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EQUITY BEYOND EQUALITY: WOMEN'S LEADERSHIP, OWNERSHIP AND PAY GAP IN EUROPEAN SMES

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Abstract

Purpose. *This study investigates the interplay between women leadership and ownership structure in shaping gender pay disparities within the European SMEs. It specifically examines how the presence of women in top leadership roles influences the gender pay gap across publicly owned and family-owned enterprises, thereby contributing to the broader discourse on governance, equity, and organizational performance.*
Design/methodology/approach. *Drawing on a panel dataset comprising 1,050 firm-level observations from European listed companies from 2010 to 2023, the study employs a high-dimensional fixed effects (HDFE) econometric model to estimate the determinants of wage inequality. The analysis is situated within a dual theoretical framework, Agency Theory and Social Role Theory, to elucidate the mechanisms through which gender representation, institutional ownership, and cultural norms influence pay structures. The empirical strategy incorporates interaction terms to assess the moderating effects of ownership type on the relationship between female leadership and the gender pay gap.*
Findings. *The results indicate a robust and statistically significant negative association between women's board representation and the gender pay gap. This relationship is particularly pronounced in public-owned enterprises, where institutional oversight and public accountability appear to enhance the efficacy of inclusive leadership. Conversely, in family-owned firms, greater women's representation is paradoxically associated with an increase in wage disparities, suggesting the presence of enduring patriarchal norms and informal power structures that may undermine formal equality initiatives. Additional findings reveal that board independence and ESG performance contribute to reducing the pay gap, while traditional financial performance indicators exhibit limited explanatory power in this context.*
Practical and social implications. *The findings yield actionable insights for both policymakers and corporate stakeholders. In the public sector, reinforcing gender-inclusive governance frameworks can yield tangible equity outcomes. In contrast, interventions in family-owned enterprises must account for embedded cultural dynamics that may resist surface-level reforms. Recommended policy measures include the enforcement of pay transparency legislation, the introduction of gender-equitable hiring and promotion practices, and the provision of structural supports such as childcare services and flexible work arrangements. These initiatives are essential for equitable labor market outcomes in an industry historically marked by gender imbalance.*
Originality of the study. *This research offers a novel contribution to the literature by providing a comparative, ownership-specific analysis of gender pay dynamics within the ICT sector, an industry characterized by both high wage inequality and persistent gender underrepresentation. Through its integration of institutional theory, gender studies, and econometric modeling, the study advances understanding of how structural and cultural variables jointly condition the impact of female leadership on pay equity.*

1. Introduction

The gender pay gap remains a key area of research, providing essential insights into the factors that contribute to wage inequality between men and women (Carlson & McEnroe, 1985). Existing literature has emphasized the role of occupational segregation, where women are often overrepresented in sectors and professions that pay lower wages compared to male-dominated fields (Ceci et al., 2014; Bishu & Headley, 2020; Blau & Kahn, 2020). This configuration of the labor market significantly increases gender-based wage disparities across various organizational contexts (Bennedsen et al., 2022).

Empirical evidence consistently shows that, on average, women receive lower compensation than men, given similar levels of education, professional experience, and job responsibilities (Litman et al., 2020; Baker et al., 2023). The increasing emphasis on the gender pay gap in corporate discussions highlights the urgent need to identify effective strategies to address this systemic issue. One of the most prominent proposals is to increase women's representation on corporate boards, based on the idea that such measures may help reduce wage inequality (Carter et al., 2017). Numerous studies have pointed out the impact of gender stereotypes in decision-making processes, indicating that female entrepreneurs frequently face systematic disadvantages due to biases favoring male-led firms, even when the characteristics of the organizations are otherwise similar (Aterido & Hallward-Driemeier, 2011; Bönte & Piegeler, 2013; Conroy et al., 2021).

Moreover, prior scholarly analyses of persistent gender wage disparities in corporate settings have prompted deeper investigations into the various factors contributing to this issue (Roethlisberger et al., 2023). One key factor is occupational segregation, which tends to funnel women into lower-paid sectors, thereby exacerbating wage inequalities across different industries (Ceci et al., 2009; Blau & Kahn, 2017).

The continued existence of wage gaps, even when controlling for education, experience, and job function, confirms the structural and systemic nature of the issue (Coffé & Bolzendahl, 2010; Ponthieux & Meurs, 2015). Auspurg et al. (2017), in their study on perceptions of pay equity, argue that subjective evaluations of fairness play a role in maintaining gender-based wage disparities. Their findings demonstrate the pervasive influence of gender bias in compensation practices and highlight the importance of critical awareness in addressing these issues. Within this context, women in senior leadership roles play a strategic part in advancing initiatives aimed at promoting pay equity. However, the issue of gender representation within corporate structures, particularly in high-tech sectors such as Information and Communication Technology (ICT), has gained increasing attention in recent research trajectories (European Institute for Gen-

der Equality, 2020). Historically, these industries have exhibited a male-dominated leadership landscape, resulting in systemic barriers that hinder women's career progression and professional recognition (Tanwir & Khemka, 2018). Nevertheless, recent years have witnessed a proliferation of initiatives aimed at addressing these structural disparities through targeted strategies to increase female representation in executive and board-level positions (OECD, 2023).

