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Does Gender Equality in Managerial Positions Improve the Gender Wage Gap? Comparative Evidence from Europe

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Abstract: In this paper, we analyse the impact of gender equality in managerial positions on wages and the gender wage gap in 22 European countries. We draw on the employer–employee microdata from the European Structure of Earnings Survey (E-SES) for the year 2018, which allows us to include firm fixed effects in our econometric specifications, thus controlling for both observed and unobserved heterogeneity at the firm level. The analysis is carried out not only at the mean but also across the wage distribution through unconditional quantile regressions. The results on the impact of gender equality in management on wages are mixed. However, we find that gender equality has a predominantly positive effect in the upper part of the wage distribution, and a negative effect in the middle and lower parts. The results on the impact on the gender wage gap show that in many cases, a more gender-equal management reduces the gender wage gap. Furthermore, gender equality in management reduces the gender wage gap mainly in the middle and lower part of the wage distribution.

Keywords: gender equality; management positions; wages; gender wage gap; quantile regression

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1. Introduction

In recent decades, gender equality has become a transversal international objective in all political, economic, labour and social aspects that govern the daily activities of countries (United Nations, SDG 5 on gender equality). Despite the progress made in terms of women's participation in the labour market, there are large disparities between countries, and important gaps remain. Both the glass ceiling and the gender pay gap persist as global issues, despite what Goldin (2014) describes as 'a great gender convergence' in human capital in much of the developed world.

Gender diversity in company management is considered a key objective in economic literature due to its potential impact on companies' economic and financial results, as well as its potential to initiate dynamics that reduce gender gaps in the workplace, in the conditions of access to positions of responsibility, in leaves of absence or in salaries. There is a large body of theoretical and empirical literature linking gender diversity in management to pay gaps, but they are without clear results. Despite there being no consensus on the key factors that facilitate the process to reduce the GWG and the magnitude of the effect, some authors such as Theodoropoulos et al. (2022) and Santero-Sánchez and Castro Núñez (2022) have pointed out that female managers reduce the GWG.

Gender diversity in decision making has traditionally been measured by the proportion of women in managerial positions. More than 6.7 million persons held a managerial position in the European Union out of the 27 Member States (EU): 4.3 million men (63% of all managers) and 2.5 million women (37%). At the EU level, this share increased slightly compared to 2012 (36%). Women account for less than a third of managers in Cyprus (19%), followed by Denmark (27%), Italy (28%), the Netherlands (29%), Czechia and Germany (both 31%) and Croatia (32%). Above average, Latvia is the only Member State where women are the majority (53%) in this occupation. This is followed by Bulgaria (49%), Poland (48%), Slovenia (44%), Hungary and Sweden (both 42%) and Portugal (40%) (Eurostat 2020).

As far as the gender wage disparity is concerned, it persists throughout Europe. According to Eurostat (2023), the average GWG for the European Union (EU27) has narrowed slightly in recent years, falling from 14.5% in 2015 to 14.4% in 2018 and 12.7% in 2021. Even after controlling for observed factors that could explain the differences, such as skills and experience, the unexplained GWG (which is the literature's measure of wage discrimination) in the EU in 2018 showed a small variation, from an unadjusted GWG of 11.4% to an unexplained GWG of 11.4% (Leythienne and Pérez-Julián 2021). The countries with the largest unexplained gender gap in 2018 were Czechia (17.6%), Latvia (17.5%), Bulgaria (16.2%) and Croatia (15.2%), while the countries with the smallest gap were Sweden (7.6%), Cyprus (8.6%), Norway (8.7%) and Denmark (9.4%) (Leythienne and Pérez-Julián 2021).

This highlights the need for further analysis of this economic and social problem to clarify the mechanisms that can lead to more equal participation and opportunities. In this respect, the European Gender Equality Strategy 2020–2025 includes the promotion of gender equality and women's empowerment in the economy as one of its key areas (European Commission 2021). The aim of this initiative is to better understand the dynamics that promote and penalise gender equality in order to find tools within the reach of politics and organisational practices to achieve effective equality between men and women.

However, most analyses of the wage gap focus on quantifying it in average terms, which by default neglects the potential differences between workers at different points in the wage distribution, both at the lowest level, associated with the 'sticky floor' phenomenon, and at the top, associated with the 'glass ceiling'. Advances in wage gap decomposition techniques have made it possible to assess the wage gap at different points in the distribution. According to the International Labour Organization (International Labour Organization 2019), 44% of all 93 countries analysed have a higher GWG in management positions. Correspondingly, some research for some countries finds a higher GWG at the top of the pay scale, while for others, the results show higher pay gaps at the bottom of the pay scale.

The absence of agreement about the impact of gender diversity in management on the GWG points to the need to study this process in more detail. This effort would lead to a better understanding of whether different organisational practices have an impact or an equal impact at different pay percentiles, in the interest of designing and implementing more effective policies against the GWG.

Against this background, the objective of this study is to provide a more complete picture of the impact of gender diversity in decision-making positions on the GWG across the European pay distribution. Our approach uses a measure of management diversity that takes into account the impact of men's entry into companies with women in management positions, a perspective which is not sufficiently taken into account in measures based purely on the proportion of women in an organisation. The use of a broad group of European countries, in which heterogeneity is high, allows for the identification of country-specific conditions that help to understand the enablers and barriers that need to be considered when designing government and company policies aimed at reducing and eliminating the GWG.

Our analysis has been based on the microdata from the European Structure of Earnings Survey for the year 2018 provided by Eurostat. This database provides employer–employee matched data, which allows for the inclusion of establishment fixed effects in the econometric specifications, thus allowing us to account for both observed and unobserved establishment heterogeneity.

In order to analyse the impact of gender equality in managerial positions on wages and on the GWG, we have estimated an extended version of the traditional workhorse Mincerian wage equation. In addition, since gender equality in managerial positions may have different effects on wages and the GWG throughout the wage distribution, we have run unconditional quantile regressions following the methodology proposed by Firpo et al. (2009).

The remainder of the paper is organised as follows: Section 2 reviews the previous empirical literature. Section 3 describes our index of managerial gender equality and the econometric methodology used throughout the paper to estimate the impact of gender equality in management on wages and the GWG. Section 4 provides a description of the employer–employee dataset used in the empirical analysis and a description of the sample. Section 5 presents the results of the regression analyses, which are discussed in Section 6. The final section presents the conclusions.

2. Literature Review

Women's opportunities to hold leadership positions in organisations are restricted due to the glass ceiling, which contributes to the perpetuation of gender inequalities within organisations (Huffman 2016). According to social closure theory (Tomaskovic-Devey 1993), males monopolise advantages and limit women's opportunities for promotion, leading to a process of subordination.

Several hypotheses have been proposed to explain the under-representation of women in leadership roles in business and politics. These hypotheses range from demand-side constraints, including pre-existing social norms and gender stereotypes that create a 'glass ceiling' effect for women, to supply-side explanations, such as a reduction in women's working time. For instance, social norms and gender stereotypes may serve to bias managers and voters against recruiting women as managers and leaders (Huddy and Terkildsen 1993; Eagly and Karau 2002). Furthermore, insufficient interactions with women leaders may perpetuate biased perceptions of women's effectiveness in leadership (Beaman et al. 2009). Women themselves may not believe in their ability to lead because they rarely see other women in such positions (Beaman et al. 2012), and they may also leave high-level careers to have children (Bertrand et al. 2010).

A comparable analysis is found in the literature on GWG. Its existence has traditionally been explained by the decisions and motivations that differentiate women and men in their personal and professional careers. A supply-side approach emphasises the workers and gives them the responsibility for wage differentials. Becker's (1962) human capital theory provided the most important explanation of how choices about education, career interruptions, education or part-time work affect workers' productivity. Thus, the first explanations given for the GWG were those related to how women's lower human capital affected their wages (Mincer and Polachek 1977). Demand-side theories have also been developed and are more specific to the dynamics of the reproduction of discrimination by firms. The different roles assigned to women and men determine the most suitable jobs (horizontal segregation), the positions reserved for each (vertical segregation) and the working conditions, such as the value of each contribution in terms of wages (Akerlof and Kranton 2000; Conde-Ruiz and Marra de Artíñano 2016; Fortin 2005; Rubery et al. 2005).

However, the GWG is not homogeneous across the wage distribution. According to empirical literature (Hara 2018; Javdani 2015; Santero-Sánchez and Castro Núñez 2022), the GWG exhibits differences between the lower and upper ends of the wage distribution, which gives significance to the phenomena of 'sticky floors' and 'glass ceilings', respectively. Some research for some countries has found a higher GWG at the top of the pay scale (Cotter et al. 2001; Albrecht et al. 2003; Huffman 2004; Christofides et al. 2013; International Labour Organization 2019), while for others, the results have showed higher pay gaps at the bottom of the pay scale (Arulampalam et al. 2007; Christofides et al. 2013). Hence, a more profound comprehension of GWG dynamics requires a deeper analysis of wage differentials across the distribution (Huffman et al. 2017).

Establishing a connection between these two phenomena reveals the impact of women's under-representation in leadership positions on the GWG. According to the statistical discrimination theory (Phelps 1972), traditionally, the presence of men in decision-making positions and gender stereotypes have biased men's statistical information on the group to which they belong in order to infer women's productivity. Similarly, the discriminatory taste theory (Becker 1957), in line with social identity theory (Tajfel and Turner 1979), explained that men value women less because they belong to different social groups. As a consequence, men hold biases against women that impact their pay; they employ or promote women when their lower pay neutralises the disutility they experience. Therefore, the consequences of this discrimination are more significant as women move closer to the top of the hierarchy, which is associated with higher salaries.

Thus, the historical connection between formalised pay systems and gender pay inequality can be attributed, in part, to the disproportionate representation of men in management roles (Abraham 2017), whereas a higher GWG found in the upper percentiles can frequently be linked to salary supplements received, which reward greater effort in terms of time, travel and the volume of projects undertaken (De la Rica et al. 2015; Christofides et al. 2013). Therefore, many pay equity programmes focus on formalising the salary assignment to avoid discriminatory situations due to the discretion of decision-makers. However, other research has found that a higher proportion of female managers with discretionary pay-setting power is negatively related to the GWG (Theodoropoulos et al. 2022; Abraham 2017).

