this first hypothesis, the pooled OLS model ignores the feature of panel data and the possible serial correlation in the error term. (Schmidheiny & Basel, 2011). Also, the Breusch-Pagan Lagrange multiplier test and Hausman test showed that the fixed effects model provided more efficient and consistent estimators. Thus, the first hypothesis would be rejected based on results in table 8 and table 9, which are found out by the fixed effects model. In other words, there seems to be no wage premium in the financial sector.

Table 9. Comparison of the hourly wage differential 2013-2017 Part II

	Ln hourly income	
	Pooled OLS	Fixed Effects Model
	b/se	b/se
Industrial production	-0.024	0.220*
	(0.03)	(0.09)
Retail trade	-0.246***	-0.01
	(0.03)	(0.08)
Catering	-0.180***	0.424*
	(0.04)	(0.17)
Transport, storage and communication	-0.085**	0.049
	(0.03)	(0.09)
Government services, public administration and mandatory social insurances	-0.069*	0.091
	(0.03)	(0.08)
Education	-0.223***	-0.11
	(0.03)	(0.1)
Healthcare and welfare	-0.155***	-0.046
	(0.03)	(0.09)
Environmental services, culture, recreation and other services	-0.169***	0.122
	(0.04)	(0.1)
Other	-0.152***	0.087
	(0.03)	(0.08)
Including controls	Yes	Yes
R^2	0.438	0.356

* p<0.05, ** p<0.01, *** p<0.001

Notes: The dependent variable is the natural logarithm of the average hourly income. Table reports the coefficients of several sectors which are significant in either the pooled OLS model or the fixed effects model, respectively. The reference variable is the financial sector. Control variables are not shown in this table. The standard errors are in parentheses. *significant at the 5% significance level.

In the next subsection, we report the results for the second hypothesis obtained by using the cross-section data from 2017 and OLS regression analysis.

4.3 Gender Pay Gap and Wage Determination

Recall that the second hypothesis is to test whether there is a significant wage differential between gender in both the financial sector and the non-financial sector. The results for the second hypothesis are shown in table 10, where the estimates of the gender dummy, female are listed for both the financial sector and the non-financial sector. Other regressors in equation (2) are controlled but not present in the table.

Table 10 indicates that in both the financial sector and non-financial sector, the estimated parameters for female are negative and significant at 5% significance level. In addition, the coefficient for the female in the financial sector is -0.213, which is slightly larger than that in the non-financial sector in absolute value. The results show that men receive higher hourly wage by around 21.3% than women in the financial sector, other things equal. As for the non-financial sector, gender pay gap also exists as men get paid higher hourly wages than women with similar ages, professions, average working hours per week and education levels by around 20.8%.

Therefore, based on the findings in the table 10, we cannot reject the second hypothesis, which means that men have significantly higher hourly income than women with similar characteristics in both the financial sector and the non-financial sector in the Netherlands.

Table 10 Gender Pay Gap in the Financial Sector and the Non-Financial Sector, 2017

	Ln Hourly Income	
	Financial Sector	Non-financial Sector
	b/se	b/se
Female	-0.213**	-0.208***
	(0.07)	(0.02)
Including controls	Yes	Yes
R^2	0.462	0.323
* p<0.05, ** p<0.01, *** p<0.001		

Notes: The dependent variable is the natural logarithm of the average hourly income. Table reports the coefficients for female in the financial sector and non-financial sector, respectively. The reference variable is male. Control variables are not shown in this table. The standard errors are in parentheses. *significant at the 5% significance level.

There are some other findings regarding the wage determination in the financial sector. The full results generated by equation (2) for the financial sector can be found in table 11. As shown in table 11, the negative and significant estimate for the working hours per week

indicates that employees in the financial sector tend to receive 2% lower hourly wage on average for working every extra hour, other things being equal. As for the non-financial sector, the decrease of working one more hour on the hourly wage is slightly smaller with only 1%. Furthermore, workers with degrees of hbo (intermediate vocational education) and wo (university) have on average 40% and 47.1% higher hourly wage than those with havo degrees (higher secondary education), respectively, when we control other individual characteristics. Similarly, in the non-financial sector, having wo (university) degrees means an increase in the hourly wage relative to having primary school degrees.

