TecnoCampus
Escola Superior
de Ciències Socials i de l'Empresa

Centre adscrit a la
upf. Universitat Pompeu Fabra Barcelona

Promotion in a Corporation: is your position affected by your gender?

Student's name: Marc Portabella Llavador

Tutor's name: Helena Hernandez-Pizarro

Date: 27/06/2020

MEMÒRIA DEL TREBALL FINAL DE GRAU

Course: 4th

Studies: Business Administration and Innovation Management

INDEX

1. ABSTRACT

Gender equality has been one of the most important discussion topics of this century. Considering that the labor market is an environment that can be regulated through governmental policies, it is representative of the gender equality standards that a country offers. Such gender disparities can be measured by a wide range of aspects, including employment rate, wages, educational bias, gender-based violence and existing legislation. Currently, according to the CEOE 2019 Report (Spanish Confederation of Business Organizations), a 85,7% of the executives in Spain are male.

This paper examines in depth the role of gender in promotion opportunities. Using ESCA data from 2011 to 2018, our results provide evidence of the gap evolution during this period in Catalonia. The study tests whether a statistically significant relationship can be established between promotion opportunities and gender. We show how the fact of being women negatively influences opportunities to work in a position with subordinated employees. Moreover, a sectorial analysis reports that the level of development in each sector is not associated with the gender equality that it offers.

Although statistical evidence demonstrates that gaps on wages and employment have decreased for the Catalan society, still, a discrimination focus is identified on our labor market.

Personal Motivations – Wage gender gap is a reality and I strongly feel we shall know as much as possible about it. Knowhow is fundamental to act ethically when developing business practices. Thus a promotion approach on the gender gap, using data of our region, will reveal evidence on what has to be further improved.

2. INTRODUCTION

The Spanish Government has been implementing gender equality policies for the last two decades, such as "The law of effective promotion for gender equality"*(Organic Law 3/2007).* Despite these efforts, large disadvantages towards women prevail in the labor market. On 2001, according to Idescat[1], the employment rate in Spain was above 77% for men in contrast to 46% for women. At that moment, the employment gap was approximately 30 percentage points. Consequently, major governmental policies on gender equality came into force on 2007, but, the gap was still significant in 2010; reporting a 13 pp disparity. According to current data, the gap has remained the same for 8 years, with a 2018 register of 73,1% employment rate for man and a 61,0% for women.

The CEOE[1] 2019 Report measures diverse aspects affecting the gap in Spain, such as the preference on studies chosen, sectorial segregation, type of contracts and positioning rates. Those rates differ between genders and suggest a recurring discrimination against women, as for instance an 18% adjusted lower wages for women, presented as a cause of the tendency to work in lower wages sectors or reduced promotion opportunities. CEOE obtains an 85,7% of executive positions occupied by man. Further, a 97,1% of CEO positions are represented by males. This statement highlights the role that gender plays on promotion opportunities, additionally, the results evidence that discrimination towards women is persistent in the Spanish labor market.

Llorà (2018) performs a comparative analysis of the Catalan gender inequalities from 2002 to 2018. Among related indexes – such as sectorial employment rates, wages, time of search for work and contract terms - Llorà measures the concentration of men and women in executive and managerial positions of Catalonia: female represent 51 pps less top positions than male (2007). Despite a reduction of the gap, in 2018 a 38 pps lower concentration of women is reported in comparison to man. The decline of the gap is associated to a decrease of male managers on the top ends.

[1] The Statistical Institute of Catalonia is an organization of institutions that make statistical research in terms related to Catalonia.

[2] "Confederacion Española de Organizaciones Empresariales" translates into Spanish Confederation of Business Organizations.

To the extent that there is still little awareness of the gender gap in positioning terms, the present study obtains an accurate and realistic view of the current situation, the evolution during the decade and the sectorial segregation of the gap in the Catalan labor market.

On this paper, we aim to test whether a statistically significant association can be established between reaching a boss position[3] and the gender. The initial hypothesis is that there exists a negative relation, to the extent that being female may contribute to worsen promotion opportunities. Also the complementary analysis assesses if the development of a sector[4] has an impact over its gender gap, in positioning terms.

According to recent literature, gender-diverse boards seem to have numerous benefits (Goyal and Kakabadse, 2018), potentially improving resource provisioning, advisory ability and monitoring amongst others. Therefore, as a second objective, we try to identify whether advanced sectors offer improved gender equality on their promotion, or whether the gap behaves similarly in sectors with various degrees of development. Thus, the secondary hypothesis is that there exists a positive relation between development of a sector[4] and the gender equality in promotion that it offers. Subsequently, we explore the effect of gender on a higher level of positioning - this analysis serves as a robustness check supporting the evidence of the negative relation between women and boss positions.

Using a data set gathered by Catalonia Health Department (ESCA[5]) between 2011 and 2018 and OLS Regression methodology, we estimate the impact of being a female on working in a boss position with demographic, economic and labor controls.

The extensive literatures on discrimination against women contain evidence of the unexplained gender gap on top ends. Yet, the evidence of negative relation between women and promotion is still limited to the highest positions. To the extent of our knowledge, this is the first research paper that provides empirical evidence of the association between gender and boss positions in Catalonia.

[3] Considered a job with at least one subordinated employee.

[4] Measured by the investment in Research and Development of the sector.

[5] "Enquesta de Salut Catalana" translates into Catalan Health Survey.

We find that, in Catalonia, women tend to have worse promotion opportunities in intermediate positions, and further evidence suggests that this disparity is held across all levels of positioning. Moreover, using various reliable indexes, we consider that such relationship is not related to the development of the sector.

Comparing to leading countries in promotion equalities (e.g. Norway), we present a reflection on how governmental policies as gender quotas for corporate boards are beneficial for the enclosure of this gap. Additionally, since disparities for genders are similar across sectors, we reveal how such policies can be applied as a generic rule, without the need of adjustment depending on the sector.

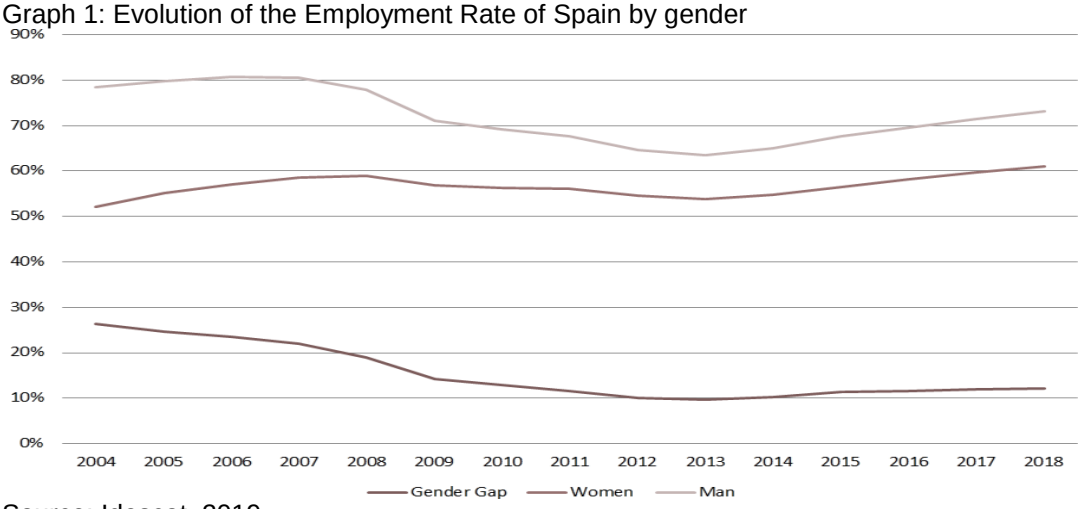
3. THEORETICAL FRAMEWORK

Aiming to address a consistent background about gender-egalitarian matters, a search on Google Scholar takes place. We explore previous literature, papers and indexes resulting from studies concluded after 2010. Keywords, including “promotion”, “gender gap”, “positioning”, “glass ceiling”, “gender equality” and “wage”, lead to relevant and related knowledge. The objective is to understand the impact of gender on various aspects of the work environment, such as wages, promotion or sectors. This research allows identifying a literature gap that can be filled by this paper.