Therefore, this study aims to explore the relationship between female leadership, ownership structure (specifically, family-owned and publicly owned firms), and the gender pay gap, with a particular emphasis on the ICT sector. To achieve this objective, this research is based on a dataset comprising 1,050 firm-level observations from European small and medium-sized enterprises (SMEs) listed companies from 2010 to 2023.

The findings reveal that an increase in female representation in top leadership roles is linked to a significant reduction in the gender pay gap, especially in publicly owned firms, where this representation has a particularly positive impact. Conversely, family ownership tends to worsen wage disparities.

This research is particularly important for discussions on gender equality, providing valuable insights that can inform strategies aimed at promoting pay equity in the ICT sector, which has traditionally seen a lack of women in both technical and executive positions.

The paper is structured as follows. Section 1 provides the theoretical framework of the study, Section 2 details the methodological approach, Section 3 presents the empirical results, and the final section offers a discussion of the findings and their implications.

2. Theoretical Background

2.1 Agency Theory and Social Role Theory

This study draws on two theoretical frameworks, the Agency Theory and Social Role Theory, to provide a structured lens through which to examine corporate ownership types and the dynamics of female leadership regarding the gender pay gap.

Agency Theory offers substantial insights into the complex relationships between principals (owners or shareholders) and agents (managers or executives) within organizational contexts. This theory analyzes issues arising from goal divergence between these two groups and investigates strategies to mitigate such conflicts, aiming to align the interests of principals and agents (Eisenhardt, 1989; Bergen et al., 1992; Linder & Foss, 2013; Moloi & Marwala, 2020). Eisenhardt (1989) proposed an integrated

perspective on Agency Theory by incorporating insights from research on cooperative challenges, information systems, incentives, risk, and empirical robustness, particularly when the agency perspective is combined with complementary approaches. Bergen et al. (1992) expanded on the theory's application in the field of marketing, exploring both forward-looking and retrospective agency research to identify how this framework can advance knowledge and practice in marketing.

Additionally, Linder and Foss (2013) investigated pre-contractual (hidden characteristics) and post-contractual (hidden actions) information asymmetries, highlighting the role of incentive mechanisms and monitoring tools in mitigating their detrimental effects on organizational performance. Moloi and Marwala (2020) explored the potential impact of artificial intelligence on agency relationships, emphasizing how advanced data exchange systems between agents and principals can foster behavioral alignment within organizations. Furthermore, Bosse and Phillips (2016) enriched the theory by examining extreme behaviors in empirical studies, incorporating principles of reciprocity and fairness into Agency Theory.

This study examines gender disparities in business, particularly focusing on the pay gap influenced by societal perceptions and gender-role stereotypes. It incorporates Social Role Theory, which explores how societal values shape individual behavior in different areas, including the workplace. This framework provides a basis for analyzing how increased female representation on corporate boards may challenge and reshape existing norms, ultimately fostering more equitable compensation practices.

Eagly and Wood (2016) examined how behavioral differences and similarities between men and women largely stem from their socially assigned roles. In a meta-analysis, Franke et al. (1997) explored gender-based differences in ethical attitudes toward business activities, emphasizing the influence of gender roles on perceptions and decision-making processes in entrepreneurial contexts. Similarly, Kiefer et al. (2022) found that gender affects small business performance, with disparities shaped by societal expectations and access to resources. These findings suggest that female leaders can have a significant impact on corporate standards by advancing fair pay practices and initiatives aimed at narrowing the gender pay gap.

Finally, Diekman and Schneider's (2010) work applying the Social Role Theory framework demonstrates that gender roles profoundly influence attitudes and behaviors in both personal and professional domains, with important implications for compensation and gender equality in the workplace.

2.2 Female leadership and the gender pay gap

An increasing number of scholarly studies have emphasized that women's representation in leadership roles is essential for strengthening organizational balance and promoting equity-driven practices within institutions (Stainback & Kwon, 2012; Bennedsen et al., 2022; Post et al., 2021; De la Torre-Torres et al., 2024). Women leaders play a crucial role in narrowing the gender pay gap by facilitating career advancement opportunities for female employees, recognizing and valuing their contributions, and implementing stricter equity standards.

Empirical evidence suggests that the presence of female supervisors is associated with a reduction in perceived discrimination among female employees, indicating that women in leadership may serve as a buffer against gender bias in the workplace. Moreover, supervisory support is positively correlated with increased organizational commitment, which in turn is associated with more substantial wage growth over time (Stainback et al., 2011; Cook et al., 2018).

According to Spencer et al. (2019), women chief executive officers (CEOs) tend to develop a unique set of leadership competencies that become more refined as they progress in their careers, ultimately reaching their peak potential during their tenure. In this context, women leaders are often driven by a strong sense of mission and a belief that their organizations can make a positive impact not only on their employees but also on the broader community. As a result, some women in leadership positions may choose to avoid roles in companies with vague or ethically questionable objectives, instead favoring organizations committed to high-value principles.