4.4 Comparison of Gender Pay Gap

We have found that in both the financial sector and the non-financial sector, the hourly wage differs between men and women with similar observable characteristics. We are also interested in whether the gender pay gap in the financial sector is significantly higher than the non-financial sector or not.

Test results for the third hypothesis are presented by table 12. The estimates for the dummy variable, female is negative and significant as in the previous regression analysis, which means the gender pay gap generally exists in the Netherlands. Besides, a male has significantly higher hourly income than a female with equivalent characteristics by about 21%. As for the interaction term, the coefficient of the interaction term is positive with 0.045. However, it is insignificant with the p-value larger than 0.05. Thus, the coefficient of the interaction term is statistically different from zero. Hence, the financial dummy and the female dummy do not interact, in other words, the relationship between the gender and the hourly wage does not depend on sectors from which the workers are. There is no significant difference in the gender pay gap between the financial sector and the non-financial sector. Therefore, we would reject the third hypothesis.

Table 12 Financial sector and non-financial sector comparison of the gender pay gap, 2017

	Ln hourly Income
	OLS
	b/se
Female	-0.210***
	(0.02)
Financial*Female	0.045
	(0.08)
R^2	0.332
* p<0.05, ** p<0.01, *** p<0.001	

Notes: The dependent variable is the natural logarithm of the average hourly income. Table reports the coefficients for female and the interaction term. The reference variable for gender is male. The interaction term captures the partial effect of working in the financial sector on gender pay gap, other things being equal. Control variables are not shown in this table. The standard errors are in parentheses. *significant at the 5% significance level.

V. Discussion

Inspired by the work of Denk (2015), in which the Netherlands is the only country with a negative wage premium for the financial sector among many other OECD countries, we raised our research question, that is, how the wage pay is in the Dutch financial sector as compared with other non-financial sectors in the Netherlands. In this paper, we have shown whether wage premium exists in the Dutch financial sector or not and answered questions regarding the gender pay gap for the Dutch financial sector by using the fixed effects model and the OLS equations.

Test results suggest that there is no wage premium in the Dutch financial sector. For an individual, there are no significant changes in the average hourly wage when he or she moves from the non-financial sector to the financial sector. The differences in individual characteristics can explain the raw wage differentials among employees. While the financial sector does not play a role in causing the wage differentials, the gender is one of the factors that can be held responsible for the wage differentials. According to the findings, income inequality profoundly persists between gender in the Netherlands, no matter in the financial

or non-financial sector. Moreover, there is no evidence that the gender pay inequality is more severe in the financial sector compared with other sectors. For both the financial sector and the non-financial sector, men get paid 21% higher on average than women with similar observable characteristics.

Answering the research question, employees in the financial sector do not receive significant advantages as compared with those in the other sector in the Netherlands. Similar to the non-financial sector, the workers' wages in the Dutch financial sector are influenced by gender, education, profession and the number of working hours. Thereinto, the gender pay gap is one common issue which constitutes a significant part in wage inequality for both the financial sector and the non-financial sector. Furthermore, no significant difference is observed in the pay gap between gender between the Dutch financial sector than and the non-financial sector group.

Comparing the findings of this paper on the wage premium in the Dutch financial sector with what Denk (2015) has found, we confirm that there is no wage premium, at least not a positive one, in the financial sector in the Netherlands. Despite using different methodologies, the results are in line with what Denk found. As mentioned in the report of Denk (2015), certain caveats exist for OLS equation when the observable characteristics like some specific skills for generating profits are positively correlated with the productivity of the employee and the likelihood of working in the financial sector. In this case, one could overestimate the wage premium. Thus, in consideration of this, the fixed effects model used in this paper helped with the omitted variable bias by removing some unobservable time-invariant characteristics. It is surprising when comparing the results of the wage premium in the Dutch financial sector with those of some other countries. According to Denk's findings, the average wage premium in the financial sector in OECD countries is 28% of an average worker's earning, among which Italy has the most substantial wage premium of 52% while the Netherlands is the only one with a negative estimate of -0.5%. This paper found the wage premium in the Dutch financial sector not significantly different from zero, and further when decomposing the sectors into each category, two sectors have wage premium relative to the financial sector. Concluded on the findings above, the financial sector in the Netherlands seems to carry some

unique features which make itself less likely to have a significant effect on income inequality than the financial sectors in other countries. In order to find out what the potential features might be, it is essential to understand what could explain the wage premium first.

