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Gender gap in the energy sector. Evidence from Spain.

MASTER THESIS

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Preface

In published in 1990 "Endogenous technological change" Paul M. Romer challenged the neoclassical development paradigm arguing that technological growth is endogenous and depends on how much human capital is dedicated to research; too low amount of it would imply stagnation. Whilst Romer was interested in elaborating the macroeconomic model exploring the relations between different parameters, in this Master Thesis we will focus on quality rather than the quantity of the labour force in the energy sector, one of the key industries in today's society. We will give special attention to women, as it is our firm belief their potential in this field has not been fully explored yet. While investigating the possible barriers for female careers in the energy sector, we will remain aware of women's heterogeneity stemming from their sociodemographic differences and workplace characteristics.

It is of great importance to us that the results of this work reach to the general public. At this point, we would like to refer to the words of Michael Burawoy (2004) who, while exploring the concept of public sociology, highlighted the need for disseminating the findings of social research. In response to his appeal, the results of this Master Thesis will be published in the Observatory of Spanish Association of Women in Energy Observatory (AEMENER, www.amener.es).

Abstract

The energy transition is at the heart of the current energy debate and its social dimension is becoming more relevant in the latest policy developments. This Master Thesis aims to develop the research on one of the socio-economic aspects of the energy transition by focusing on the gender dimension of human capital in the energy sector. It examines the size of the gender gap in the energy sector and explores its potential drivers using data from the Wage Structure Survey (2010, 2014, 2018). Stemming from the literature review and the descriptive information in our sample, we test the hypotheses on 1) the significance of firm size for the gender pay gap, 2) the impact of the position on the income distribution to determine wage ceiling and floor patterns, 3) the importance of salary supplements for the gender gap in the energy sector. To verify those claims, we compute linear and quantile regression models and provide additional robustness checks. This thorough analysis provides the evidence to support claims that the gender wage gap in the energy sector is mostly driven by differences in salary supplements. Furthermore, it is wider in large companies, which also exhibit ceiling patterns. The obtained results also highlight the complexity of trends in earnings gaps, revealing the differences between base salary and supplements and the pivotal role of company-related variables. Based on those conclusions, we offer policy recommendations for private and public entities.

Key words: gender gap, energy policy, glass ceiling, salary supplements, quantile regression

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1. Introduction

The previous century was undoubtedly the turning point in the process of women's emancipation, due to their mass participation in the labour market. While this process certainly marked a milestone, gender inequalities still persist. In this regard, studies on labour market with a gender perspective usually explore three entwined gender gaps: 1) in participation 2) in working hours 3) in earnings. Following Romer's (1990) line of argument, these disparities hinder exploration of the full potential of female workers and, consequently, might jeopardize further development.

Another issue related to gender equality in the labour market is segregation of men and women into different sectors or activities, the feminised usually being worse-paid and less prestigious. One of the most important male-dominated industries is the energy sector, in which the gender imbalance is particularly striking. Irena (2019) shows that worldwide women account only for 22% of the total workforce in the energy sector. These results are in line with the data from the last wave of Wage Structure Survey depicted in Figure 1a. It shows that in Spain the percentage of women in this sector was only half of the share of female workers in the whole sample. This gender imbalance persists despite the fact that the presence of women in the energy sector has systematically been growing in 2010, 2014 and 2018 (Figure 2).

Figure 1: Gender composition in the energy sector as of 2018 (%)

Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

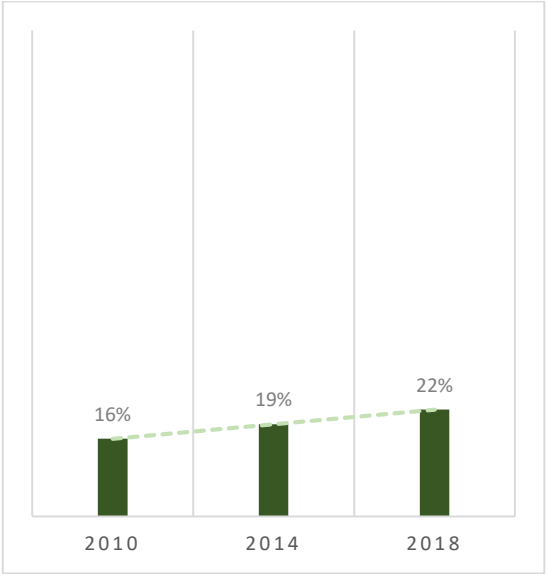
This is worrying not only because of underlying gender inequality. Energy transition is vital for thwarting the ongoing climate crisis, which might obstruct running business operations, maintaining state functions and living everyday lives. The importance of taming the climate catastrophe is reflected in the UN sustainable goals. "Taking urgent action to combat climate change and its impacts" was declared the Nº 13 among the UN. Sustainable Goals, along with 7th goal highlighting the necessity for developing "Clean and affordable energy".

Thus, an adequate response from the energy sector is key for fulfilling the UN Sustainable Development Agenda[1]. Parallel to this, the UN Development Agenda aims to reduce inequalities (Goal 10) and achieve gender equality (Goal 5). All these objectives are interwoven: combating

[1] See UN Sustainable Development https://www.un.org/sustainabledevelopment/development-agenda/, last checked on 30th June, 2021.

climate change will not be possible without a radical energy transition that increases the use of renewable sources. Meeting these two goals will not be feasible without eliminating gender-based discrimination that impedes expanding the talent pool in the energy sector.

Figure 2: Changes in the share of women in the energy sector, 2010, 2014, 2018 (%)



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Therefore, the main aim of this Master Thesis is to respond to the aforementioned challenges. This goal is to be achieved by exploring gender gap in the energy sector using the evidence from Spain, in order to gain a better understanding of the mechanisms underlying discrimination against women. We believe that gauging the main aspects of gender-based inequalities would be the first necessary step to better tailor workplace policies and improve the opportunities of human potential in the field.

This motivated us to pose the following research questions:

1) Is the gender gap in the strongly male-dominated energy sector different than in other fields?
2) If so, how? What factors contribute to it?

Stemming from these questions are the hypotheses, based on the literature review and descriptive analysis:

1) Gender gap changes depending on other variables, precisely on the company size. This choice was determined by including in the regression models interactions of gender with selected variables, of which female with company size yielded the most significant results.
2) Based on the literature findings, we assumed that ceiling pattern prevails, both in the energy and in the whole sample. Thinking of replicating our results in further research, we decided to use the definition provided by Arulampalam, Booth & Bryan (2007: 170). Thus we claim the gender gap follows a ceiling pattern whenever the difference at q90 is higher by at least 2 p.p. than any other $q \in \{0.1,\ 0.25,\ 0{,}5,\ 0.7\}$; whereas the floor pattern criterion specifies that the gap at q10 must be 2 pp. higher compared to q25. We tested hypothesis by applying quantile regression models.
3) Finally, the results described above indicate that salary supplements are the largest when it comes to gender earnings disparities. To measure this, we specified three

dependent variables: total salary per hour of work, base salary per hour of work and salary supplements per hour of work.

While a substantial number of studies has been dedicated to critically examine gender inequalities in the labour market, little has been done to explore the situation of women in the energy sector specifically. Consequently, this literature might not grasp the idiosyncrasy of the energy sector. On the other hand, research on women in the energy sector is limited to descriptive statistics and provides little insight into salary differences.

Therefore, this Master Thesis hopes to bridge the gap between these two kinds of studies, by a thorough analysis of the salary disparities between men and women working in the energy sector. It will attempt to unveil the underlying factors and reveal patterns across the income distribution. This study does not only aim to enrich the current knowledge on the female workforce in the energy sector, but also to contribute to the discourse on energy transition focusing on its social dimension and its yet unexplored gender aspect.

Another important aspect of this Thesis is that it investigates a male-dominated sector and examines how the general gender gap patterns apply to this particular industry. If new tendencies are observed, then our study could not only offer useful information for research on the labour markets as such, but also provide some background for further research on women working in STEM fields, traditionally dominated by men.

This Master Thesis is organized as follows: Section 2 summarizes the main literature and Section 3 presents the data together with the main descriptive statistics on the energy sector's employers and employees. Section 4 continues by describing the methodology followed to calculate the gender gaps. Section 5 discusses the results obtained for the unadjusted and adjusted gender gaps using linear and quantile regression models. Finally, Section 6 covers the conclusions and policy recommendations.

2. Literature review

In this section we will discuss the main literature on the subject. We divided it into two parts: the first is focused on the literature on women in labour market in general, the second reviews the reports on the situation of women in the energy sector.

2.1 Exploring the gender gap – ceiling and floor patterns

A substantial number of studies has focused on exploring gender gaps in the labour market. Regarding participation, the low employment rates of women in Spain (Amuedo-Dorantes & de la Rica 2006, de la Rica, Gorjón & Vega-Bayo, 2019) and in Southern Europe in general (Ciminelli, Schwellnuss & Stadler, 2021) are often highlighted in the literature. Furthermore, it was claimed that the participation gap is positively correlated with the pay gap (Leythienne & Ronkowski, 2018). The reason underlying this seeming paradox was that without adequate family conciliation policies, women tend to withdraw from the labour market; unless they have a higher comparative advantage related to earnings they would gain otherwise. Lower gender participation gap in younger women (Kleven, Landais & Søgaard, 2018; de la Rica, Gorjón & Vega-Bayo, 2019; Quesada Campos, 2020) seems to validate the claims about female workers dropping out of the labour market once they give birth. Therefore, lower pay disparities might stem from the fact that only highly skilled female workers remain active after starting a family. For that very reason, focusing solely on the unadjusted gender gap might lead to inaccurate conclusions about women's discrimination or a lack of thereof.

Further evidence for the correlation between gender gap and female participation is provided by Amuedo-Dorantes & de la Rica (2006) who suggested that salary differences tend to be lower in male dominated industries, with lower percentage of female workers. This might be interpreted in the following way: women who break the vertical segregation and enter highly competitive fields are likely to be carefully selected highly qualified professionals, to whom developing their professional career brings considerable comparative advantage. An alternative explanation, however, is proposed by Ciminelli, Schwellnuss & Stadler (2021). According to them, technical jobs, which tend to be male-dominated, offer greater flexibility in terms of working hours, whereas occupations relying on personal contacts often involve working overtime.

Another important aspect of gender differences in the Spanish labour market is the fact that women tend to work fewer hours compared to their male counterparts (de la Rica, Gorjón & Vega-Bayo, 2019). Consequently, the wage gap narrows once earnings per hour of work are taken into account. It is broadly discussed whether women's shorter working time is a consequence of individual preferences or societal constraints. However, the last cited study emphasized that in Spain, 50% of part-time working women claimed their labour situation was not their personal choice. Moreover, there are more reasons why the gap in working hours should not be analysed in terms of individual inclinations. Firstly, the influence of cultural norms and expectations on the individual preferences should not be overlooked. Secondly, shorter hours of work of female workers might in the future be translated into a wider pension gap, currently in the European Union reaching 40% (Clancy & Fenstra 2019).

Gender differences in earnings are shaped by a variety of factors, of which educational attainment has been widely debated. De la Rica, Gorjón & Vega-Bayo (2019) demonstrated that the gap is the least explained in women with higher education levels. In other words, it can be attributed to observable differences between men and women to a lesser extent, compared to those with lower educational attainment.

On a similar note, de la Rica, Dolado & Llorens (2008) showed that in Spanish labour market the pay gap seems to increase with the position on the income distribution for higher educated women, following thus a ceiling pattern. However, there was no similar effect in female workers with a lower education level, in whom the pay gap was higher at the bottom of the distribution. The latter tendency, labelled by authors as floor pattern is – as they emphasized - not to be confused with other phenomenon, described as "sticky floors". This issue is further explored by Ciminelli, Schwellnuss & Stadler (2008), who distinguish three types of gender gap drivers: 1) women investing less in their human capital due to their family responsibilities 2) female workers breaking their careers after childbirth 3) systemic discrimination stemming from cultural gender bias. While the first two sets of obstacles are defined as glass ceiling, the latter is identified as sticky floor.

The aforementioned differences between women representing different educational backgrounds in Spain are explained by the fact lower educated women, who have less comparative advantage, tend to drop out of the labour market after giving a birth. As a result, in this category those who are in the labour force are more likely to be childless and follow male-like pattern along their career path. Conversely, their higher-educated counterparts, struggling to reconcile family and work responsibilities, are more likely to fall into the glass ceiling trap (de la Rica, Dolado & Llorens, 2008). Another study (Moreno-Mencina, Fernandez-Sainz & Rodríguez-Poo, 2020) focuses on the difference between explained and unexplained gender gap. It demonstrates that whilst the first is lower at the top quantiles of the income distribution,

the latter grows with income. These findings obtained from analysing Wage Structure Survey data for Spain in 2014 also appear to provide further evidence for the results by de la Rica, Gorjón & Vega-Bayo (2019), pointing out the gap is less explainable in higher educated women.

Current literature does not agree on a single conclusion when it comes to the floor and ceiling patterns. On the one hand, Arulampalam, Booth, & Bryan (2007) claim the latter pattern prevails across the EU-12 countries. Conversely Ciminelli, Schwellnuss & Stadler (2021) suggest that no correlation between educational attainment and gender gap was found in Southern Europe, and hypothesise that Southern European labour markets follow floor patterns. The findings of those studies, however, are not necessarily mutually exclusive. Firstly, the latter concentrated on a different subject, lumping in the "Southern Europe" Italy, Spain, Portugal, Greece and Turkey, obtaining as a result a heterogeneous category with diverse legal framework and cultural traditions. Secondly, the previously cited research carried out in Spain unveiled the complexity of the gender gap, showing how it might depend on education or differ while broken into unexplained and explained part. Consequently, since gender gap is intertwined with other factors, it might be desirable to analyse it in interaction with other variables; as some authors did, revealing the possible drivers of gender inequalities of gender pay gap.

One such approach was proposed by Ciminelli, Schwellnuss & Stadler (2021) who interacted gender with age and thus were able to estimate the impact of child penalty on the pay gap. Indeed, some studies provide the evidence for claim that gender inequalities in family responsibilities are essential in explaining child penalty, which, interestingly, does not seem to decrease once the child is born (Kleven, Landais & Søgaard, 2018; Kleven et al., 2019, Quesada Campos, 2020) These results, however, do not offer plausible explanations of why gender gap exists in younger age groups. It is, thus, worth reminding that other authors focused on other potential drivers, such as gender (unconscious) bias leading to discrimination in hiring (González, Cortina, & Rodríguez, 2019), competitiveness aversion in females (Gneezy, Niederle & Rustichini, 2003) or lack of confidence experienced in particular by women working in STEM fields (Michelmore & Sassler, 2016). Nevertheless, Ciminelli, Schwellnuss & Stadler (2021, p. 11) rejected the similar suggestions stating that most studies showed that personality differences ("soft skills") would account only for 10% of gender gap once other variables are controlled for. That being said, personality-related factors should not be automatically dismissed, as they might provide meaningful explanations for studies focusing on particular sectors (STEM-related fields) or age categories, in which, along with gender discrimination in hiring, they might play a pivotal role.

The systemic nature of gender-based discrimination described above could lead to the conclusion that should earnings be exclusively performance-based; all the gender differences would stem from observable characteristics, such as higher productivity. As a result, the gender gap would diminish. The study carried out by de la Rica, Dolado & Vegas (2010) demonstrated, however, that in Spain this was hardly the case; the unadjusted gap being much higher in performance-based components compared to other compensations. The authors attributed this difference to monopsonistic tendencies in the labour market enabling employers to pay lower wages than the marginal product of labour. This advantage over potential employees would stem from women's household responsibilities limiting their negotiation power. Hence, performance-based pay would neither reduce nor eliminate gender-gap. Conversely, some research shows that gender differences in total salary are strongly affected by the wide gap in salary supplements, whereas the base salary gap remains much lower (Amuedo-Dorantes & de la Rica, 2008). Consequently, the wage components strongly subjected to legal framework

seems to be less "discriminatory" than those relying to a larger extent on individual's performance at work. This claim is underpinned by the findings of Moreno-Mencina, Fernandez-Sainz and Rodríguez-Poo (2020) showing that heavily regulated wage policies in the public sector result in lower gender pay gap. Most of the cited studies, however, focused on the analysis of the labour market as a whole, trying to find the general patterns, rather than exploring differences between sectors.

2.2 Women in the male-dominated energy industry

Whilst the advantages of increasing the diversity in the sector by scaling up women's employment are broadly discussed (Pearl-Martinez & Stephens, 2016; Irena, 2019), little research has been carried out regarding gender-based differences in employment. Despite numerous studies incorporating the gender perspective into their research on the energy sector, the main focus was on consumers.

More importantly, the existing studies on the subject are constrained to descriptive results (Clancy & Fenstra, 2019; Irena, 2019; Jul Sánchez & Romera Martínez. 2020). Most of them emphasize the employment gap in the energy sector, women accounting for around 22% of the total workforce in energy sector worldwide (Irena, 2019, p. 10) and in the EU (Clancy & Fenstra, 2019, p. 19), while in Spain this figure would be as high as 28,5% (Jul Sánchez & Romera Martínez, 2020, p. 68). Furthermore, Irena's study (2019, p. 10) suggests there is a vertical segregation within the renewable sector with female workers largely concentrated in administrative jobs (45%) compared to 35 % in non-STEM technical, and 28% in STEM-technical jobs. Another study adds that women hardly occupy top managerial positions, the energy sector in the US having the lowest share of female directors on boards (Pearl-Martinez & Stephens, 2016, p.10). It is worth emphasizing that according to some research, the gender employment gaps widens after graduation – not only women account for a lower percentage of STEM graduates compared to their male counterparts, but they are also more likely to renounce professional careers in their field of studies (Pearl-Martinez & Stephens, 2016, p. 12). That being said, the analysis of gender pay gap in those studies is limited; IRENA's report relies on subjective opinions of survey respondents on the existence of gender barriers (2019, p. 32).

The situation is somewhat different, however, once the renewable energy sector is considered. Some studies suggest the share of female workers might be higher (32%) compared to the traditional energy sector (Irena, 2019, p. 35). This change in gender balance was attributed to the fact that in the renewable energy sector personal connections are less important, which is more beneficial for young female workers, as these networks might be rooted in male bonding (Irena, 2019, p. 35; Clancy & Fenstra, 2019, p. 29). Some authors, however, are more sceptical, claiming that there are no sufficient data to validate similar claims (Clancy & Fenstra, 2019, p. 16) as at the EU level there are many countries which do not disaggregate employment data by gender in this sector. Furthermore, Clancy & Fenstra (2019, p. 19) emphasize that in the renewable energy sector vertical gender segregation still occurs, women mostly occupying administrative positions and men – technical, which are better paid.