Women executives also exhibit a lower propensity for gender bias in evaluative processes, contributing to the mitigation of wage penalties for female employees and supporting the upward mobility of women in lower hierarchical positions. Empirical research shows that female presence on corporate boards is linked to reduced occupational segregation and greater inclusion of women in managerial roles, thus fostering their professional development (Eagly et al., 2003; Skaggs et al., 2012; Stainback et al., 2016).

Furthermore, women's board representation acts as a catalyst for cultural transformation, serving as a role model for women across various organizational levels (Kirsch, 2022). Exposure to women in senior positions can inspire employees to pursue career advancement and negotiate more equitable employment terms. At the same time, women's board members may serve as mentors, facilitating access to professional opportunities and contributing to the enhancement of compensation policies (Eagly et al., 2018; Chang et al., 2023). A study by Biswas et al. (2021) examined the impact of female board representation on gender equality, with a focus on occupational segregation in non-managerial roles. The findings suggest that,

while the effects of female leadership may not be immediately evident, they generate long-term structural changes in organizational culture and internal policies, encouraging a more balanced distribution of responsibility across genders.

Cook et al. (2018) investigated whether the gender composition of boards and compensation committees affects executive pay disparities. Their data indicate that the pay gap tends to narrow when a woman chairs the compensation committee, suggesting that empowering female leaders in decision-making roles is key to addressing wage inequality.

Magda and Cukrowska-Torzewska (2019) analyzed the correlation between female leadership, and the gender pay gap in both public and private sectors in Poland. Their findings indicate that greater female representation in managerial roles positively affects pay equity, with the effect being more pronounced in the public sector, which is typically characterized by a highly qualified workforce. Later, Magda and Sâach (2020) observed that wage disparities are more pronounced in foreign-owned firms than in locally owned ones, suggesting that ownership structure significantly influences wage dynamics. Masso et al. (2020) explored firm-level determinants of the gender pay gap, finding that these inequalities are shaped by institutional labor market structures and women's comparatively weaker negotiating power. In parallel, Chen et al. (2018) studied the impact of motherhood on wage disparities, showing that gaps widen during marriage and childbirth phases. However, as women ascend the corporate hierarchy, their income tends to rise, and the wage gap gradually narrows. Consistent with Cohen and Huffman's (2007) conclusions, greater gender diversity in leadership appears to promote more equitable outcomes for all employees by mitigating pay disparities.

In conclusion, as demonstrated by Saeed et al. (2016), the importance of women's leadership in the ICT sector aligns with the overarching objectives of promoting diversity and inclusion, which are vital for fostering innovation in today's labor market. Empowering women to take on leadership roles allows technology companies to establish a sustainable competitive advantage. Given these insights, the first hypothesis to be tested in this study is formulated as follows:

H1: There is a negative relationship between female representation in leadership and the gender pay gap in the ICT sector.

2.3 Public-owned enterprises and the gender pay gap

The analysis of publicly owned enterprises is an important area of study within business administration and corporate governance. This research particularly focuses on the implications of government ownership for organizational dynamics, strategic decision-making processes, and financial

and economic performance. The literature highlights that the impact of public ownership on managerial effectiveness largely depends on the ideological and political orientation of the ruling government. This relationship tends to vary significantly based on the institutional and national context (Zaid et al., 2020; Aguilera et al., 2021).

From this perspective, public ownership and its interconnections with political and institutional spheres play a critical role in shaping corporate strategies, affecting key variables such as financial leverage, investment in research and development (R&D), and internationalization processes (Tihanyi et al., 2019). Publicly owned firms are conceptualized as hybrid entities, exhibiting varying degrees of public participation and control. These characteristics justify the need for an analytical approach capable of capturing the complex role such firms play within the global economic structure (Bruton et al., 2015; Ang et al., 2022).

An important area of investigation focuses on the relationship between ownership structure and organizational dynamics, particularly regarding the role of public ownership in shaping internal corporate policies, including those aimed at promoting gender equity. Publicly owned enterprises often adopt governance models that differ significantly from those of private companies. This difference is especially noticeable in sectors like ICT, where innovation and competitiveness are crucial for success. In this context, Yu (2013) examined the relationship between public ownership and firm performance in Chinese listed companies. The study revealed that higher levels of public ownership could provide advantages through access to government support and privileged political connections, thereby creating a favorable environment for innovation.

Ang et al. (2022) explored the relationship between Corporate Social Responsibility (CSR) and financial performance, specifically examining how ownership structure moderates this relationship in environmentally impactful Chinese firms. Their findings reveal that CSR positively affects economic performance; however, this effect is stronger in private enterprises compared to those with public ownership.

In a related study, Zaid et al. (2020), applying principles of agency theory, found that both government and foreign ownership positively influence CSR disclosure. This suggests that these ownership structures encourage a greater commitment to social responsibility among corporations. The effect is particularly pronounced in firms with a highly independent board of directors, which enhances the positive impact of CSR initiatives.