3.1. Stylized Facts

The empirical literatures about gender equality bring a wide range of indicators used to measure disparities between males and females. Workplace indicators are highly representative because they can potentially be regulated through governmental policies. Lombardo (2015) acknowledges how, during the early 2000s, regulations were updated in Spain, aiming to improve women employment opportunities. Despite this efforts resulted in a significant enclosure of the gap, measures enforced to face economic recession in 2008 impacted negatively on the ascendant tendency of gender equality. To support this information, we assess the evolution of the Spanish employment rate:

Graph 1: Evolution of the Employment Rate of Spain by gender

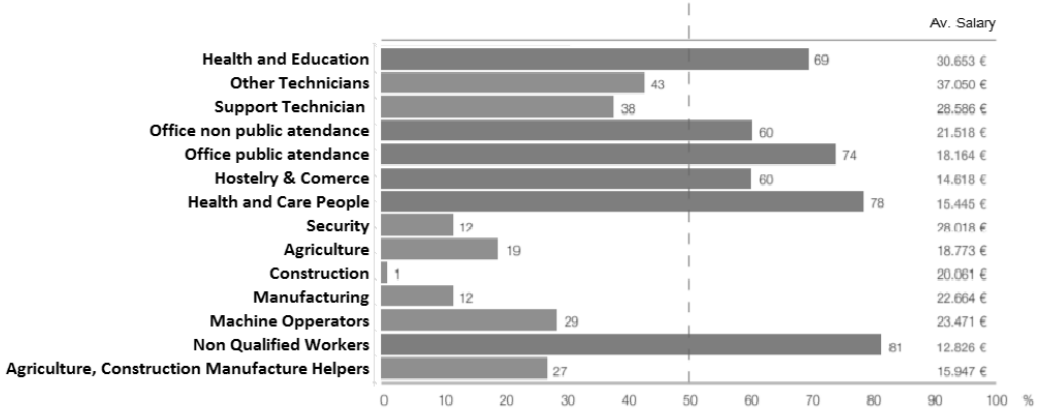


Source: Idescat, 2019

While the extensive margin gap shows a decrease from 2004 to 2012, data demonstrate a reasonably similar gap over the following six years. Such effects may support Lombardo's theory. In addition, the decline of the gap resulted from a decrease in male employment rate appears to be strong evidence. Although Graph 1 is a convenient summary, this indicator may be misleading since it should be explained in the context of willingness. Yet, measurable aspects could be associated to such context, for instance, women spending twice the time off man on unpaid activities (CEOE, 2019).

Many studies consider the progress towards equal pay a consistent indicator of labor market equality, as captured by the Spanish Wage Gap Analysis (CEOE, 2019), an adjusted gender gap of 12,2 percentage points in income prevails in Spain. The unexplained disparity is usually linked to sectorial segregation, which is indeed confirmed by Graph 2.

Graph 2: % of women working per sector, plus average salary per sector



Source: CEOE, 2019

Apart from Health/Education and Helpers status, Graph 2 shows a clear pattern, in which sectors with higher salaries are dominated by men. On the other hand, where the average wages are lower, women hold a higher percentage. Evidence by Hegewisch and Hartmann (2014) of a clear wage penalty for work in predominantly female occupations supports the relation between job segregation and pay gap.

Largely differing rates are also shown in entrepreneurship terms. The European Monitor of Start-ups (Kensbock and Kollmann, 2016) reports that female hold a 16% of startup founder positions in Spain. As noted by Vossenberg (2013), even though there is a lack of data about benefits in women-led entrepreneurship, a variety of established sources have identified it as “the way forward” (WEF, 2012).

We now turn into positioning rates, CEOE (2019) reports the percentage of women in the executive positions is 14,3%, and a 2,9% of CEOs in Spain are females. With the guidance of previous studies, the unexplained gap between genders, in labor market terms is made evident.

3.2. Literature Review

Previous literature suggests that empowering women leads to a more efficient use of human talent (Zahidi and Ibarra, 2010), as they represent half of this talent inside a country. Along this line, The Global Gender Gap Report confirms the correlation between gender equality and the development of countries, supporting the previous theory. In addition, many studies have revealed potential benefits from gender diversity in boards, such as improved monitoring (Terjesent, Aguilera and Lorenz, 2015), improved advisory ability (Terjesen and Couto, 2015) and improved resource provisioning (Bohren and Strom, 2010).

The allocation of more women to top positions in the firm is therefore expected. On the contrary, wage differentials analyzed on different levels of the corporations (Christofides, 2013) result in a disadvantage for women to promote into high positions. Using data from the European Union Statistics on Income and Living Conditions, for 26 European Countries, this outcome appears to be applicable to most developed countries. A major exception to this trend is Norway, where a government regulation mandates a minimum of 40% on the boards of public companies (Zahidi and Ibarra, 2010). The disparity on opportunities may be linked to barriers facing women such as inadequate career opportunities, gender differences in linguistic styles and socialization, gender based stereotypes, etc.

The impact of gender in the labor market has also been studied for the Catalan population. Using a comparison methodology, Llorà (2019) studies the development of women opportunities in the market, from 2002 to 2018. Through the comparison of indexes, she holds that a slightly improvement is shown during the period. However discrimination is prevailing in Catalonia, as captured by pay gap, contrasted time spent on unpaid tasks, sectorial segregation and promotion discrimination, among other indicators. Although top position proportions are studied (5% men and 3,1% women) in Catalonia, a deeper analysis takes place on this paper.

The extensive literature on gender equality account for gender percentage rates at the top ends, hence, this study focuses on promotion to the mid-range positions. We consider the variance of opportunities to promote from a lower position into a boss position. Moreover, complementing the correlation between gender equality and development of countries (Zahidi and Ibarra, 2010), we also study the promotion gap in relationship to development of sectors in Catalonia.

We conclude that gender equality policies have positively affected the Spanish labor market, particularly on the beginning of the century. However, promotion opportunities are identified as a discrimination focus for women today. Although gender equality is considered a social affair, extensive literatures on diversity on boards suggest that the enclosure of gender gap in promotion opportunities has potential economic and performance benefits for both companies and countries. Hence, this analysis on the Catalan labor market reveals a potential social and economic growth, through the enclosure of the gap evidenced.

4. HYPOTHESIS

In an early stage, business ethics are in continuous development and they attract considerable attention, thus, this study aims to answer the question: are the opportunities to achieve a boss position related to the gender? After considering empirical results of promotion gender disparities in the top ends, we explore an intermediate position promotion approach. In addition, evidence shows how gender-egalitarian countries tend to be more developed. Therefore, we also study this relation in a regional extent by associating the development of a sector to the development of a country. Hence, we also seek to answer the second question: is the level of development of a sector influencing the gender equality that offers?

The objective of the statistical analysis is to understand the degree of disadvantage women face to promote into a position with subordinated employees. The main factors to account are positioning, gender and sectors, divided by their development level. In particular, based on previous literature reviewed, the following hypothesis is posed:

H1: There is a negative relation between being a female and working in a position with at least one subordinated employee.

As consequence of current figures in gender proportions at executives and CEOs positions (CEOE, 2019; Llorà, 2018), we begin by estimating a negative correlation in intermediate levels comparable to the relation in higher positions. Quantifying the gap between men and women allows for a comparison across sectors. This hypothesis fills a literature gap, not only at intermediate positions, but also measuring statistical significance of the unexplained promotion gap. Furthermore, the measure of the gender gap allows identifying a potential source of development growth for the region, according to Zahidi and Ibarra's (2010) theory.

Evidence shown in previous literature suggests a positive relationship between gender equality and development of a country, but such effects remain unexplored on a sectorial degree. Consequently, we intend either to confirm or reject the second hypothesis:

H2: Development[6] of a sector causes the promotion gender gap to decrease.

In relation to The Global Gender Gap Report confirmation, the gender equality and the development of countries are correlated (Zahidi and Ibarra, 2010). Assuming that the relation holds through different levels, we estimate that the gap will be reduced in more developed sectors. Suggestions of this relation are also shown on the potential companies performance improvement accounted by gender diverse boards (Goyal and Kakabadse, 2018). Appropriate sectorial classification is achieved through the use of research and development investment per sector, which is a widely accepted index to measure development. Nevertheless, a robustness check is developed by using the digitalization index as the development classification tool (CEOE, 2017).

[6] Measured by the investment in Research and Development of the sector.

5. DATA SOURCES

This study assesses the relationship between gender and labor position using data from the Health Survey of Catalonia (ESCA[5]) for the years 2011 to 2018. This survey aims to evaluate health needs and services among differentiated population profiles, along with the objectives and effectiveness of health interventions. Apart from gathering health data, the survey also collects most aspects on demographics and labor terms. Such information is convenient for our statistical purposes, therefore this survey is appropriate.

Reporting two waves per year, the cross-sectional data set is composed by a total of 16 survey waves, recording labor and demographical variables of 39.352 observations. The sample is limited to individuals aged from 25 to 54, since these are believed to be in the prime working age[7]. In addition, the sample is restricted to individuals that reported a current working situation. Consequently, the final data set contains a total of 12.252 observations, in which women account for the 46% - men for the 54% - and the average age is 40.

5.1. Positioning measures

Work positioning, as the dependent variable, is measured by the number of subordinated employees that individuals report. Despite not measuring the importance of the tasks performed, it is a highly reliable indicator of the job position level inside a company. The survey reports such information through a categorical variable with five classifications: No subordinated employees, 1 to 4 subordinated employees, 5 to 10 subordinated employees, 10 to 20 subordinated employees and more than 20 subordinated employees.

According to our mid-range positioning purposes, the variable boss position is created as a result of dividing the sample between observations without subordinated employees (noted as 0[8]) and observations with, at least, 1 subordinated employee (noted as 1[8]). Consequently, a person in charge of one or more employees is considered to be working in a boss position.

[7] PWA is a calculation for USA, but it is applicable to our country.

[8] Note that coding the dependent variable as a dummy allows interpreting the results as a percentage over 1.

Besides, we pose a secondary positioning variable aiming to perform a robustness check. The high position status is measured with the same ESCA data, but divides the sample between observations with less than 10 subordinated employees (noted as 0) and observations with more than 10 subordinated employees (noted as 1).