Lindley and Mcintosh (2014) tried to explain the financial-sector wage premium from the perspective of the rent sharing. They believed the possible greater rents in the financial sector that are shared by the workforce could account for the wage premium. Also, they found evidence that showed the financial sector did have the highest observed rents among all sectors. Denk (2015) also pointed out that wage premium can be the channel to transmit the rents to the employees in the financial sector, and financial institutions can create such rents by taking advantage of the valuable public support and some barriers to entry. For instance, the highly concentrated banking sector, which constitutes of only several firms, provides services to the whole country. So, if the financial institutions are still capable of creating large rents and exploiting profits with their concentrated and dominant power, we tend to believe a wage premium is much likely to exist in the financial sector. For the Dutch financial sector, however, facts show that it does not seem to be the situation discussed before. The Dutch banking sector is shrinking over these years. Although as mentioned before, the banking assets are about 365% of the GDP in 2016, they were 600% in 2008. In the meantime, the technology innovation in the Netherlands has become one of the most influential developments affecting the financial sector (DNB, 2016). Increased competitions and new technologies on the models of the financial institutions make it harder for the financial sector to keep providing services profitably. In conclusion, the decreasing rents and profitability due to more intensive competitions in the Dutch financial sector might account for both the findings of Denk and this paper, that is, there is no wage premium in the financial sector.

Another interesting finding in this paper is that no significant difference exists in the gender pay gap between the financial sector and that of the non-financial sector in the Netherlands. This result is kind of different from what researchers usually find out for the financial sector in other countries. In some countries like the UK, Sweden, and Norway and so on, the men's wage premium in the financial sector is significantly higher than in other sectors (Denk, 2015). Many potentials can be the reason for the Dutch financial sector not having a higher

men's premium than other sectors. One of them is perhaps the relatively more equal distribution of the rent for men and women in elite financial positions. Thus, according to Lin and Neely (2017), the wage increases in high finance which are usually all captures by elite men are also distributed to elite women. Therefore, the gender pay gap in the Dutch financial sector is likely to be of no difference to the non-financial sectors.

Moreover, we have noticed that the estimates of the working hours per week for both the financial and non-financial sector are significantly negative, which is not as we expected. The result indicates that for Dutch employees, working for more hours per week on average does not lead to a higher hourly wage. According to the human capital theory, workers should be compensated for the increase in their investment in human capital. The increased human capital is primarily the increase in the workers' productivity, on which the wage is determined. If the amount of the working hours relates to the productivity of the workers in some degrees, that is, working for more hours does not necessarily mean a higher bonus or reward but a signal or inefficient work and low productivity, we would expect such a negative relationship between the working hours and the hourly wage in the financial sector. Worral and Cooper (1999) found that 68 % of the managers they surveyed felt that the long working hours were hurting their productivity. Also, later in the report by Kodz (2003), it pointed out that the long working hours increased the incidence of error-making, which led to a decrease in productivity.

There are some limitations to this study. When testing the first hypothesis, we conducted another regression analysis of the natural logarithm of the hourly income on observable characteristics with breaking down the non-financial sectors into each sector. The relatively small sample size for each sector group may not be representative enough for the population in each sector, thus, overestimate or underestimate some effects due to observations with extreme value. This limitation might explain why in table 9 the catering sector has such a significant wage premium compared to the financial sector, which is not as common as we thought.

Moreover, one drawback of this dataset is that it did not specify the bonuses in the questionnaire and recorded only the gross monthly income. Gross monthly data generated

the hourly income in this paper. Bonuses are an essential part of the compensation. As was noted by Bell and Reenen (2010), bonus payments which tend to be paid before the end of the financial year might be left out by using weekly or monthly wage. Although it is yet not clear that a specific relationship exists between the bonus payments and types of the wage, we believe the income received during a longer time span tend to cover more information. Thus, we would suggest using the annual income for further improvement of research.