Based on the above, some empirical studies have linked gender diversity in management to the promotion of equal conditions in a firm's work environment. Several have suggested that diversity in management reduces barriers to career advancement (Dalvit et al. 2021; Kunze and Miller 2017; Mateos de Cabo et al. 2011; Matsa and Miller 2011). And others have referred to equality as a method to reduce the GWG (Bell 2005; Bertrand et al. 2019; Cardoso and Winter-Ebmer 2010; Cohen and Huffman 2007; Flabbi et al. 2019; Theodoropoulos et al. 2022; Hensvik 2014; Hirsch 2013; Vega et al. 2016). However, the results were quite varied in terms of significance and the size of the specific group of women affected. Furthermore, the impact on the GWG is not homogeneous across the distribution. Huffman et al. (2017) conducted studies in Germany, and Santero-Sánchez and Castro Núñez (2022) in Spain, and they concur that policies on promoting women decrease wage inequality, particularly in the lower ranks. Meanwhile, Bertrand et al. (2019) found that increasing women's representation on boards was associated with a significant decrease in the GWG among top executives but found limited evidence of changes at the bottom of the corporate hierarchy.

Two mechanisms can potentially explain the impact of female managers on the GWG within an organisation. Firstly, female staff may benefit from the homophily and mentoring provided by female managers when interacting with them (Hultin and Szulkin 2003). Secondly, female managers might use their organisational power to change organisation practices, resulting in a more gender equitable organisation (Cohen and Huffman 2007). The results of Zimmermann (2022) showed a decrease in the GWG only with female executives at the second level. They are able to redistribute wages between men and women because they are in direct contact with workers. Meanwhile, first-level managers, who could change the organizational structure by making strategic decisions, only affected GWG when firms were small enough to contact workers.

An alternative possibility is that the presence of women in management does not have any impact on the GWG because the measures adopted take on a purely symbolic meaning and do not permeate the organisational culture (Huffman 2016). Moreover, several studies, including the ones conducted by Magda and Cukrowska-Torzewska (2019) and by van Hek and van der Lippe (2019) for a set of European Union countries, found no relationship between the proportion of female managers and the income of women and men. In this context, female employees would essentially be cogs in the machine (Cohen and Huffman 2007) without changing the discriminatory dynamics of organisations.

Furthermore, if women have not achieved sufficient power to change organisational practices, their presence will have no impact on the GWG. However, some women leaders may not be changing agents simply because they do not want to be. Scholars have suggested that it is women who accept the status quo who are promoted to positions of responsibility (Cohen and Huffman 2007; Huffman 2016), and that they sometimes follow this behaviour because they assume gender stereotypes to be true (Derks et al. 2011). In contrast, according to the queen bee theory, other female managers would not oppose gender discrimination because they believe it would risk their position. As a result, women managers may benefit outgroup members (men) by imitating their behaviours to fit in (Kalogeraki and Georgakakis 2021) in an attempt to justify and protect their position in a male-dominated environment.

Lastly, one factor to consider is the market's sectoral segregation, which allows women to be promoted to positions of responsibility in companies with a majority of women and belonging to a feminised sector. It is acknowledged that sectors with a high proportion of women are devalued in terms of salaries. This phenomenon could be explained through the theory of structural occupational crowding (Groshen 1991; Sorensen 1989) and the theory of the devaluation of women's work (England 1992). According to the former, women have a propensity for lower-paying positions and therefore are crowded out of higher-paying jobs. The latter argues that female-dominated occupations have a lower wage value and/or occupational prestige than male-dominated occupations simply because they are occupied by women.

In line with the previous point, the results obtained by Santero-Sánchez and Castro Núñez (2022) for Spain show that increasing gender diversity in managerial positions only had a significant impact on reducing the GWG when more women access these positions in companies managed by men. Thus, it is crucial to examine the association between GWG and diversity in company management from an analytical view.

In conclusion, the existing literature outlines the causes of both the glass ceiling and the GWG and links them; the GWG refers to another barrier under the term glass ceiling (Bertrand et al. 2019), whereas the under-representation of women in decision-making positions leads men to decide the wages of subordinate women with a gender bias. As such, the presence of women in leadership positions is theoretically associated with a GWG reduction, as they can form networks to support other women and influence gendered-bias organisational structures. Thus, an analysis of the impact of the presence of women in decision making on the GWG is necessary. And it is of analytical interest to understand its effect not only on the median wage but also on the various levels of the wage distribution because the GWG varies depending on wage levels.

3. Methodology

3.1. Measuring Gender Equality in Managerial Positions

To measure the degree of gender equality in managerial positions, we calculate the following index[1] for each establishment in the sample:

$$GEMP_j = 1 - \left| \frac{X_j^F}{X_j^T} - \frac{X_j^M}{X_j^T} \right| \quad (1)$$

where X_j denotes the number of managers in an establishment j, and the superscripts F, M and T relates to female, male and total. Thus, the gender equality index in managerial positions (*GEMP*) is calculated for each workplace, as one minus the difference in absolute value in the share of female and male managers. Our index is gender neutral since all gaps, regardless of whether they are to the disadvantage of women or men, are taken into consideration and treated in the same way. The index takes values in the interval [0,1], where 1 represents gender equality (equal share of female and male managers) and 0 represents inequality.

3.2. Baseline Estimates

Following common practice on previous empirical works analysing the gender wage gap, our departure point is an augmented version of the traditional workhorse Mincerian wage equation (Mincer 1974). This equation rests on the premise that the wage of a worker is determined by their productivity, which, in turn, depends on the level of education and the accumulated work experience of the worker. Our augmented version takes the following form:

$$W_{ij} = \alpha + \beta female_{ij} + \delta GEMP_j + \lambda female_{ij} \times GEMP_j + \sum_k \gamma_k Z_{kij} + \varepsilon_{ij} \quad (2)$$

where the subscript i refers to workers and the subscript j refers to local units or establishments. The dependent variable (W_{ij}) is the hourly wage log-transformed. Among the explanatory variables, *female* is a dummy variable which takes a value of one if worker i is female and zero otherwise, *GEMP* is the value of the gender equality index in management positions in establishment j, and Z is a vector of explanatory variables including worker (sex, age and education level), job (tenure, type of contract, type of working day and occupation) and establishment characteristics (side, location and economic sector). Lastly, ε_{ij} is the idiosyncratic error term.

As for the coefficients of interest to be estimated, the value of β represents the wage difference in log points between females and males with similar individual and job characteristics working in similar establishments. The adjusted gender wage gap is calculated from the estimated β coefficient as GWG = $(e^{\beta} - 1) \times 100$. The coefficient δ quantifies the effect of gender equality in management on wages. More specifically, its value represents the impact on log wages of a one-unit increase in the gender equality index in management. Lastly, the parameter λ of the interaction term between gender equality in management and the female dummy measures the effect of gender equality in management on the adjusted GWG.

Additionally, we include establishment fixed effects which allows us to control for unobserved heterogeneity between local units or firms. The equation to be estimated now is

$$W_{ij} = \alpha + \beta female_{ij} + \lambda female_{ij} \times GEMP_j + \sum_k \gamma_k Z_{kij} + \mu_j + \varepsilon_{ij} \quad (3)$$

where μ_j is the establishment fixed effect. In Equation (3), we include neither the gender equality index in management nor the characteristics of the establishment since they are absorbed by the workplace fixed effect. While the estimation results are improved, a drawback of using fixed effects is that we cannot address the effect of gender equality on wages.

3.3. Unconditional Quantile Regression

To analyse the impact of gender equality in management positions on wages and on the GWG throughout the wage distribution, we conducted UQR following the methodology proposed by Firpo et al. (2009). In contrast to conditional quantile regression, UQR defines quantiles for the variable of interest (in our case, the log hourly wage) before conducting regression. This implies that when covariates are included in the regression, they serve to account for their impact on the specific relationship under study (such as the relationship between wages, gender and equality in management positions). However, the inclusion of covariates does not influence the assignment of observations to specific quantiles within the wage distribution (Killewald and Bearak 2014). UQR is a two-step procedure where, in the first step, the log hourly wage variable is transformed into the recentred influence function (RIF) of the unconditional quantile of the wage distribution, defined as

$$RIF(W_i; Q_\tau) = Q_\tau + \frac{\tau - 1[W_i \leq Q_\tau]}{f_W(Q_\tau)} \quad (4)$$

where $\tau \in (0, 1)$ is a given quantile, Q_τ is the value of the wage variable (W_i) at the τth quantile, $f_W(Q_\tau)$ is the density function of wages at quantile Q_τ and $1[W_i \leq Q_\tau]$ is a dummy variable indicating whether the wage observation is at or below quantile Q_τ. In the second step, standard OLS regression can be applied to Mincerian wage equations, substituting the dependent variable (log hourly wage) with the RIF calculated at different quantiles. Thus, for a given quantile $\tau \in (0, 1)$, the UQR equivalent to Equations (2) and (3) are represented, respectively, by the following equations[2]:

$$R\hat{I}F(W_i; Q_\tau) = \alpha + \beta female_{ij} + \delta GEMP_j + \lambda female_{ij} \times GEMP_j + \sum_k \gamma_k Z_{kij} + \varepsilon_{ij} \quad (5)$$

$$R\hat{I}F(W_i; Q_\tau) = \alpha + \beta female_{ij} + \lambda female_{ij} \times GEMP_j + \sum_k \gamma_k Z_{kij} + \mu_j + \varepsilon_{ij} \quad (6)$$

4. Data and Sample Description

This research paper draws upon the employer–employee microdata from the European Structure of Earnings Survey (E-SES) for the year 2018. The survey, which is a comprehensive source of labour market information, is conducted on a quadrennial basis through a collaborative effort between Eurostat and the National Statistical Institutes of numerous European nations, ensuring a harmonised and standardised methodology across the participating countries. Its design employs a two-stage random sampling procedure. Initially, a stratified random sample of firms and/or local units is selected, and then, a random sample of employees is drawn from these chosen units. To minimise potential biases in the data, the survey is typically conducted in the month of October, which is usually associated with fewer job absences due to annual leave or public holidays. The E-SES encompasses enterprises and local units, both public and private, with a workforce of at least 10 employees, spanning economic activities from section B to S (excluding O) as defined in NACE Rev. 2. Hence, the survey does not include information on workers from section A (agriculture, forestry and fishing), section T (activities of households as employers) and section U (activities of extraterritorial organisations and bodies).