Nevertheless, the scope of those studies remains limited. Therefore, some authors highlight that without having more data on women in this sector, it will not be possible to tailor gender mainstreaming policies. Pearl-Martinez & Stephens (2016, p. 10) emphasize the need for improving the data collection, warning: "In our data-driven society, we know that what is measured is more likely to be addressed (…)—in other words what has not been counted, does not count."

Moreover, the absence of thorough analysis of gender in the energy sector from the employment perspective hinders the full understanding of the possible factors underlying the difference between and within genders. The heterogeneity of women should not be underestimated; without a more complex statistical model including other socio-demographic or company-related variables it will not be possible to accurately assess the differences between female workers in the energy sector, stemming from age, educational attainment etc.

3. Data

In this section we will describe the dataset we will describe the dataset and will present the descriptive results related to 1) the energy sector itself 2) socio-demographic characteristics and gender differences of its workers.

3.1 Dataset

The data we use in our research project come from the Wage Structure Survey carried out by the Spanish National Statistics Institute (INE) on a four-year basis. On average, for each wave 28,500 companies with approximately 220,000 of workers are selected. The sampling is carried out in two steps: in the first stage companies are selected, then a representation of workers, depending on the firm size. Consequently, a stratified random sample is obtained.

Industries are classified according to the National Classification of Economic Activities (Cnae-2009). The energy sector is codified as "D0", encompassing firms "supplying electrical energy, gas, steam and air conditioning". The number of observations for years 2010 – 2018 ranged from 1,856 – 2,011, which corresponded to 213 – 226 companies (see Table 1)[2].

Table 1. The number of observations in the energy sector in each wave

Year	Observations	Companies
2010	2011	213
2014	1856	226
2018	1916	222

Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

The Wage Structure Survey provides accurate and representative data on earnings and their components, as well as educational attainment. However, it has certain limits. Firstly, it does not provide information on non-working population; as a result, the observations are burdened with self-selection bias. Secondly, its nexus is the labour market, for which it offers little insight into the private lives of researched employees; this kind of information might be essential when analysing gender differences at the workplace.

That being said, from our project's perspective the benefits clearly outweigh the constraints. Another dataset we could possibly work on – Spanish Labour Force Survey – does not provide reliable data on education level because it is based on a census, last carried out in 2011. This is crucial for analysing the gender gap size; without accurate data on educational attainment we would risk omitted variable bias. Secondly, as explained above, precise information on earnings is vital, since salary supplements are one of our main points of interest. In this regard, hardly could we rely on self-reported questionnaires, like those of Spanish Labour Force Survey, since they do not provide information on salary components. Moreover, individuals' estimation of their monthly income might very well lack precision. Finally, the Spanish Labour Force Survey

[2] For more information, check the Wage Structure Survey webpage (https://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736177025&menu=metodologia&idp=1254735976596 last checked on 20th July 2020).

does not collect data on firms' characteristics (i.e. firm size, sector, collective agreements, etc.), which are very useful to analyse the attributes of the gender gap.

These arguments weighed in on our choice for Wage Structure Survey Data. Remaining aware of its limits, we will elaborate an exhaustive model with additional robustness checks, detailed inSection 4.

3.2 Descriptive findings.

This subsection is divided into two parts. The first one outlines the main characteristics of the energy sector, whereas the second one explores the sociodemographic composition of men and women working in this industry.

3.2.1 Main characteristics of the energy sector.

Below are detailed the main features of the Spanish energy sector, such as typical company size, market, the share of immigrant-born workers, average age, education level and working conditions (salary, type of contract).

1) Company size: small firms prevail

In the analysed period, small companies hiring less than 49 employees dominated in the energy sector, and their share seems to have been growing in 2010 – 2014, from 61 to 67%. However, in 2018 this percentage slightly decreased, by 1 pp. By the same token, the share of large companies with 200 or more workers dropped from 18 % in 2010 to 11% in 2014, rising again to 14% in 2018. Concerning the medium-size firms (51 – 199 workers), their share oscillated around 20 – 22% in 2010 – 2018. Such composition resembles other sectors in Spain, in which small companies prevailed (66 – 68%) in 2010 – 2018, followed by middle-size firms (18%) and large ones (16 – 14%).

2) Market: energy sector[3] is dominated by companies operating on the national level

In the same period, the majority of the entities operated on the national level (63% in 2010, 59% in 2018), with the exception of 2014 (47%). In this year, an unusually high share of enterprises working on a regional level was recorded (30%), which otherwise was 21% (both 2010 and 2018). Finally, the share of international companies was the lowest in 2010 (15%), rising to 23% in 2014 and decreasing to 20% in 2018. Conversely, in other sectors regional-oriented firms dominated, albeit their share had been gradually decreasing: from 52% in 2010 to 50% in 2014 and 48% in 2018. Parallel to this, the percentage of enterprises operating on a national level was stable between 36 – 38% and large entities rose from 11% in 2010 to 14% in 2014, remaining unchanged for the next four years.

It should be emphasised that in the last two decades the electricity market in Spain, an important part of the energy sector, underwent significant changes following the implementation of the EU Directive 96/92/EC about the liberalization of the energy markets in the EU members' states (Ciarreta, Nasirov & Silva, 2016, pp. 701 – 702). Despite these proceedings, it remains highly regulated. Such circumstances undoubtedly had an impact on the singularity of the labour market in the field of energy.

[3] As mentioned before the energy sector covers a variety of fields (electrical energy, gas, steam and air conditioning). In addition to this different kind of companies are involved (retailers, providers, producers). However, mapping the whole sector in detail using the data from Wage Structure Survey is not possible because the questionnaire does not record such information.

3) Share of immigrant workers

Nearly all of the labour force in Spanish energy sector are native-born: the share of foreign-born workers in 2010, 2014 & 2018 was never higher than 2%, which did not significantly differ from the average for all sectors, in which this figure oscillated around 5%. These numbers suggest the claims of Spanish labour market being taken over by immigrant workers are unfounded. Matter-of-factly, the energy sector might need to attract more foreign workers so as to tackle demographic challenges it might face in the future (see below).

4) Age structure: the energy sector is ageing more rapidly

As previously remarked, since 2010 the share of workers from the youngest age group in the energy sector has been decreasing; while in 2010 34% of all employees were 39 or younger, in 2014 this percentage decreased by 2 percentage points, barely reaching 25% in 2018. On the other hand, the share of workers aged 50 or older had been slowly yet constantly growing: in 2010 they accounted for 39% of all the workforce in the energy sector, increasing to 40% in 2014 and 41% in 2018. By the same token, the percentage of 40-year-olds had been rising, reaching 33% in 2018, whereas in previous years they accounted for 27 and 28% (2010 & 2014, respectively). Whilst it should be emphasized that these aging trends affected the whole analysed sample, the energy sector seems to grow old at a faster rate. As already mentioned, in 2018 those aged 39 or less accounted for 25% of the total workforce in this industry and employees older than 49 – 40%. In the whole analysed sample in 2018 these proportions were respectively 34% and 32%, see Figure 3a & 3b.

5) Education: the energy sector appears to be more demanding

In 2010 employees with a higher education degree accounted for 73% of all workers in the energy sector. This percentage rose to 76% four years later, to drop to its previous level in 2018. Notwithstanding, the share of employees with a secondary education diploma increased from 20% in 2010 and 2014 to 23% in 2018. Consequently, the percentage of workers with the lowest level of schooling decreased from 7% in 2010 to 4% in 2014 and remained unchanged in 2018 (Figure 4). In the whole sample, the education composition of the workforce was following: 15-17% had only primary education, 44 – 46% - secondary and 39% - tertiary; notably these proportions remain largely unchanged in the analysed period. These figures reveal that employees in the energy sector are more highly educated compared to the average.

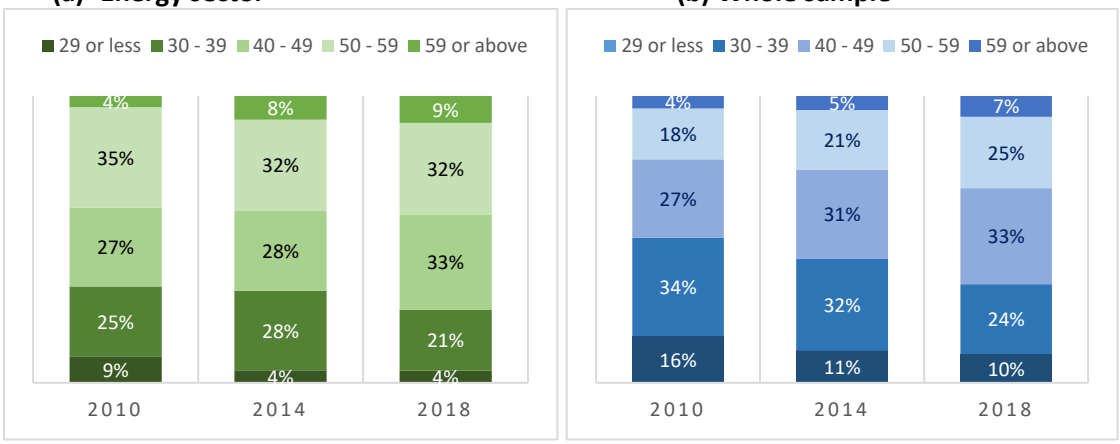
Summarizing, as far as education is concerned the energy sector is much more demanding compared to the average, a fact which might to some extent explain the lower share of younger employees in the field of energy.

6) Employment conditions: energy sector offers higher salaries and better stability

Nearly all the workers in the energy sector have a permanent job contract (96%) and work full-time (98-97%); much more compared to the whole sample, with 77- 79% hired on a permanent basis and 83-82% working full-time. Furthermore, in the energy sector a strong tendency to work longer years for the same company was evident; in 2010 the median tenure was 18. Even though it decreased by four years and 2014 and rose to 15 in 2018, the considerable gap between the energy sector and the whole sample persisted, for the latter the median tenure being 5 years in 2010, 7 – in 2014 and 9 – in 2018.

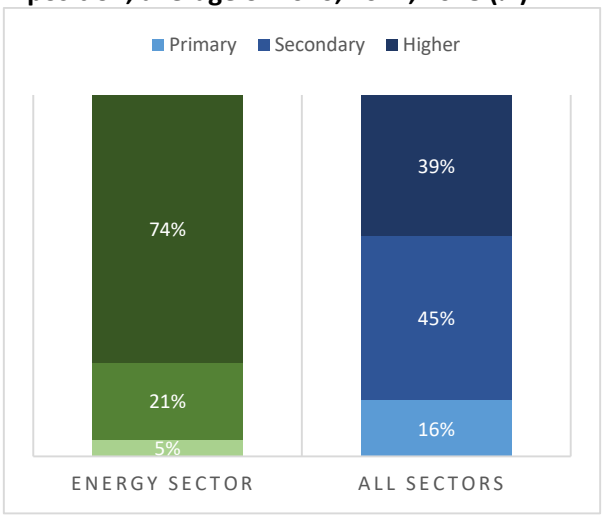
Figure 3: Age structure in 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Figure 4: Education composition, average of 2010, 2014, 2018 (%)



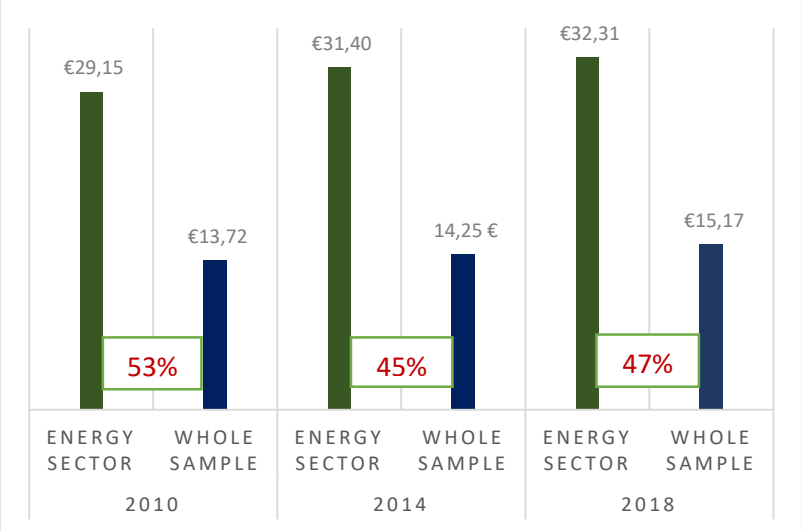
Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

As Figure 5 shows, equally large was the salary gap; in 2010 the median salary per hour in the energy sector was 29,15€, more than double of the average (13,72€). In the following waves these figures were respectively 31,40€ and 14,25€ in 2014 and 32,31€ and 15,72€ in 2018.

Thus, it would not be unfounded to claim that the employees in the energy sector in Spain are relatively privileged compared to the average. Furthermore, no clear tendency regarding the unadjusted salary gap could be observed. Even though it narrowed by 8 percent points in 2014, it widened again by 2 pp. in 2018. Therefore, there is no evidence to argue the gap would be closing in the foreseeable future.

It is worth noting that the collective agreements in the energy sector also differ from the whole sample. In this field internal company-level arrangements dominated in 2010, 2014 and 2018 accounting for 81% in 2010, 75% in 2014 and 78% in 2018; whereas in the whole sample it was 27, 25 and 24%, respectively. On average, the lion's share of the agreements was external, sector-level: 66% in each analysed year. However, in the energy sector this figure was much lower, ranging from 17% in 2010 and 2018 to 21% in 2014. Thus, not only are employees in the energy sector better paid, but also they enjoy better working conditions, as internal collective pay agreements tend to be more beneficial.

Figure 5: Median salary 2010, 2014, 2018 (€)



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Finally, the data on the median tenure show that the time worked for the same company is strikingly high in the energy sector, even though it decreased from 18 years in 2010 to 14 in 2014 and 15 in 2018. Nevertheless, the median tenure in the whole sample was nowhere near as high: 7 years in 2010 and 2014 each, 9 in 2018. Hence, even though the tenure gap between the energy sector and the average had been narrowing, the first still stands out.

Summarizing, if there were seven key phrases capturing the main features of the Spanish energy sector, that would be: small companies, national-market-oriented, Spanish-born workers, ageing, higher education, better salaries, stability.

3.2.2 Gender and other sociodemographic characteristics

Age and gender in the energy sector: more women in younger age groups

In 2010, women accounted for 23% of 30-year-old employees, which was the most feminized age category, followed by 20-year-olds (20%), and workers aged 40 – 49 (18%). In comparison, two oldest categories had much lower percentage of women: 9% in 50-year-olds and 10% in those aged 59 or more. Similar tendencies could be observed in the whole analysed sample: while in the youngest age group nearly half of the workforce was female, in employees on the verge of retirement they accounted for only 31%.

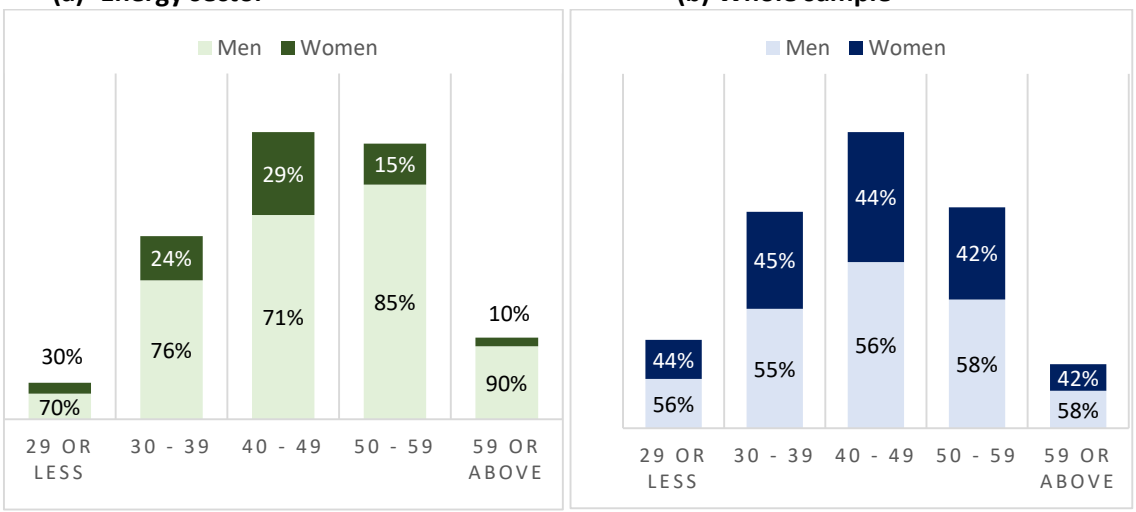
These proportions in the energy sector slightly changed in 2014, expect for employees aged 50 – 59, in which the percentage of female workers rose by 5 percent points. Nevertheless, the youngest age categories continued to have the highest proportions of women (23% each), being followed closely by 40-year-old employees (25%). No changes, with respect to the previous wave, were recorded in the oldest employees in the energy sector, even though in the whole sample the share of women in this age category rose by 4 percent points, whilst little changes (no more than +/- 2 pp.) were observed in younger groups.

In the last wave (2018), it became evident that in the energy sector the biggest share of women was in the youngest age category (30%) and in 40-year-olds (29%), see Figure 6a. Slightly lower percentage was recorded in the employees aged 30 – 39 (24%). Similar to the previous waves, workers aged 50 or more were the most masculinized age categories, with female employees accounting for 15% in 50-year-olds and 10% in those older than 59. As far as the whole sample

is concerned, women made up 44 – 45% of the labour force younger than 50 and 42% in the two oldest age groups, see Figure 6b.

Figure 6: Gender composition and age structure in 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2018)

Hence, the following conclusions can be drawn:

- In the energy sector the percentage of women in the youngest age categories was growing, while in the whole sample it remained stagnant or even decreased from 48 to 44% in employees aged 20 – 29 years. This could be attributed to the better comparative advantage offered by the energy sector relating to higher earnings and more stable working conditions.
- Interestingly, however, while the share of women in the oldest group in all sectors had systematically been increasing, it remained unchanged in the energy sector. One of the possible reasons behind this trend could possibly be the difference in the retirement age.
- In the energy sector, the youngest groups had always been the most feminized; in 2010 it was 30-year-olds, in 2014 – 30- and 20-year olds, and in 2018 – 20-year-olds. Strikingly, in the last analysed year, the share of women was higher in employees aged 40-49 than in those in their thirties. These differences could be partially explained by the rising average age of having the first child in Spain: while in 2010 it was 31.20, in 2014 it increased to 31.78[4].