5.2. Demographic measures

Most demographical aspects are required to implement the appropriate sample adjustments. However, gender acts as the independent variable. As it is directly reported by the survey, we create the variable woman, which classifies women as 1 and men as 0. Using this formulation in OLS regression, male as the standardized situation is applied; then, the results represent the difference that women experience, in comparison to men.

Beginning with age, we apply adequate sample adjustments which result from demographical covariates. Despite restricting the sample to the PWA, age can be associated to skills, so we estimate a positive influence on boss position. We also incorporate the variable age^2 to the regression set in order to account for its exponential character.

The survey provides information about household aspects, which are used to extract two covariates regarding cohabitation with a couple and children holding. Finally, in consideration to cultural differences the fact of not having the Spanish nationality is also taken into account in the immigrant variable.

Both mental and physical health are measured in the statistical analysis. We can find a wide range of variables referring to individual health in the database. According to them, we have chosen a reliable source by considering mentally healthy the individual who has not been diagnosed by a doctor with any common mental illnesses, such as anxiety, schizophrenia or depression. On the other hand, a person is considered physically healthy if, he/she does not report limited capacities, disability or lack of autonomy. Concluding an observation is overall healthy when it is documented as both physically and mentally healthy.

Questions included in the survey capture educational terms. In the data base, a categorical variable divides the answers in three classifications. This measure reports the maximum level of studies completed, dividing the sample in people with primary or less studies, secondary or professional formation studies and university or higher studies.

5.3. Labor measures

Personal economic factors are measured from three main perspectives: contractual situation, bad economic situation at home and risk to lose the job. Firstly, the type of the current contract that individuals have in their job positions is reported by the following differentiation: functionary, indefinite, temporal, temporal via ETT[9], no contract, autonomous or entrepreneur. According to their similarities for our purposes, autonomous and entrepreneur are categorized together as own contracts. Secondly, a bad economic situation is considered when the household has difficulties to meet ends. And finally, a risky job situation is reported when the individual reports possibilities to lose the job position during the following 6 months. Due to its subjective nature, these covariates are appropriate to adjust the results into a standardized economic situation.

5.4. Sectorial measures

Sectorial segregation is used in our study to assess gender equality across different working environments. In this case, the survey records the main activity of companies which individuals are working for. Within a list of around five hundred possible answers, our study classifies per sectors according to a forty main sector classification.

Research and development investment is associated to improvement in performance and economic growth (Savrul and Incekara; 2015). Thus investment in R&D is considered a reliable indicator of development both for countries and sectors. Using data reported in the Report of Corporative Innovation in Spain (CEOE, 2017) our sectorial ranking is divided on the forty major sectors in Spain[10]. For regression purposes, we code the variable advanced sector by dividing the ranking in the median, dividing our sample between advanced sectors (more than 90 million € spent in R&D) and traditional sectors(less than 90 million euros spent in R&D).

For further objectives we also divide the sectorial development rank in quartiles resulting in the following categories: very low development sector (less than 25

[9] ”Empresa de Trabajo Temporal” transales into Temporary Employment Agency.

[10] See Table 8 in annex 1.

million euros spent in R&D), low development sector (more than 25 but less than 90 million euros spent in R&D), high development sector (more than 90 but less than 200 million euros spent in R&D) and very high development sector (more than 200 million euros spent in R&D).

Determinant of the consistency in the sectorial analysis, a second development index is used for the sectorial ranking. Digitalization can also be associated to development, thus, using CEOE (2017) data about sectorial digitalization[11], a robustness check is performed by classifying sectors in the following: very low digitalization (tourism and telecommunications), low digitalization (financial services and transport), high digitalization (pharmaceutical, health and energy) and very high digitalization (infrastructure and industry).

6. ECONOMETRIC SPECIFICATION

Using OLS regression methodology, we can assess how the gender relates to the positioning - this analysis is conducted using STATA 14. Firstly, we analyze the simple relationship between them, followed by a sectorial interaction, to conclude how development of a sector affects to the previous relationship.

We model gender relation to boss position according to the following equation:

$$\mathrm{BP}_i = \alpha + \beta \mathrm{W}_i + \delta_j \Sigma X_{ji} + \partial FE_t, + \varepsilon_i$$

Where BP is the measure for positioning of an individual, which is set by 1 if, at least, has one subordinated employee. β is the coefficient of the main explanatory variable – woman – and δ is the coefficient for the set j of covariates X. The coefficient for assumed fixed effects – time and region – is given by ∂. Finally, ε_i stands for the error term of the regression, namely the unobserved heterogeneity in the data that may influence mental health outcome.

Secondly, we model the relation of development of a sector to the previous relationship according to the following equation:

$$\mathrm{BP}_i = \alpha + \beta \mathrm{W}_i + \delta_j \Sigma X_{ji} + \beta \mathrm{S}_i + \beta \mathrm{W}_i \mathrm{S}_i + \partial FE_t, + \varepsilon_i$$

Where S refers to the level of development of the sector that an individual reports.

[11] See Table 8 in annex 1.

The second independent variable is added to measure the impact that exerts on positioning. Applied econometricians have typically allowed for interaction effects between two independent variables; $W_i S_i$ refers to a variable calculated as the simple observation-by-observation product of W and S. We refer to W and S as main terms and to $W_i S_i$ as interaction terms.

7. DESCRIPTIVE ANALYSIS

Table 2 reports the descriptive statistics of variables used in the regression analysis (column 1), contains the mean and standard deviation of the total sample (columns 2 and 3), for a female subsample (columns 4 and 5) and a male subsample (columns 6 and 7). Column 8 reports the p-vale of a t-test performed to check whether the listed variables have a significant mean difference between both subsamples.

Table 1: Descriptive Analysis

	Total		Woman		Man		
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**T-Test**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable							
Boss Position	0,18	0,38	0,13	0,34	0,22	0,41	0,000
High position	0,03	0,17	0,02	0,14	0,04	0,20	0,000
Independent Variables							
Woman	0,46	0,50					
Developed Sector	**0,53**	**0,50**	**0,53**	**0,50**	**0,54**	**0,50**	**0,582**
Very low development	0,13	0,33	0,14	0,35	0,12	0,32	0,099
Low development	0,34	0,47	0,33	0,47	0,34	0,48	0,502
High development	0,28	0,45	0,28	0,45	0,28	0,45	0,838
Very high development	0,25	0,43	0,24	0,43	0,26	0,44	0,342
Control Variables							
Age	40,00	8,07	40	8,1	40	8,05	0,341
Couple	0,80	0,40	0,79	0,41	0,80	0,40	0,036
Children Holder	0,69	0,46	0,72	0,45	0,66	0,47	0,000
Immigrant	0,15	0,36	0,14	0,35	0,16	0,37	0,009
Education level							
Primary or less	0,09	0,28	0,06	0,25	0,1	0,3	0,000
Secondary or PF	0,60	0,49	0,57	0,50	0,64	0,48	0,000
University or more	0,31	0,46	0,37	0,48	0,26	0,44	0,000
Contractual Situation							
Functionary	0,07	0,25	0,08	0,27	0,06	0,23	0,000
Indefinite	0,60	0,49	0,61	0,49	0,59	0,49	0,009
Temporal	0,13	0,33	0,14	0,34	0,12	32,00	0,001
Temporal contract via ETT	0,00	0,06	0,00	0,07	0,00	0,05	0,111
No contract	0,02	0,03	0,02	0,15	0,01	0,1	0,000
Autonomus or Entrepreneur	0,17	0,38	0,13	0,33	0,21	0,41	0,000
Overall Healthy	**0,95**	**0,21**	**0,95**	**0,22**	**0,96**	**0,2**	**0,011**
Mental Health	0,99	0,10	0,98	0,12	0,99	0,08	0,000
Phisical Health	0,96	0,19	0,96	0,2	0,96	0,19	0,372
Bad economic Situation	0,36	0,48	0,37	0,48	0,36	0,48	0,213
Risky job situation	0,13	0,34	0,13	0,34	0,13	34	0,788
Number of observations	12252		6700		7941		

Source: Own results from ESCA Data Base

Notes: Positioning variables are measured by boss if it has at least one employee at it's charge, while high position is more than 10 subordinated employees. Variable development of the sector has been ranked using CEOE 2014 Report by the investment in R&D of each sector, and a quartile split leads to the categories.Is considered immigrant if it has not registered the spanish nationality. When a person has not been diganosed by a doctor with any mental desease is considered Mental Healthy. When the person does not suffer Limited Capacities, Disability or lack of Own Authonomy is considered Pisically Healthy. Bad Economic situation is considered when the observation has got problems to meet ends(75% of the sample has answered the question). While a Risky Job situation means that the person considers chances to lose it's actual job during the following 6 months.

Our data is well spread between genders, having almost half man (54%) and half woman (46%), therefore the results on the subsample comparison are consistent. To highlight some of the key factors, we can see how just an 18% of our sample has employees at their charge (having a 0.18 mean where the values of the variable are 0 to 1).

The sample spans for the Prime Working Age, with a mean on 40 years old individuals. Besides, in the mean population around 80% and 70% people have a couple and children respectively, as expected. As a health status the vast majority (95%) declare a good overall health status and we can account for a higher propensity to be rather mentally than physically healthy (99% and 96% respectively).