Since the survey provides employer–employee matched data, individuals working in the same establishment can be identified, a fact that enables us to include local-unit or establishment fixed effects in the econometric specifications. Thus, it is possible to account for both establishment observed and unobserved heterogeneity, thus improving the econometric estimates. Nonetheless, the survey presents two noteworthy limitations. On the one hand, information in certain key factors to explain wage disparities among individuals, such as marital status and the number of children, is missing. Secondly, the E-SES lacks a longitudinal design, which means that it does not capture the trajectory of employers and employees over time.

The key variable in our analysis is the hourly wage, which is directly available within the E-SES dataset. We harmonised the variable to euros for nations that do not use the euro and whose wage variable was originally denominated in their national currencies, enhancing the interpretability and comparability of wage data across all countries. Average exchange rates for the year 2018 published by the European Central Bank were used in the transformation.

Workers in management positions are identified as those with occupation defined as 'Group A' in the National Classification of Occupations for 2011, which includes directors and managers.

As indicated in the methodology section, we use three sets of covariates as explanatory variables in our wage equations: individual or worker characteristics, job characteristics, and establishment characteristics. Regarding the set of individual characteristics, we include information on age as a proxy of work experience and the level of education. Data on age were aggregated into six categories, as follows: workers below the age of 19, between 20 and 29, between 30 and 39, between 40 and 49, between 50 and 59, and 60 years old and above. For the level of education, the original four categories in the E-SES were kept, as follows: basic education, secondary education, tertiary education (up to 4 years) and tertiary education (more than 4 years). As for the set of job characteristics, we included information on job tenure in years (log transformed), the type of contract (permanent or fixed-term), the type of working day (full-time or part-time), and occupation aggregated at the nine major groups according to ISCO-08[3]. Regarding the characteristics of the establishment or local unit, we utilised the accessible data regarding size, specifically the number of workers, geographical location at the NUTS 1 level, and the economic sector. Regarding establishment size, we relied on enterprise size information, as specific data for individual local units is often optional and consequently unavailable for numerous countries. We grouped establishments into three categories based on size, as follows: those with fewer than 50 workers, those with between 50 and 249 workers, and those with 250 workers or more. Regarding the economic sector, we included the section as defined in NACE Rev. 2.

In all estimates, we use the worker-level weights provided with the survey to account for sample selection probabilities, as well as to address any discernible non-response bias. This approach guarantees the representativeness of our findings for all individuals within the surveyed population.

We restricted the sample of local units to those that provided data relating to at least two workers holding a managerial role. As a result, we excluded establishments with only one managerial position due to the absence of gender equality. That is, those establishments cannot demonstrate gender diversity in management positions. Furthermore, the selection of local units with a minimum of two workers ensures the accurate identification of establishment fixed effects in the econometric estimates (Casado-Díaz et al. 2020). The drawback of this decision is that many small firms were not included in the analysis, resulting in a certain sample selection bias.

Given the availability of data, our ultimate dataset comprises comprehensive details regarding firm and worker attributes across 22 countries, all of which are members of the European Union except for Norway. Summary sample statistics are shown in Table 1. The sample size of workers varies considerably across countries, ranging from 3382 individuals in Greece to 2,153,729 in Czechia. The former, along with Norway (1,340,799) and Denmark (1,285,307), have the largest sample size. Among the countries where the mean index of gender equality in management has the highest values are Romania (65.4), Sweden (53.5), Croatia (52.6), France (51.4) and Malta (50.8). This evidence is consistent with the evolution of the EU Gender Equality Index (GEI) between 2010 and 2018 (Eurofound and EIGE 2021) and with the evolution of the score in the domain of power, which includes gender balance on company boards. Sweden leads in the overall GEI score, and Malta is one of the countries with the highest growth in the overall index (over 16% in the period). In both Sweden and Romania, women's share of women's employment accounted for by education, health and welfare activities is about four times that of men. And France is one of the countries that has increased its power domain as a result of quota policies.

Table 1. Sample statistics.

Country	Code	N° Workers	N° of Local Units	Gender Equality in Management Positions (Mean)	Mean Hourly Wage		GWG (%)
					Male	Female	
Belgium	BE	13,744	339	39.9 (40.8)	26.7 (10.1)	24.6 (10.0)	8.0
Bulgaria	BG	82,561	1761	48.9 (37.8)	4.4 (4.0)	3.6 (2.8)	18.7
Cyprus	CY	17,927	127	41.6 (34.6)	16.2 (14.0)	13.8 (9.3)	14.6
Czechia	CZ	2,153,729	7353	45.3 (32.4)	8.4 (5.6)	6.6 (3.4)	21.5
Germany	DE	120,910	3727	28.6 (38.8)	31.5 (18.5)	23.9 (11.1)	24.2
Denmark	DK	1,285,307	15,476	47.9 (35.8)	34.8 (17.2)	29.2 (11.4)	15.9
Estonia	EE	22,437	1046	34.2 (40.9)	8.5 (5.3)	6.8 (4.1)	20.4
Greece	EL	3382	189	42.4 (38.2)	16.1 (17.2)	11.5 (8.8)	28.1
Spain	ES	16,620	1063	46.1 (42.1)	18.7 (11.5)	16.2 (8.8)	13.2
France	FR	125,060	8790	51.4 (37.2)	23.8 (24.8)	19.2 (13.2)	19.0
Croatia	HR	21,370	621	52.6 (40.2)	7.3 (5.5)	6.6 (4.5)	9.3
Hungary	HU	606,293	7307	48.7 (36.8)	6.5 (5.2)	5.5 (3.1)	16.3
Italy	IT	12,805	479	40.1 (41.4)	21.9 (23.6)	17.7 (10.1)	19.1

Table 1. *Cont.*

Country	Code	N° Workers	N° of Local Units	Gender Equality in Management Positions (Mean)	Mean Hourly Wage		GWG (%)
					Male	Female	
Latvia	LV	139,945	3247	47.3 (37.3)	7.3 (6.0)	6.0 (4.5)	17.0
Malta	MT	31,161	227	50.9 (37.5)	14.1 (10.5)	12.2 (5.5)	13.2
Netherlands	NL	54,625	1243	46.7 (36.1)	22.6 (15.1)	18.7 (11.9)	17.4
Norway	NO	1,340,799	31,189	46.7 (36.1)	35.0 (71.5)	29.6 (61.4)	15.5
Poland	PL	646,405	11,546	49.3 (34.3)	7.1 (5.9)	6.1 (4.1)	14.3
Portugal	PT	14,337	548	48.0 (41.9)	11.8 (10.4)	9.5 (7.0)	19.5
Romania	RO	179,634	7266	65.4 (35.3)	6.1 (5.5)	6.0 (4.7)	1.6
Sweden	SE	229,130	2080	53.5 (29.3)	22.6 (11.5)	19.3 (7.0)	14.5
Slovakia	SK	811,412	4291	47.2 (33.9)	8.0 (7.0)	6.2 (3.6)	22.1

Notes: Grossing-up factors were used to compute gender equality in management, the mean hourly wages, and the raw gender wage gap (GWG). The hourly wage was expressed in euros for countries that do not use the euro and whose the wage variable was originally measured in their national currency by using the average exchange rates in 2018 published by the European Central Bank. The GWG is calculated as the difference between male and female mean hourly wages divided by the male mean hourly wage. Source: own elaboration based on the authors' estimate using E-SES 2018.

As it can be noted, females are underpaid compared to men in all 22 countries in the sample. The gender pay gap varies from 1.6% (Romania) to 28.1% (Greece), yet it persists at a rate higher than 10% in all countries except for three. Romania is an exception because jobs in the public sphere are, on average, financially more rewarding that in the private sector, thus causing a reduction in the GWG (Leythienne and Pérez-Julián 2021). Apart from Romania, the countries with the smallest gender pay gap are Belgium (8%), Croatia (9.3%) and Spain (13.2%). On the other hand, following Greece, the countries with the largest gender gap are Germany (24.2%), Slovakia (22.1%) and Czechia (21.2%).

Additionally, Figure 1 plots each country in the sample, with the unadjusted gender pay gap on the y-axis and the average of the GEMP index on the x-axis. As can be seen, the cloud of points shows a certain negative trend, indicating that those countries where the GEMP index is higher on average have a lower GWG.

Figure 1. Gender equality in management and the raw GWG. Source: own elaboration based on the authors' estimate using E-SES 2018.

5. Econometric Results

5.1. Baseline Estimates

The results of Equation (2) are shown in Table 2. For each country, the estimated coefficients and their respective standard error deviations for the variables female, *GEMP* and the cross product of both are displayed[4]. Additionally, the number of observations and the resulting adjusted R^2 are presented.

Table 2. Summary of wage equation estimates by OLS.