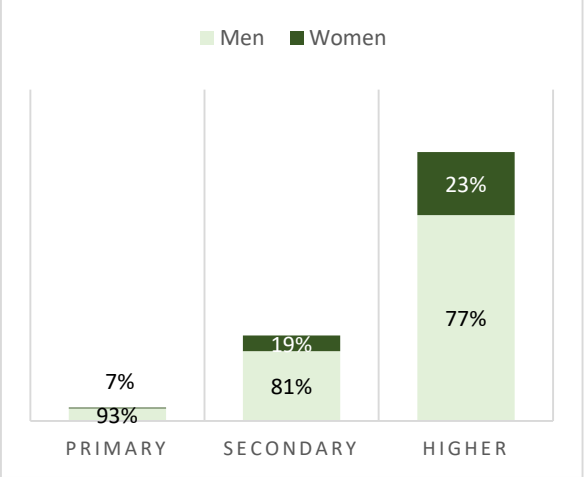
Gender and schooling: female workers are better educated

It is widely acknowledged that female workers are on average better educated in comparison with their male counterparts. The data obtained from the Wage Structure Survey in 2010, 2014 & 2018 appear to validate those claims showing that the most masculinized groups are workers with primary education, of which women make up 35% in each analysed year. The higher education level, the higher proportion of female workers; they account for 42 – 46% of the workforce with secondary education and 47 – 49% of those with a higher education degree. The

[4] More data on average age at first birth are available at the National Statistics Institute website https://www.ine.es/jaxiT3/Tabla.htm?t=1579 (last checked 18th June 2021).

education composition of the energy sector to a certain extent mirrors these tendencies, as in 2010, 16% of all the workforce with a higher education degree or a secondary school diploma were women, compared to only 9% in those with compulsory schooling (primary). Four years later the percentage of women increased to 20% in tertiary education. Astonishingly, however, a similar increase was observed in employees with mandatory schooling, of which in 2014 20% were female. On the other hand, it must be taken into account that the share of workers with primary education in the energy sector nearly halved from 7% in 2010 to 4% in 2014. Consequently, this radical increase was probably not due to the inflow of new female workers with primary studies, but most likely the share of men with mandatory schooling was decreasing at a faster rate. Four years later, the higher concentration of women in workers with tertiary education became evident: their share in this group was 23%, much higher in comparison to secondary (19%) or primary schooling (7%), see Figure 7.

Figure 7: Education composition in the energy sector in 2018 (%)



Source: Own calculations based on INE Wage Structure Survey (2018)

Summarizing, in 2018 when the percentage of women was the highest, the gendered education composition reflected the common tendency for women in the labour market to be on average better educated in comparison to their male counterparts.

Gender and occupation: beyond female office workers

It could be assumed that women in the male-dominated industries would occupy mostly non-technical, administrative positions. The data obtained in 2010 seem to confirm that intuition; 59% of office clerks in the energy sector were female. This figure was strikingly high, given that women accounted for only 16% of the labour force in that field. However, in the following years the share of female office clerks reduced to 48% in 2014 and 52% in 2018. Thus, even though there was an increase in the percentage of women in the sector, new inflow of female workers was not directed exclusively to the administration departments, despite the fact that the share of office clerks in total labour force rose from 5% in 2010 to 9% in 2014 and 10% in 2018. In reality, in two categories constant increase of women was observed along the analysed period:

1) Professionals: while initially the share of female workers in this category was 21%, it rose to 23% in 2014 and 27% in 2018.
2) Even greater growth of female workers was observed in "Directors and managers". Whereas in 2010 it was 15%, four years later women accounted for 22% and 25% in 2018. However, to obtain more robust results, the gender balance in employees who are in charge of other workers was checked. This data showed a slightly different

picture, the proportion of women being 1/3 in each analysed year, with only very small changes.

Moreover, as far as associate professionals were concerned, the percentage of women rose from 17% in 2010 to 20% in 2014 and remained unchanged four years later. Matter-of-factly some changes in gender balance were even observed in the most masculinized category "Qualified operators", of which only 1% was female in 2010-2014 and 3% in 2018.

Summarizing, based on the data displayed above, it can be concluded that in 2010 – 2018 in the energy sector:

1) The percentage of women was rising, in all age groups except from the oldest category;
2) The proportion of female workers is highest in better-educated employees (high school or a higher education degree);
3) The most feminized group are office clerks, however the share of women had been growing in all occupational categories, especially in "Managers and Directors" and "Professionals".

Family responsibilities are still a burden of women

In the gender gap discourse, the disparities in family responsibilities are often used to explain the salary inequalities. Comparing the number of days of parental leave and /or working part time in order to take care of a family member seems to confirm such a view. Women tend to be absent at work more often; it is a common tendency for the energy sector and the whole sample. This disparity is particularly evident in case of tending to a family member with men reducing their working hours for less than one day in a year, while for women in 2018 it was 13.2 in the energy sector and 15.6 in the whole sample. Notably, there had been the sharp rise; from 3.8 in 2010 to 11.9 in 2014 for the first and 9.5 and 12.9, respectively, for the latter. Parallel to this, the average number of days of maternity leave rose for female workers in the energy sector from 3.2 to 4.5 in 2018; whereas for women in the whole sample it decreased to 3.3. As far as men were concerned, the average days of paternity leave in a year were 1 – 2. Curiously, male workers followed the same pattern as their female counterparts; the length of paternity leave was increasing in the energy sector and shortening in the whole sample in the last analysed year.

All the above being said, it needs to be highlighted that very few employees found themselves in either of the situation described above; in each analysed year only 2 – 3% of workforce in the energy sector were on maternity/paternity leave and 1 – 2% reduced their working hours in order to take care for a relative; for the whole sample these figures were 4 – 3% and 2 – 3%. Whilst the impact of family responsibilities on working life is undeniable and was confirmed by numerous research papers (Kleven, Landais and Sogaard, 2018; Kleven at al., 2019), the conciliation of private life and labour might not be fully grasped by the Wage Structure Survey. However, analysing possible informal arrangements is out of scope of this paper.

4. Methodology

In this section, we explain the method we applied to measure the gender gaps. In subsection 4.1 we present the unadjusted gender gap, whilst in subsections 4.2 and 4.3 we detail the adjusted gender gap, using linear and quantile models, respectively.

4.1 Unadjusted gender gap (median)

To measure the unadjusted gender gap, we will first compare the median values of the following variables: tenure, number of working hours, total salary. Then, the latter will be contrasted with

total salary per hour of work, which we further break into base salary and supplements. The last category encompasses the following complements: extra monthly pay check, overtime pay, shift pay, other salary complements and non-cash bonuses.

Comparing mean salary involves the risk of results being inflated by extreme values. Therefore, we opted for comparing median values; except for the working hours, in which case the mean values were also discussed.

4.2 Adjusted gender gap: linear model

In this part we will further explore the changes in three dependent variables: total salary, base salary and salary supplements, measured per hour of work and in logarithms. The reason behind such modification is twofold: 1) to control for gender differences in average working hours, 2) to avoid inflating the results by extreme salary values.

As far as explanatory variables are concerned, we divide them into two categories. The first one describes personal characteristics including gender, age, education level, tenure, managing/leading role and occupation level. The latter is in turn related to firms, with variables such as company size, operating on the international and firm-level salary agreement (See Table 2).

Table 2. Regression model – explained and explanatory variables

	VARIABLE NAME	CATEGORIES[5]
DEPENDENT VARIABLES	***Total Salary phw***	N/A
	Base Salary phw	N/A
	Salary Supplements phw	N/A
EXPLANATORY VARIABLES PESONAL VARIABLES	***Gender***	Female
		Male
	Age	**39 or below**
		40 – 49
		50 or above
	Education level	**Primary**
		Secondary
		Tertiary
	Tenure	N/A
	Managing/leading role	Managing/leading role
		Non-managerial position
	Occupation level	**Low-skilled**
		Mid-skilled
		High-skilled
EXPLANATORY VARIABLES COMPANY VARIABLES	***Company size***	**Small firms (49 or below**)
		Medium-size firms (50 – 199)
		Large firms (200 or above)
	International market	International market
		National/regional market
	Firm-level salary agreement	Firm-level salary agreement
		Other salary agreement

[5] For more information about category specifications, see **Table 3**. The reference categories are emboldened.

Having selected the variables, we defined the model as follows:

Equation 1. Regression model specification

$$\log S_i^j = \alpha^j + f_i'\beta^j + p_i'\gamma^j + c_i'\delta^j + y_i'\theta^j + \varepsilon_i^j;$$

where S_i^j represents dependent salary variables (total salary, base salary and supplements per hour of work), α^j - the constant term; f_i' - vector of gender gap variables (female indicator, female interaction with the company size); p_i' - vector of personal characteristics (age, educational level, managing role indicator, occupational level); c_i' - company variables (size, international market indicator, firm-level salary agreement; y_i' - year dummies (2014, 2018) and ε_i^j – the error term. Owing to the fact that all analysed years displayed similar patterns (see Section 3), we decided to pool in all three waves for the purpose of regression. As a result, the sample size considerably increased, with the number of observations for the energy sector being 5,676 and the whole sample - 642,931.

We carried out these estimations for the energy sector and the whole sample in order to compare and contrast the results.

Due to the possible self-selection bias in salary supplements, we considered alternative estimation models, such as two-step Heckman's model. However, it was eventually rejected. Following the line of argument developed by Puhani (1997), we recognized there is no set of variables which would have a decided impact on receiving salary supplements and not salary per se. Therefore, we chose the OLS estimator, with a wide range of explanatory variables aiming for obtaining possibly the most robust results.

The nexus of this analysis is gender gap estimation. As mentioned before, *female* variable is interacted with company size. As small firms are the reference category, the gap indicator for them is the coefficient on female; whereas the differences in middle-size and large companies are the sums of female coefficient plus female # middle-size enterprises or female # large firms, as detailed below:

Equation 2. Gender gap estimations

$$gap\ in\ small\ firms = \beta_0 female\ (a)$$

$$gap\ in\ midsize\ firms = \beta_0 female + \beta_1 female\#midsize\ firms\ (b)$$

$$gap\ in\ large\ firm = \beta_0 female + \beta_2 female\#large\ firms\ (c)$$

The results of those estimations are discussed in section 5, followed by the presentation of the descriptive results.

4.3 Adjusted gender gap: quantile models

Using **Equation 1** and **Equation 2** we will estimate how the gender gap varies depending on the position on income distribution, for selected quantiles (10, 25, 50, 75 & 90). While the procedure specified in **Equation 2** will remain the same, we will modify **Equation 1** changing the estimation method to quantile regression. As in the previous case, we will juxtapose the results obtained for the energy sector with the whole sample.

5. Estimation results

In this section we present the outcomes of our estimations, divided into four subsections: 1) unadjusted gender gap; 2) adjusted gender gap (linear models); 3) adjusted gender gap (quantile model); 4) robustness check.

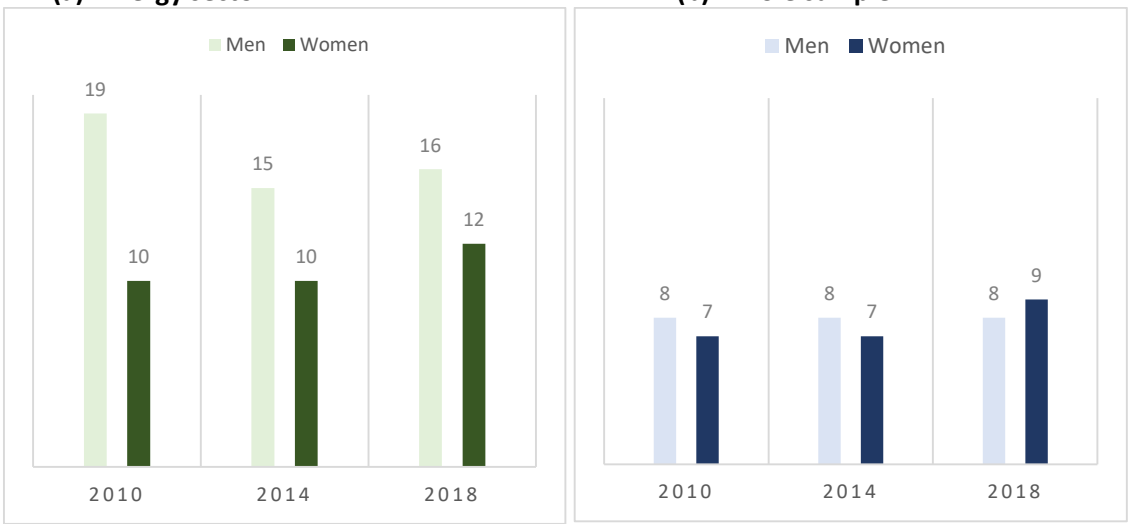
5.1 Unadjusted gender gap (median)

Women in the energy sector: narrowing tenure gap

Before analysing the gender gap in earnings we should highlight the differences in tenure and number of worked hours, which might influence differences in salaries. Seemingly, the median time worked for one company was higher for men, especially in 2010, when the difference was 9 years. However, this gap narrowed to 5 years in 2014 and 4 years in 2018 (see Figure 8a). Interestingly, as Figure 8b shows similar tendencies were not observed in the whole sample, in which the difference between genders was around one year, except from 2018 when, unlike in the previous waves, the median in women was 2 higher than in their male counterparts.

Figure 8: Gender tenure gap in 2010, 2014, 2018 (years)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Working hours: do women work less?

Another important data is the number of hours worked, which according to numerous studies differ for men and women, the latter on average working less (De la Rica, Gorjón & Vega-Bayo 2019: 22 – 26). However, the Wage Structure Survey data analysis revealed that the working hour gap might vary depending on the measure.

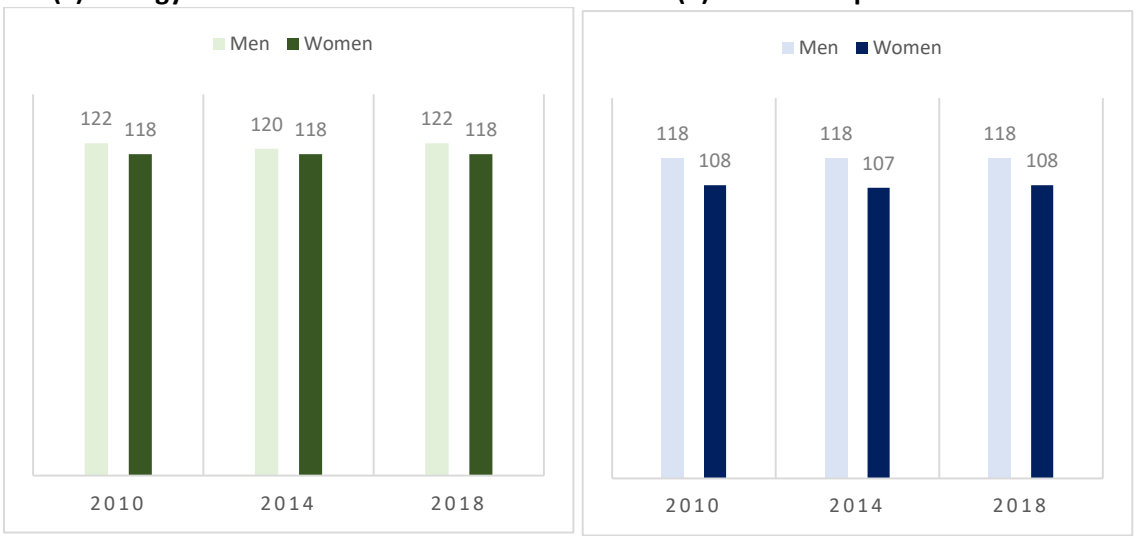
Comparing the mean working hours, the gender gap is apparent, both in the energy sector and in the whole sample; in the first being much lower than in the latter (2 – 4 hours compared to 11 – 10). In fact, women in the energy sector worked as many hours as men in the whole sample, see Figure 9a & 9b.

However, analysing the median reveals somewhat different patterns in the energy sector. The median working hours were initially the same for men and women (126). Four years later, the median was higher for female workers (123 compared to 119) and in 2018 for their male counterparts (124 and 119), respectively. Thus, there were fluctuations in the gender hour gap in the sector. At present, it is unclear whether the increasing proportion of women will render

their working hours similar to the female workers in the whole sample, which would imply a greater gender disproportion. Importantly, in all sectors the median working hours remained unchanged across the analysed period, with a 6-hour gap.

Figure 9: Mean gender hour gap, 2010, 2014, 2018 (working hours)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

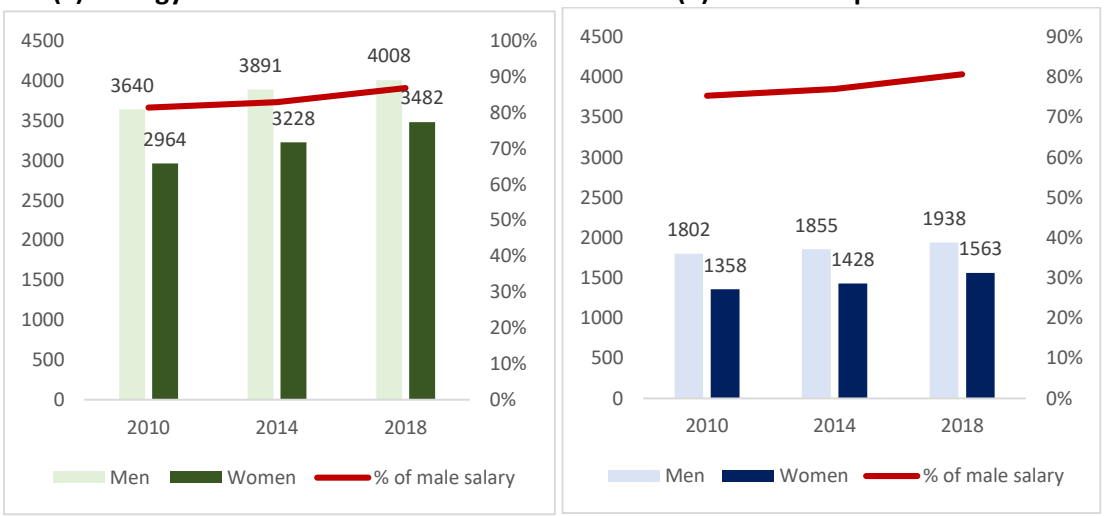
Nevertheless, most of the results presented above confirm the gender hour gap exists, which in turn might have an impact on salary inequalities between men and women, as detailed below.

Total gender salary gap is gradually narrowing

While it is undisputed that an unadjusted salary gap in the energy sector in 2010 – 2018 existed, it should also be emphasised it had been narrowing from 19% in 2010 to 17% in 2014 and 13% in 2018 (Figure 10a). This trend reflected the processes happening in the whole sample, in which salary differences between men and women were reduced from 25% in 2010 to 23% and 19% in the following waves, see Figure 10b.