Conversely, institutional ownership, when board independence is lacking, did not demonstrate a significant effect on sustainability disclosure. However, when board independence is taken into account, a positive and statistically significant interaction is observed, indicating that institutional investors can play a crucial role in promoting CSR practices, provided they

operate in an environment of genuine board autonomy.

Given this evidence, the current study utilizes agency theory as a conceptual framework to explore the relationship between public ownership, and the gender pay gap and proposes the following research hypotheses:

H2a: There is a negative relationship between public ownership in firms and the gender pay gap in the ICT sector.

Women leaders in public firms have the potential to influence pay structures and help close gender pay gaps. Their leadership may be supported by institutional incentives aimed at promoting equity (Zaid et al., 2020; Magda & Cukrowska-Torzewska, 2019).

This influence can lead to several interconnected benefits. First, women executives often possess a heightened awareness of gender equity issues, shaped by their professional experiences and informed perspectives on workplace inequality. This awareness can result in the development of more inclusive policies, such as transparent salary bands, equitable promotion criteria, and proactive pay audits.

Second, public firms usually face increased scrutiny from institutional investors, regulatory bodies, and the general public. These stakeholders are increasingly demanding accountability and transparency regarding diversity, equity, and inclusion (DEI) outcomes. As a result, women leaders, especially those in prominent top-management or board positions, may feel empowered or even incentivized to implement reforms that address structural inequities in pay.

Research indicates that institutional pressures, such as ESG reporting requirements or shareholder activism, can align with the values and leadership styles of women executives, promoting fairness and equity in compensation.

H2b: The effect of public ownership on the gender pay gap is moderated by women's representation in leadership positions within the ICT sector.

2.4 Family businesses and the gender pay gap

In the ICT industry, which is marked by intense competition and a continuous drive for innovation, the dynamics of family ownership and their implications for gender equality have become increasingly important in academic and economic discussions (Arujunan et al., 2018; Cordeiro et al., 2020; Sarto et al., 2021). Historically, family-run businesses have played a crucial role across various sectors, including technology. These companies often have unique organizational cultures and long-term decision-making

processes influenced by legacy-driven values and relational logics (Liedholm & Röström, 2023).

However, the ownership structure of family businesses can sometimes act as a barrier to gender diversity and inclusion. It may reinforce traditional role distributions and perpetuate inequitable decision-making, particularly in the ICT sector, where stereotypes regarding technical competence and leadership persist.

The attributes of family ownership exert a significant influence on gender-based wage disparities within firms. Unlike managers in non-family firms, who are often guided by short-term goals and impersonal management approaches, family business owners tend to develop a strong identity-based attachment to their firm (Duh et al., 2010). This connection can promote organizational cohesion and reduce hierarchical rigidity, fostering closer interactions between employees and top management. However, such proximity does not necessarily lead to greater pay equity: while factors typical of non-family firms, such as disparities in bargaining power or the absence of advocacy mechanisms, may be somewhat attenuated (Bhaumik et al., 2010; Giancotti et al., 2024), internal dynamics in family firms may still reproduce implicit discriminatory practices.

Women's inclusion in family-run firms is often mediated by treatment akin to that afforded to family members. While this may reduce overt forms of discrimination, it can simultaneously uphold structural inequalities. In firms steeped in tradition, there is often a tendency to reproduce conventional gender norms, where men are viewed as primary earners and women are relegated to supportive or caregiving roles (Jain et al., 2021). This configuration contributes to an unequal distribution of career opportunities, with men favored for advancement into top-level positions and women confined to lower-paid roles with limited prospects for upward mobility.

Family dynamics within firms may reinforce traditional gender norms and implicit biases, exacerbating the gender pay gap. While family businesses may offer relatively transparent compensation mechanisms and closer interaction between management and employees, this does not necessarily translate into reduced wage asymmetries. Deep-seated perceptions about the division of labor continue to shape strategic and organizational decisions (Nadeem et al., 2020). In many family firms, there is a persistent cultural preference for male leadership, with women often assigned administrative or supportive functions (D'Allura et al., 2021; Naciti et al., 2021). This orientation can distort hiring, promotion, and compensation policies, fueling gender-based disparities in the allocation of economic resources.

Despite facing various challenges, family-owned firms have characteristics that could help reduce the gender pay gap. Additionally, closer relationships between employees and management (Tsai, 2010) might promote greater transparency in wage-setting processes. This transparency could

minimize pay imbalances resulting from information asymmetries or the weaker negotiation power of female employees (Campopiano et al., 2017). Therefore, the long-term focus often found in many family businesses may lead to a greater emphasis on employee well-being and an inclusive approach to compensation policies.

Based on these considerations, the following hypothesis is proposed for empirical testing:

H3a: Family ownership has a positive effect on the gender pay gap in the ICT industry.

When women, especially those with family ties to the firm, hold leadership positions, they may reflect values that closely align with the family's long-term strategic vision and reputational concerns (Cambrea et al., 2024). This alignment can encourage the adoption of socially responsible practices, such as implementing fairer compensation policies (Cambrea et al., 2024). In this setting, female leadership can influence the organizational culture by introducing inclusive norms and practices, which may help reduce the gender pay gap often seen in family-owned businesses. Therefore, we propose the following hypothesis:

H3b: The impact of family ownership on the gender pay gap is moderated by the degree of female representation in leadership positions within the ICT industry.