Country	Female		Gender Equality in Management (GEM)		Female × GEM		N	R^2
	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)		
BE	−0.0136	(0.0083)	0.0146 *	(0.0081)	0.0191	(0.0172)	13,744	0.86
BG	−0.1636 ***	(0.0061)	0.0158 **	(0.0070)	0.0702 ***	(0.0094)	82,561	0.43
CY	−0.1621 ***	(0.0125)	−0.0060	(0.0228)	0.0996 ***	(0.0261)	17,927	0.74
CZ	−0.1721 ***	(0.0022)	−0.0336 ***	(0.0034)	−0.0055	(0.0038)	2,153,729	0.52
DE	−0.0861 ***	(0.0039)	−0.0063	(0.0056)	−0.0088	(0.0072)	120,910	0.60
DK	−0.1068 ***	(0.0011)	0.0053 ***	(0.0013)	0.0094 ***	(0.0017)	1,285,307	0.56
EE	−0.1901 ***	(0.0143)	−0.0976 ***	(0.0202)	0.0499 *	(0.0257)	22,437	0.34
EL	−0.0964 ***	(0.0294)	−0.0021	(0.0354)	−0.0449	(0.0470)	3382	0.53
ES	−0.1335 ***	(0.0159)	0.0092	(0.0147)	0.0103	(0.0217)	16,620	0.49
FR	−0.1311 ***	(0.0077)	0.0173 **	(0.0072)	−0.0150	(0.0108)	125,060	0.46
HR	−0.1620 ***	(0.0093)	−0.0165 *	(0.0092)	0.0006	(0.0135)	21,370	0.48
HU	−0.0958 ***	(0.0036)	−0.0031	(0.0048)	0.0098 *	(0.0055)	606,293	0.58
IT	−0.1496 ***	(0.0113)	−0.0503 ***	(0.0151)	0.0834 ***	(0.0178)	12,805	0.50
LV	−0.2117 ***	(0.0090)	−0.0280 **	(0.0119)	0.0855 ***	(0.0145)	139,945	0.39
MT	−0.0883 ***	(0.0189)	−0.0463 **	(0.0234)	−0.0205	(0.0286)	31,161	0.48
NL	−0.0640 ***	(0.0061)	0.0301 ***	(0.0078)	−0.0126	(0.0091)	54,625	0.71
NO	−0.1029 ***	(0.0009)	−0.0058 ***	(0.0010)	0.0102 ***	(0.0013)	1,340,799	0.51
PL	−0.1654 ***	(0.0019)	−0.0068 ***	(0.0023)	0.0127 ***	(0.0030)	646,405	0.48
PT	−0.1497 ***	(0.0131)	−0.0401 **	(0.0158)	0.0190	(0.0213)	14,337	0.70
RO	−0.0897 ***	(0.0057)	0.0098 *	(0.0053)	−0.0465 ***	(0.0074)	179,634	0.53
SE	−0.0565 ***	(0.0032)	0.0140 ***	(0.0039)	−0.0092 *	(0.0048)	229,130	0.54
SK	−0.2114 ***	(0.0049)	−0.0357 ***	(0.0073)	0.0282 ***	(0.0087)	811,412	0.44

Notes: Sampling weights are used in all estimations. Robust standard errors (s.e.) between parentheses. All estimations include a constant term. Statistically significance indicated by *** 1% level, ** 5% level and * 10% level. Source: own elaboration based on the authors' estimate using E-SES 2018.

Overall, the results presented provide evidence for the existence of a relatively high GWG in almost all the countries considered. Furthermore, we find that the *GEMP* has a positive effect on wages in 10 countries, while a higher *GEMP* is also associated with a lower GWG in 10 out of 22 countries.

The estimated coefficient for the female variable is negative and statistically significant at the 1% level in all countries except for Belgium. Its value ranges from −0.0565 log points (Sweden) to −0.2117 log points (Latvia), which implies an adjusted gender wage gap ranging from 5.5% to 19.9%.

The relationship between gender equality in management positions and wages yields mixed results. In 10 of the 22 countries examined, a higher gender equality in management corresponds to lower wages, as indicated by the negative and statistically significant coefficient for the *GEMP* variable at conventional levels. Conversely, in 6 of the 22 countries, the estimated coefficient for the *GEMP* variable is positive and statistically significant. Thus, in Belgium, Bulgaria, Denmark, France, the Netherlands and Romania, there is evidence that a greater level of gender equality in management is associated with increased wages. However, for the other six countries, the estimated coefficient of *GEMP* is not statistically significant. Empirical studies have showed that firms with higher gender diversity in management positions improve compensation conditions for all workers (Santero-Sánchez and Castro Núñez 2022 for Spain).

Regarding the relationship between gender equality in managerial positions and the GWG, the results are also mixed. In 10 out of the 22 countries, the estimated coefficient for the cross product of the variables female and *GEMP* is positive and statistically significant, indicating that an increase in gender equality in management positions leads to a reduction in the GWG, as supported by most of the previous empirical literature (Bell 2005; Cardoso and Winter-Ebmer 2010; Hensvik 2014). These countries are Bulgaria, Cyprus, Denmark, Estonia, Hungary, Italy, Latvia, Norway, Poland and Slovakia. Among them, those where the estimated coefficient have greater values are Cyprus (0.0996 log points), Latvia (0.0855 log points), Italy (0.0834 log points) and Bulgaria (0.0702 log points). These values imply that a one-point increase in the index of *GEMP* (e.g., the difference between a female- or male-led establishment and an establishment where management is gender neutral) is associated with a decrease in the GWG of almost 9 percentage points in Cyprus (from 15% to 6.1%), 7.2 percentage points in Latvia (from 19.1% to 11.9%), 7.5 percentage points in Italy (from 13.9% to 6.4%) and in 6.2 percentage points in Bulgaria (from 15.1% to 8.9%). In the other six countries where the coefficient for the cross product of the variables female and *GEMP* is positive and statistically significant, the impact is smaller, ranging from a reduction in GWG of 0.8 percentage points in Denmark (from 10.1% to 9.3%) to a reduction of 4.2 percentage points in Estonia (from 17.3% to 13.1%). For the remaining countries, in 10 cases, the coefficient is not statistically significant at conventional levels, indicating that gender equality in management positions has no effect on the GWG. Spain is one of these countries, and this result coincides with Santero-Sánchez and Castro Núñez (2022). In only two cases, the estimated coefficient is negative and statistically significant: Romania and Sweden.

The estimation results of Equation (3), where the wage equation is estimated including establishment or local unit fixed effects, are shown in Table 3. Again, we find a relatively high GWG in all the countries in the sample. Also, in eight countries, the results suggests that a higher GEMP reduces the GWG.

Table 3. Summary of wages equation estimates by OLS with establishment fixed effects.

Country	Female		Female × GEM		N	R^2
	Coefficient	**(s.e.)**	**Coefficient**	**(s.e.)**		
BE	−0.0136 *	(0.0081)	0.0180	(0.0190)	13,744	0.87
BG	−0.1104 ***	(0.0049)	0.0309 ***	(0.0077)	82,561	0.74
CY	−0.1157 ***	(0.0134)	0.0461 *	(0.0249)	17,927	0.79
CZ	−0.1479 ***	(0.0020)	0.0063 *	(0.0034)	2,153,729	0.69
DE	−0.1195 ***	(0.0048)	0.0230 ***	(0.0079)	120,910	0.73
DK	−0.0890 ***	(0.0010)	0.0020	(0.0016)	1,285,307	0.66
EE	−0.1109 ***	(0.0132)	0.0259	(0.0217)	22,437	0.65
EL	−0.0767 ***	(0.0246)	−0.0431	(0.0391)	3382	0.70
ES	−0.1222 ***	(0.0136)	0.0227	(0.0187)	16,620	0.69
FR	−0.1171 ***	(0.0070)	−0.0234 **	(0.0101)	125,060	0.61
HR	−0.0991 ***	(0.0089)	−0.0346 **	(0.0137)	21,370	0.69
HU	−0.0897 ***	(0.0033)	0.0177 ***	(0.0049)	606,293	0.75
IT	−0.1196 ***	(0.0113)	0.0366 **	(0.0174)	12,805	0.62
LV	−0.0878 ***	(0.0083)	−0.0380 ***	(0.0131)	139,945	0.66
MT	−0.1122 ***	(0.0192)	0.0317	(0.0278)	31,161	0.59
NL	−0.0657 ***	(0.0059)	−0.0004	(0.0092)	54,625	0.76
NO	−0.0728 ***	(0.0009)	−0.0137 ***	(0.0014)	1,340,799	0.64
PL	−0.1167 ***	(0.0018)	−0.0121 ***	(0.0030)	646,405	0.69
PT	−0.1447 ***	(0.0123)	0.0466 **	(0.0202)	14,337	0.79
RO	−0.0950 ***	(0.0058)	−0.0266 ***	(0.0073)	179,634	0.72
SE	−0.0647 ***	(0.0033)	0.0092 *	(0.0051)	229,130	0.62
SK	−0.1336 ***	(0.0042)	−0.0102	(0.0070)	811,412	0.67

Notes: Sampling weights are used in all estimations. Robust standard errors (s.e.) between parentheses. All estimations include a constant term. Statistically significance indicated by *** 1% level, ** 5% level and * 10% level. Source: own elaboration based on the authors’ estimate using E-SES 2018.

Here, the estimated coefficient for the female variable provides an estimate of the GWG within establishments or local units. The estimated coefficient is negative and statistically significant at the 1% level in all 22 countries. Compared to the results of Equation (2), the GWG is lower in 16 countries. Its value now ranges from −0.0136 log points (Belgium) to −0.1479 log points (Czechia), implying an adjusted gender wage gap ranging from 1.4% to 13.7%. The countries where the GWG decreased more when including establishment fixed effects are Latvia (from 19.1% to 8.4%), Estonia (from 17.3% to 10.5%) and Slovakia (from 19.1% to 12.5%).

The estimated coefficient for the cross product of the female and *GEMP* variables is now positive and statistically significant in eight countries (Bulgaria, Cyprus, Czechia, Germany, Hungary, Italy, Portugal and Sweden), suggesting that an increase in gender equality in managerial positions leads to a reduction in the GWG. Previous studies by Hirsch (2013) for Germany, Cardoso and Winter-Ebmer (2010) for Portugal and Hensvik (2014) for Sweden have reached the same result. The countries where the estimated coefficient have greater values are Portugal (0.0466 log points), Cyprus (0.0461 log points), Italy (0.0309 log points) and Bulgaria (0.0309 log points). A further interpretation of these coefficients suggests that a one-point increase in *GEMP* within the same establishment or local unit would reduce the GWG in 4.1 percentage points in Portugal (from 13.5% to 9.3%), 4.2 percentage points in Cyprus (from 10.9% to 6.7%), 3.3 percentage points in Italy (from 11.3% to 8%) and 2.8 percentage points in Bulgaria (from 10.5% to 7.6%). As for the rest of the countries, the estimated coefficient for the cross product of the female and *GEMP* variables is not statistically significant in 11 countries (including Spain, with the same result in Santero-Sánchez and Castro Núñez (2022)) and is positive and significant at conventional levels in three countries: France, Hungary, and Latvia.

5.2. Unconditional Quantile Regression Results

Table 4 summarises the results of the UQR without including establishment fixed effects, as stated in Equation (5). For each country, the table reports the estimated coefficients and their respective standard deviations for the variables female, *GEMP* and the cross product of both, in the 10th, 25th, 50th, 75th, and 90th percentiles of the wage distribution.

In summary, three main results are obtained: (i) the GWG is lower at lower percentiles and higher at the top of the wage distribution, (ii) GEMP has a positive effect on the upper part of the wage distribution and a negative effect at the middle and lower parts of the distribution, and (iii) GEMP reduces the GWG in the middle and lower part of the wage distribution.