Figure 10: Total salary gender gap in 2010, 2014, 2018 (€)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Working hour gap does not reduce the salary differences in the energy sector

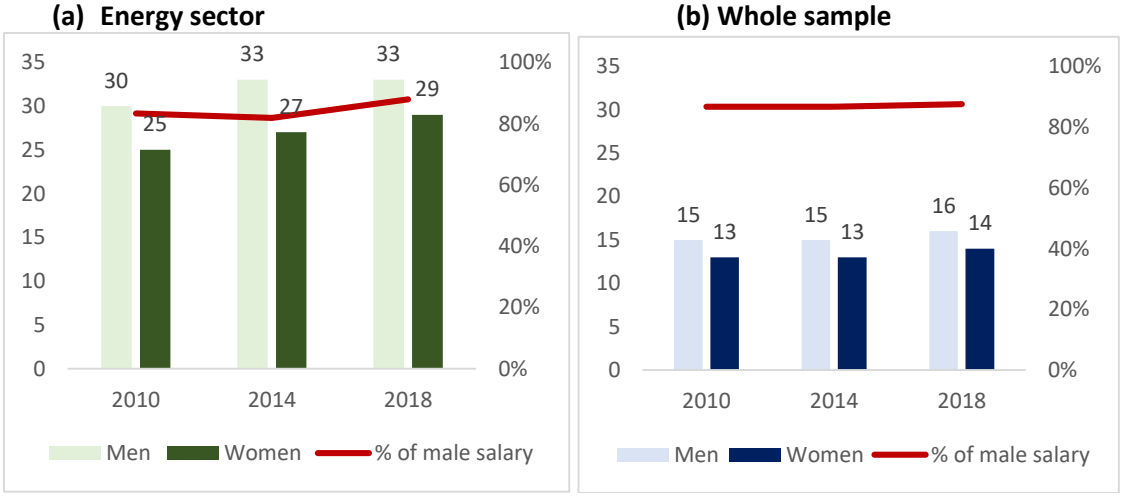
However, as pointed out before, any claims about equal compensation for equal work only on comparison of earnings between male and female workers will not be reliable unless the difference in working hours is taken into account. That being said, we should remain aware of the fact that women's time spent at the workplace might not be a consequence of their personal choices, but result from other factors, such as childcare responsibilities, tending to elderly/disabled family members etc.

Effectively, comparison of wages per hour of work demonstrates that gender gap is much narrower in the whole sample: it was 13% in 2010, same in 2014 and 12% in 2018. This means the distance between men and women was reduced by 12, 10 and 7 percent points, respectively (Figure 11b). However, unlike the gap in total earnings, no reduction in disparities in earnings per hour of work was recorded across the analysed period. Interestingly, opposing tendencies were observed in the energy sector, in which the gender pay gap per hour of work was 17% in 2010, 18% in 2014 and 12% in the last analysed year (Figure 11a). This fact has three important implications:

- Contrary to the whole sample, controlling for the differences in working hours reduces gender pay gap in the energy sector only by 1 – 2 pp, meaning that the earning differences cannot be attributed to women working less.
- While the pay gap per hour of work on average remained unchanged, some improvement was observed in the energy sector in the last analysed year, when the distance between median earnings of men and women was shortened by 6 pp.
- Concerning earnings per se, the gap seems to be narrower in the energy sector (see above). Nevertheless, comparison of salaries per hour leads to a contrary conclusion – except from 2018, the difference was smaller in the whole sample.

The results displayed above imply we should seek further explanation of possible reasons behind gender disparities. Following Amueno-Dorantes & De La Rica's (2006, p. 9) suggestion that the key to understanding wage differences is analysing the salary components, we will now break down the earnings to base salary and supplements per hour of labour.

Figure 11: Gender pay gap per hour of work in 2010, 2014, 2018 (€)



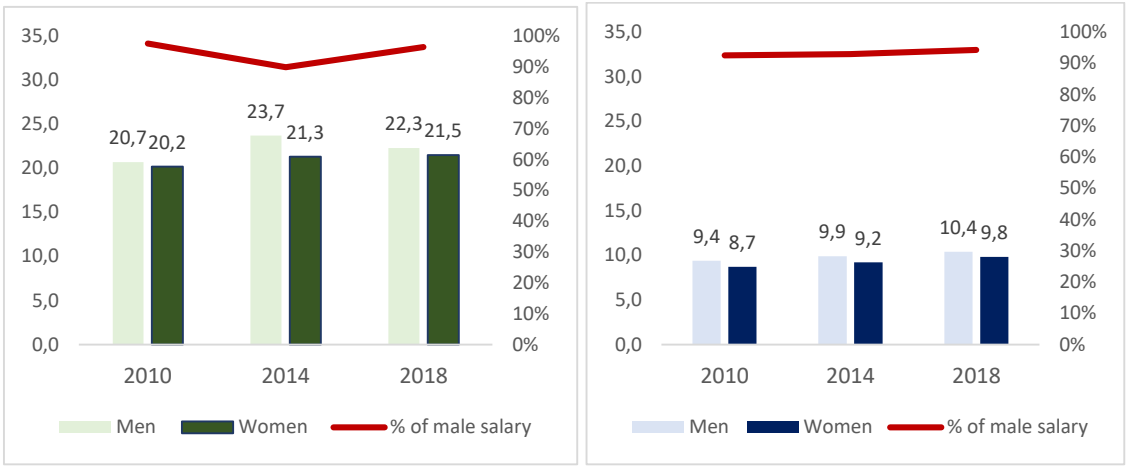
Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Little difference in base salary, soaring disparities in supplements

Analysing base salary per hour of labour in the whole sample, it is evident that the gender gap is smaller compared to total salary: in 2010 – 2014 it was 7% and in 2018 – 6% (Figure 12b). The gap in the energy sector displayed more volatility soaring from 2 to 10% in 2014 and plummeting to 4% in 2018 (Figure 12a). Given these changes it would be premature to jump to any conclusions regarding the pattern in the energy sector. Nevertheless, it is evident that the base salary gap per hour is narrower than the total salary gap per hour, both in the energy sector and in the whole sample.

Figure 12: Base salary gap per hour of work in 2010, 2014, 2018 (€)

(a) Energy sector **(b) Whole sample**

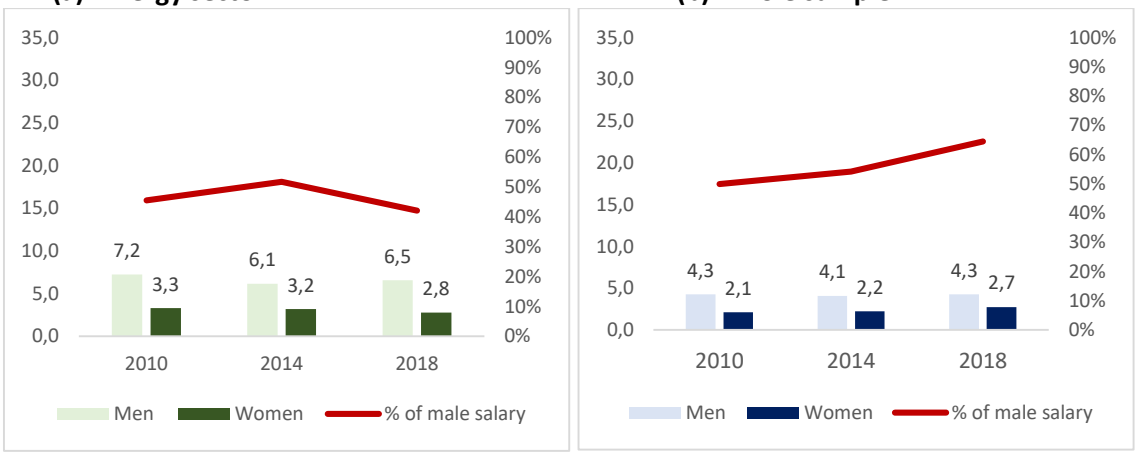


Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

However, the gender gap becomes strikingly high once salary supplements are analysed. This is particularly accurate in the energy sector with a 55% gap in 2010, reduced to 48% four years later, to increase again to 52% in 2018 (Figure 13a). Conversely, the salary supplement gap in the whole sample had systematically been decreasing starting at 50% (2010), reaching 46% in 2014 and 36% in 2018 (Figure 13b). Moreover, while the earnings of women in the energy sector were much higher than the average, the salary supplements per hour were nearly the same in both groups in the last analysed year.

Figure 13: Salary supplements gap per hour of work in 2010, 2014, 2018 (€)

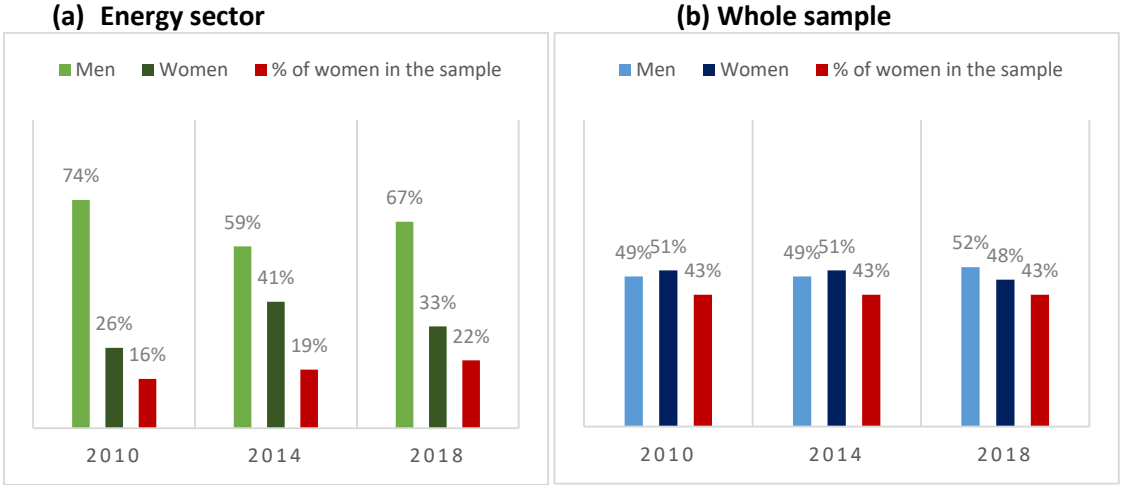
(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Therefore, in order to gain a better understanding of the gender pay gap it is essential to explore the differences in salary supplements, which account for a considerable portion of total salary: 26% in the energy sector and 28% in the whole sample[6]. An in-depth analysis will be presented in the next section; however, at this point we would like to point out that women are overrepresented in the workers who receive no salary supplements. In the energy sector their percentage in this category was 26% in 2010, 41% in 2014 and 33% in 2018, while the total share of female workers was 16, 19 and 22%, respectively (Figure 14a). As far as the whole sample is concerned the disproportion was less apparent: 51 – 48% in comparison to 43% of women (Figure 14b).

Figure 14: The share of women in workers receiving no salary supplements, 2010, 2014, 2018 (%)



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

Summarizing, it appears that the differences in salary supplements are the most important aspect of the gender pay gap. However, comparing descriptive statistics contribute little to understanding the differences between men and women, as both categories are heterogeneous aggregates of individuals who differ in age, education and occupational status. Answers to these questions will be provided by the regression models discussed in the next section.

5.2 Adjusted gender gap: linear model

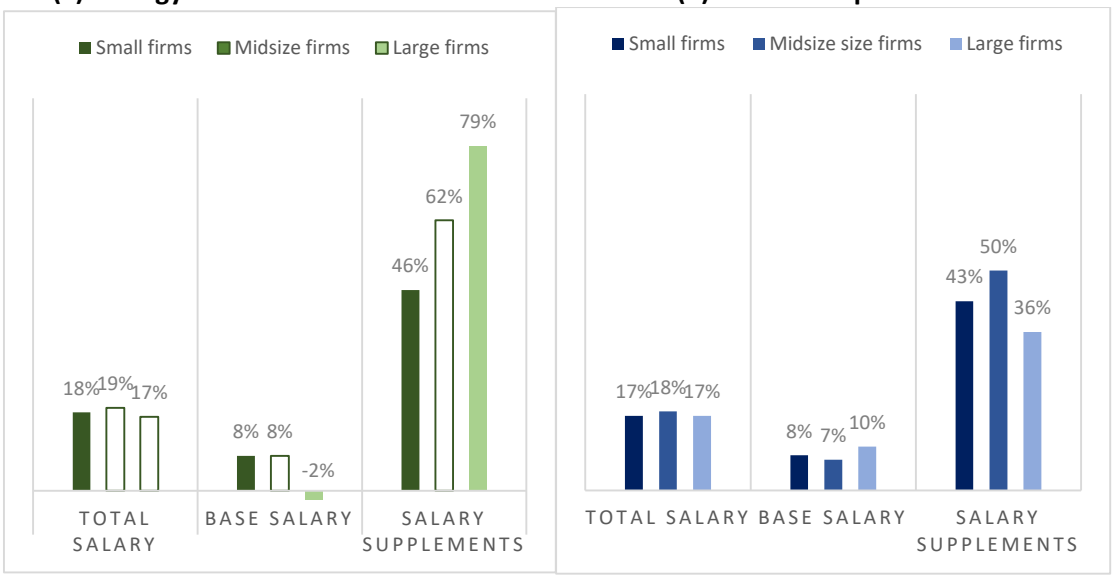
Before we discuss the results for gender gap, we would like to briefly comment on the most important drivers of base salary and supplements estimated by **Equation 1**. In the energy sector age, education, tenure, occupational level and company size had a positive impact on both salary components. Strikingly, managerial position only raised base salary, but had no significant effect in salary supplements. Conversely, operating on the international market would reduce supplements and had no significant effect in base salary. Finally, firm-level collective pay agreement affected the components ambiguously, increasing base salary and reducing supplements[7]. Similarly, in the whole sample nearly all variables were significant and positive for both base and salary supplements– except from mid-skilled occupations (insignificant) and operating on international market, which decreased salary supplements[8]. **Equation 1** also estimated the coefficients we used to measure the gender gap, as detailed below.

[6] Average of three waves (2010, 2014, 2018).
[7] For more details check **Table 4** and **Figure A1**.
[8] For more detail check **Table 5** and **Figure A2**.

Figure 15a depicts the gender gap in the energy sector as specified in **Equation 2**. After controlling for personal and company variables, being female working in a small company still had a negative impact on salaries – reducing base salary by 8% and supplements by 46%, resulting in an 18% lower total salary. No significant differences were recorded between small and midsize companies, regarding all earnings components. Nevertheless, working for large firms did matter. In comparison with small entities, women hired by large enterprises had higher base salaries to such extent that the gender gap was negative (-2%), meaning they did not only was it smaller than female workers working for small companies, but also earned more compared to their male counterparts. By contrast, women in large firms received less in salary supplements, in which case the gap soared to 79%. Regarding the whole sample, it was apparent the pattern for large enterprises was the opposite; the gap in base salary was wider compared to the small companies, and narrower in salary supplements (see Figure 15b) By contrast, the tendency observed for midsize firms mirrored large companies in the energy sector, with smaller gender gap in base salary and higher in supplements[9].

Figure 15: Linear models: adjusted gender gap per hour of work, 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018). The blank columns were not significant at 10%. To improve the readability of the graphs, the sign of the gap was changed from negative to positive and vice versa.

Comparing both graphs, it might be astonishing that the 16% difference between midsize and small firms was insignificant in small companies. However, it could be attributed to the smaller sample size and larger standard errors exacerbating the precision of the estimation.

These key findings of the linear models are displayed on Scheme 1. Whilst there are some common tendencies for the energy sector and the whole sample, such as the role of education or age; there were important differences in terms of effects of mid-skilled jobs, company-level agreement, managing/leading role and operating on the international market.

Most importantly, the estimations on the gender gap seem to confirm the hypothesis about salary supplements being the main driver behind gender pay gap. Furthermore, the results reveal complex patterns behind the role of company size on gender pay gap. Multivariate models provide no evidence for claims that the gap increases or decreases with company size, as this variable affects base salary and supplements in different manners. Furthermore, in the

[9] For more details, see **Table 4** and **Table 5**.

energy sector, the company size mattered only if large entities were juxtaposed with small ones, without significant differences recorded for midsize firms.

Scheme 1 Multilinear models – key findings; energy sector (up) and the whole sample (bottom)

Base salary	Salary supplements	Gender pay gap
• **Key factors:** education, age, managing/leading role, tenure, occupational level, collective pay agreement, firm size • **Insignificant:** intenational market	• **Managing/leading postition** is irrelevant • Negative impact of operating on **the international market and firm-level agreement**	• **Ambiguous impact of large company size** (reduction in base salary, increase in supplements) • **Mostly driven by supplements**

Base salary	Salary supplements	Gender pay gap
•**Key factors:** education, age, managing/leading role, tenure, occupational level (high-skilled), collective pay agreement, international market firm size •**Insignificant**: mid-skilled level	•**Managing/leading postition** is irrelevant •Negative impact of operating on **the international market and firm-level agreement** •**Mid-skilled level** is irrelevant	•**Ambiguous influence of large company size** (increases in base salary, reduces in supplements); •**Mostly driven by supplements**

5.3 Adjusted gender gap: quantile models

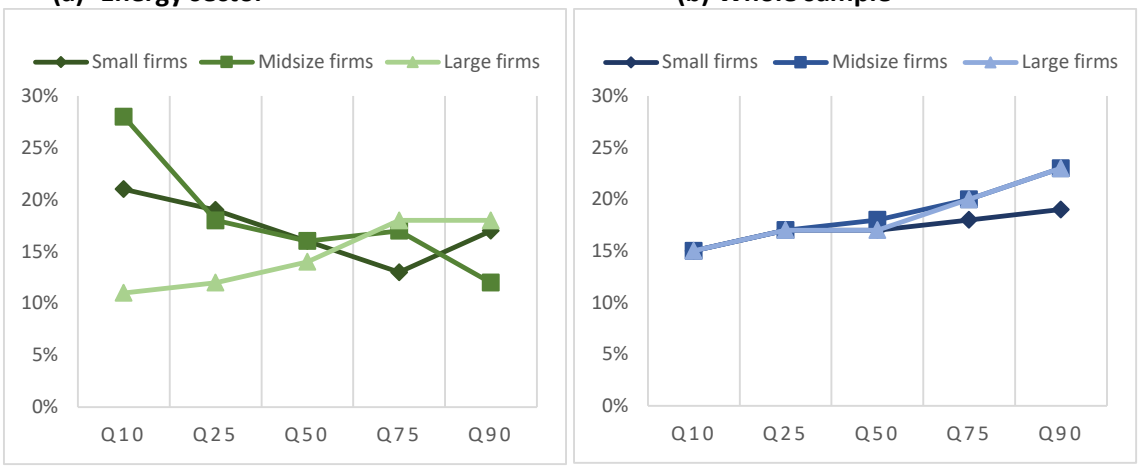
So far, our results have focused on average gender gap. However, little do they reveal about the possible existence of glass or ceiling patterns. Thus, this will be the main focus of this section, in which the quantile regression results will be presented, starting with total salary, followed by base salary and salary supplements. The model will be estimated using **Equation 1** and gender gap will measured through **Equation 2**.