3. Methodology and Data

3.1 Research design

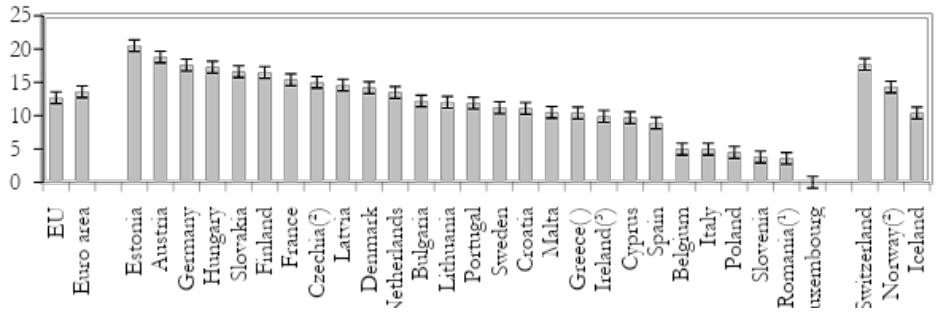
The European Union's ability to legislate on gender equality dates to the Treaty of Rome in 1957. Since then, the European Commission (EC) and European Parliament (EP) have continued efforts to promote a more balanced approach to representing men and women in decision-making positions. In 2010, the EC launched a strategy for equality between women and men, placing the issue of corporate boardroom gender diversity on its political agenda. In 2011, the EC called for credible self-regulation by companies to ensure a better gender balance on the boards of directors. However, as progress was too slow, the EC introduced a draft directive to accelerate progress toward a more balanced gender representation on boards of listed companies throughout Europe. The EP approved the directive with a substantial majority on November 20, 2013. The main principles of the directive were to introduce (i) a minimum of 40% representation of

the underrepresented sex for non-executive board members of listed companies by January 1, 2020; (ii) the adoption of unambiguous and neutrally formulated criteria for the selection process within the boards; (iii) priority to a candidate of the underrepresented sex if they are as qualified as candidates of the opposite sex; and (iv) the use of dissuasive sanctions for companies that fail to comply with the terms of the directive.

Despite the European government's efforts to reduce the gap in the average gross hourly earnings between women and men, in 2021, women's gross hourly earnings were, on average, 12.7 % lower than those of men in the European Union (EU) and 13.6% lower in the Euro area (EUROSTAT, 2021)[1].

Figure 1 shows the difference in average gross hourly earnings between male and female employees as a percentage of male gross earnings in 2021. The gender pay gap across European countries varies by 20.3%, with the lowest gap of 0.7% in Luxembourg and the highest gap of 21% in Estonia.

Figure 1. *The gender pay gap across the EU in 2021*



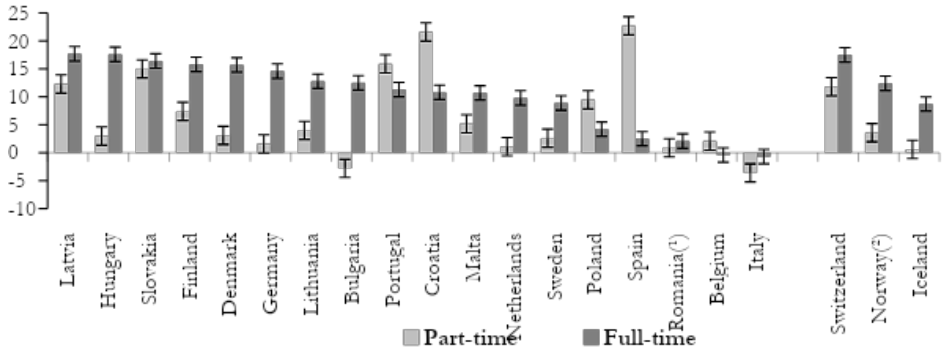
Source: EUROSTAT

On average, women earn 0.87 cents for every euro earned by men, and they need to work 1.5 extra months to make up for the difference.

In addition, Figure 2 reports the gender pay gap analyzed from a part-time and full-time employment (%) perspective in 2021. Although data are not available for all EU member states, the gender pay gap for part-time workers varies from -3.6% in Italy to 22.7% in Spain, whereas for full-time workers, it ranges from -0.7% in Italy to 17.7% in Latvia. Even if a negative sign for the gender pay gap indicates that women's gross hourly earnings are higher than those of men, the sign can be misleading because of selection bias, especially when the employment rate is lower for women than for men.