On an educational perspective, a tendency towards middium studies is clearly defined (60%). While a small fraction states primary as the higher level achieved (9%), there is a 31% of the sample having reached university degrees or higher. Consecutively, we can see a higher inclination for fixed contracts (60%) followed by a 17% of own workers and a 13% temporal contracts in contractual situation. A 64% of the set do not have any troubles to meet ends and just a 13% are considered in risk to lose their job.

In sectorial variables, having a 17% of the sample answers, an even distribution is reported. Apart from the lowest development sectors which have less observations, a propensity towards mid-range development sectors is shown - with a 62% of the sample working between Low and High development sectors - followed by a quarter of the sample on the very high developed sectors. With p-values over 0,05 is fair to conclude that there is a spread sample which does not relate the gender with the development of the sector where the respondent works.

Relevant differences between genders are reported on both positioning variables and p-values on the two sample T-Test are smaller than 0.05; stating the significance of the gap. Spending a bit more time with the Boss Position variable, a 33% woman and 66% man proportion is reported; although the Spanish rate is around 14% for executive women (CEOE, 2019). This fact could be caused by a biased sample, or could be due to a contrast between Catalan and Spanish culture.

Concerning control variables, interesting facts are revealed, both in age and satisfaction at work a direct relation with the variable gender is not seen. Otherwise, the fact of being immigrant notes a p-value (0,03) under the significance level, what means for man a higher possibility to be immigrant.

Educational biases, reporting 0 p-values, state a significant relation with gender. While man show higher possibilities of ending educational career on primary and secondary, women have more possibilities to reach university or more. This fact can be interpreted as women needing more studies to expect a similar working position which a man could expect with lower studies.

Contractual situation reports disparities between genders in all the kinds of contracts but ETTs. While women have higher chances to work with functionary, indefinite, temporal or no contracts, they have less opportunities, compared to men, of working as Autonomous or Entrepreneurs.

In contrast, men tend to have worse health, confirmed by p-values. Overall health is inclined against man, because of a major risk of having mental health illnesses. Nevertheless, physical health has no relation with the gender. Finally, when taking into account Economic situation or the Risk to lose a job, we do not state a direct relation with gender. Supported by the effect of a majority of households tending to have both a man and a woman, equitable answers were expected.

8. ECONOMETRIC ANALYSIS

8.1. Positioning OLS regression

To assess the effect of being women on the probability of having a boss position, we develop a regression Ordinary Least Squares (OLS) Regression analysis with the convenient specifications. To account for relevant characteristics of the sample, specifications include sets of control variables to minimise omitted variable bias. Table 2 contains the regression set of the effect of women over boss-position. The main relationship is stated and appropriate sample adjustments are consecutively implemented. The estimation is statistically significant, and states a negative coefficient, meaning that being a woman reduces the probability of working as a boss independently of the set of covariates included.

Table 2: OLS regression (boss position by woman)

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0847***	-0.0844***	-0.0955***	-0.0810***	-0.0817***	-0.0733***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Observations	12,252	12,251	12,251	12,251	11,794	8,795
R-squared	0.012	0.034	0.047	0.071	0.071	0.086
Demographics	No	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

According to Table 2 we can affirm of there is a negative relationship sustained in the 6 regressions so we state than women have worse opportunities to be promoted into boss positions with a confidence level of 99%. Yet, due to limitations in the data set, detailed information about the characteristics of the sample implies a reduction in the sample size. However, the r-squared increases through including covariates, resulting in a 8,6% explanation of the relationship.

The initial correlation coefficient reported in column 1 decreases in magnitude as we control more variables, ending in a 99% statistically significant negative 7,3 pp in column 6. According to these results, being a women reduces by 7,3 percentage points the probability of reaching a position with subordinated employees. Note that due to the cross-sectional nature of our data, we cannot interpret this result as a causal effect.

Moreover, by exploring the differences across regressions, we can notice three notable changes in woman coefficient coming from the inclusion of educational covariates (from column 2 to 3), contractual situation (from column 4 to 5) and fixed effects (from column 5 to 6).

Firstly, educational level covariate in the regression (column 3) increases the inequality between genders by more than a percentage point. This behaviour is expected due to the significant educational differences reported on the descriptive analysis. The fact of women having higher studies than men in similar jobs influences the inequality to increase when the level of studies between genders is considered.

Secondly, adding contractual covariates (column 4) the coefficient produces a reduction on the slope, due to men tending to achieve more own contractual situation while women tend to work for third parties. Taking into account the higher likeliness to have subordinated employees on entrepreneur situations, there was a bias toward women having worse possibilities than men[11]. Adding this covariate with the referent fixed contracts corrects the bias resulting in lower discrimination.

Finally, with robustness purposes, fixed effect covariates are computed (column 6) along with the bad economic situation variable. Despite the decrease of the sample size, the result increases consistency as reported by the gain on the R-squared which confirms that all sets of covariates are helping to better explain the relation.

Supplementary Table 9[12] contains a convenient summary of the correlation coefficients for each of the covariates. Statistically significant influences are found in age, having couple and own contractual situations. Such effects may be caused because of age (1,7pp) being associated to expertise, couple (4,2pp) as sign of a stable situation and entrepreneur (12,4pp) subject to the decision power inside the company.

On the other hand, immigrant status (-4,1pp) exerts a negative index towards promotion, what is often due to lack of experience on the geographical market. Primary (-10,4pp) and Secondary (-8,4pp) education result in negative significant coefficients when being compared to University or higher educational levels. Furthermore, all types of contracts but entrepreneurs are reporting significant negative influence in comparison to the omitted category - fixed contract. Finally, a negative tendency with risky labour situations (-2,9pp) and bad economy (-5,1pp) are also prevailing. These effects are expected since the criteria used to select omitted variables have been by estimating a standard individual's situation.

8.2. Sectorial OLS regression

Evidence is shown on the negative relationship between woman and the possibilities to become a boss. Secondly, this study aims to explore whether such negative relationship is altered depending on the development of each sector. The hypothesis states that more advanced sectors are also more gender-egalitarian.

[12] See Table 9 in annex 2.

Therefore we expect to find a significant reduction of the women coefficient in more developed sectors. The subsample accounts for sectorial information from 2017 to 2018, with approximately 2000 observations due to data limitations. Note that this subsample is more recent, what enables an evolution comparison of gender equality during this decade. Table 3 reports 7 multiple regressions with interaction effects that illustrate our estimation, and tests second hypothesis.

Table 3: OLS regression (boss position by woman with sector interaction)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0524***	-0.0426*	-0.0422*
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.024)	(0.024)
Advanced Sector					-0.0305*	-0.0221	-0.0268
					(0.016)	(0.022)	(0.022)
Woman + Advanced Sector						-0.0185	-0.0214
						(0.032)	(0.032)
Observations	2,059	2,058	2,058	2,058	2,049	2,049	2,049
R-squared	0.005	0.025	0.048	0.091	0.093	0.093	0.131
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, higher half is considered Developed. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

Table 3 shows a major change in respect to Table 2, the coefficients across all regressions report a notable decrease. Oscillating between 4 and 5 negative percentage points, a decline of around 3 percentage points is stated in the gender gap. Accounting for the subsample temporal characteristics, this fact is suggesting that the unexplained gender gap has been slightly addressed during the period 2011 to 2016.

A parallel pattern to the previous regression analysis is reported from column 1 to 4, having a notable increase when including educational covariates and a reduction in magnitude when accounting for contractual situation. In column 5, including advanced sector effects, it suggests that on the developed sectors the probability to work in a boss position decreases by 3 pp in comparison to traditional ones, with a 90% of confidence level. However, the main variable coefficient is not affected by the covariate inclusion. To test our hypothesis, the interaction effect is implemented in column 6, which results in no statistical significances. Despite that the standard error of the main coefficient of women also grows, the R-squared also increases into a 13,1% of relationship explained by the model. We conclude that our sectorial

classification does not exert any influence on promotion, as captured by columns 6 and 7. In our case, we reject H2: "Advanced Sectors offer better gender equality" and conclude that the gender gap is equally spread across developed and traditional sectors.

8.3. Quartile Sectorial OLS regression

Providing further econometric evidence of the relation between development of a sector and gender gap, a third set of OLS regressions accounts for a set of variables measuring the sectorial development level. Using a quartile split on the ranking of research and development investment, four categories are included on the model in Table 4. By exploring more detailed variables on development of the sector, we expect to give consistency to previous results and reveal more sectorial information.

Table 4 contains the same subsample and covariates than Table 3, resulting in exact same results until column 4. Despite having the highest ending r-squared (14,4%) and ending in a negative 8 pps statistically significant at 90%, this model does not determine consistency to the previous regressions set in Table 3, because of the disparity of results in columns 5 to 7.

Table 4: OLS regression (boss position by women with sectorial ranking interaction)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0575***	-0.0696	-0.0804*
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.044)	(0.044)
Low R&D investment					-0.1366***	-0.1496***	-0.1539***
					(0.026)	(0.037)	(0.037)
High R&D investment					-0.1418***	-0.1408***	-0.1572***
					(0.027)	(0.038)	(0.038)
Very High R&D investment					-0.1138***	-0.1228***	-0.1225***
					(0.027)	(0.038)	(0.038)
woman + Low development Sector						0.0262	0.0421
						(0.052)	(0.052)
Woman + High development Sector						-0.0048	0.0033
						(0.053)	(0.053)
Woman + Very High development Sector						0.0179	0.0268
						(0.054)	(0.054)
Observations	2,059	2,058	2,058	2,058	2,058	2,058	2,058
R-squared	0.005	0.025	0.048	0.091	0.105	0.105	0.144
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, a quartile split defines the level of development. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Developed in sectorial rank.