Figure 16a depicts trends for total salary in the energy sector. According to the definition we applied (see Section 3), small and midsize firms would follow a floor pattern, whereas the large entities, albeit do not meet the criteria, bear some resemblance to the ceiling pattern, which, in turn, is observed in midsize and large firms in the whole sample. No discernible tendency was detected in small firms (see Figure 16b).

Analysing base salary, the floor pattern was observed in small and midsize firms. While there was a distinguishable trend regarding supplements, it is worth noting that the gender gap was negative along the whole distribution (Figure 17a). Conversely, ceiling pattern dominated in midsize and large firms in the sample. Although the tendencies discerned in small firms showed the gap was enlarging at the upper part of income distribution, it did not meet the ceiling criteria (Figure 17b).

Figure 16: Gender gap, total salary, by quantiles, 2010, 2014, 2018 (%)

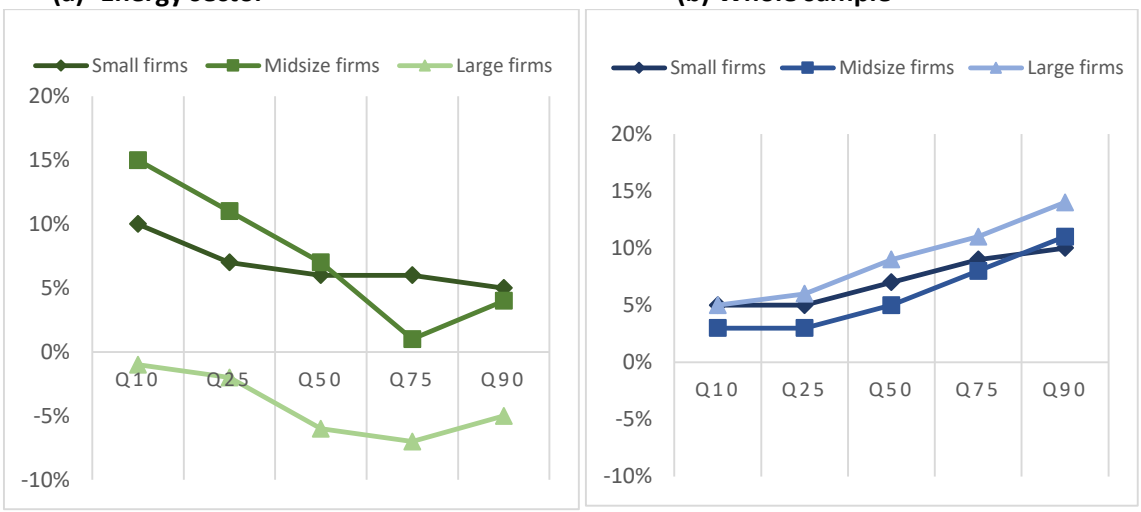
(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018). Wald test results: Energy sector F=3.53, All sectors F= 38.16

Figure 17: Gender gap, base salary, by quantiles, 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018). Wald test results: Energy sector F=13.95, All sectors F= 35.08.

Conversely, in salary supplements the bottom pattern seems to prevail. First and foremost, all types of companies in the energy sector meet its criteria. Moreover, all but small firms exhibit this tendency in the whole sample (see Figures 18a & 18b)[10].

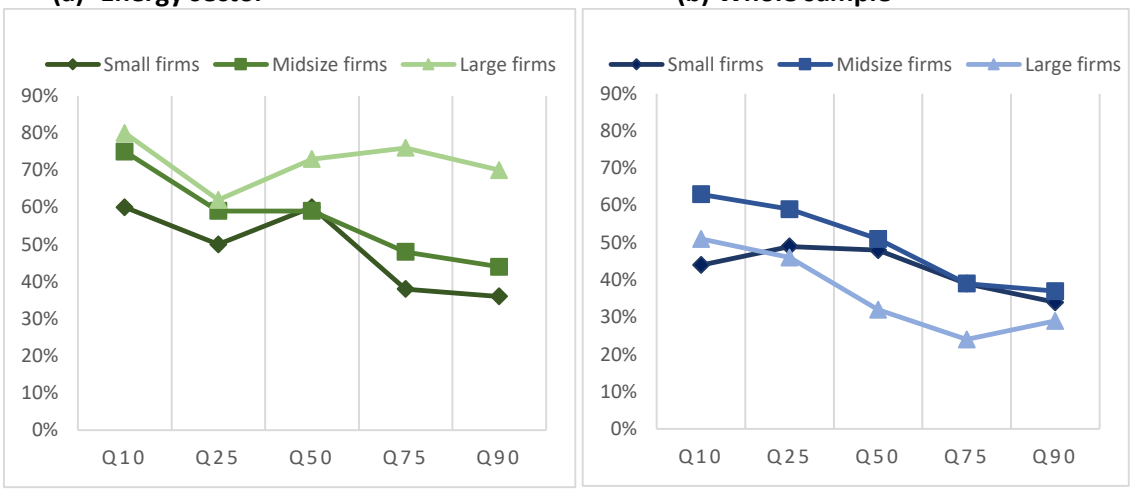
Returning to our initial hypothesis assuming that given the characteristics of women in the energy sector (higher income, and education level), ceiling pattern would dominate, the last estimations suggest quite the opposite – the floor pattern is more common. In fact, the gap did not significantly widen in the upper part of the distribution for any dependent variable.

Furthermore, our study shows differences in salary components. While the disparities in base salary tends to grow in the upper part of the distribution, the salary supplements gap is evidently wider at the bottom part. In other words, base salary would follow ceiling pattern and complements – floor.

[10] For more details, see **Table 6**, **Table 7**, **Table 8**, **Table 9**, **Table 10**, **Table 11**.

Figure 18: Gender gap, salary supplements, by quantiles, 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018). Wald test results: Energy sector F= 2.67, All sectors F= 152.84.

Nonetheless, before jumping to conclusions, we opted for more robustness checks, involving controlling for the firm fixed effect in the energy sector, adding the industry fixed effect in the whole sample, including industries as a set of dummy variables. The results of these estimations are discussed below.

5.4 Robustness check

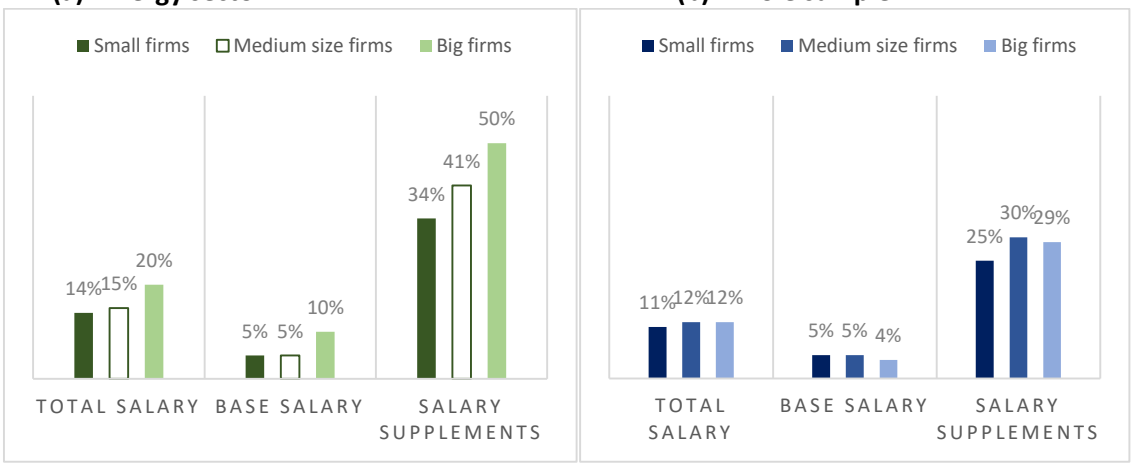
After controlling for firm fixed effect, the midsize companies in the energy sector do not significantly differ from small entities. However, the results obtained for large enterprises indicate that the gap is wider. As for the whole sample, the trend was reversed for big companies, in which the gap decreased in base salary, but, compared to the reference category, increased in supplements. Slightly changed the pattern in midsize firms, with the gap in base salary narrowing down to 5% and the one in salary supplements remaining wider than in small companies. However, it has to be emphasized, in all cases the salary supplements gap decreased after introducing the firm fixed effect (See Figure 19a & 19b). It is worth highlighting that those differences are larger in the energy sector; as a consequence, gender disparities in total salary are greater. Evidently, there are no differences regarding the base salary gap between the energy sector and the whole sample, except for large companies.

Including additional fixed effects also modified the impact of selected variables on salary differences. That was the case of mid-skilled occupations in the whole sample, which received less in salary supplements, than elementary categories. Understandably, compared to the previous estimations, company variables lose their significance in the energy sector once firm fixed effect is controlled for. By the same token, in the new model secondary education was irrelevant and occupation level did not matter for salary supplements[11].

[11]For more details, see **Table 12** and **Table 13**.

Figure 19: Gender gap per hour of work, firm fixed effect, 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018). The blank columns were not significant at 10%. To improve the readability of the graphs, the sign of the gap was changed from negative to positive and vice versa.

9

Furthermore, including firm and industry effect in the quantile models[12], radically changed the observed tendencies along income distribution, especially for large companies in the energy sector, which now exhibit a ceiling pattern. Although the gap was seemingly wider in the upper part of the distribution in the whole sample, no type of company met the ceiling criteria[13].

Even though the base salary gap clearly narrows down in small and midsize enterprises in the energy sector while approaching the upper end of the salary distribution, the difference is too little to claim it follows the floor pattern. Conversely, glass ceiling trends were observed in large firms in the energy sector, whereas examining the tendencies for the whole sample showed that the gap remained largely unchanged on all distribution levels[14].

The only case in which the floor pattern was observed were midsize companies in the energy sector, other kinds of companies showing the opposite trends. Interestingly, in the whole sample, the gap was narrowing in all cases, albeit the differences between selected quantiles were not large enough to be denoted as floor pattern[15].

6. Conclusions and policy recommendations

In this Master Thesis we examine the gender gap in the energy sector, seeking to determine whether it was different than in other fields, and trying to find the possible explanations. We chose this sector for two main reasons 1) its singularity, which might involve different gender gap patterns 2) it is the key economy branch of growing importance, given the climate crisis threat. Strong male domination suggested there might be hurdles for female workers to develop their careers in the energy sector. This would not only exacerbate gender inequality, but could also handicap the energy transition by limiting the available talent pool.

[12] For more details, see **Table 14**, **Table 15**, **Table 16**, **Table 17**, **Table 18**, **Table 19**, **Table 20**, **Table 21**, **Table 22**, **Table 23**.

[13] See **Figure A3 (a & b).**

[14] See **Figure A4 (a & b).**

[15] See **Figure A5 (a & b).**

Our analysis revealed that size of the gap is greater in this sector, compared to the whole sample, following thus trends observed for salary differences for highly educated women (Amuedo-Dorantes & de la Rica, 2006). This difference stems from a wider gap in supplements on one hand, and greater gender disparities in the large firms in the sector, in which the gap was greater. However, we found no statistically significant differences between midsize and small companies. Furthermore, the company effect was ambiguous in the whole sample, and differed for base salary and supplements. Moreover, large firms in the energy sector exhibit a clear ceiling pattern, which was unobserved neither the whole sample, nor in small and midsize companies in the sector. While initial evidence suggested otherwise, these claims are underpinned by the results of additional robustness check controlling for firm and industry fixed effects.

Owing to the complexity of factors underlying the ceiling and floor patterns, it would be premature to argue the gender gap in the energy sector follow either of them, even though it might be reasonable to claim glass ceiling exists in large companies. The absence of precise definitions of those tendencies hinders replications of results obtained by other authors, which underlines the need for improving operationalization of these terms.

It is widely acknowledged that in Spain, women are better educated than men, which in the light of our results serves to partially reduce a gender gap that would be even larger if this were not the case, because of the positive impact of education on base salary. University degree or a diploma may also be a pass to high-skilled occupation, which given the lower gains of mid-skilled jobs is vital for moving up the income ladder. However, the age gap between genders might be problematic, as salary supplements tend to increase for older workers. While this fact might reflect the rewarding of professional experience, it also can signal that widely defined human capital, understood as a network of personal connections, might play an important role. This should not be underestimated, as earlier quoted reports suggested the renewable sectors might be more attractive to women due to the absence of such informal networks which might potentially exclude female workers. Besides, such these personal connections could discourage young female workers from building their career in the energy sector, which would have a detrimental effect on its future, given the high proportion of workers aged 50 or above.

All the above being said, our estimations revealed the importance of companies, demonstrating that firm variables can be essential gender gap drivers and overlooking them might result in omission bias. Shifting the focus from employee to employer could be an important suggestion for further research.

Having defined companies as important agents, below we present policy recommendations to be considered by private and public entities, represented by companies and lawmakers:

1) Companies: transparent salary supplements schemes targeting unfair rewarding of sectors stakeholders, understood as employees with robust networks of personal connections. These policies would be essential as, unlike the base salary fixed by collective pay agreements and legal regulations, in case of supplements both sides involved have more leeway. This room for negotiation might certainly be beneficial for high-profile experts; however, it can be a pathway for discrimination of workers belonging to disadvantage groups, such as women. Furthermore, the importance of supplements should not be underestimated; our analysis show they account for 26% of total salary in the energy sector and 28% in the whole sample.
2) Companies and lawmakers: earlier studies suggested the glass ceiling was related to child penalty. Hence, affordable childcare schemes should be implemented; whereas

policies targeting floor patterns we observed in midsize companies in the energy sector should involve higher wage floors and gender mainstreaming schmes (see Ciminelli, Schwellnuss & Stadler, 2021, p. 28).

By no means should the list above be considered exhaustive. Further research is needed, to validate the conclusions we drew. Tailored questionnaires, exploring social networks in the sector could shed more light on the nature of complexities behind salary supplements, which should be the main concern for further research on gender differences on the labour market. Our Master Thesis unequivocally shows they are the main drivers behind the gender salary gap and might be the key to explain the – so far – unexplained salary disparities.

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Appendix

Regression models: categorical variables

Categorical variable list and definitions

Age:

1) 39 or below – corresponds to the following categories in the questionnaire; less than 20, 20 – 29, 30 – 39. Because of the specific age structure in the energy sector with underrepresentation of young people, it was decided to place them in the same category
2) 40 – 49
3) 50 or above – includes 50 – 59 and 59 or above

Education level

1) Primary – includes "primary" and "less than primary"
2) Secondary – includes "lower secondary" and "upper secondary"
3) Tertiary – includes "vocational training", "undergraduate studies", "master or PhD"

Managing/leading role

1) Managing/leading role – all individuals who are in charge of other employees
2) Non-managerial position – all individuals who are not in charge of other employees

Occupational level

1) Low-skilled – categories M – P in cno11 classification

2) Mid-skilled – categories E – L in cno11 classification
3) High-skilled – categories A – D in cno11 classification

Firm size

1) Small firms – hiring up to 49 employees
2) Midsize firms – 50 – 199 employees
3) Large firms – 200 employees or more

International market

1) International market – operating on EU/world market
2) Non-international market – operating on regional/national market

Company-level agreement

1) Company-level agreement – collective pay agreement offered by a company
2) No company-level agreement – all other types of collective pay agreement (sectoral state-level, sectoral regional-level, other)

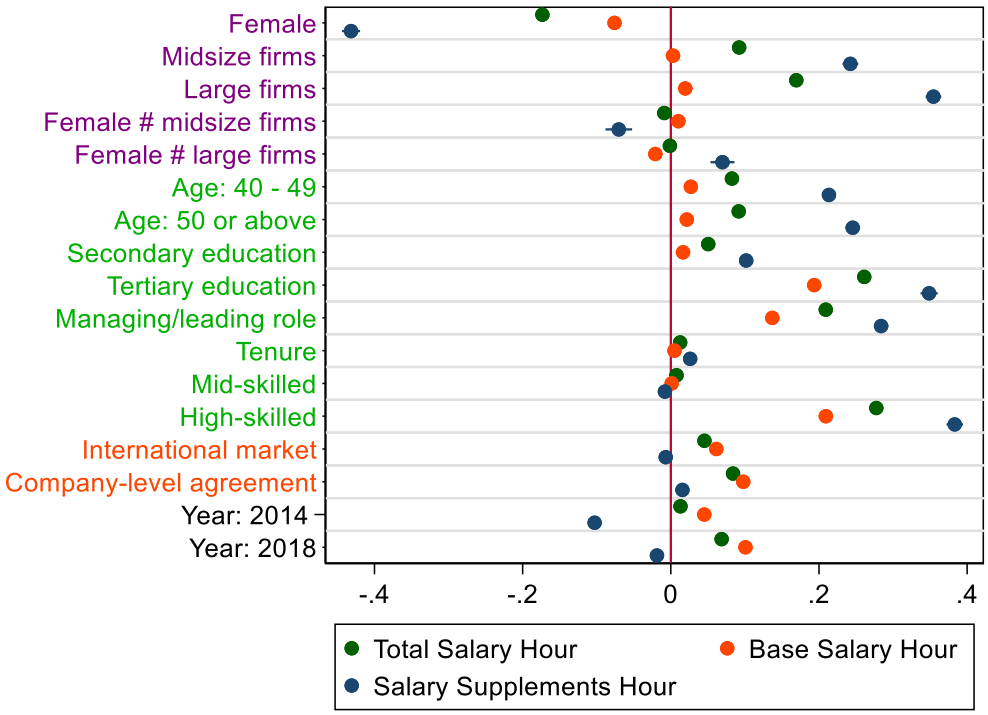
Table 3. Model variables – descriptive statistics