[1] For more details, see: Genderpaygap.pdf (europa.eu) and The gender pay gap situation in the EU - European Commission (europa.eu)

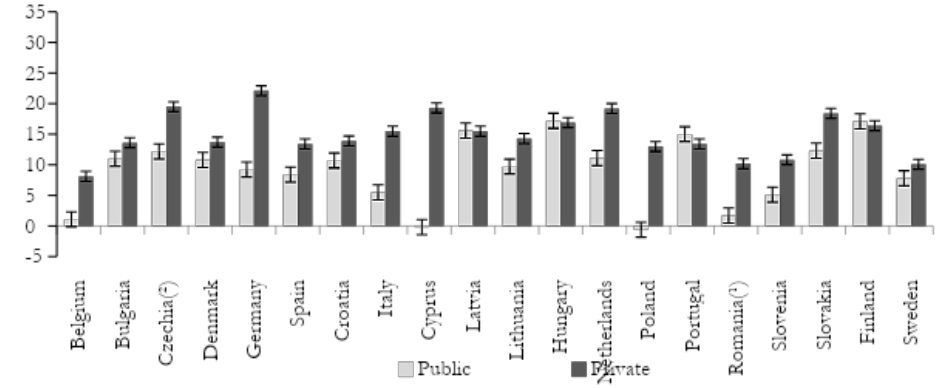
Figure 2. The gender pay gap by working time in 2021



Source: EUROSTAT

Furthermore, the gender pay gap varies across sectors of the European labor market in 2021. As Figure 3 shows, many EU countries have a higher pay gap in absolute terms in the private sector than in the public sector. The gender pay gap ranges from 8.1% in Belgium to 22.1% in Germany in the private sector and from -0.6% in Poland to 17.2% in Hungary in the public sector. The high gender pay gap in the private sector may be attributed to transparent wage grids that apply equally to men and women in the public sector of EU countries[2].

***Figure 3**. The gender pay gap by sectors (%) in 2021*

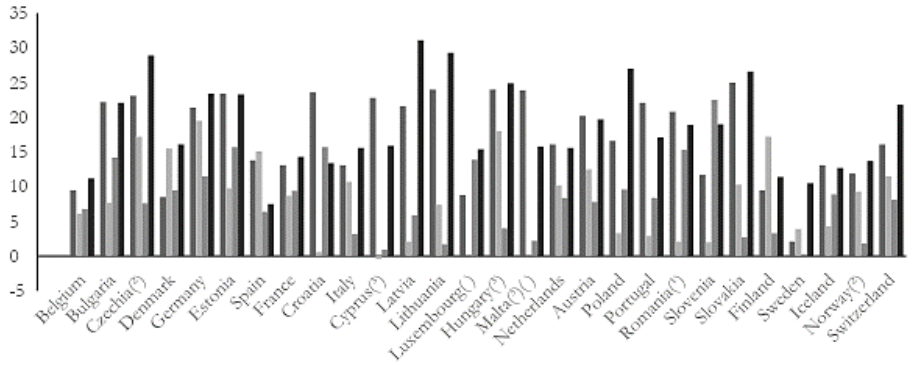


Source: EUROSTAT

[2] For further details, see: Equal Pay: http://ec.europa.eu/justice/gender-equality/gender-pay-gap/index_en.htm and European Institute for Gender Equality (EIGE): http://www.eige.europa.eu/

Finally, the gender pay gap varies according to economic activity in the European labor market in 2021. Figure 4 shows a significant difference in pay levels between manufacturing, electricity and natural resources, construction, and ICT industries. The manufacturing and ICT industries register the highest gaps at 15% and 20%, respectively, compared to the electricity and construction industries at 5% and 10%. Although ICT is a cutting-edge industry that matches the current demand required by Generation 4.0, a significant gender pay gap exists between female and male employees. Therefore, this study focuses on some factors affecting the persistent pay gap within companies in this sector, as demonstrated in the remaining part of the study.

Figure 4. *The gender pay gap by activity (%) in 2021*



Source : EUROSTAT[3]

3.2 Dataset

This study utilizes a balanced panel dataset comprising 1,050 firm-year observations collected from 75 publicly listed companies across 14 European countries, covering the years from 2010 to 2023. The dataset was constructed using information obtained from Refinitiv, focusing on firms classified in the ICT sector according to Refinitiv's industry taxonomy. Due to the limited public availability of gender-disaggregated compensation data, the final sample includes only those firms for which consistent and reliable gender pay gap indicators were accessible throughout the entire period.

In addition to gender pay data, we required comprehensive information on key financial metrics such as EBITDA, ROA, total assets, and leverage, as well as governance attributes including board structure and gender

[3] Note: Dark grey denotes manufacturing, light grey electricity and natural resources, shaded grey constructions, and black information and communication industries.

representation in leadership. We also considered ownership classification (publicly owned or family-owned) and ESG scores. Firms with missing data for any of these essential variables were excluded to ensure the robustness and comparability of the dataset.

While the relatively small sample size may limit the generalizability of the findings, it still represents over 50% of the total market capitalization in each EU country included in the study. Therefore, it effectively reflects the current state of data availability and disclosure practices in the private sector, particularly in industries and firms where transparency regarding pay equity is inconsistent. This structured sampling strategy enhances the replicability of the research while maintaining the internal validity of the empirical analysis.

All variables were winsorized at the 5th and 95th percentiles to control for the outliers.