Source: Own elaboration with ESCA data

Coinciding with Table 3, interaction effects report no statistical significance (column 6) validating the rejection of H2 and the spread gender gap across sectors with different levels of development, indicating that our sectorial classification is not affecting gender equality. Nevertheless, note that sectorial variables report 99% of significance level with negative coefficients across them. This fact suggests that all development levels offer a higher gender gap than the referent category "Very Low R&D investment". This influence may be explained by the sectorial segregation, tending to have more women in lower development sectors, what translates into higher gender equality.

9. ROBUSTNESS CHECKS

We perform a series of robustness checks to provide further statistical evidence of the relationships studied between gender, positioning and development of a particular sector. To verify consistency on the previous results, we perform equally structured set of regressions using a different positioning measure to compare similarities in their patterns. In addition, we execute the regression set using digitalization as development measure, which accounts for sectorial results consolidation. Finally, we perform a statistical check by using a logistical model[13].

9.1. Positioning Robustness Check

Aiming to explore if the negative relationship between woman and boss position prevails across higher levels of positioning, the variable high position is used as the independent variable in the previous regression model. Defined as 1 if the individual accounts for the charge of 10 or more employees, and 0 otherwise, we expect to find a similar behavior than in the previous regression sets.

In this specification, the coefficients decrease compared to Table 2, which uses the same model with mid-range positioning. Such contrast is paired to a reduction of the constant, what suggests a decrease in opportunities for both genders, not as a minor gender gap. Note the increase of the coefficient when including contractual covariates due to a change on the influence of own contracts from positive (Table 9[14]) to negative in Table 12[14].

[13] See Table 16 in annex 3.

[14] See tables in annex 3.

Table 5: OLS regression (high position by women)

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0209***	-0.0208***	-0.0256***	-0.0276***	-0.0283***	-0.0240***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Observations	12,252	12,251	12,251	12,251	11,794	8,795
R-squared	0.004	0.009	0.020	0.028	0.028	0.036
Demographics	No	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

In higher positioning, Table 12 shows how the referent classification – fixed contract – is offering the higher possibilities in positioning terms, while in intermediate position – Table 2 - entrepreneur gives higher possibilities than fixed contract. Despite column 4, woman coefficient follows a similar pattern as its equivalent regression set reinforcing results extracted from Table 2. In Table 13 and 14, in Annex 3 similar patterns through coefficients as their equivalents using boss position (Tables 10 and 11) are evidenced. Despite the fact of the different influence on contractual situation, the results are proven to be statistically strong.

9.2. Sectorial Robustness Check

We apply the digitalization per sector (CEOE, 2017) as a development measure, aiming to further confirm that sectorial development does not influence gender equality through a different classification. Provided by the same model than Table 4, Table 6 reports the effect of sectorial digitalization over the gender gap on positioning.

Concerning digitalization classifications the higher levels do not affect significantly the coefficient. We do see a significant impact of negative -7 pps in low digitalization level. However, according to interactions, there is no statistical significance affecting the main relationship.

Table 6: OLS regression (boss position by women with digitalization interactions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0476***	-0.0240	-0.0291
	(0.017)	(0.017)	(0.017)	(0.016)	(0.017)	(0.041)	(0.041)
Low Digitalization					-0.0755***	-0.0803**	-0.0776**
					(0.028)	(0.039)	(0.039)
High Digitalization					-0.0144	-0.0091	-0.0022
					(0.024)	(0.029)	(0.029)
Very High Digitalization					0.0121	0.0310	0.0446
					(0.023)	(0.030)	(0.030)
woman + Low Digitalization						-0.0046	-0.0033
						(0.057)	(0.057)
Woman + High Digitalization						-0.0194	-0.0113
						(0.052)	(0.052)
Woman + Very High Digitalization						-0.0463	-0.0447
						(0.049)	(0.049)
Observations	2,059	2,058	2,058	2,058	2,058	2,058	2,058
R-squared	0.005	0.025	0.048	0.091	0.097	0.097	0.136
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Variable Developed sector is ranked using CEOE 2017 Report by digitalization per sector, a quartile split defines the level of development. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Digitalized in sectorial rank.

Source: Own elaboration with ESCA data

Despite further research should be done, two reliable development measures of a sector have been applied and no statistically significant relationship has been evidenced. Consequently, we conclude that the unexplained gender gap on positioning is equally spread across sectors in different development levels.

9.3. Logistic Robustness Check

Although we have applied OLS regression with explanatory purposes, the logistic regression in Table 16[15] confirms the consistency of the previous analysis results. Table 16 reports negative coefficients for women, matching the linear regression results. Further, coefficients for all sets of covariates match the sign in both OLS and logistic regressions. Table 16[15] provides further econometric evidence of the negative relation between the variables women and boss position. Besides, by reporting no statistical significance on interactions, the results support the weak effect of sector development over gender equality.

[15] See Table 16 in annex 3.

10. CONCLUSIONS

The female gender negatively associated to working in a job with subordinated employees. In this study, we evidence how women tend to have worse promotion opportunities in intermediate positions, and further evidence suggests that this disparity is held across all levels of positioning. Moreover, using various reliable indexes, we consider that such relationship is not related to the development of a certain sector.

We account for individual characteristics and labor related aspects. Measuring positioning from different angles, the negative relationship prevails statistically strong - both intermediate and high positioning show to be significant at the 99% confidence level. In particular, we can see how demographic aspects as age, nationality and having a couple positively affect the likelihood to promote. Further, considerable positive correlations are shown for university studies or higher, safe job and good economic situation. Surprisingly, being self-employed, while considerably improving the possibilities to get an intermediate position, affects negatively to achieve higher positions.

Appliances for the sectorial development analysis remain unproven, considerable evidence is reporting that sector development does not have an influence on gender equality; at least for our classifications. By the appliance of two major measures of development – research and development investment and digitalization – strength of the reasonably similar gap across sectors is exposed. Nevertheless, the sectorial analysis results, evidence that sectors with less research and development investment, offer better gender equality with a 99% of confidence level.

Note that in this study we are unable to assess the causal effect of sector development on gender gap, since the interaction effects model usually requires for a larger sample size, that we cannot control due to limitations in the data set.

According to our results, appliance of gender quota policies on higher positioning would reduce the gender gap on promotion and consequently equally spread intermediate positions between both genders. Further investigation is demanded on establishing the relationship between gender and the likelihood to be an entrepreneur, as well as the educational levels, due to the high effects that exert on our positioning relationship.

11. ACWKNOLEDGEMENTS

I would like to thank the members of Health Department of Catalonia for offering the ESCA data, and all the people involved in its facilitation to me. I would like to give a special acknowledgement to my tutor Dr Helena Hernandez Pizarro, for all her guidance and advice, which has helped me in the elaboration of this project. And also thank the court for giving me advice to improve the final result.

.

12. BIBLIOGRAPHICAL REFERENCES

CEOE *(2019) Analisis de la Brecha Salarial en España*

Ana Llorà Bach (2018) *Comparison of gender inequalities on the labour market of Catalonia*
Universitat Oberta de Catalunya

Andew Kakabadse, Rita Goyal, Nada Kakabadse (2018) *Value-creating Boards – Diversity and Evolved Processes*
Journal of Creating Value

Emmanuela Lombardo (2015) *Políticas de igualdad de género y sociales en España: origen, desarrollo y desmantelamiento en un contexto de crisis económica*
Universidad Complutense de Madrid

Ariane Hegewisch, Heidi Hartmann (2014) *Occupational Segregation and the Gender Wage Gap: A Half Done job.* Cornell University

Kensbock and Kollmann (2016) *European Startup Monitor*
German Starups Asociation

Saskia Vossenberg (2013) *Women Entrepreneurship Promotion in Developed Countries: What Explains the Gender Gap in entrepreneurship and how to close it?*
Maastricht School of Management

Siri Terjesen, Ruth Aguilera and Ruth Lorenz (2015) *Legislating a Woman's Seat on the Board: Institutional Factors Driving Gender Quotas for Boards of Directors*
Journal of Business Ethics

Siri Terjesen and Eduardo Couto (2015) *Does the presence of independent and female directors impact firm performance? A multi-country study of board diversity*
Journal of Business Ethics

Reidar Strom (2010) *Governance and Politics: Regulating Independence and Diversity in the Board Room*
Journal of Business Ethics

CEOE (2017) *Plan Digital 2020: la digitalización de la sociedad española*

Mesut Savrul and Ahmet Incekara (2015) *The Effect of R&D Intensity on Innovation Performance: A Country Level Evaluation*
Procedia Social and Behavioral Sciences

CEOE (2014) *El estado de la Innovación Sectorial en España*

Celia Valiente (1995) *State feminism and gender equality policies: the case of Spain*

Octavia Salazar Benitez (2016) *The Fragility of Gender Equality Policies in Spain.*
University of Cordova