	VARIABLE NAME	CATEGORIES	ENERGY SECTOR		ALL SECTORS	
			Mean	Std. Deviation	Mean	Std. Deviation
DEPENDENT	***Total Salary phw***	N/A	33.49	20.86	18.02	14.91
VARIABLES	***Base Salary phw***	N/A	23.82	16.23	11.69	10.95
	Salary Supplements phw	N/A	9.66	12.33	6.32	10.42
EXPLANATORY	***Gender***	Female	0.19	0.39	0.43	0.50
VARIABLES		**Male**	0.81	0.39	0.57	0.50
PESONAL	***Age***	**40 or below**	0.30	0.46	0.43	0.49
VARIABLES		40 – 49	0.30	0.46	0.31	0.46
		50 or above	0.40	0.49	0.27	0.44
	Education level	**Primary**	0.05	0.21	0.16	0.36
		Secondary	0.21	0.40	0.46	0.50
		Tertiary	0.74	0.44	0.39	0.49
	Tenure	N/A	17.11	12.02	9.81	9.86
	Managing/leading role	Managing/leading role	0.25	0.43	0.17	0.37
		Non-managerial position	0.75	0.43	0.83	0.37
	Occupational level	**Low-skilled**	0.05	0.22	0.21	0.41
		Middle-skilled	0.26	0.43		
		High-skilled				
EXPLANATORY	***Company size***	**Small firms**	0.66	0.48	0.66	0.46
VARIABLES		Medium-size firms	0.20	0.40	0.18	0.38
COMPANY		Large firms				
VARIABLES		International market	0.14	0.35	0.16	0.37
	International market	**National/regional market**	0.20	0.14	0.40	0.35
	Firm-level salary	Firm-level salary agreement	0.80	0.14	0.60	0.35
	agreement	**Other salary agreement**	0.60	0.49	0.15	0.36
			0.40	0.49	0.85	0.36

Source: Own calculations based on INE Wage Structure Survey (2010, 2014, 2018)

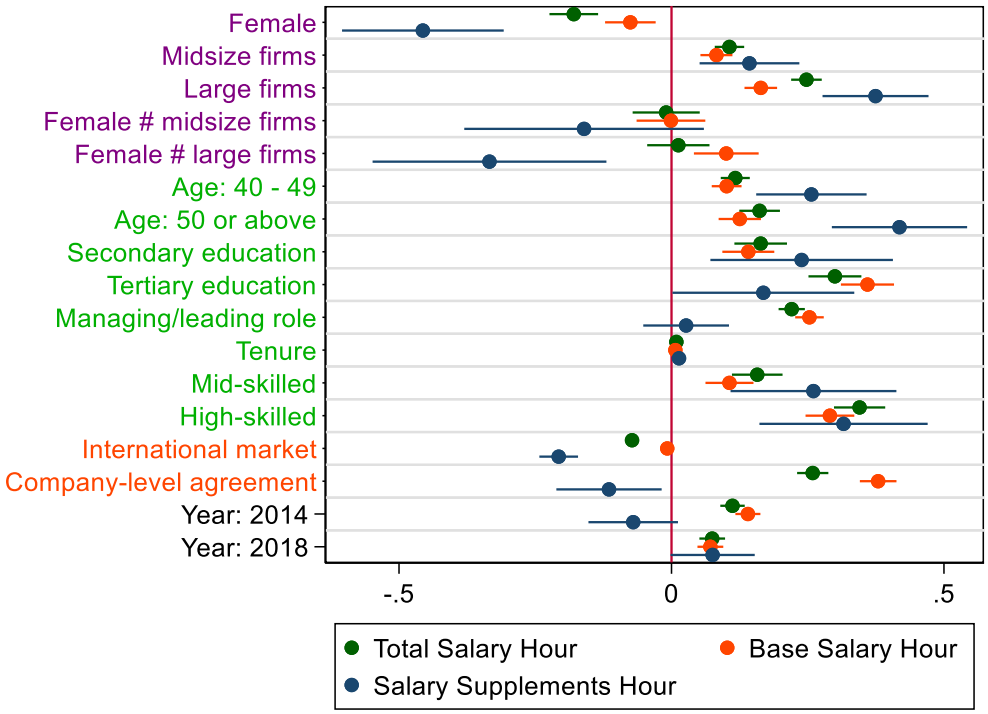
Regression models: graphs

Figure A1: Multivariate linear regression model, energy sector 2010, 2014, 2018.



Source: own calculations based on INE Wages Structure Survey (2010, 2014,2018)

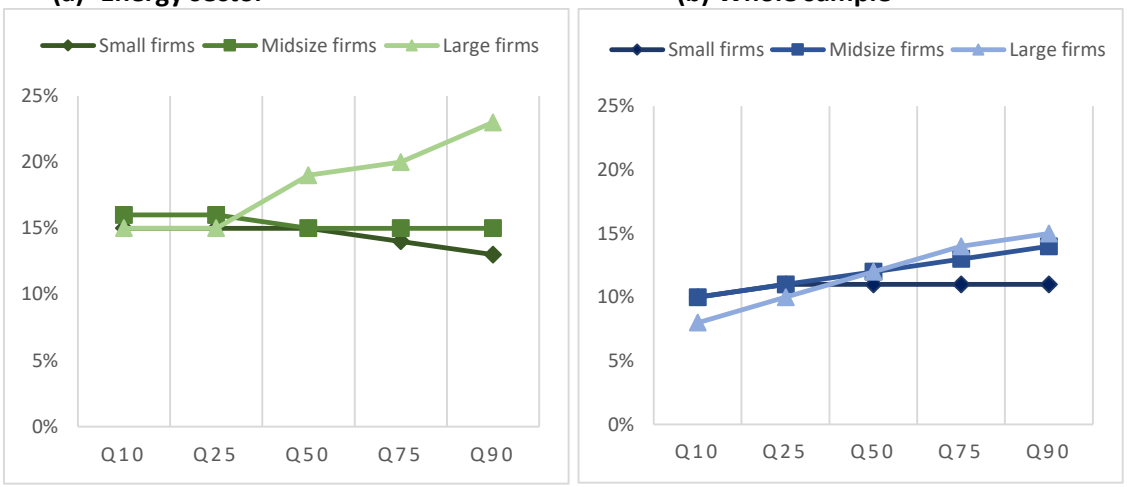
Figure A2: Multivariate linear regression model, all sectors 2010, 2014, 2018.



Source: own calculations based on INE Wages Structure Survey (2010, 2014,2018)

Figure A3: Gender gap in total salary, by quantiles, fixed firm effect, 2010, 2014, 2018 (%)

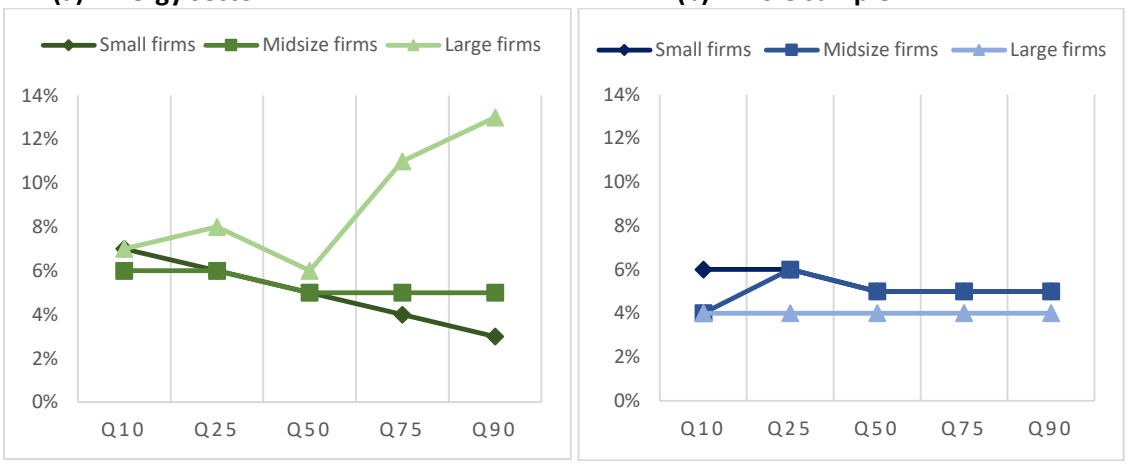
(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018).

Figure A4: Gender gap in base salary, by quantiles, fixed firm effect, 2010, 2014, 2018 (%)

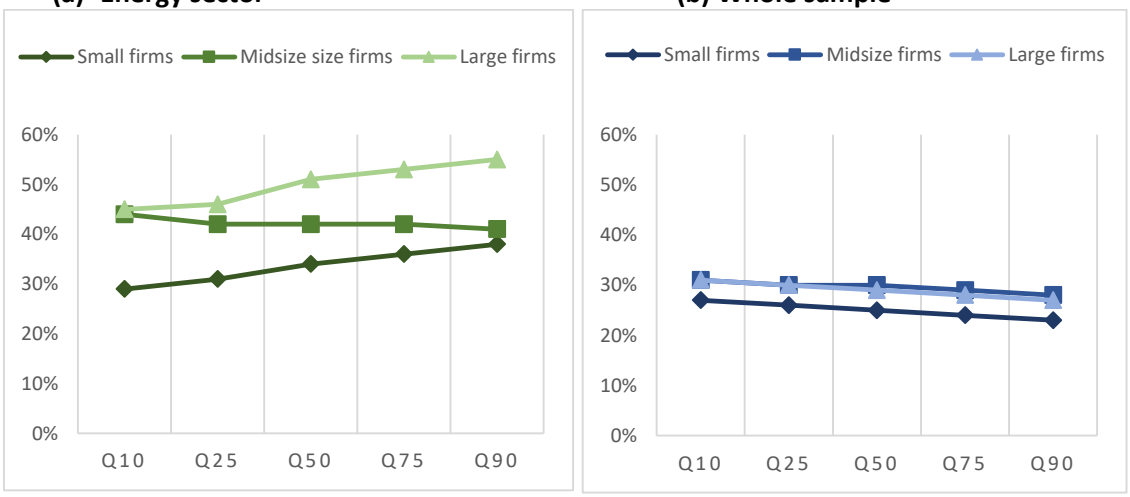
(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018).

Figure A5: Gender gap in salary supplements, by quantiles, fixed firm effect, 2010, 2014, 2018 (%)

(a) Energy sector **(b) Whole sample**



Source: own calculations based on INE Wage Structure Survey (2010, 2014, 2018).

Regression models: tables of results

Table 4. Linear regression model estimated for the energy sector

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.179***	-0.0754***	-0.456***
	(0.0228)	(0.0237)	(0.0757)
Midsize firms	0.106***	0.0825***	0.143***
	(0.0138)	(0.0150)	(0.0467)
Large firms	0.248***	0.164***	0.374***
	(0.0143)	(0.0153)	(0.0496)
Female#Midsize firms	-0.00975	-0.000949	-0.160
	(0.0314)	(0.0322)	(0.112)
Female#Large firms	0.0126	0.101***	-0.334***
	(0.0292)	(0.0303)	(0.109)
Age: 40 - 49	0.117***	0.101***	0.257***
	(0.0136)	(0.0140)	(0.0517)
Age: 50 or above	0.162***	0.125***	0.418***
	(0.0190)	(0.0198)	(0.0633)
Secondary education	0.164***	0.141***	0.239***
	(0.0246)	(0.0243)	(0.0854)
Tertiary education	0.300***	0.360***	0.169**
	(0.0248)	(0.0248)	(0.0851)
Managing/leading role	0.221***	0.253***	0.0269
	(0.0123)	(0.0134)	(0.0401)
Tenure	0.00898***	0.00712***	0.0139***
	(0.000707)	(0.000734)	(0.00222)
Mid-skilled	0.157***	0.106***	0.261***
	(0.0237)	(0.0225)	(0.0776)
High-skilled	0.345***	0.291***	0.316***
	(0.0240)	(0.0228)	(0.0787)
International market	-0.0724***	-0.00775	-0.207***
	(0.00499)	(0.00529)	(0.0181)
Company-level agreement	0.259***	0.379***	-0.115**
	(0.0146)	(0.0171)	(0.0493)
Year: 2014	0.112***	0.140***	-0.0702*
	(0.0114)	(0.0117)	(0.0419)
Year: 2018	0.0748***	0.0714***	0.0755*
	(0.0120)	(0.0121)	(0.0394)
Constant	2.292***	1.809***	1.126***
	(0.0263)	(0.0257)	(0.0948)
Firm fixed effect	No	No	No
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294
R-squared	0.544	0.554	0.145

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Linear regression models estimated for all sectors

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.173***	-0.0760***	-0.432***
	(0.00168)	(0.00161)	(0.00622)
Midsize firms	0.0923***	0.00302*	0.242***
	(0.00164)	(0.00166)	(0.00546)
Large firms	0.169***	0.0195***	0.355***
	(0.00164)	(0.00170)	(0.00540)
Female#Midsize firms	-0.00880***	0.0103***	-0.0702***
	(0.00246)	(0.00248)	(0.00917)
Female#Large firms	-0.00123	-0.0209***	0.0698***
	(0.00227)	(0.00234)	(0.00826)
Age: 40 - 49	0.0825***	0.0271***	0.213***
	(0.00117)	(0.00120)	(0.00432)
Age: 50 or above	0.0917***	0.0216***	0.246***
	(0.00146)	(0.00149)	(0.00509)
Secondary education	0.0505***	0.0165***	0.102***
	(0.00128)	(0.00128)	(0.00478)
Tertiary education	0.261***	0.194***	0.349***
	(0.00166)	(0.00172)	(0.00592)
Managing/leading role	0.209***	0.137***	0.284***
	(0.00155)	(0.00168)	(0.00500)
Tenure	0.0126***	0.00503***	0.0261***
	(6.35e-05)	(6.91e-05)	(0.000203)
Mid-skilled	0.00775***	0.00116	-0.00792*
	(0.00117)	(0.00119)	(0.00446)
High-skilled	0.277***	0.209***	0.383***
	(0.00162)	(0.00168)	(0.00568)
International market	0.0454***	0.0615***	-0.00685***
	(0.000640)	(0.000697)	(0.00235)
Company-level agreement	0.0840***	0.0978***	0.0157***
	(0.00126)	(0.00142)	(0.00439)
Year: 2014	0.0130***	0.0452***	-0.103***
	(0.00117)	(0.00122)	(0.00432)
Year: 2018	0.0686***	0.101***	-0.0187***
	(0.00118)	(0.00124)	(0.00409)
Constant	2.170***	1.956***	0.534***
	(0.00185)	(0.00189)	(0.00682)
Firm fixed effect	No	No	No
Industry fixed effect	No	No	No
Observations	642,878	642,791	540,475
R-squared	0.453	0.246	0.175

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. Quantile regression: total salary (energy sector)

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Female	-0.209***	-0.192***	-0.158***	-0.134***	-0.168***
	(0.0360)	(0.0334)	(0.0316)	(0.0302)	(0.0477)
Midsize firms	0.187***	0.137***	0.0834***	0.0690***	0.0568*
	(0.0210)	(0.0150)	(0.0152)	(0.0175)	(0.0290)
Large firms	0.228***	0.213***	0.206***	0.225***	0.252***
	(0.0181)	(0.0170)	(0.0118)	(0.0216)	(0.0309)
Female#Midsize firms	-0.0740	0.00975	-0.00432	-0.0368	0.0486
	(0.0684)	(0.0489)	(0.0410)	(0.0379)	(0.0665)
Female#Large firms	0.101***	0.0702**	0.0191	-0.0441	-0.0155
	(0.0392)	(0.0347)	(0.0304)	(0.0373)	(0.0628)
Managing/leading role	0.159***	0.187***	0.196***	0.231***	0.293***
	(0.0154)	(0.0117)	(0.0152)	(0.0173)	(0.0239)
Age: 40 - 49	0.0706***	0.0966***	0.119***	0.123***	0.113***
	(0.0175)	(0.0134)	(0.0135)	(0.0197)	(0.0300)
Age: 50 or above	0.0579**	0.0814***	0.162***	0.185***	0.238***
	(0.0289)	(0.0182)	(0.0140)	(0.0243)	(0.0270)
Secondary education	0.134***	0.133***	0.128***	0.194***	0.272***
	(0.0387)	(0.0304)	(0.0186)	(0.0282)	(0.0528)
Tertiary education	0.298***	0.266***	0.243***	0.309***	0.392***
	(0.0420)	(0.0245)	(0.0255)	(0.0303)	(0.0572)
International market	-0.0265***	-0.0503***	-0.0698***	-0.0899***	-0.125***
	(0.00583)	(0.00395)	(0.00616)	(0.00871)	(0.0117)
Tenure	0.0129***	0.0114***	0.00845***	0.00729***	0.00437***
	(0.000823)	(0.000818)	(0.000733)	(0.00101)	(0.00116)
Mid-skilled	0.108***	0.178***	0.219***	0.211***	0.0819
	(0.0318)	(0.0332)	(0.0249)	(0.0487)	(0.0687)
High-skilled	0.240***	0.329***	0.401***	0.411***	0.281***
	(0.0331)	(0.0306)	(0.0255)	(0.0489)	(0.0646)
Company-level agreement	0.274***	0.300***	0.296***	0.240***	0.227***
	(0.0253)	(0.0207)	(0.0190)	(0.0211)	(0.0274)
2014.year	0.0991***	0.104***	0.127***	0.129***	0.130***
	(0.0150)	(0.0109)	(0.00895)	(0.0177)	(0.0190)
2018.year	0.0400***	0.0640***	0.0754***	0.0924***	0.141***
	(0.0135)	(0.0108)	(0.0104)	(0.0181)	(0.0293)
Constant	1.906***	2.045***	2.257***	2.490***	2.827***
	(0.0386)	(0.0428)	(0.0198)	(0.0550)	(0.0556)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	5,783	5,783	5,783	5,783	5,783

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7. Quantile regression: base salary (energy sector)

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Female	-0.0952**	-0.0739*	-0.0650***	-0.0640**	-0.0516
	(0.0413)	(0.0412)	(0.0217)	(0.0259)	(0.0358)
Midsize firms	0.161***	0.102***	0.0648***	0.0302	0.0522**
	(0.0288)	(0.0224)	(0.0187)	(0.0208)	(0.0257)
Large firms	0.204***	0.124***	0.0925***	0.118***	0.137***
	(0.0343)	(0.0238)	(0.0194)	(0.0193)	(0.0230)
Female#Midsize firms	-0.0588	-0.0386	-0.00377	0.0509	0.0142
	(0.0583)	(0.0534)	(0.0324)	(0.0398)	(0.0519)
Female#Large firms	0.108**	0.0947**	0.123***	0.132***	0.100**
	(0.0497)	(0.0415)	(0.0283)	(0.0377)	(0.0455)
Managing/leading role	0.154***	0.193***	0.239***	0.299***	0.392***
	(0.0176)	(0.00891)	(0.00932)	(0.0169)	(0.0219)
Age: 40 - 49	0.0591***	0.0795***	0.0770***	0.133***	0.130***
	(0.0194)	(0.0160)	(0.0161)	(0.0218)	(0.0360)
Age: 50 or above	0.0535*	0.0919***	0.0803***	0.167***	0.186***
	(0.0285)	(0.0179)	(0.0222)	(0.0264)	(0.0371)
Secondary education	0.130**	0.146***	0.106***	0.133***	0.198***
	(0.0531)	(0.0362)	(0.0270)	(0.0296)	(0.0417)
Tertiary education	0.329***	0.371***	0.329***	0.337***	0.361***