Another point to make for the gender pay gap is that the estimate may suffer from omitted variable bias. The fixed effects model cannot be used for the time-invariant variable, which is our interest variable for the second hypothesis, the gender. So, when using the OLS equation, it is more likely that some variables correlated to the gender influence the average hourly wage but are not controlled, which may overestimate or underestimate the gender wage gap. Working part-time or full-time is a potential factor. Statistics Netherlands (CBS, 2014) mentioned in its report that part-time work paid a lower hourly wage to workers than full-time work, and more men than women work full-time. We do not know yet in this study whether working part-time or full-time significantly influence the gender pay gap or not due to the lack of relevant information.

VI. Conclusion

The debate persists on the role of the financial sector that plays in income equality after the financial crisis in 2008. The wage determination is supposed to depend on the capital acquired through workers' investment and the productivity of the workers to achieve income equality, according to the human capital theory. Public tend to believe that employees in the financial sector get paid higher wages and bonuses than their equivalents in other sectors, which is also known as the wage premium. Concerning this issue, researchers conducted many studies on whether working in the financial sector receives massive wage advantages or not for different countries.

The Netherlands is the only one country among the OECD countries that have a negative wage premium (Denk, 2015), which inspired us to study on the financial sector pay in the Netherlands. By using the fixed effects model and OLS equations, we found that the workers

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in the financial sector did not receive any wage premium when compared with the workers with similar characteristics in the non-financial sectors. However, gender was shown to be affecting the income inequality in both the financial sector and the non-financial sectors in the Netherlands to the same extent. No larger or smaller gender pay gap was observed in the Dutch financial sector relative to the non-financial ones.

In order to understand the implications of our results. We compared the findings with previous literature and tried to explain the differences between them. We believe that some specific features in the Dutch financial sector can explain why there is no wage premium in the financial sector. On one hand, the well-developed financial infrastructure reduced the barriers to entry; on the other hand, innovations of the new Fin-tech enhance the competitions and in the financial sector, making it more difficult to explore the rents. The shrinking banking sector is likely to be an outcome of these features. In addition, the gender pay gap in the financial sector is close to that in the non-financial sector in the Netherlands, different from other countries where the gender pay gap is usually the highest in the financial sector. We proposed a possible explanation, that is, the relatively more equal distribution of the rents for elite men and elite women in the Dutch financial sector is the reason for reducing the differences between the gender pay gap in the financial sector and that in other sectors. Also, we found that in both the financial sector and the non-financial sector group, working for on average longer hours per week does not increase the hourly wage but has an adverse effect. The inefficiency and error-making resulting from working for longer hours could possibly explain this negative relationship.

This paper has some contributions to the field study of wage pay and determination. Looking at previous academic work, there are few studies on the wage premium in the financial sector focusing on the Netherlands. This paper contributes to current research work by confirming the results from the previous study and providing a more detailed picture of what the wage pay in the Dutch financial sector is like. The differences of the finance pay between the Netherlands and other countries cause us to think that, studying more about the features of the Dutch financial sector might help reduce the effect of the financial sectors on income

inequality in other countries. It is still in question whether adapting the features of the Dutch financial sector to other countries can decrease the wage premium and reduce income inequality in those countries or not. Can deconcentrating the banks, reducing the barriers to entry the financial sector, and developing new innovations of financial techniques work for every country with a wage premium in the financial sector? In order to answer this question, more researches are needed.

Appendix

Table 1 Profession categories of the individuals, 2013-2017

Profession
1 higher academic or independent profession (e.g. architect, physician, scholar, academic instructor, engineer)
2 higher supervisory profession (e.g. manager, director, owner of large company, supervisory civil servant)
3 intermediate academic or independent profession (e.g. teacher, artist, nurse, social worker, policy assistant)
4 intermediate supervisory or commercial profession (e.g. head representative, department manager, shopkeeper)
5 other mental work (e.g. administrative assistant, accountant, sales assistant, family career)
6 skilled and supervisory manual work (e.g. car mechanic, foreman, electrician)
7 semi-skilled manual work (e.g. driver, factory worker)
8 unskilled and trained manual work (e.g. cleaner, packer)
9 agrarian profession (e.g. farm worker, independent agriculturalist)