Table 1 illustrates the average percentages of the gender pay gap (%) of firms in the ICT industry across the EU countries. Table 2 presents descriptive statistics, and Table 3 illustrates the correlation matrix. The primary data sources are Refinitiv, a Thomson Reuters database that is part of the London Stock Exchange Group (LSEG), which delivers a vast array of real-time and historical data, analytics, and market insights, including data on equities, fixed income, commodities, foreign exchange, and derivatives. The remaining missing data from LSEG is provided by Yahoo Finance, a database offered by Yahoo. The additional source for statistics on pay policies across the EU is EUROSTAT.

Table 1. *Gender pay gap (%) in the EU firms in 2023*

Country	Mean (%)	Std. Dev. (%)	Min (%)	Max (%)
All countries	83.0	12.0	47.0	100.0
Belgium	75.0	5.0	56.0	100.0
Denmark	76.0	4.0	73.0	81.0
United Kingdom	78.0	9.0	56.0	100.0
Finland	79.0	2.0	76.0	81.0
France	82.0	16.0	47.0	100.0
Germany	84.0	11.0	61.0	100.0
Greece	82.0	8.0	73.0	93.0
Italy	94.0	19.0	75.0	100.0
Luxembourg	83.0	1.0	81.0	84.0
Netherlands	79.0	15.0	65.0	100.0
Norway	64.0	4.0	61.0	69.0
Poland	73.0	2.0	70.0	75.0
Spain	80.0	11.0	66.0	90.0
Sweden	71.0	7.0	56.0	100.0

Source: Refinitiv

Note: Values express the average gender pay gap per country in 2023.
All figures are rounded to 1 decimal place and expressed as percentages.

Table 2. *Descriptive statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
GP_gap (%)	1,050	95.21	9.98	47.30	100.00
DWLeader	1,050	0.25	0.43	0.00	1.00
Public_ownership	1,050	0.65	0.48	0.00	1.00
Family_ownership	1,050	0.35	0.48	0.00	1.00
Board_independence	1,050	0.53	0.49	0.00	1.00
Board_dimension	1,050	0.77	0.42	0.00	1.00
Firm_age (years)	1,050	21.89	4.52	14.00	33.00
Firm_total_assets (€)	1,050	12,873.30	4,388.56	0.00	64,482.32
EBITDA (€)	1,050	158.80	643.28	-5,121.00	7,399.00
ROA (%)	1,050	1.41	12.79	-0.24	180.62
Leverage	1,050	0.002	0.03	0.00	1.05
ESG_score (0–100)	1,050	17.83	26.51	0.00	100.00
Firm_id	1,050	9.93	4.92	1.00	75.00
Region_id	1,050	7.13	3.92	1.00	14.00
Year	1,050	2016.50	4.03	2010.00	2023.00

Note: All variables are based on 1,050 firm-year observations. Percentages and decimals are rounded to 2 decimal places where appropriate. Financial values are shown in thousands of EU.

Table 3. *Matrix of correlation*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) GP_gap	1.000									
(2) DWLeader	-0.347	1.000								
(3) board_indipend	-0.001	-0.069	1.000							
(4) board_dimension	0.077	0.040	0.519	1.000						
(5) firm_age	-0.051	0.046	0.024	-0.048	1.000					
(6) Firm_total_asset	0.022	0.279	0.057	0.121	0.435	1.000				
(7) EBITDA	-0.040	0.132	0.094	0.102	0.238	0.174	1.000			
(8) ROA	-0.081	-0.050	0.102	0.059	0.125	-0.045	-0.032	1.000		
(9) Leverage	0.025	-0.033	-0.030	0.011	-0.022	0.008	-0.021	-0.018	1.000	
(10) ESG_score	-0.331	0.682	0.031	0.121	0.431	0.051	0.355	0.394	0.176	1.000

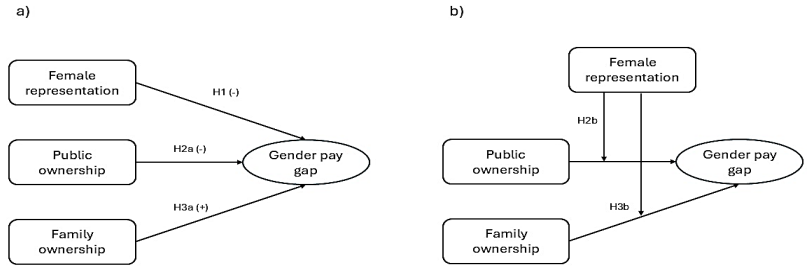
3.3 Theoretical model and the empirical strategy

As aforementioned, this study proposes a theoretical model to investigate the determinants of the gender pay gap, with a particular focus on the roles of organizational ownership structure and female representation in leadership. Figure 5 presents the diagrammatic representation of the research hypotheses.

Panel (a) illustrates the direct effects model, which includes Hypotheses H1, H2a, and H3a. This model posits that women's representation in leadership positions, public ownership, and family ownership each have independent influences on the gender pay gap. Specifically, it hypothesizes that higher female representation and public ownership are associated with a reduction in wage disparities, while family ownership tends to reinforce these pay gaps.