	(0.0496)	(0.0344)	(0.0214)	(0.0245)	(0.0423)
International market	0.0124	-0.00216	-0.0147***	-0.0103	-0.0254***
	(0.00852)	(0.00410)	(0.00465)	(0.00666)	(0.00938)
Tenure	0.00866***	0.00848***	0.00833***	0.00571***	0.00544***
	(0.00106)	(0.000573)	(0.000682)	(0.000911)	(0.00125)
Mid-skilled	0.0765**	0.0953***	0.106***	0.116***	0.144***
	(0.0374)	(0.0247)	(0.0127)	(0.0352)	(0.0540)
High-skilled	0.228***	0.229***	0.269***	0.318***	0.401***
	(0.0336)	(0.0245)	(0.0137)	(0.0325)	(0.0597)
Company-level agreement	0.532***	0.489***	0.425***	0.310***	0.192***
	(0.0311)	(0.0329)	(0.0236)	(0.0177)	(0.0287)
2014.year	0.0927***	0.105***	0.146***	0.169***	0.168***
	(0.0216)	(0.0112)	(0.0124)	(0.0149)	(0.0204)
2018.year	0.0377**	0.0360***	0.0726***	0.0800***	0.0887***
	(0.0161)	(0.0135)	(0.0111)	(0.0172)	(0.0261)
Constant	1.360***	1.590***	1.849***	2.061***	2.267***
	(0.0526)	(0.0374)	(0.0297)	(0.0382)	(0.0500)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	5,783	5,783	5,783	5,783	5,783

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8. Quantile regression: salary supplements (energy sector)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Female	-0.603***	-0.499***	-0.603***	-0.382***	-0.359***
	(0.161)	(0.0910)	(0.0839)	(0.0713)	(0.0620)
Midsize firms	0.186***	0.155**	0.114***	0.136***	0.132***
	(0.0616)	(0.0607)	(0.0406)	(0.0308)	(0.0510)
Large firms	0.187***	0.251***	0.378***	0.492***	0.539***
	(0.0589)	(0.0816)	(0.0558)	(0.0518)	(0.0371)
Female#Midsize firms	-0.149	-0.0932	0.0133	-0.105	-0.0862
	(0.215)	(0.107)	(0.116)	(0.111)	(0.106)
Female#Large firms	-0.196	-0.120	-0.131	-0.377***	-0.341***
	(0.308)	(0.0922)	(0.0950)	(0.105)	(0.0835)
Managing/leading role	0.00341	-0.129*	-0.00873	0.0957**	0.240***
	(0.0611)	(0.0691)	(0.0420)	(0.0469)	(0.0476)
Age: 40 - 49	0.379***	0.205***	0.169***	0.198***	0.104**
	(0.120)	(0.0646)	(0.0519)	(0.0499)	(0.0496)
Age: 50 or above	0.651***	0.333***	0.279***	0.321***	0.233***
	(0.145)	(0.0882)	(0.0646)	(0.0615)	(0.0604)
Secondary education	0.364**	0.146	0.165	0.151**	0.242***
	(0.159)	(0.131)	(0.104)	(0.0651)	(0.0858)
Tertiary education	0.289	0.0403	0.0691	0.136**	0.233***
	(0.206)	(0.146)	(0.0927)	(0.0585)	(0.0648)
International market	-0.00117	-0.210***	-0.313***	-0.275***	-0.278***
	(0.0292)	(0.0229)	(0.0259)	(0.0258)	(0.0269)
Tenure	0.0319***	0.0211***	0.0103***	0.00392*	0.00489**
	(0.00411)	(0.00333)	(0.00266)	(0.00205)	(0.00206)
Mid-skilled	0.194	0.406***	0.317***	0.229***	0.173**
	(0.175)	(0.0949)	(0.0787)	(0.0853)	(0.0763)
High-skilled	0.128	0.276***	0.415***	0.417***	0.342***
	(0.208)	(0.103)	(0.0724)	(0.0722)	(0.0631)
Company-level agreement	-0.148	-0.124	-0.0685	-0.0143	-0.0393
	(0.103)	(0.0825)	(0.0455)	(0.0387)	(0.0492)
2014.year	-0.126	0.0239	-0.0579**	0.0327	0.143***
	(0.0867)	(0.0359)	(0.0278)	(0.0318)	(0.0349)
2018.year	-0.197***	-0.0728	0.134***	0.197***	0.279***
	(0.0711)	(0.0495)	(0.0451)	(0.0330)	(0.0376)
Constant	-0.834***	0.640***	1.560***	1.999***	2.438***
	(0.237)	(0.0850)	(0.102)	(0.0907)	(0.0999)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	5,294	5,294	5,294	5,294	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9. Quantile regression: total salary (all sectors)

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Female	-0.146***	-0.166***	-0.174***	-0.180***	-0.190***
	(0.00207)	(0.00183)	(0.00141)	(0.00197)	(0.00322)
Midsize firms	0.0819***	0.0796***	0.0850***	0.105***	0.117***
	(0.00212)	(0.00143)	(0.00130)	(0.00210)	(0.00288)
Large firms	0.133***	0.136***	0.158***	0.196***	0.223***
	(0.00254)	(0.00189)	(0.00133)	(0.00178)	(0.00300)
Female#Midsize firms	-0.000195	-0.000263	-0.00740***	-0.0238***	-0.0435***
	(0.00228)	(0.00179)	(0.00261)	(0.00267)	(0.00409)
Female#Large firms	0.00384*	0.00909***	0.00452**	-0.0232***	-0.0409***
	(0.00220)	(0.00197)	(0.00196)	(0.00299)	(0.00365)
Managing/leading role	0.154***	0.168***	0.191***	0.228***	0.271***
	(0.00211)	(0.00137)	(0.00111)	(0.00227)	(0.00326)
Age: 40 - 49	0.0629***	0.0667***	0.0688***	0.0792***	0.0885***
	(0.00162)	(0.00153)	(0.00140)	(0.00178)	(0.00248)
Age: 50 or above	0.0488***	0.0561***	0.0676***	0.0917***	0.119***
	(0.00256)	(0.00210)	(0.00163)	(0.00184)	(0.00296)
Secondary education	0.0373***	0.0388***	0.0445***	0.0567***	0.0717***
	(0.00168)	(0.00138)	(0.00125)	(0.00162)	(0.00273)
Tertiary education	0.200***	0.222***	0.250***	0.278***	0.305***
	(0.00195)	(0.00214)	(0.00169)	(0.00194)	(0.00274)
International market	0.0535***	0.0486***	0.0435***	0.0421***	0.0446***
	(0.000845)	(0.000746)	(0.000729)	(0.000850)	(0.00131)
Tenure	0.0131***	0.0133***	0.0132***	0.0129***	0.0119***
	(8.71e-05)	(7.05e-05)	(6.51e-05)	(8.02e-05)	(0.000166)
Company-level agreement	0.0468***	0.0678***	0.0905***	0.102***	0.110***
	(0.00123)	(0.00145)	(0.00145)	(0.00211)	(0.00317)
2014.year	0.0183***	0.0223***	0.0208***	0.0147***	0.0105***
	(0.00181)	(0.00152)	(0.00125)	(0.00148)	(0.00213)
2018.year	0.0661***	0.0701***	0.0741***	0.0733***	0.0761***
	(0.00128)	(0.00120)	(0.00114)	(0.00143)	(0.00242)
Mid-skilled	0.0201***	0.0139***	0.00654***	0.00784***	0.00583**
	(0.00154)	(0.00158)	(0.00133)	(0.00166)	(0.00261)
High-skilled	0.196***	0.232***	0.271***	0.319***	0.371***
	(0.00184)	(0.00185)	(0.00219)	(0.00260)	(0.00246)
Constant	1.809***	1.979***	2.161***	2.345***	2.551***
	(0.00308)	(0.00151)	(0.00197)	(0.00247)	(0.00395)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	642,878	642,878	642,878	642,878	642,878

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10. Quantile models: base salary (all sectors)

VARIABLES	(6) q10	(7) q25	(8) q50	(9) q75	(10) q90
Female	-0.0547***	-0.0539***	-0.0685***	-0.0881***	-0.102***
	(0.00299)	(0.00225)	(0.00155)	(0.00190)	(0.00285)
Midsize firms	-0.0157***	-0.00881***	-0.00713***	0.00661***	0.0346***
	(0.00276)	(0.00187)	(0.00123)	(0.00227)	(0.00318)
Large firms	-0.0420***	-0.0146***	0.00334	0.0457***	0.0986***
	(0.00278)	(0.00188)	(0.00208)	(0.00264)	(0.00233)
Female#Midsize firms	0.0267***	0.0184***	0.0171***	0.0111***	-0.0113**
	(0.00446)	(0.00389)	(0.00280)	(0.00323)	(0.00479)
Female#Large firms	0.000784	-0.0115***	-0.0207***	-0.0235***	-0.0315***
	(0.00418)	(0.00290)	(0.00277)	(0.00322)	(0.00330)
Managing/leading role	0.0993***	0.0891***	0.113***	0.147***	0.220***
	(0.00233)	(0.00148)	(0.00163)	(0.00275)	(0.00316)
Age: 40 - 49	0.00688***	0.00563***	0.0122***	0.0280***	0.0508***
	(0.00173)	(0.00128)	(0.00119)	(0.00122)	(0.00244)
Age: 50 or above	-0.0225***	-0.0164***	-0.00204*	0.0319***	0.0718***
	(0.00147)	(0.00175)	(0.00122)	(0.00128)	(0.00272)
Secondary education	-0.0299***	-0.000518	0.0197***	0.0273***	0.0366***
	(0.00196)	(0.00124)	(0.00151)	(0.00150)	(0.00227)
Tertiary education	0.105***	0.130***	0.171***	0.230***	0.277***

	(0.00253)	(0.00161)	(0.00196)	(0.00292)	(0.00412)
International market	0.0553***	0.0617***	0.0663***	0.0609***	0.0529***
	(0.00114)	(0.000547)	(0.000857)	(0.000933)	(0.000969)
Tenure	0.000136	0.00235***	0.00494***	0.00818***	0.00946***
	(0.000110)	(7.28e-05)	(7.43e-05)	(8.85e-05)	(0.000126)
Company-level agreement	-0.0311***	0.0374***	0.106***	0.141***	0.147***
	(0.00242)	(0.00189)	(0.00173)	(0.00186)	(0.00247)
2014.year	0.0383***	0.0423***	0.0512***	0.0501***	0.0441***
	(0.00161)	(0.00119)	(0.00126)	(0.00170)	(0.00202)
2018.year	0.0987***	0.0978***	0.107***	0.104***	0.103***
	(0.00197)	(0.00114)	(0.00125)	(0.00122)	(0.00149)
Mid-skilled	-0.0265***	0.00220*	0.00710***	0.00454***	0.0121***
	(0.00155)	(0.00128)	(0.00112)	(0.00133)	(0.00236)
High-skilled	0.114***	0.141***	0.183***	0.252***	0.324***
	(0.00236)	(0.00197)	(0.00161)	(0.00261)	(0.00444)
Constant	1.731***	1.828***	1.950***	2.100***	2.257***
	(0.00286)	(0.00162)	(0.00161)	(0.00227)	(0.00362)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	642,791	642,791	642,791	642,791	642,791

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11. Quantile models: salary supplements (all sectors)

	(11)	(12)	(13)	(14)	(15)
VARIABLES	q10	q25	q50	q75	q90
Female	-0.437***	-0.494***	-0.482***	-0.389***	-0.342***
	(0.0148)	(0.00816)	(0.00798)	(0.00701)	(0.0107)
Midsize firms	0.297***	0.315***	0.272***	0.234***	0.204***
	(0.0126)	(0.00748)	(0.00688)	(0.00687)	(0.00763)
Large firms	0.319***	0.445***	0.427***	0.400***	0.363***
	(0.0140)	(0.00583)	(0.00644)	(0.00672)	(0.00775)
Female#Midsize firms	-0.196***	-0.0922***	-0.0254**	-0.00671	-0.0277***
	(0.0240)	(0.0116)	(0.0117)	(0.0103)	(0.0102)
Female#Large firms	-0.0779***	0.0359***	0.161***	0.137***	0.0574***
	(0.0200)	(0.00903)	(0.00967)	(0.00814)	(0.0115)
Managing/leading role	0.176***	0.288***	0.298***	0.316***	0.322***
	(0.0147)	(0.00777)	(0.00361)	(0.00286)	(0.00503)
Age: 40 - 49	0.264***	0.226***	0.198***	0.172***	0.150***
	(0.00974)	(0.00564)	(0.00409)	(0.00397)	(0.00395)
Age: 50 or above	0.279***	0.221***	0.218***	0.216***	0.199***
	(0.0103)	(0.00695)	(0.00545)	(0.00398)	(0.00436)
Secondary education	0.0855***	0.110***	0.114***	0.124***	0.111***
	(0.0122)	(0.00663)	(0.00565)	(0.00495)	(0.00681)
Tertiary education	0.255***	0.346***	0.389***	0.384***	0.366***
	(0.0117)	(0.00630)	(0.00617)	(0.00517)	(0.00694)
International market	-0.0841***	-0.0126***	0.0119***	0.0231***	0.0359***
	(0.00644)	(0.00322)	(0.00225)	(0.00197)	(0.00224)
Tenure	0.0409***	0.0326***	0.0244***	0.0182***	0.0147***
	(0.000406)	(0.000271)	(0.000186)	(0.000148)	(0.000143)
Company-level agreement	-0.0766***	0.0283***	0.0502***	0.0704***	0.0836***
	(0.0130)	(0.00495)	(0.00370)	(0.00356)	(0.00273)
2014.year	-0.162***	-0.0975***	-0.0666***	-0.0519***	-0.0457***
	(0.0123)	(0.00639)	(0.00418)	(0.00355)	(0.00398)
2018.year	-0.0648***	-0.0550***	-0.0302***	-0.0155***	-0.00347
	(0.00771)	(0.00588)	(0.00450)	(0.00427)	(0.00479)
Mid-skilled	-0.0502***	-0.0202***	0.0200***	0.0118***	0.0296***
	(0.0119)	(0.00548)	(0.00524)	(0.00431)	(0.00385)
High-skilled	0.262***	0.345***	0.421***	0.412***	0.459***
	(0.0128)	(0.00702)	(0.00640)	(0.00592)	(0.00613)
Constant	-0.864***	-0.0960***	0.648***	1.281***	1.789***
	(0.0129)	(0.00809)	(0.00636)	(0.00624)	(0.00761)
Firm fixed effect	No	No	No	No	No
Industry fixed effect	No	No	No	No	No
Observations	540,475	540,475	540,475	540,475	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12. Linear model, fixed effect (energy sector)

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.145***	-0.0504***	-0.336***
	(0.0180)	(0.0179)	(0.0682)
Midsize firms	0.0281	0.125*	-0.337
	(0.0638)	(0.0722)	(0.232)
Large firms	-0.00874	0.0876	-0.510*
	(0.0731)	(0.0821)	(0.281)
Female#Midsize firms	-0.0103	-0.00271	-0.0868
	(0.0267)	(0.0254)	(0.0980)
Female#Large firms	-0.0433*	-0.0488*	-0.164*
	(0.0256)	(0.0261)	(0.0994)
Age: 40 - 49	0.121***	0.106***	0.271***
	(0.0117)	(0.0114)	(0.0446)
Age: 50 or above	0.161***	0.143***	0.347***
	(0.0161)	(0.0158)	(0.0550)
Secondary education	0.00139	-0.0190	0.116
	(0.0222)	(0.0208)	(0.0833)
Tertiary education	0.114***	0.111***	0.169**
	(0.0227)	(0.0210)	(0.0825)
Tenure	0.00684***	0.00490***	0.0139***
	(0.000626)	(0.000627)	(0.00210)
Managing/leading role	0.273***	0.294***	0.102***
	(0.0118)	(0.0124)	(0.0391)
Mid-skilled	0.0219	-0.0322	0.147*
	(0.0252)	(0.0216)	(0.0871)
High-skilled	0.132***	0.0931***	0.118
	(0.0252)	(0.0216)	(0.0893)
Company-level agreement	0.0209	0.0209	-0.0916
	(0.0379)	(0.0315)	(0.136)
International market	0.00270	-0.0197	0.0638
	(0.0140)	(0.0137)	(0.0495)
Year: 2014	0.0538***	0.114***	-0.199***
	(0.0142)	(0.0130)	(0.0528)
o.Year: 2018	-	-	-
Firm fixed effect	Significant	Significant	Significant
Constant	2.898***	2.565***	1.404***
	(0.0602)	(0.0617)	(0.223)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294
R-squared	0.771	0.790	0.538

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13. Linear model, fixed effects (all sectors)

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.107***	-0.0533***	-0.250***

	(0.00165)	(0.00151)	(0.00590)
Midsize firms	0.0198*	0.00450	0.0130
	(0.0102)	(0.0106)	(0.0389)
Large firms	0.0272**	-0.0209*	0.0553
	(0.0115)	(0.0119)	(0.0444)
Female#Midsize firms	-0.0125***	0.00501**	-0.0457***
	(0.00241)	(0.00223)	(0.00866)
Female#Large firms	-0.0121***	0.0156***	-0.0377***
	(0.00221)	(0.00208)	(0.00786)
Age: 40 - 49	0.0682***	0.0321***	0.157***
	(0.000976)	(0.000938)	(0.00362)
Age: 50 or above	0.0896***	0.0518***	0.162***
	(0.00126)	(0.00123)	(0.00438)
Secondary education	0.0215***	0.0113***	0.0557***
	(0.00160)	(0.00162)	(0.00601)
Tertiary education	0.144***	0.119***	0.180***
	(0.00187)	(0.00187)	(0.00690)
Tenure	0.00756***	0.00283***	0.0213***
	(6.48e-05)	(6.51e-05)	(0.000215)
Managing/leading role	0.266***	0.170***	0.410***
	(0.00140)	(0.00137)	(0.00464)
Mid-skilled	0.00604***	0.0119***	-0.0186***
	(0.00128)	(0.00128)	(0.00506)
High-skilled	0.203***	0.173***	0.205***
	(0.00169)	(0.00167)	(0.00634)
Company-level agreement	0.00952***	0.0163***	-0.00695
	(0.00368)	(0.00389)	(0.0145)
International market	0.000438	0.00984***	-0.0195**
	(0.00233)	(0.00235)	(0.00857)
Firm fixed effect	Significant	Significant	Significant
Industry fixed effect:			
industry_dummies14	significant	significant	significant
Otherwise	insignificant	insignificant	inisignificant
Year: 2014	0.0144***	0.0415***	-0.0715***
	(0.00155)	(0.00158)	(0.00596)
o.Year: 2018	-	-	-
Constant	2.413***	2.150***	0.736***
	(0.0333)	(0.0326)	(0.116)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475
R-squared	0.732	0.681	0.594