Saadia Zahidi, Herminia Ibarra (2010) *The Corporate Gender Gap Report 2010.* 2010
World Economic Forum

Mirian Izquierdo, Morten Huse, Hannah Möltner (2016) *Value Creating Boards and Gender Diversity: Suggestions to progress in getting women on boards in Spain.* BI Norwegian Business School

Sonia Taneja, Mildred Golden, Jennfer Oylen (2012) *Empowerment and Gender Equality: The Retention and Promotion of women in Workforce.* Journal of Business Diversity

Héctor Hernández (2014) *The 2010 EU industrial R&D investment SCOREBOARD* Joint Research Centre European Comission

Louis N.Christofides, Alexandros Polycarpou , Konstantinos Vrachimis (2013) *Gender Wage Gap,"Sticky Floors" and "Glass Ceilings" in Europe.* University of Cyprus

Martin Bugeja, Zoltan P. Matolcsy, Helen Spiropoulos (2012) *Is there a Gender Gap in CEO compensation?* University of Technology, Sydney

David A.Matsa, Amalia R.Miller (2011) *Chipping Away the Glass Ceiling: Gender Spillovers in Corporate Leadership.* RAND Labour and Population

Marianne Bertrand, Claudia Goldin, Lawrence F. Katz (2009) *Dynamics of the Gender Gap for young professionals in the corporate and financial sectors.* National Bureau of Economic Research

Musa Pinar, Michael K. McCuddy, Ibrahim Birkan, Metin Kozac (2009) *Gender diversity in the hospitality industry: An empirical study in Turkey.* College Valparaiso University

Juan D. Barón (2008) *Occupational Segregation and the Gender Wage Gap in Private- and Public-SectorEmployment: A Distributional Analysis.* Australian National University

Irene E.De Pater, Annelies E.M. VanVianen, Myriam N. Bechtoldt (2010) *Gender Differences in Job Challenge: A Matter of Task Allocation.* Univesity of Amsterdam

Renée Adams, Patricia Funk (2009) *Beyond the Glass Ceiling: Does the Gender Matter?* Universitat Pompeu Fabra

David Purcell, Kelly Rhea, Sarah Stamblanet (2010) *Gender and the Glass Ceiling at Work.* Kent State University

David W. Johnston (2011) *Climbing the Job Ladder: New Evidence of Gender Inequality.* Econstor

Rosario Zurriaga (2019) *Motivation and Active Job Search Behaviour in Young People: Gender Differences.* University of Valencia

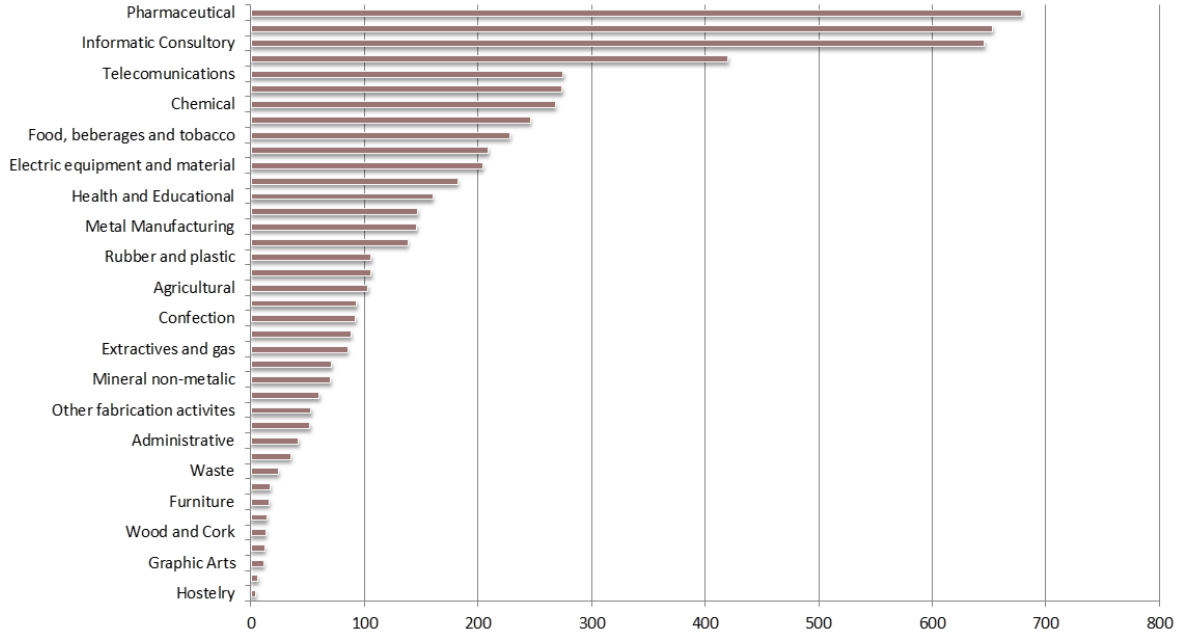
CEOE (2020) *Observatorio del mercado laboral*

Maria Callejón and Jose Garcia Quevedo (2000) *Economía y Política del Cambio Tecnológico en la Industria de Cataluña*
Universitat de Barcelona

Agustí Segarra-Belasco (2008) *Innovation and productivity in manufacturing and service firms in Catalonia: a regional approach*
Routledge

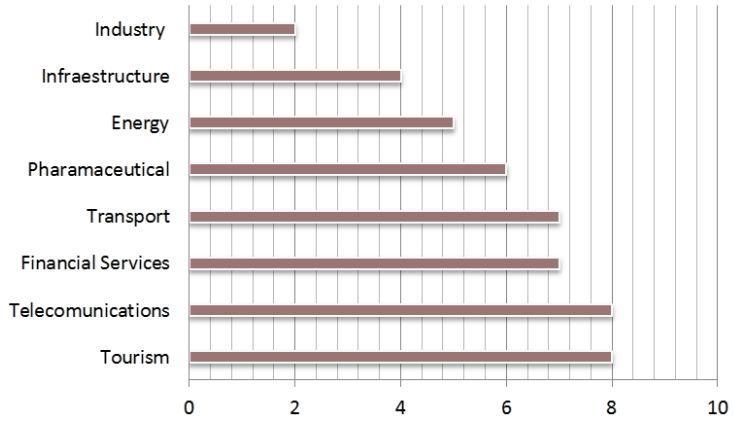
Annex 1

Table 7: sectorial R&D investment 2011



Source: CEOE, 2014

Table 8: sectorial digitalization 2017



Source: CEOE, 2014

Annex 2

Table 9: OLS regression (boss position by woman)

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0847***	-0.0844***	-0.0955***	-0.0810***	-0.0817***	-0.0733***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Age		0.0246***	0.0233***	0.0191***	0.0202***	0.0170***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age2		-0.0003***	-0.0002***	-0.0002***	-0.0002***	-0.0002***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0203	0.0125	0.0033	-0.0001	0.0030
		(0.016)	(0.016)	(0.016)	(0.016)	(0.018)
Non spanish nationality holder		-0.0889***	-0.0751***	-0.0560***	-0.0568***	-0.0414***
		(0.010)	(0.010)	(0.010)	(0.010)	(0.011)
Cohabiting with a couple		0.0541***	0.0510***	0.0440***	0.0432***	0.0427***
		(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Children holder		0.0011	0.0061	0.0069	0.0066	0.0064
		(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
Primary or less			-0.1316***	-0.1257***	-0.1268***	-0.1040***
			(0.013)	(0.013)	(0.014)	(0.016)
Secondary or PF			-0.0847***	-0.0903***	-0.0902***	-0.0841***
			(0.008)	(0.008)	(0.008)	(0.009)
Functionary contract				-0.0760***	-0.0781***	-0.0934***
				(0.014)	(0.014)	(0.016)
Temporal contract				-0.0734***	-0.0633***	-0.0439***
				(0.011)	(0.011)	(0.013)
Temporal contract via ETT				-0.1009*	-0.0955	-0.0903
				(0.056)	(0.060)	(0.063)
No contract				-0.1060***	-0.1019***	-0.0861***
				(0.027)	(0.028)	(0.032)
Autonomous or entrepreneur contract				0.1194***	0.1176***	0.1244***
				(0.009)	(0.009)	(0.011)
There is a risk to lose the work					-0.0304***	-0.0288**
					(0.011)	(0.014)
Bad Economical situation at home						-0.0509***
						(0.009)
Observations	12,252	12,251	12,251	12,251	11,794	8,795
R-squared	0.012	0.034	0.047	0.071	0.071	0.086
Demographics	No	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