The results indicate that the GWG is lower in the lower part of the wage distribution and then rises progressively as we move up the wage distribution. This fact is clearly observed in the majority of countries, with the exception of Belgium, Cyprus, Malta and Spain. The countries where the difference in the GWG at the upper and lower part of the wage distribution is larger are Hungary, with a difference of almost 21 percentage points (21.1% at the 90th percentile and 0.5% at the 10th percentile); Estonia, with a difference of 18.7 percentage points (24.1% at the 90th percentile and 5.4% at the 10th percentile); and Latvia, with a difference of 15.4 percentage points (26.1% at the 90th percentile and 10.6% at the 10th percentile). This finding provides evidence for the well-known fact that women experience a glass ceiling in the job market (Arulampalam et al. 2007; Chzhen and Mumford 2011; Christofides et al. 2013; Blau and Kahn 2017; Gharehgozli and Atal 2021; Santero-Sánchez and Castro Núñez 2022). As Bertrand et al. (2019) point out, there is an under-representation of women at the top of the labour market, and wage gender gaps are larger there than average, which is often referred to as the glass ceiling, meaning that women are under-represented (or over-represented) in high (or low) paying jobs, and this under-representation becomes more noticeable as we move up the wage distribution. As a result, the wage difference between male and female workers are greater at the top of the wage distribution than in the middle or at the bottom.

When examining the effect of *GEMP* on wages, the results show that gender equality in management has a predominantly positive effect in the upper part of the wage distribution, and a negative effect at the middle and lower parts of the distribution. Indeed, the estimated coefficient for *GEMP* is positive and statistically significant in 12 and 15 countries at the 75th and 90th percentile, respectively. On the other hand, the number of countries where the estimated coefficient is negative and statistically significant at the 10th, 25th and 50th percentiles is 15, 14, and 16, respectively. Furthermore, countries can be categorised into five groups. In the first group with the Netherlands and Sweden, a higher *GEMP* is associated with higher wages in almost all points of the wage distribution. Moreover, the effect is higher at the top than at the bottom. In the Netherlands, a one-point increase in the *GEMP* index is associated with an increase in wages of 1.4 percentage points at the 10th percentile, and an increase of 5.3 percentage points at the 90th percentile. In Sweden, a one-point increase in the index of *GEMP* is associated with an increase of 1.1 percentage points in wages at the 10th percentile and an increase of 2.7 percentage points at the 90th percentile. In the second group, consisting of Bulgaria, Cyprus, Denmark, France, Germany, Hungary, Norway, Portugal and Romania, the estimated coefficient of the *GEMP* variable is positive and statistically significant in the upper part of the wage distribution (75th and 90th percentiles) and negative and statistically significant in the middle and lower parts (50th, 25th and 10th percentiles). Thus, high-paid workers benefit from more gender-equal management, while middle-paid and lower-paid workers are negatively affected in these countries. In the third group, formed by Belgium, Poland and Slovakia, the estimated coefficient for the *GEMP* variable is positive and statistically significant only at the extremes of the distribution (10th and 90th percentiles) and negative and significant for the rest. On the other hand, in Spain (fourth group), the wage of highly paid workers (90th percentile) and low-paid workers (10th percentile) is negatively affected by a higher gender equality in management, while the wage of workers in the rest of the distribution is positively affected. Finally, in the fifth group, consisting of Croatia, Czechia, Estonia, Greece, Italy, Latvia and Malta, the estimated coefficient for *GEMP* is negative and statistically significant in almost the entire wage distribution.

With regard to the effect of *GEMP* on the GWG, the results suggest that gender equality in managerial positions reduces the GWG mainly in the middle and lower part of the wage distribution. More specifically, the estimated coefficient of the cross product of the female and *GEMP* variables is positive (negative) and statistically significant at conventional levels in 11 countries (6 countries) at the 10th percentile, 17 countries (2 countries) at the 25th percentile, and 17 countries (4 countries) at the 50th percentile. However, at the top of the wage distribution, a greater gender equality in management is associated with a higher GWG. The estimated coefficient for the cross product of the female and *GEMP* variables is negative (positive) and statistically significant in 10 countries (8 countries) at the 75th percentile and in 12 countries (4 countries) at the 90th percentile. The sample of countries can also be divided into five groups. The first group, in which the estimated coefficient for the cross product of the female and *GEMP* variables is now positive and statistically significant in almost the entire distribution, consists of Belgium, Bulgaria, Estonia, Italy, Latvia and Norway. Thus, in these six countries, the results indicate that higher gender equality in management reduces the GWG at different points of the wage distribution. In the case of Bulgaria, Italy and Latvia, the results also show that the impact is larger at the middle (50th percentile) and the lower (10th and 25th percentiles) parts of the distribution than at the top (75th and 90th percentiles).

For illustrative purposes, Figure 2 shows the reduction in the GWG (in percentage points) resulting from a one-point increase in the *GEMP* index. For example, in Italy, the difference between an establishment where managers are all male or all female and an establishment where management is gender neutral, implies a reduction in the GWG of 7.7 percentage points at the 10th percentile and of 11.4 percentage points at both the 25th and 50th percentiles, compensating for the overall underpayment suffered by women at these three percentiles. However, at the 75th percentile, the GWG is reduced by 3.1 percentage points (from 14.6% to 11.6%) and at the 90th percentile by 2.4 percentage points (from 21.5% to 19.1%).

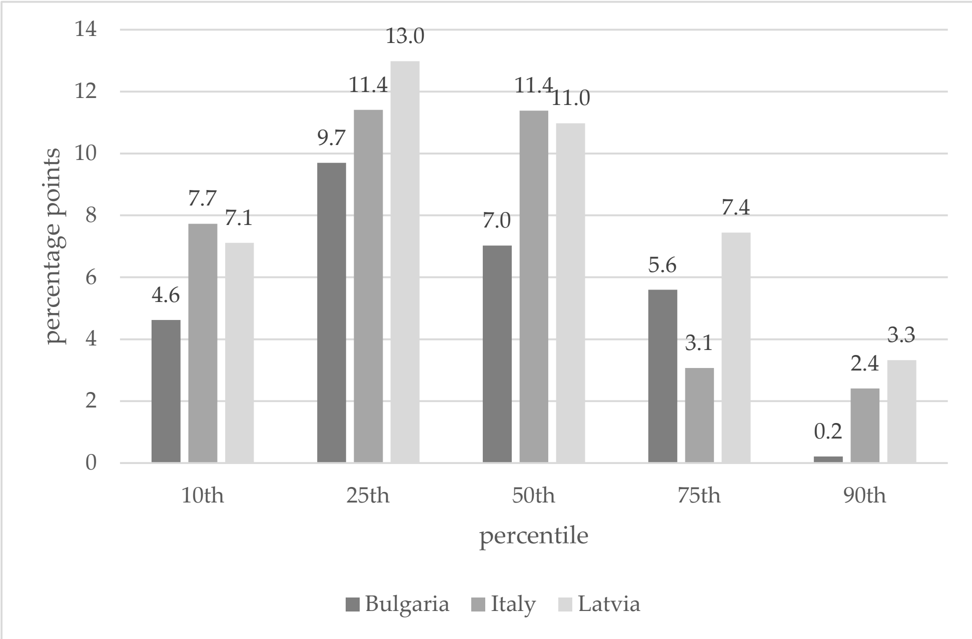

Figure 2. Reduction in the GWG due to an increase in GEMP. Source: own elaboration based on the authors' estimate using E-SES 2018.

The second group of countries consists of Cyprus, France, Malta, Poland and Sweden. In these countries, the estimated coefficient of the cross product of the female and *GEMP* variables is positive and statistically significant in the middle and lower parts of the wage distribution and becomes negative moving up the distribution. This indicates that in these countries, a higher *GEMP* reduces the wage difference between low-paid women and men and increases it for high-paid workers. Among these countries, Cyprus presents by far the largest coefficients at the middle and bottom parts of the distribution. More specifically, the estimated coefficients suggest that, in Cyprus, a one-point increase in the GEMP index, reduces the GWG by 18.7 and 23.2 percentage points at the 10th and 25th percentiles, respectively, compensating considerably for the adjusted GWG, and by 16.7 percentage points (from 20.9% to 4.2%) at the median. In the third group of eight countries (Croatia, Czechia, Denmark, Germany, Hungary, the Netherlands, Portugal and Slovakia), the estimated coefficient of the cross product of the female and *GEMP* variables is positive and statistically significant at the 50th percentile and, in some cases, at the 25th and 75th percentiles. However, the coefficient is negative and significant at the edges of the distribution. Thus, a more gender-balanced composition of management reduces the GWG for workers at the median of the distribution. The countries where the estimated coefficient is highest at the median are Portugal, Slovakia and Hungary. Indeed, a one-point increase in the *GEMP* index is associated with a 19.7, 24.3 and 11.5 percentage point reduction in the adjusted GWG in Portugal, Slovakia and Hungary, respectively. The fourth group includes only Romania, where the estimated coefficient of the cross product of the female and *GEMP* is negative and statistically significant at all percentiles considered. Finally, the fifth group consists of Greece and Spain, where it is difficult to find a clear pattern along the wage distribution.

The results of the UQR including establishment fixed effects, as stated in Equation (6), are summarised in Table 5. Similar to Table 4, the estimated coefficients and their respective standard deviations for the variables female and the cross product of the female and *GEMP* are reported for each country and for the 10th, 25th, 50th, 75th and 90th percentiles of the wage distribution.

Table 4. Summary of unconditional quantile estimates of wages equation.