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14. Quantile regression with fixed effect: energy sector, q10

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.154***	-0.0662	-0.286
	(0.0289)	(0.0438)	(0.199)
Midsize firms	0.0367	0.0840	-0.388
	(0.103)	(0.161)	(0.727)
Large firms	0.0136	0.0266	-0.529
	(0.120)	(0.183)	(0.886)

Female#Midsize firms	-0.00419	0.00754	-0.149
	(0.0415)	(0.0601)	(0.275)
Female#Large firms	0.00847	-0.00886	-0.155
	(0.0392)	(0.0608)	(0.270)
Managing/leading role	0.224***	0.215***	0.0478
	(0.0178)	(0.0276)	(0.106)
Age: 40 - 49	0.0899***	0.0933***	0.406***
	(0.0178)	(0.0259)	(0.120)
Age: 50 or above	0.107***	0.0989***	0.462***
	(0.0244)	(0.0362)	(0.153)
Secondary education	-0.0162	-0.0320	0.185
	(0.0365)	(0.0544)	(0.231)
Tertiary education	0.0787**	0.0672	0.116
	(0.0372)	(0.0556)	(0.231)
International market	-0.0213	-0.0434	-0.0179
	(0.0217)	(0.0322)	(0.128)
Tenure	0.00921***	0.00585***	0.0259***
	(0.000927)	(0.00137)	(0.00556)
Company-level agreement	0.0327	0.0514	-0.0201
	(0.0603)	(0.0763)	(0.349)
2014.year	0.0668***	0.119***	-0.195
	(0.0224)	(0.0312)	(0.138)
2018o.year	-	-	-
Mid-skilled	0.0227	-0.0435	0.139
	(0.0371)	(0.0486)	(0.219)
High-skilled	0.116***	0.0559	0.0512
	(0.0384)	(0.0503)	(0.224)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15 Quantile regression with fixed effect: energy sector, q25

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.151***	-0.0600*	-0.310**
	(0.0216)	(0.0336)	(0.138)
Midsize firms	0.0333	0.100	-0.363
	(0.0765)	(0.124)	(0.502)
Large firms	0.00485	0.0504	-0.519
Female#Midsize firms	-0.00659	0.00354	-0.118
	(0.0309)	(0.0461)	(0.190)
Female#Large firms	-0.0119	-0.0245	-0.159
	(0.0292)	(0.0467)	(0.186)
Managing/leading role	0.243***	0.246***	0.0741
	(0.0132)	(0.0212)	(0.0731)
Age: 40 - 49	0.102***	0.0983***	0.340***
	(0.0133)	(0.0199)	(0.0829)
Age: 50 or above	0.128***	0.116***	0.406***
	(0.0182)	(0.0278)	(0.105)
Secondary education	-0.00927	-0.0269	0.151
	(0.0272)	(0.0417)	(0.160)
Tertiary education	0.0925***	0.0844**	0.142
	(0.0277)	(0.0426)	(0.159)
International market	-0.0119	-0.0342	0.0220
	(0.0162)	(0.0247)	(0.0884)
Tenure	0.00828***	0.00548***	0.0200***
	(0.000691)	(0.00105)	(0.00384)
Company-level agreement	0.0280	0.0395	-0.0550
	(0.0449)	(0.0586)	(0.240)
2014.year	0.0617***	0.117***	-0.197**
	(0.0167)	(0.0239)	(0.0953)
2018o.year	-	-	-
Mid-skilled	0.0224	-0.0391	0.143
	(0.0277)	(0.0373)	(0.151)
High-skilled	0.122***	0.0704*	0.0838
	(0.0286)	(0.0386)	(0.155)

Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16. Quantile regression with fixed effect: energy sector, q50

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.145***	-0.0518**	-0.340***
	(0.0175)	(0.0243)	(0.0908)
Midsize firms	0.0287	0.122	-0.334
	(0.0619)	(0.0894)	(0.331)
Large firms	-0.00697	0.0822	-0.508
	(0.0724)	(0.102)	(0.403)
Female#Midsize firms	-0.00981	-0.00181	-0.0822
	(0.0250)	(0.0334)	(0.125)
Female#Large firms	-0.0392*	-0.0453	-0.164
	(0.0237)	(0.0338)	(0.123)
Managing/leading role	0.269***	0.287***	0.106**
	(0.0107)	(0.0154)	(0.0482)
Age: 40 - 49	0.118***	0.105***	0.260***
	(0.0108)	(0.0144)	(0.0548)
Age: 50 or above	0.157***	0.139***	0.338***
	(0.0148)	(0.0201)	(0.0695)
Secondary education	1.41e-06	-0.0201	0.111
	(0.0220)	(0.0302)	(0.105)
Tertiary education	0.111***	0.107***	0.173
	(0.0224)	(0.0309)	(0.105)
International market	0.000806	-0.0218	0.0699
	(0.0131)	(0.0179)	(0.0583)
Tenure	0.00703***	0.00498***	0.0130***
	(0.000561)	(0.000764)	(0.00254)
Company-level agreement	0.0218	0.0236	-0.0969
	(0.0363)	(0.0424)	(0.159)
2014.year	0.0548***	0.114***	-0.199***
	(0.0135)	(0.0173)	(0.0629)
2018o.year	-	-	-
Mid-skilled	0.0220	-0.0332	0.148
	(0.0224)	(0.0270)	(0.0998)
High-skilled	0.130***	0.0898***	0.123
	(0.0231)	(0.0280)	(0.102)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17. Quantile regression with fixed effect: energy sector, q75

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.139***	-0.0412	-0.364***
	(0.0252)	(0.0276)	(0.105)
Midsize firms	0.0232	0.149	-0.309
	(0.0894)	(0.102)	(0.384)
Large firms	-0.0213	0.123	-0.499
	(0.104)	(0.115)	(0.467)
Female#Midsize firms	-0.0137	-0.00867	-0.0528
	(0.0361)	(0.0379)	(0.145)
Female#Large firms	-0.0725**	-0.0721*	-0.168
	(0.0341)	(0.0384)	(0.142)
Managing/leading role	0.300***	0.341***	0.131**
	(0.0155)	(0.0175)	(0.0560)
Age: 40 - 49	0.138***	0.114***	0.196***

	(0.0155)	(0.0164)	(0.0635)
Age: 50 or above	0.191***	0.168***	0.284***
	(0.0213)	(0.0229)	(0.0806)
Secondary education	0.0112	-0.0114	0.0777
	(0.0317)	(0.0343)	(0.122)
Tertiary education	0.134***	0.137***	0.198
	(0.0324)	(0.0351)	(0.122)
International market	0.0162	-0.00600	0.109
	(0.0189)	(0.0203)	(0.0676)
Tenure	0.00551***	0.00435***	0.00724**
	(0.000808)	(0.000867)	(0.00294)
Company-level agreement	0.0143	0.00322	-0.131
	(0.0525)	(0.0482)	(0.184)
2014.year	0.0465**	0.111***	-0.201***
	(0.0195)	(0.0197)	(0.0729)
2018o.year	-	-	-
Mid-skilled	0.0215	-0.0256	0.152
	(0.0323)	(0.0307)	(0.116)
High-skilled	0.140***	0.115***	0.155
	(0.0334)	(0.0318)	(0.118)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No
Observations	5,783	5,783	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 18. Quantile regression with fixed effect: energy sector, q90

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.134***	-0.0307	-0.383***
	(0.0375)	(0.0434)	(0.146)
Midsize firms	0.0183	0.177	-0.289
	(0.133)	(0.160)	(0.531)
Large firms	-0.0340	0.163	-0.491
	(0.156)	(0.181)	(0.647)
Female#Midsize firms	-0.0172	-0.0154	-0.0285
	(0.0538)	(0.0595)	(0.201)
Female#Large firms	-0.102**	-0.0985	-0.172
	(0.0508)	(0.0603)	(0.197)
Managing/leading role	0.328***	0.393***	0.152**
	(0.0230)	(0.0275)	(0.0774)
Age: 40 - 49	0.156***	0.122***	0.143
	(0.0231)	(0.0257)	(0.0878)
Age: 50 or above	0.222***	0.197***	0.239**
	(0.0317)	(0.0359)	(0.111)
Secondary education	0.0212	-0.00274	0.0505
	(0.0472)	(0.0539)	(0.169)
Tertiary education	0.153***	0.166***	0.218
	(0.0482)	(0.0551)	(0.169)
International market	0.0298	0.00963	0.141
	(0.0281)	(0.0319)	(0.0936)
Tenure	0.00417***	0.00372***	0.00250
	(0.00120)	(0.00136)	(0.00406)
Company-level agreement	0.00756	-0.0169	-0.159
	(0.0781)	(0.0757)	(0.255)
2014.year	0.0391	0.107***	-0.203**
	(0.0290)	(0.0309)	(0.101)
2018o.year	-	-	-
Mid-skilled	0.0210	-0.0182	0.156
	(0.0481)	(0.0482)	(0.160)
High-skilled	0.149***	0.139***	0.181
	(0.0497)	(0.0499)	(0.164)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	No	No	No

Observations	5,783	5,783	5,294

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 19. Quantile regression with fixed effect: all sectors, q10

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.105*	-0.0576***	-0.267
	(0.0535)	(0.00851)	(0.768)
Midsize firms	0.0356	0.0217	0.156
	(0.313)	(0.0549)	(4.606)
Large firms	0.0454	0.0230	0.277
	(0.351)	(0.0610)	(5.212)
Female#Midsize firms	0.00498	0.0106	-0.0409
	(0.0758)	(0.0122)	(1.083)
Female#Large firms	0.0199	0.0224**	-0.0401
	(0.0690)	(0.0112)	(0.977)
Managing/leading role	0.197***	0.102***	0.309
	(0.0433)	(0.00719)	(0.568)
Age: 40 - 49	0.0583*	0.0304***	0.190
	(0.0301)	(0.00492)	(0.441)
Age: 50 or above	0.0520	0.0241***	0.137
	(0.0383)	(0.00626)	(0.538)
Secondary education	0.0202	0.00674	0.0583
	(0.0484)	(0.00821)	(0.720)
Tertiary education	0.118**	0.0973***	0.154
	(0.0566)	(0.00959)	(0.831)
International market	0.000806	0.0101	-0.0550
	(0.0704)	(0.0122)	(1.013)
Tenure	0.00833***	0.00211***	0.0305
	(0.00185)	(0.000317)	(0.0254)
Company-level agreement	0.0150	0.0236	0.0441
	(0.112)	(0.0202)	(1.746)
2014.year	0.0202	0.0464***	-0.0745
	(0.0470)	(0.00821)	(0.705)
2018o.year	-	-	-
Mid-skilled	-0.00523	-0.000828	-0.0551
	(0.0389)	(0.00661)	(0.606)
High-skilled	0.136***	0.124***	0.0914
	(0.0513)	(0.00868)	(0.756)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 20. Quantile regression with fixed effect: all sectors, q25

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.106***	-0.0537***	-0.248
	(0.0241)	(0.00524)	(0.272)
Midsize firms	0.0207	0.00596	0.00141
	(0.141)	(0.0338)	(1.631)
Large firms	0.0282	-0.0172	0.0373
	(0.158)	(0.0375)	(1.846)
Female#Midsize firms	-0.0115	0.00548	-0.0461
	(0.0341)	(0.00750)	(0.384)
Female#Large firms	-0.0102	0.0161**	-0.0376
	(0.0310)	(0.00691)	(0.346)
Managing/leading role	0.262***	0.164***	0.418**
	(0.0195)	(0.00443)	(0.201)
Age: 40 - 49	0.0676***	0.0320***	0.154
	(0.0135)	(0.00303)	(0.156)
Age: 50 or above	0.0875***	0.0494***	0.164
	(0.0172)	(0.00385)	(0.191)

Secondary education	0.0214	0.0109**	0.0554
	(0.0218)	(0.00505)	(0.255)
Tertiary education	0.143***	0.117***	0.182
	(0.0255)	(0.00590)	(0.294)
International market	0.000459	0.00986	-0.0166
	(0.0316)	(0.00749)	(0.359)
Tenure	0.00760***	0.00277***	0.0206**
	(0.000832)	(0.000195)	(0.00898)
Company-level agreement	0.00983	0.0169	-0.0111
	(0.0501)	(0.0124)	(0.618)
2014.year	0.0147	0.0419***	-0.0712
	(0.0211)	(0.00505)	(0.250)
2018o.year	-	-	-
Mid-skilled	0.00540	0.0108***	-0.0156
	(0.0175)	(0.00407)	(0.214)
High-skilled	0.200***	0.169***	0.215
	(0.0230)	(0.00534)	(0.268)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 21. Quantile regression with fixed effect: all sectors, q50

	(1)	(2)	(3)
VARIABLES	log_total_salary_hour	log_salary_base_hour	log_salary_supplements_hour
Female	-0.106***	-0.0537***	-0.248
	(0.0241)	(0.00524)	(0.272)
Midsize firms	0.0207	0.00596	0.00141
	(0.141)	(0.0338)	(1.631)
Large firms	0.0282	-0.0172	0.0373
	(0.158)	(0.0375)	(1.846)
Female#Midsize firms	-0.0115	0.00548	-0.0461
	(0.0341)	(0.00750)	(0.384)
Female#Large firms	-0.0102	0.0161**	-0.0376
	(0.0310)	(0.00691)	(0.346)
Managing/leading role	0.262***	0.164***	0.418**
	(0.0195)	(0.00443)	(0.201)
Age: 40 - 49	0.0676***	0.0320***	0.154
	(0.0135)	(0.00303)	(0.156)
Age: 50 or above	0.0875***	0.0494***	0.164
	(0.0172)	(0.00385)	(0.191)
Secondary education	0.0214	0.0109**	0.0554
	(0.0218)	(0.00505)	(0.255)
Tertiary education	0.143***	0.117***	0.182
	(0.0255)	(0.00590)	(0.294)
International market	0.000459	0.00986	-0.0166
	(0.0316)	(0.00749)	(0.359)
Tenure	0.00760***	0.00277***	0.0206**
	(0.000832)	(0.000195)	(0.00898)
Company-level agreement	0.00983	0.0169	-0.0111
	(0.0501)	(0.0124)	(0.618)
2014.year	0.0147	0.0419***	-0.0712
	(0.0211)	(0.00505)	(0.250)
2018o.year	-	-	-
Mid-skilled	0.00540	0.0108***	-0.0156
	(0.0175)	(0.00407)	(0.214)
High-skilled	0.200***	0.169***	0.215
	(0.0230)	(0.00534)	(0.268)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 22. Quantile regression with fixed effect: all sectors, q75

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.108***	-0.0508***	-0.240
	(0.00516)	(0.00715)	(0.199)
Midsize firms	0.0106	-0.00547	-0.0652
	(0.0302)	(0.0461)	(1.196)
Large firms	0.0166	-0.0464	-0.0661
	(0.0338)	(0.0512)	(1.354)
Female#Midsize firms	-0.0227***	0.00178	-0.0483
	(0.00731)	(0.0102)	(0.281)
Female#Large firms	-0.0307***	0.0116	-0.0365
	(0.00665)	(0.00943)	(0.254)
Managing/leading role	0.306***	0.209***	0.465***
	(0.00418)	(0.00604)	(0.147)
Age: 40 - 49	0.0739***	0.0331***	0.139
	(0.00290)	(0.00414)	(0.114)
Age: 50 or above	0.112***	0.0679***	0.175
	(0.00370)	(0.00526)	(0.140)
Secondary education	0.0222***	0.0139**	0.0542
	(0.00467)	(0.00690)	(0.187)
Tertiary education	0.159***	0.131***	0.194
	(0.00546)	(0.00806)	(0.216)
International market	0.000225	0.00968	8.24e-06
	(0.00678)	(0.0102)	(0.263)
Tenure	0.00711***	0.00324***	0.0163**
	(0.000178)	(0.000267)	(0.00659)
Company-level agreement	0.00630	0.0121	-0.0349
	(0.0107)	(0.0169)	(0.453)
2014.year	0.0110**	0.0386***	-0.0698
	(0.00453)	(0.00690)	(0.183)
2018o.year	-	-	-
Mid-skilled	0.0126***	0.0193***	0.00146
	(0.00374)	(0.00556)	(0.157)
High-skilled	0.243***	0.202***	0.268
	(0.00494)	(0.00729)	(0.196)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 23. Quantile regression with fixed effect: all sectors, q90

VARIABLES	(1) log_total_salary_hour	(2) log_salary_base_hour	(3) log_salary_supplements_hour
Female	-0.109***	-0.0481***	-0.234
	(0.0142)	(0.0108)	(0.306)
Midsize firms	0.00178	-0.0162	-0.118
	(0.0833)	(0.0697)	(1.836)
Large firms	0.00649	-0.0738	-0.148
	(0.0933)	(0.0773)	(2.078)
Female#Midsize firms	-0.0324	-0.00170	-0.0501
	(0.0202)	(0.0155)	(0.432)
Female#Large firms	-0.0485***	0.00731	-0.0356
	(0.0184)	(0.0142)	(0.389)
Managing/leading role	0.345***	0.251***	0.502**
	(0.0115)	(0.00913)	(0.226)
Age: 40 - 49	0.0794***	0.0342***	0.127
	(0.00801)	(0.00625)	(0.176)
Age: 50 or above	0.133***	0.0852***	0.184
	(0.0102)	(0.00794)	(0.215)
Secondary education	0.0229*	0.0168	0.0532

	(0.0129)	(0.0104)	(0.287)
Tertiary education	0.173***	0.145***	0.204
	(0.0151)	(0.0122)	(0.331)
International market	1.96e-05	0.00951	0.0132
	(0.0187)	(0.0154)	(0.404)
Tenure	0.00668***	0.00369***	0.0129
	(0.000492)	(0.000403)	(0.0101)
Company-level agreement	0.00322	0.00752	-0.0539
	(0.0297)	(0.0256)	(0.696)
2014.year	0.00782	0.0355***	-0.0686
	(0.0125)	(0.0104)	(0.281)
2018o.year	-	-	-
Mid-skilled	0.0189*	0.0272***	0.0150
	(0.0103)	(0.00839)	(0.241)
High-skilled	0.280***	0.233***	0.310
	(0.0136)	(0.0110)	(0.302)
Firm fixed effect	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
Observations	642,878	642,791	540,475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1