Table 2 Groups of working hours per week, 2013-2017

Average Working Hours Per Week	
Group1	0-10 hours
Group2	11-20 hours
Group3	21-30 hours
Group4	31-40 hours
Group5	41-50 hours
Group6	51-60 hours
Group7	61-70 hours
Group8	71-80 hours
Group9	81-90 hours

Table 3 Education levels of the individuals, 2013-2017

Level of education in CBS (Statistics Netherlands) categories
1 primary school
2 vmbo (intermediate secondary education, US: junior high school)
3 havo/vwo (higher secondary education/preparatory university education, US: senior high school)
4 mbo (intermediate vocational education, US: junior college)
5 hbo (higher vocational education, US: college)
6 wo (university)

Table 4 Sector categories

In what sector did you work in your last job?
1 agriculture, forestry, fishery, hunting
2 mining
3 industrial production
4 utilities production, distribution and/or trade (electricity, natural gas, steam, water)
5 construction
6 retail trade (including repairs of consumer goods)
7 catering
8 transport, storage and communication
9 financial
10 business services (including real estate, rental)
11 government services, public administration and mandatory social insurances
12 education
13 healthcare and welfare
14 environmental services, culture, recreation and other services
15 other

Table 5 Profession categories of the individuals from the financial sector, 2017

Profession
1 higher academic or independent profession (e.g. architect, physician, scholar, academic instructor, engineer)
2 higher supervisory profession (e.g. manager, director, owner of large company, supervisory civil servant)
3 intermediate academic or independent profession (e.g. teacher, artist, nurse, social worker, policy assistant)
4 intermediate supervisory or commercial profession (e.g. head representative, department manager, shopkeeper)
5 other mental work (e.g. administrative assistant, accountant, sales assistant, family career)

Table 6 Education Levels of the Individuals from the Financial Sector, 2017

Level of education in CBS (Statistics Netherlands) categories
vmbo (intermediate secondary education, US: junior high school)
havo/vwo (higher secondary education/preparatory university education, US: senior high school)
mbo (intermediate vocational education, US: junior college)
hbo (higher vocational education, US: college)
wo (university)

Table 7 Age categories

Age in CBS (Statistics Netherlands) categories
1 14 years and younger
2 15 - 24 years
3 25 - 34 years
4 35 - 44 years
5 45 - 54 years
6 55 - 64 years
7 65 years and older

Table 11 Full results of regression analysis on wage determination in the financial sector and non- financial sector, 2017

	Ln Hourly Income	
Variables	Financial Sector b/se	Non-financial Sector b/se
Age of the household	0.019	0.033***
	(0.02)	(0.00)
Age square	0.000	-0.000***
	(0.00)	(0.00)
Female	-0.213**	-0.208***
	(0.07)	(0.02)
Higher supervisory profession	0.218	0.186***
	(0.13)	(0.04)
Intermediate academic or independent profession	-0.108	-0.067*
	(0.11)	(0.03)
Intermediate supervisory or commercial profession	-0.024	-0.059
	(0.09)	(0.04)
Other mental work	-0.124	-0.149***
	(0.09)	(0.04)
Working hours per week	-0.020***	-0.011***
	(0.00)	(0.00)
Havo/vwo (higher secondary education)	0.335*	-0.058
	(0.15)	(0.06)
Mbo (intermediate vocational education)	0.202	-0.073
	(0.13)	(0.06)
Hbo (higher vocational education)	0.400**	0.085
	(0.13)	(0.06)
Wo (university)	0.471**	0.190**
	(0.16)	(0.06)
Vmbo (intermediate secondary education)		-0.145*
		(0.06)
Skilled and supervisory manual work		-0.150**
		(0.05)
Semi-skilled manual work		-0.283***
		(0.05)
Unskilled and trained manual work		-0.437***
		(0.06)
Agrarian profession		-0.310*
		(0.12)
Constant	3.014***	2.480***
	(0.44)	(0.13)
R^2	0.462	0.323

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

Notes: The dependent variable is the natural logarithm of the average hourly income. Table reports the regression results for the financial sector and non-financial sector. The reference variable of the gender is male in both cases. The referecne varibale of the education for the financial sector is Vmno while for the non-financial sector is primary school. The reference variable of the profession for the financial sector and the non-financial sector is higher academic profession. The standard errors are in parentheses. *significant at the 5% significance leve

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