Country	Variable	q10		q25		q50		q75		q90	
		Coefficient	**(s.e.)**	**Coefficient**	**(s.e.)**	**Coefficient**	**(s.e.)**	**Coefficient**	**(s.e.)**	**Coefficient**	**(s.e.)**
Belgium	female	0.0198 ***	(0.0046)	−0.0462 ***	(0.0043)	−0.0607 ***	(0.0031)	−0.0019	(0.0032)	0.0089 ***	(0.0030)
	GEM	0.0172 ***	(0.0048)	−0.0002	(0.0045)	−0.0121 ***	(0.0035)	−0.0110 ***	(0.0039)	0.0299 ***	(0.0041)
	female × GEM	0.0620 ***	(0.0075)	0.0862 ***	(0.0068)	0.0308 ***	(0.0050)	0.0084	(0.0054)	−0.0077	(0.0055)
Bulgaria	female	−0.0298 ***	(0.0021)	−0.1060 ***	(0.0024)	−0.1967 ***	(0.0025)	−0.2273 ***	(0.0031)	−0.2007 ***	(0.0039)
	GEM	−0.0128 ***	(0.0023)	−0.0004	(0.0025)	0.0345 ***	(0.0027)	0.0228 ***	(0.0036)	0.0628 ***	(0.0046)
	female × GEM	0.0465 ***	(0.0033)	0.1024 ***	(0.0037)	0.0821 ***	(0.0038)	0.0679 ***	(0.0048)	0.0026	(0.0060)
Cyprus	female	−0.1588 ***	(0.0064)	−0.2423 ***	(0.0052)	−0.2339 ***	(0.0065)	−0.0379 ***	(0.0052)	−0.0164 ***	(0.0053)
	GEM	−0.0053	(0.0081)	0.0244 ***	(0.0073)	−0.1025 ***	(0.0098)	0.0451 ***	(0.0091)	0.0548 ***	(0.0105)
	female × GEM	0.1985 ***	(0.0099)	0.2588 ***	(0.0088)	0.1912 ***	(0.0120)	−0.0993 ***	(0.0107)	−0.1646 ***	(0.0119)
Czechia	female	−0.0971 ***	(0.0014)	−0.1501 ***	(0.0010)	−0.1854 ***	(0.0008)	−0.2188 ***	(0.0010)	−0.2282 ***	(0.0016)
	GEM	0.0180 ***	(0.0017)	−0.0435 ***	(0.0012)	−0.0716 ***	(0.0010)	−0.0637 ***	(0.0013)	−0.0098 ***	(0.0024)
	female × GEM	−0.0313 ***	(0.0025)	0.0041 **	(0.0017)	0.0426 ***	(0.0014)	0.0212 ***	(0.0017)	−0.0620 ***	(0.0029)
Germany	female	0.0246 ***	(0.0012)	−0.0307 ***	(0.0006)	−0.1247 ***	(0.0007)	−0.1269 ***	(0.0007)	−0.1514 ***	(0.0010)
	GEM	−0.0218 ***	(0.0016)	−0.0153 ***	(0.0009)	−0.0176 ***	(0.0009)	0.0114 ***	(0.0010)	0.0279 ***	(0.0017)
	female × GEM	−0.0207 ***	(0.0023)	0.0041 ***	(0.0012)	0.0244 ***	(0.0013)	−0.0103 ***	(0.0012)	−0.0597 ***	(0.0019)
Denmark	female	−0.0543 ***	(0.0015)	−0.0859 ***	(0.0010)	−0.1017 ***	(0.0009)	−0.1328 ***	(0.0012)	−0.1639 ***	(0.0020)
	GEM	−0.0080 ***	(0.0015)	−0.0152 ***	(0.0011)	−0.0041 ***	(0.0010)	0.0268 ***	(0.0014)	0.0492 ***	(0.0027)
	female × GEM	−0.0002	(0.0023)	0.0334 ***	(0.0016)	0.0304 ***	(0.0014)	0.0000	(0.0018)	−0.0268 ***	(0.0031)
Estonia	female	−0.0559 ***	(0.0076)	−0.2175 ***	(0.0099)	−0.1847 ***	(0.0055)	−0.2000 ***	(0.0068)	−0.2757 ***	(0.0110)
	GEM	−0.1570 ***	(0.0095)	−0.1536 ***	(0.0118)	−0.1014 ***	(0.0066)	−0.0370 ***	(0.0088)	−0.0581 ***	(0.0151)
	female × GEM	−0.0097	(0.0137)	0.0309 *	(0.0164)	0.0878 ***	(0.0088)	0.0250 **	(0.0111)	0.0540 ***	(0.0180)
Greece	female	−0.0460 ***	(0.0069)	−0.0749 ***	(0.0053)	−0.0583 ***	(0.0049)	−0.1524 ***	(0.0061)	−0.2216 ***	(0.0115)
	GEM	−0.1065 ***	(0.0084)	−0.0576 ***	(0.0062)	0.0397 ***	(0.0060)	−0.0417 ***	(0.0078)	0.0013	(0.0167)
	female × GEM	0.0347 ***	(0.0120)	−0.0066	(0.0090)	−0.0743 ***	(0.0081)	0.0047	(0.0101)	0.0213	(0.0194)
Spain	female	−0.1436 ***	(0.0028)	−0.1684 ***	(0.0021)	−0.1600 ***	(0.0023)	−0.0924 ***	(0.0022)	−0.1093 ***	(0.0027)
	GEM	−0.0259 ***	(0.0026)	0.0268 ***	(0.0021)	0.0247 ***	(0.0023)	0.0291 ***	(0.0023)	−0.0280 ***	(0.0031)
	female × GEM	0.0067	(0.0044)	0.0530 ***	(0.0033)	−0.0003	(0.0034)	−0.0200 ***	(0.0033)	0.0372 ***	(0.0042)
France	female	−0.0917 ***	(0.0008)	−0.0990 ***	(0.0007)	−0.0934 ***	(0.0006)	−0.1520 ***	(0.0008)	−0.1960 ***	(0.0013)
	GEM	−0.0049 ***	(0.0006)	−0.0007	(0.0006)	0.0037 ***	(0.0006)	0.0119 ***	(0.0009)	0.0387 ***	(0.0014)
	female × GEM	0.0270 ***	(0.0012)	0.0190 ***	(0.0011)	−0.0025 ***	(0.0009)	−0.0194 ***	(0.0013)	−0.0316 ***	(0.0020)

Table 4. *Cont.*

Country	Variable	q10		q25		q50		q75		q90	
		Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)
Croatia	female	−0.1540 ***	(0.0041)	−0.1698 ***	(0.0038)	−0.1521 ***	(0.0035)	−0.1592 ***	(0.0045)	−0.1898 ***	(0.0066)
	GEM	−0.0431 ***	(0.0035)	−0.0130 ***	(0.0036)	−0.0235 ***	(0.0035)	−0.0110 ***	(0.0041)	−0.0182 ***	(0.0061)
	female × GEM	−0.0061	(0.0061)	−0.0172 ***	(0.0055)	0.0229 ***	(0.0051)	0.0108 *	(0.0063)	−0.0095	(0.0091)
Hungary	female	−0.0046 ***	(0.0012)	−0.0250 ***	(0.0013)	−0.1152 ***	(0.0016)	−0.1186 ***	(0.0017)	−0.2366 ***	(0.0033)
	GEM	−0.0058 ***	(0.0014)	−0.0192 ***	(0.0015)	−0.0392 ***	(0.0018)	0.0070 ***	(0.0020)	0.0469 ***	(0.0044)
	female × GEM	−0.0115 ***	(0.0018)	−0.0014	(0.0019)	0.0587 ***	(0.0024)	−0.0160 ***	(0.0026)	−0.0653 ***	(0.0053)
Italy	female	−0.0680 ***	(0.0015)	−0.1207 ***	(0.0013)	−0.1413 ***	(0.0013)	−0.1581 ***	(0.0018)	−0.2423 ***	(0.0039)
	GEM	−0.0102 ***	(0.0017)	−0.0191 ***	(0.0015)	−0.0406 ***	(0.0015)	−0.0094 ***	(0.0025)	−0.1263 ***	(0.0057)
	female × GEM	0.0795 ***	(0.0022)	0.1211 ***	(0.0020)	0.1232 ***	(0.0020)	0.0353 ***	(0.0032)	0.0302 ***	(0.0068)
Latvia	female	−0.1125 ***	(0.0028)	−0.2212 ***	(0.0036)	−0.2022 ***	(0.0025)	−0.2417 ***	(0.0032)	−0.3019 ***	(0.0054)
	GEM	−0.0412 ***	(0.0029)	−0.0784 ***	(0.0040)	−0.0446 ***	(0.0029)	−0.0113 ***	(0.0038)	0.0153 **	(0.0065)
	female × GEM	0.0766 ***	(0.0043)	0.1501 ***	(0.0056)	0.1261 ***	(0.0039)	0.0906 ***	(0.0050)	0.0440 ***	(0.0083)
Malta	female	−0.1033 ***	(0.0071)	−0.0818 ***	(0.0063)	−0.0343 ***	(0.0054)	−0.0271 ***	(0.0065)	−0.1654 ***	(0.0109)
	GEM	−0.0641 ***	(0.0071)	−0.0962 ***	(0.0068)	−0.0046	(0.0061)	−0.0311 ***	(0.0078)	−0.0093	(0.0146)
	female × GEM	0.0540 ***	(0.0107)	0.0095	(0.0097)	−0.0632 ***	(0.0084)	−0.0875 ***	(0.0102)	−0.0054	(0.0170)
Netherlands	female	0.0358 ***	(0.0011)	−0.0646 ***	(0.0012)	−0.0719 ***	(0.0009)	−0.1093 ***	(0.0010)	−0.1245 ***	(0.0016)
	GEM	0.0141 ***	(0.0013)	0.0320 ***	(0.0015)	0.0301 ***	(0.0010)	0.0193 ***	(0.0012)	0.0521 ***	(0.0021)
	female × GEM	−0.0357 ***	(0.0017)	0.0272 ***	(0.0019)	0.0155 ***	(0.0014)	−0.0152 ***	(0.0015)	−0.0303 ***	(0.0025)
Norway	female	−0.0372 ***	(0.0016)	−0.0642 ***	(0.0011)	−0.0893 ***	(0.0009)	−0.1464 ***	(0.0013)	−0.1896 ***	(0.0022)
	GEM	−0.0329 ***	(0.0017)	−0.0254 ***	(0.0011)	−0.0040 ***	(0.0010)	0.0130 ***	(0.0015)	0.0079 ***	(0.0028)
	female × GEM	0.0224 ***	(0.0025)	0.0197 ***	(0.0017)	0.0130 ***	(0.0014)	0.0157 ***	(0.0020)	0.0047	(0.0033)
Poland	female	−0.0505 ***	(0.0009)	−0.1285 ***	(0.0008)	−0.1795 ***	(0.0007)	−0.2078 ***	(0.0010)	−0.1988 ***	(0.0014)
	GEM	0.0027 ***	(0.0009)	−0.0272 ***	(0.0008)	−0.0423 ***	(0.0009)	−0.0047 ***	(0.0011)	0.0384 ***	(0.0015)
	female × GEM	0.0181 ***	(0.0014)	0.0346 ***	(0.0012)	0.0448 ***	(0.0011)	0.0129 ***	(0.0016)	−0.0378 ***	(0.0022)
Portugal	female	−0.0794 ***	(0.0020)	−0.0988 ***	(0.0023)	−0.1936 ***	(0.0043)	−0.1960 ***	(0.0053)	−0.1556 ***	(0.0054)
	GEM	−0.0668 ***	(0.0020)	−0.0621 ***	(0.0023)	−0.1433 ***	(0.0048)	0.0509 ***	(0.0055)	0.0878 ***	(0.0063)
	female × GEM	0.0050	(0.0031)	0.0588 ***	(0.0034)	0.1139 ***	(0.0067)	−0.0469 ***	(0.0079)	−0.1104 ***	(0.0084)
Romania	female	−0.0016	(0.0014)	−0.0842 ***	(0.0018)	−0.1067 ***	(0.0016)	−0.1076 ***	(0.0019)	−0.1320 ***	(0.0026)
	GEM	−0.0271 ***	(0.0014)	−0.0020	(0.0017)	−0.0089 ***	(0.0016)	0.0303 ***	(0.0017)	0.0789 ***	(0.0023)
	female × GEM	−0.0141 ***	(0.0018)	−0.0347 ***	(0.0023)	−0.0543 ***	(0.0021)	−0.0450 ***	(0.0024)	−0.0505 ***	(0.0033)