Table 10: OLS regression (boss position by woman with sectorial interaction)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0524***	-0.0426*	-0.0422*
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.024)	(0.024)
Age		0.0338***	0.0320***	0.0269**	0.0268**	0.0267**	0.0292***
		(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Age2		-0.0004***	-0.0003***	-0.0003**	-0.0003**	-0.0003**	-0.0003**
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0531*	0.0442	0.0447	0.0440	0.0439	0.0378
		(0.030)	(0.030)	(0.029)	(0.029)	(0.029)	(0.030)
Non spanish nationality holder		-0.0607***	-0.0483**	-0.0402*	-0.0431*	-0.0433*	-0.0291
		(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)
Cohabiting with a couple		0.0343	0.0247	0.0182	0.0182	0.0185	0.0181
		(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Children holder		0.0147	0.0251	0.0268	0.0271	0.0269	0.0232
		(0.020)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)
Primary or less			-0.1406***	-0.1302***	-0.1309***	-0.1313***	-0.1223***
			(0.037)	(0.036)	(0.036)	(0.036)	(0.038)
Secondary or PF			-0.1222***	-0.1285***	-0.1329***	-0.1331***	-0.1314***
			(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Functionary contract				-0.1350***	-0.1423***	-0.1411***	-0.1519***
				(0.035)	(0.035)	(0.036)	(0.036)
Temporal contract				-0.0784***	-0.0808***	-0.0813***	-0.0614**
				(0.026)	(0.026)	(0.026)	(0.026)
Temporal contract via ETT				-0.0908	-0.0924	-0.0946	-0.0327
				(0.129)	(0.129)	(0.129)	(0.131)
No contract				-0.1227*	-0.1283*	-0.1293*	-0.1025
				(0.070)	(0.070)	(0.070)	(0.071)
Autonomous or entrepreneur contract				0.1636***	0.1621***	0.1615***	0.1532***
				(0.022)	(0.022)	(0.022)	(0.023)
Advanced Sector					-0.0305*	-0.0221	-0.0268
					(0.016)	(0.022)	(0.022)
Woman + Advanced Sector						-0.0185	-0.0214
						(0.032)	(0.032)
Bad Economical situation at home							-0.0639***
							(0.019)
Observations	2,059	2,058	2,058	2,058	2,049	2,049	2,049
R-squared	0.005	0.025	0.048	0.091	0.093	0.093	0.131
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, higher half is considered Developed. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

Table 11: OLS regression (boss position by woman with sectorial ranking interactions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0575***	-0.0696	-0.0804*
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.044)	(0.044)
Age		0.0338***	0.0320***	0.0269**	0.0289***	0.0287***	0.0313***
		(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Age2		-0.0004***	-0.0003***	-0.0003**	-0.0003**	-0.0003**	-0.0003***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0531*	0.0442	0.0447	0.0411	0.0403	0.0355
		(0.030)	(0.030)	(0.029)	(0.029)	(0.029)	(0.030)
Non spanish nationality holder		-0.0607***	-0.0483**	-0.0402*	-0.0581**	-0.0589**	-0.0453*
		(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)
Cohabiting with a couple		0.0343	0.0247	0.0182	0.0189	0.0191	0.0180
		(0.022)	(0.022)	(0.022)	(0.021)	(0.021)	(0.021)
Children holder		0.0147	0.0251	0.0268	0.0281	0.0283	0.0250
		(0.020)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)
Primary or less			-0.1406***	-0.1302***	-0.1419***	-0.1436***	-0.1348***
			(0.037)	(0.036)	(0.036)	(0.036)	(0.038)
Secondary or PF			-0.1222***	-0.1285***	-0.1393***	-0.1400***	-0.1398***
			(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Functionary contract				-0.1350***	-0.1165***	-0.1147***	-0.1237***
				(0.035)	(0.036)	(0.036)	(0.036)
Temporal contract				-0.0784***	-0.0810***	-0.0814***	-0.0590**
				(0.026)	(0.025)	(0.026)	(0.026)
Temporal contract via ETT				-0.0908	-0.0823	-0.0846	-0.0218
				(0.129)	(0.128)	(0.128)	(0.130)
No contract				-0.1227*	-0.1095	-0.1132	-0.0868
				(0.070)	(0.070)	(0.070)	(0.071)
Autonomous or entrepreneur contract				0.1636***	0.1604***	0.1587***	0.1495***
				(0.022)	(0.022)	(0.022)	(0.023)
Low R&D investment					-0.1366***	-0.1496***	-0.1539***
					(0.026)	(0.037)	(0.037)
High R&D investment					-0.1418***	-0.1408***	-0.1572***
					(0.027)	(0.038)	(0.038)
Very High R&D investment					-0.1138***	-0.1228***	-0.1225***
					(0.027)	(0.038)	(0.038)
woman + Low development Sector						0.0262	0.0421
						(0.052)	(0.052)
Woman + High development Sector						-0.0048	0.0033
						(0.053)	(0.053)
Woman + Very High development Sector						0.0179	0.0268
						(0.054)	(0.054)
Bad Economical situation at home							-0.0648***
							(0.019)
Observations	2,059	2,058	2,058	2,058	2,058	2,058	2,058
R-squared	0.005	0.025	0.048	0.091	0.105	0.105	0.144
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, a quartile split defines the level of development. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Developed in sectorial rank.

Source: Own elaboration with ESCA data

Annex 3

Table 12: OLS regression (high position by woman)

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0209***	-0.0208***	-0.0256***	-0.0276***	-0.0283***	-0.0240***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Age		0.0050**	0.0045**	0.0045**	0.0049**	0.0032
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age2		-0.0001**	-0.0000*	-0.0000	-0.0000*	-0.0000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0015	-0.0016	-0.0008	-0.0032	-0.0095
		(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Non spanish nationality holder		-0.0180***	-0.0124***	-0.0106**	-0.0112**	-0.0079
		(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Cohabiting with a couple		0.0112***	0.0100**	0.0102**	0.0102**	0.0083*
		(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Children holder		0.0007	0.0028	0.0029	0.0038	0.0037
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Primary or less			-0.0517***	-0.0521***	-0.0522***	-0.0414***
			(0.006)	(0.006)	(0.006)	(0.007)
Secondary or PF			-0.0386***	-0.0388***	-0.0394***	-0.0336***
			(0.003)	(0.004)	(0.004)	(0.004)
Functionary contract				-0.0161**	-0.0158**	-0.0175**
				(0.006)	(0.006)	(0.007)
Temporal contract				-0.0201***	-0.0192***	-0.0124**
				(0.005)	(0.005)	(0.006)
Temporal contract via ETT				-0.0261	-0.0278	-0.0203
				(0.026)	(0.028)	(0.029)
No contract				-0.0219*	-0.0222*	-0.0129
				(0.012)	(0.013)	(0.014)
Autonomous or entrepreneur contract				-0.0386***	-0.0392***	-0.0333***
				(0.004)	(0.004)	(0.005)
There is a risk to lose the work					-0.0021	0.0007
					(0.005)	(0.006)
Bad Economical situation at home						-0.0193***
						(0.004)
Observations	12,252	12,251	12,251	12,251	11,794	8,795
R-squared	0.004	0.009	0.020	0.028	0.028	0.036
Demographics	No	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable High Position is defined by 1 if in the current job has at least ten subordinated employees or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

Table 13: OLS regression (high position by woman with sectorial interaction)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0208***	-0.0196**	-0.0260***	-0.0276***	-0.0284***	-0.0322***	-0.0296**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)
Age		0.0093*	0.0085*	0.0084	0.0083	0.0083	0.0087*
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Age2		-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0229	0.0187	0.0164	0.0158	0.0159	0.0152
		(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Non spanish nationality holder		-0.0190*	-0.0132	-0.0099	-0.0101	-0.0100	-0.0133
		(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Cohabiting with a couple		0.0056	0.0011	0.0012	0.0010	0.0009	0.0004
		(0.011)	(0.011)	(0.011)	(0.010)	(0.010)	(0.011)
Children holder		0.0025	0.0074	0.0057	0.0054	0.0055	0.0060
		(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Primary or less			-0.0667***	-0.0686***	-0.0678***	-0.0676***	-0.0618***
			(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Secondary or PF			-0.0572***	-0.0596***	-0.0589***	-0.0588***	-0.0567***
			(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Functionary contract				-0.0533***	-0.0532***	-0.0537***	-0.0551***
				(0.017)	(0.017)	(0.017)	(0.018)
Temporal contract				-0.0249**	-0.0251**	-0.0249**	-0.0199
				(0.012)	(0.012)	(0.012)	(0.013)
Temporal contract via ETT				-0.0176	-0.0180	-0.0171	0.0076
				(0.063)	(0.063)	(0.063)	(0.064)
No contract				-0.0277	-0.0281	-0.0277	-0.0148
				(0.034)	(0.034)	(0.034)	(0.035)
Autonomous or entrepreneur contract				-0.0457***	-0.0455***	-0.0453***	-0.0452***
				(0.011)	(0.011)	(0.011)	(0.011)
Advanced Sector					-0.0032	-0.0065	-0.0040
					(0.008)	(0.011)	(0.011)
Woman + Advanced Sector						0.0071	0.0042
						(0.016)	(0.016)
Bad Economical situation at home							-0.0124
							(0.009)
Observations	2,059	2,058	2,058	2,058	2,049	2,049	2,049
R-squared	0.003	0.010	0.032	0.044	0.044	0.044	0.064
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable High Position is defined by 1 if in the current job has at least 10 subordinated employees or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, higher half is considered Developed. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education and Fixed contracts on contractual Situation.