Table 4. *Cont.*

Country	Variable	q10		q25		q50		q75		q90	
		Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)
Sweden	female	−0.0157 ***	(0.0009)	−0.0235 ***	(0.0007)	−0.0475 ***	(0.0008)	−0.0642 ***	(0.0012)	−0.1359 ***	(0.0020)
	GEM	0.0107 ***	(0.0009)	0.0059 ***	(0.0007)	−0.0031 ***	(0.0008)	0.0294 ***	(0.0014)	0.0262 ***	(0.0025)
	female × GEM	0.0057 ***	(0.0014)	0.0054 ***	(0.0011)	0.0025 **	(0.0012)	−0.0358 ***	(0.0018)	−0.0075 **	(0.0031)
Slovakia	female	−0.0751 ***	(0.0021)	−0.1701 ***	(0.0016)	−0.2520 ***	(0.0015)	−0.2625 ***	(0.0019)	−0.2204 ***	(0.0028)
	GEM	0.0051 **	(0.0024)	−0.0324 ***	(0.0018)	−0.0703 ***	(0.0019)	−0.0554 ***	(0.0025)	0.0441 ***	(0.0040)
	female × GEM	−0.0074 **	(0.0035)	0.0494 ***	(0.0026)	0.0880 ***	(0.0025)	0.0321 ***	(0.0031)	−0.1067 ***	(0.0049)

Notes: Sampling weights are used in all estimations. Robust standard errors (s.e.) between parentheses. Statistically significance indicated by *** 1% level, ** 5% level and * 10% level.
Source: own elaboration based on the authors' estimate using E-SES 2018.

Table 5. Summary of unconditional quantile estimates of wage equation with establishment fixed effects.

Country	Variable	q10		q25		q50		q75		q90	
		Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)
Belgium	female	0.0359	(0.0348)	−0.0241	(0.0249)	−0.0675 ***	(0.0155)	−0.0258	(0.0170)	0.0030	(0.0154)
	female × GEM	0.0413	(0.0567)	0.0555	(0.0419)	0.0509 *	(0.0291)	0.0449	(0.0323)	−0.0030	(0.0328)
Bulgaria	female	−0.0107	(0.0069)	−0.0559 ***	(0.0077)	−0.1174 ***	(0.0077)	−0.1473 ***	(0.0103)	−0.1835 ***	(0.0148)
	female × GEM	0.0208 *	(0.0107)	0.0437 ***	(0.0117)	0.0242 **	(0.0121)	0.0177	(0.0161)	0.0218	(0.0232)
Cyprus	female	−0.1214 ***	(0.0247)	−0.1748 ***	(0.0219)	−0.1707 ***	(0.0259)	−0.0282	(0.0216)	−0.0069	(0.0248)
	female × GEM	0.1667 ***	(0.0378)	0.1912 ***	(0.0361)	0.1198 **	(0.0583)	−0.1261 ***	(0.0481)	−0.1667 **	(0.0649)
Czechia	female	−0.0876 ***	(0.0049)	−0.1202 ***	(0.0031)	−0.1522 ***	(0.0024)	−0.1825 ***	(0.0030)	−0.1999 ***	(0.0052)
	female × GEM	−0.0061	(0.0082)	0.0198 ***	(0.0052)	0.0527 ***	(0.0039)	0.0337 ***	(0.0048)	−0.0644 ***	(0.0087)
Germany	female	0.0006	(0.0123)	−0.0418 ***	(0.0072)	−0.1411 ***	(0.0074)	−0.1513 ***	(0.0070)	−0.2347 ***	(0.0128)
	female × GEM	0.0005	(0.0212)	0.0069	(0.0123)	0.0503 ***	(0.0125)	0.0187	(0.0120)	0.0326	(0.0219)
Denmark	female	−0.0309 ***	(0.0020)	−0.0565 ***	(0.0014)	−0.0818 ***	(0.0012)	−0.1266 ***	(0.0016)	−0.1680 ***	(0.0029)
	female × GEM	−0.0005	(0.0031)	0.0162 ***	(0.0022)	0.0175 ***	(0.0018)	0.0033	(0.0026)	−0.0246 ***	(0.0047)
Estonia	female	−0.0303	(0.0239)	−0.1499 ***	(0.0284)	−0.1138 ***	(0.0167)	−0.1013 ***	(0.0203)	−0.1977 ***	(0.0287)
	female × GEM	0.0228	(0.0388)	0.0673	(0.0455)	0.0518 **	(0.0260)	−0.0366	(0.0312)	0.0473	(0.0472)
Greece	female	−0.0043	(0.0421)	−0.0791 *	(0.0444)	−0.0481	(0.0403)	−0.1314 ***	(0.0483)	−0.1605	(0.1014)
	female × GEM	0.0011	(0.0750)	0.0199	(0.0716)	−0.0662	(0.0622)	−0.0202	(0.0747)	−0.0452	(0.1578)

Table 5. *Cont.*

Country	Variable	q10		q25		q50		q75		q90	
		Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)	Coefficient	(s.e.)
Spain	female	−0.1275 ***	(0.0246)	−0.1359 ***	(0.0251)	−0.1516 ***	(0.0257)	−0.0984 ***	(0.0233)	−0.1411 ***	(0.0304)
	female × GEM	0.0419	(0.0376)	0.0528	(0.0358)	0.0228	(0.0351)	−0.0024	(0.0318)	0.0776 *	(0.0433)
France	female	−0.0683 ***	(0.0132)	−0.0861 ***	(0.0115)	−0.0877 ***	(0.0086)	−0.1342 ***	(0.0119)	−0.1925 ***	(0.0152)
	female × GEM	0.0228	(0.0181)	0.0360 **	(0.0159)	−0.0048	(0.0121)	−0.0486 ***	(0.0168)	−0.0647 ***	(0.0232)
Croatia	female	−0.0614 ***	(0.0142)	−0.0678 ***	(0.0127)	−0.0748 ***	(0.0135)	−0.1201 ***	(0.0188)	−0.1636 ***	(0.0271)
	female × GEM	−0.0466 **	(0.0223)	−0.0625 ***	(0.0196)	−0.0127	(0.0209)	−0.0041	(0.0284)	−0.0474	(0.0409)
Hungary	female	−0.0418 ***	(0.0050)	−0.0230 ***	(0.0043)	−0.0720 ***	(0.0053)	−0.0918 ***	(0.0055)	−0.1986 ***	(0.0109)
	female × GEM	0.0307 ***	(0.0071)	0.0122 **	(0.0062)	0.0340 ***	(0.0075)	−0.0195 **	(0.0079)	−0.0511 ***	(0.0161)
Italy	female	−0.0389 ***	(0.0123)	−0.0899 ***	(0.0124)	−0.1185 ***	(0.0115)	−0.1327 ***	(0.0177)	−0.1929 ***	(0.0389)
	female × GEM	0.0362 *	(0.0189)	0.0755 ***	(0.0179)	0.0954 ***	(0.0176)	−0.0247	(0.0297)	−0.0656	(0.0654)
Latvia	female	−0.0273 **	(0.0112)	−0.0550 ***	(0.0136)	−0.0722 ***	(0.0095)	−0.1282 ***	(0.0126)	−0.1648 ***	(0.0223)
	female × GEM	−0.0126	(0.0186)	−0.0028	(0.0215)	−0.0048	(0.0151)	−0.0340 *	(0.0198)	−0.1058 ***	(0.0351)
Malta	female	−0.1428 ***	(0.0314)	−0.1485 ***	(0.0265)	−0.0504 **	(0.0238)	−0.0705 **	(0.0292)	−0.1690 ***	(0.0492)
	female × GEM	0.1231 ***	(0.0434)	0.1267 ***	(0.0379)	−0.0262	(0.0335)	0.0015	(0.0427)	0.0087	(0.0750)
Netherlands	female	0.0373 ***	(0.0144)	−0.0352 ***	(0.0112)	−0.0675 ***	(0.0072)	−0.1258 ***	(0.0083)	−0.1429 ***	(0.0117)
	female × GEM	−0.0507 **	(0.0226)	0.0133	(0.0186)	0.0183	(0.0115)	0.0203	(0.0130)	0.0199	(0.0182)
Norway	female	−0.0014	(0.0019)	−0.0288 ***	(0.0012)	−0.0545 ***	(0.0010)	−0.1058 ***	(0.0014)	−0.1690 ***	(0.0024)
	female × GEM	−0.0044	(0.0028)	−0.0039 **	(0.0018)	−0.0161 ***	(0.0016)	−0.0221 ***	(0.0023)	−0.0194 ***	(0.0038)
Poland	female	−0.0370 ***	(0.0030)	−0.0829 ***	(0.0027)	−0.1121 ***	(0.0026)	−0.1598 ***	(0.0035)	−0.1549 ***	(0.0050)
	female × GEM	0.0090 *	(0.0047)	0.0136 ***	(0.0042)	0.0130 ***	(0.0040)	−0.0038	(0.0055)	−0.0760 ***	(0.0083)
Portugal	female	−0.0455 ***	(0.0141)	−0.0616 ***	(0.0153)	−0.1804 ***	(0.0265)	−0.2299 ***	(0.0334)	−0.1936 ***	(0.0360)
	female × GEM	−0.0076	(0.0296)	0.0415	(0.0265)	0.1362 ***	(0.0411)	0.0328	(0.0486)	−0.0240	(0.0551)
Romania	female	−0.0347 ***	(0.0053)	−0.0785 ***	(0.0090)	−0.0902 ***	(0.0094)	−0.1206 ***	(0.0115)	−0.1232 ***	(0.0151)
	female × GEM	0.0212 ***	(0.0072)	−0.0171	(0.0115)	−0.0499 ***	(0.0118)	−0.0156	(0.0141)	−0.0576 ***	(0.0194)
Sweden	female	−0.0052	(0.0045)	−0.0144 ***	(0.0037)	−0.0496 ***	(0.0039)	−0.0821 ***	(0.0059)	−0.1606 ***	(0.0112)
	female × GEM	−0.0036	(0.0069)	0.0012	(0.0057)	0.0155 ***	(0.0060)	0.0027	(0.0090)	0.0276	(0.0174)
Slovakia	female	−0.0587 ***	(0.0068)	−0.0970 ***	(0.0048)	−0.1481 ***	(0.0048)	−0.1664 ***	(0.0061)	−0.1670 ***	(0.0112)
	female × GEM	−0.0054	(0.0109)	0.0227 ***	(0.0080)	0.0381 ***	(0.0080)	−0.0111	(0.0104)	−0.1354 ***	(0.0198)