Source: Own elaboration with ESCA data

Table 15: OLS regression (high position by woman with sectorial ranking interactions)

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0208***	-0.0196**	-0.0260***	-0.0276***	-0.0287***	-0.0345
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.022)
Age		0.0093*	0.0085*	0.0084	0.0088*	0.0092*
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Age2		-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0229	0.0187	0.0164	0.0156	0.0144
		(0.015)	(0.014)	(0.014)	(0.014)	(0.015)
Non spanish nationality holder		-0.0190*	-0.0132	-0.0099	-0.0135	-0.0163
		(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Cohabiting with a couple		0.0056	0.0011	0.0012	0.0013	0.0009
		(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Children holder		0.0025	0.0074	0.0057	0.0059	0.0061
		(0.010)	(0.009)	(0.009)	(0.009)	(0.010)
Primary or less			-0.0667***	-0.0686***	-0.0711***	-0.0634***
			(0.018)	(0.018)	(0.018)	(0.019)
Secondary or PF			-0.0572***	-0.0596***	-0.0616***	-0.0592***
			(0.009)	(0.009)	(0.009)	(0.009)
Functionary contract				-0.0533***	-0.0486***	-0.0510***
				(0.017)	(0.017)	(0.018)
Temporal contract				-0.0249**	-0.0253**	-0.0194
				(0.012)	(0.012)	(0.013)
Temporal contract via ETT				-0.0176	-0.0156	0.0112
				(0.063)	(0.063)	(0.064)
No contract				-0.0277	-0.0244	-0.0106
				(0.034)	(0.034)	(0.035)
Autonomous or entrepreneur contract				-0.0457***	-0.0462***	-0.0453***
				(0.011)	(0.011)	(0.011)
Low R&D investment					-0.0294**	-0.0322*
					(0.013)	(0.018)
High R&D investment					-0.0280**	-0.0359*
					(0.013)	(0.019)
Very High R&D investment					-0.0216	-0.0180
					(0.013)	(0.019)
Bad Economical situation at home						-0.0133
						(0.009)
Observations	2,059	2,058	2,058	2,058	2,058	2,058
R-squared	0.003	0.010	0.032	0.044	0.047	0.069
Demographics	No	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes
Bad Economic Situation	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable High Position is defined by 1 if in the current job has at least ten subordinated employees or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, a quartile split defines the level of development. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Developed in sectorial rank.

Source: Own elaboration with ESCA data

Table 15: OLS regression (boss position by woman with digitalization ranking interactions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.0550***	-0.0518***	-0.0653***	-0.0525***	-0.0476***	-0.0240	-0.0291
	(0.017)	(0.017)	(0.017)	(0.016)	(0.017)	(0.041)	(0.041)
Age		0.0338***	0.0320***	0.0269**	0.0279***	0.0280***	0.0309***
		(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Age2		-0.0004***	-0.0003***	-0.0003**	-0.0003**	-0.0003**	-0.0003***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Good overall health		0.0531*	0.0442	0.0447	0.0452	0.0450	0.0396
		(0.030)	(0.030)	(0.029)	(0.029)	(0.029)	(0.030)
Non spanish nationality holder		-0.0607***	-0.0483**	-0.0402*	-0.0524**	-0.0524**	-0.0395*
		(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)
Cohabiting with a couple		0.0343	0.0247	0.0182	0.0200	0.0198	0.0184
		(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Children holder		0.0147	0.0251	0.0268	0.0250	0.0251	0.0214
		(0.020)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)
Primary or less			-0.1406***	-0.1302***	-0.1463***	-0.1440***	-0.1370***
			(0.037)	(0.036)	(0.037)	(0.037)	(0.038)
Secondary or PF			-0.1222***	-0.1285***	-0.1435***	-0.1421***	-0.1417***
			(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Functionary contract				-0.1350***	-0.1210***	-0.1208***	-0.1302***
				(0.035)	(0.036)	(0.036)	(0.036)
Temporal contract				-0.0784***	-0.0784***	-0.0776***	-0.0570**
				(0.026)	(0.025)	(0.025)	(0.026)
Temporal contract via ETT				-0.0908	-0.0939	-0.0924	-0.0293
				(0.129)	(0.129)	(0.129)	(0.131)
No contract				-0.1227*	-0.1331*	-0.1308*	-0.1055
				(0.070)	(0.070)	(0.070)	(0.071)
Autonomous or entrepreneur contract				0.1636***	0.1530***	0.1542***	0.1451***
				(0.022)	(0.023)	(0.023)	(0.023)
Low Digitalization					-0.0755***	-0.0803**	-0.0776**
					(0.028)	(0.039)	(0.039)
High Digitalization					-0.0144	-0.0091	-0.0022
					(0.024)	(0.029)	(0.029)
Very High Digitalization					0.0121	0.0310	0.0446
					(0.023)	(0.030)	(0.030)
woman + Low Digitalization						-0.0046	-0.0033
						(0.057)	(0.057)
Woman + High Digitalization						-0.0194	-0.0113
						(0.052)	(0.052)
Woman + Very High Digitalization						-0.0463	-0.0447
						(0.049)	(0.049)
Bad Economical situation at home							-0.0618***
							(0.019)
Observations	2,059	2,058	2,058	2,058	2,058	2,058	2,058
R-squared	0.005	0.025	0.048	0.091	0.097	0.097	0.136
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2017 Report by digitalization per sector, a quartile split defines the level of development. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Digitalized in sectorial rank.

Source: Own elaboration with ESCA data

Table 16: Logistic regression (boss position by woman with sectorial ranking interactions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
woman	-0.3900***	-0.3682***	-0.4734***	-0.3842***	-0.4283***	-0.4048	-0.5491*
	(0.119)	(0.121)	(0.124)	(0.127)	(0.129)	(0.301)	(0.316)
Age		0.2902***	0.2819***	0.2378***	0.2602***	0.2592***	0.2813***
		(0.084)	(0.085)	(0.088)	(0.089)	(0.089)	(0.091)
Age2		-0.0032***	-0.0031***	-0.0026**	-0.0029***	-0.0028***	-0.0031***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Good overall health		0.4172*	0.3542	0.3751	0.3395	0.3376	0.2583
		(0.244)	(0.246)	(0.253)	(0.254)	(0.254)	(0.268)
Non spanish nationality holder		-0.5026***	-0.4264**	-0.3641*	-0.5160**	-0.5162**	-0.4813**
		(0.188)	(0.192)	(0.200)	(0.204)	(0.204)	(0.215)
Cohabiting with a couple		0.2691	0.2129	0.1622	0.1844	0.1808	0.1318
		(0.173)	(0.174)	(0.179)	(0.180)	(0.181)	(0.188)
Children holder		0.0924	0.1511	0.1683	0.1741	0.1785	0.1525
		(0.148)	(0.150)	(0.154)	(0.155)	(0.155)	(0.162)
Primary or less			-0.9848***	-0.9305***	-1.0634***	-1.0763***	-1.0541***
			(0.298)	(0.308)	(0.313)	(0.314)	(0.340)
Secondary or PF			-0.8204***	-0.8965***	-0.9970***	-1.0037***	-1.0809***
			(0.125)	(0.130)	(0.134)	(0.134)	(0.149)
Functionary contract				-1.1558***	-1.0002***	-0.9891***	-1.0724***
				(0.345)	(0.350)	(0.351)	(0.359)
Temporal contract				-1.0511***	-1.0830***	-1.0865***	-0.9780***
				(0.301)	(0.304)	(0.304)	(0.313)
Autonomous or entrepreneur contract				0.9297***	0.9288***	0.9181***	0.9208***
				(0.143)	(0.145)	(0.146)	(0.156)
Low R&D investment					-1.0152***	-1.0279***	-1.1471***
					(0.194)	(0.256)	(0.270)
High R&D investment					-1.0134***	-0.9497***	-1.1881***
					(0.199)	(0.260)	(0.277)
Very High R&D investment					-0.7993***	-0.8143***	-0.8513***
					(0.196)	(0.259)	(0.271)
woman + Low development Sector						0.0314	0.1764
						(0.381)	(0.399)
Woman + High development Sector						-0.1648	-0.1062
						(0.387)	(0.405)
Woman + Very High development Sector						0.0417	0.1184
						(0.391)	(0.406)
Bad Economical situation at home							-0.5877***
							(0.162)
Observations	2,059	2,058	2,058	2,022	2,022	2,022	2,022
Demographics	No	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	Yes	Yes	Yes	Yes	Yes
Contractual Situation	No	No	No	Yes	Yes	Yes	Yes
Sector	No	No	No	No	Yes	Yes	Yes
Risky Labour Situation	No	No	No	No	No	Yes	Yes
Bad Economic Situation	No	No	No	No	No	No	Yes
Year FE	No	No	No	No	No	No	Yes
Region FE	No	No	No	No	No	No	Yes

Notes: Standard errors in parentheses(*** p<0.01, ** p<0.05, * p<0.1). The dependent variable Boss Position is defined by 1 if in the current job has at least one subordinated employee or a 0 otherwise. Demographics contain variables: Age, Age^2, Health, Immigrant, Couple and Children. Is considered healthy when it has not been diagnosed with any mental or physical illness. Is considered immigrant if it has not registered the spanish nationality. Risky labor situation when there are posibilities to lose the job during the following 6 months. Variable Developed sector is ranked using CEOE 2014 Report by investment of R&D per sector, a quartile split defines the level of development. Bad Economic situation is reported when there is trouble to arrive to end of the month. The referent or omitted variables of cathegories are: University in case of education, Fixed contracts in contractual Situation and Very Low Developed in sectorial rank.

Source: Own elaboration with ESCA data