Notes: Sampling weights are used in all estimations. Robust standard errors (s.e.) between parentheses. Statistically significance indicated by *** 1% level, ** 5% level and * 10% level.
Source: own elaboration based on the authors' estimate using E-SES 2018.

In line with the results previously presented in Table 4, the estimated coefficient for the variable female is lowest in absolute value at the bottom of the wage distribution and increases in magnitude as we move up along the wage distribution. This evidence of the presence of the glass ceiling for women in the job market is found in all countries except for Belgium and Cyprus. The countries where the difference in the GWG between the 90th and 10th percentile of the wage distribution is larger are Germany, the Netherlands and Bulgaria. The difference is by almost 21 percentage points in Germany, 17.1 percentage points in the Netherlands, and 15.7 percentage points in Bulgaria.

Regarding the effect of *GEMP* on the GWG, the results are similar to those without establishment fixed effects. Thus, gender equality in management reduces the GWG in the middle and lower part of the wage distribution, while a greater gender equality is associated with a higher GWG at the top of the distribution. This may be attributed to the standardisation of lower-wage jobs, typically established through collective agreements, while higher wages are usually negotiated based on the perceived value contributed by workers, with different gender biases playing a role. Furthermore, it is usual for higher wages to be linked to perceived wage bonuses that reward greater effort in terms of time, travel and the volume of projects undertaken, which women often do not have because they are engaged in care work (De la Rica et al. 2015; Christofides et al. 2013).

However, there is a significant increase in the number of cases where the estimated coefficient is not statistically significant. At the 10th, 25th and 50th percentiles the number of countries where the estimated coefficient of the cross product of the female and *GEMP* variables is positive and statistically significant is 7, 10 and 13, respectively, while the coefficient is negative in only two countries at each indicated percentile. At the 75th percentile, the estimated coefficient is negative (positive) in five countries (one country). At the 90th percentile, the estimated coefficient is negative (positive) in 10 countries (1 country). The countries can be now divided into four groups. The first group consists of countries where greater gender equality reduces the wage gap between women and men at the lower and medium parts of the wage distribution and increases it between high-paid women and men. These countries are Bulgaria, Cyprus, Czechia, Denmark, France, Hungary, Italy, Malta, Poland, Romania and Slovakia. The second group consists of Belgium, Estonia, Germany, Portugal and Sweden. In these countries, the estimated coefficient of the cross product of the female and *GEMP* is positive and statistically significant at the median and not statistically significant in the rest of the wage distribution. Among these, the estimated coefficient is larger in Portugal. Its value indicates that a one-point increase in the *GEMP* index reduces the GWG at the 50th percentile by 12.2 percentage points, from 16.5% to 4.3%. For Belgium, Germany and Estonia, the estimated coefficient is rather similar (around 0.05), indicating that a one-point increase in the *GEMP* index reduces the GWG at the median by 4.8 percentage points in Belgium (from 6.5% to 1.7%), 4.5 percentage points in Germany (from 13.2% to 8.6%) and 4.7 percentage points in Estonia (from (10.8% to 6%). In the third group of countries, the estimated coefficient of the cross product of the female and *GEMP* is negative and statistically significant at one or more points of the wage distribution. This group consists of Croatia, Latvia, Norway and the Netherlands. Finally, in Spain and Greece, the results suggest that gender equality in management has no effect on the GWG at any point of the wage distribution.

6. Discussion

Encouraging women to promote to leadership positions is one of the mechanisms proposed in the literature and policies to reduce the GWG. Involving more women in decision making would prioritise gender equality, facilitating the implementation of policies and practices, like family-friendly policies, enabling women to compete on an equal term. Previous studies have showed that countries with less generous gender policies have a lower pay gap at the top of the wage distribution and a larger gap at the bottom, suggesting that the positive effect of family-friendly policies dominates at the bottom of the distribution (Arulampalam et al. 2007). Such policies do indeed correlate with the duration of employment breaks taken by women after the birth of their first child. This correlation is significant when female employees are specifically targeted for promotion, through initiatives such as mentoring programmes, which lead to a faster return to work (Bächmann et al. 2020).

The legal framework of the European Union acts as a keystone for closing the gender pay gap that reveals possible gender stereotypes and bias, contributing to the endurance of the other cause of the GWG, like sectoral and vertical segregation—the glass ceiling (Leythienne and Pérez-Julián 2021). The European Union itself has already introduced gender quotas into their legislation to reduce the glass ceiling. Although certain studies indicate that quotas have not achieved their purpose, the political and social obligation to report on board composition and pay gaps generates public image pressure to improve gender equality (Theodoropoulos et al. 2022).

The absence or presence of a structured childcare system in the countries could cause women managers to be less or more attached to the labour market, especially at the bottom of the wage distribution. This characteristic along with social and cultural biases may constitute a significant obstacle to equality between men and women in terms of wages and participation in managerial position, particularly for the high hierarchical levels (Sccichiano 2014).

Cultural changes could have led more highly and technical-educated women to choose stereotypically male work in order to pursue goals of increased status and pay (Busch 2020). In this sense, the challenges are associated with the continuous requirement for up-skilling and reskilling as an adaptive reaction to technological changes that will affect the labour market and the new jobs (Cramarenco et al. 2023). Artificial Intelligence is expected to generate disruptive transformations in the labour market, affecting job requirements, work procedures, task design, and assessment techniques. These transformations will also impact gender equality. Therefore, closing the gender gaps—both the glass ceiling and the GWG—depends on society's continued support of women's training in STEM and AI and ensuring that today's gender stereotypes do not become internalised in future technology systems (Collett et al. 2022).

7. Conclusions

Our work includes a gender-neutral diversity perspective to contribute to a deeper understanding of the dynamics through which gender diversity might reduce the GWG. In addition to examining only the proportion of women in leadership positions, this approach broadens the scope of the evaluation to include the impact of men's entry into women-led organisations. Moreover, studying its effects throughout the income distribution offers additional valuable perspectives.

Our findings indicate the relationship between gender equality in management positions and wages yields mixed results. In 10 of the 22 countries, higher gender equality in management corresponds to lower wages, while in 6 of the 22 countries, there is evidence that a greater level of gender equality in management is associated with increased wages. Furthermore, the results show that gender equality in management has a predominantly positive effect in the upper part of the wage distribution, and a negative effect at the middle and lower parts of the distribution.

Regarding the relationship between gender equality in managerial positions and the GWG, the results are also mixed, but the cases where a higher gender equality reduces the GWG predominate. Also, the estimation results of the UQR indicate that gender equality in managerial positions reduces the GWG mainly in the middle and lower parts of the wage distribution, in accordance with the results obtained by Santero-Sánchez and Castro Núñez (2022) for Spain and Huffman et al. (2017) for Germany.

There are several possible causes for these findings. Firstly, the current number of women in managerial positions might not be adequate to bring about the required transformations. Specifically, their increased representation may not be enough to provide the power necessary to change the sexist structures that generate the GWG. Secondly, if gender equality in management is mainly achieved in feminised sectors, the lower salaries in these sectors would inhibit a reduction in the GWG at the global level.

Moreover, it is possible that gender diversity in corporate management requires a time lag for changes to become visible within organisations. It would be interesting to test whether the influence of gender diversity affects wages with a time lapse, in the sense that the effect could be observed in later years. Therefore, it is needed to have a panel database that would allow us to analyse changes in the variables over time in the same set of companies.

On the other hand, these results represent a policy dilemma, as promoting gender equality in management improves the situation for the majority of women who are concentrated at the bottom of the wage distribution, while disadvantaging a few at the top (Huffman et al. 2017).

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Notes

1. The formula used to calculate the index of gender equality in managerial positions is based on the gender wage gap measure used in the construction of the Gender Equality Index by the European Institute for Gender Equality (European Institute for Gender Equality 2017).
2. Equation (6) is estimated using the STATA module rifghde by Ríos-Ávila (2020). The command uses a two-step procedure. First, RIF are estimated as in Equation (4), and second, OLS with one high-dimensional fixed effect (the establishment fixed effect) is applied. The module is part of the STATA package RIF available at: https://github.com/friosavila/stpackages/tree/main/rif (accessed on 27 March 2023).
3. International Standard Classification of Occupations, year 2008.
4. We do not present the results for the rest of control variables due to space limitations. The overall results are available upon request on the authors.

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