Panel (b) introduces the moderation effects model, corresponding to Hypotheses H2b and H3b, and emphasizes the contingent role of female leadership. It proposes that the impact of ownership structure on the gender pay gap is not uniform; rather, it varies depending on the level of female representation in leadership positions.

Figure 5. *Proposed theoretical model*



Source: Authors' elaboration

To test the hypotheses outlined in Section 2, we employed a multivariate econometric model using High Dimensional Fixed Effects (HDFE) and clustered robust standard errors. This approach controls for both firm-level and country-level fixed effects, as described by Correia (2016).

$$GP\_gap_{it} = \beta_0 + \beta_1 DWLeader_{it} + \beta_2 public\_ownership_{it} + \beta_3 family\_ownership_{it} + \beta_k interaction_{it} + \beta_{j\ldots j+n} X_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad [1]$$

The dependent variable employed in this study is the gender pay gap (*GP_gap*), expressed as the percentage difference in average gross hourly earnings between male and female employees. In addition, a set of key independent variables is introduced to examine the impact of gender representation and ownership structures on wage disparities, as follows:

1. Woman Leadership (*DWLeader*): This binary variable equals one if there is at least one woman in a leadership role on the board (e.g., CEO, Chair, or executive and non-executive director) and zero if no women hold leadership positions on the board. This variable provides insights into gender representation at the highest levels of corporate governance. Incorporating this variable into the analysis allows for the assessment of gender disparities at the executive level and tracking progress toward achieving gender equality in corporate leadership positions.
2. Public-Owned Enterprises (*public_ownership*): A dummy variable coded as one if the firm exhibits significant public ownership and zero otherwise. It reflects the influence of institutional ownership and state oversight on organizational behavior. The reason for adding this variable is twofold: first, it controls for the ownership structure that influences firms' behavior, including employment policies, pay practices, and diversity initiatives; second, it accounts for differences not solely due to gender policies but also due to i) wage-setting practices (more standardized or regulated in government-owned enterprises, GOEs), ii) unionization (often higher in GOEs, which can reduce pay disparities), and iii) industry concentration. Without controlling for this, government ownership effects may be confounded with those of gender policies of other corporate structures.
3. Family-Owned Firms (*family_ownership*): A binary variable indicating whether the firm is under family control (presence of family shareholding), taking the value of one if so, and zero otherwise. This variable accounts for family-related cultural and structural factors potentially associated with pay practices.
4. Interaction Terms: Two interaction terms are included, the *DWLeader*×*public_ownership* and the *DWLeader*× *family_ownership*, to assess the joint effects of ownership structure and women leadership. These terms capture whether the impact of women in leadership roles varies depending on the firm's ownership configuration. In particular, the interaction allows for examination of whether public ownership amplifies and whether family ownership constrains the effect of women's leadership on the gender pay gap. Given that family-owned enterprises tend to be private, part of the observed gender pay differential may be attributable to the greater wage

transparency and equity enforcement typically found in publicly owned firms.

The model also incorporates a vector of control variables (X_it) to account for other organizational factors influencing pay inequality:

5. For board characteristics, we include the board independence (*board_independence*), which is a dummy variable equal to one if the board includes independent directors, zero otherwise. Board size (*board_dimension*) is a dummy variable coded with one if the board is large (above the sample median) and zero otherwise.
6. For firm characteristics, we add the firm age (*firm_age*), measured as the number of years since the firm's founding. Firm Size (*firm_total_assets*), which is expressed as the total value of the firm's assets, is a proxy for organizational scale and the firm's complexity.
7. For a firm's operational risk and sustainability-related Earnings Before Interest, Taxes, Depreciation, and Amortization (*EBITDA*) and Return on Assets (*ROA*) are used to capture operating and financial performance. Financial leverage (*leverage*) is calculated as the ratio of total debt to total assets, reflecting the firm's capital structure and associated financial risk. Finally, the Environmental, Social, and Governance index (*ESG_score*) assesses a firm's performance in environmental sustainability, social responsibility, and governance practices. It is based on Agency Theory, where high ESG performance aligns managerial actions with stakeholder interests, reflecting transparency and long-term strategies. From the perspective of Social Role Theory, high ESG scores indicate a commitment to challenging gender norms and promoting inclusive workplace cultures, ultimately helping to reduce gender-based pay disparities.

Finally, the term α represents unobserved, time-invariant fixed effects at the regional level, while λ captures unobserved, time-invariant fixed effects at the year level. The error term ε is assumed to be independently and identically distributed.

Results

4.1 Main estimated results

The estimated results of the multivariate model specified in Equation 1 are presented in Table 3. Model (1) serves as the baseline specification, while the subsequent models (2 through 6) present expanded specifications, each incrementally including additional variables. The first three models (1–3) differ from the latter three (4–6) in that the latter incorporate family-owned firms as an independent variable instead of publicly

owned enterprises. Moreover, models (3) and (6) include interaction terms to assess the moderating effect between *DWLeader* and *public_ownership* or *family_ownership* structures of the ICT firms, respectively. All specifications include fixed effects of the firms, country, and year levels. Additionally, firm-year and country-year interaction terms were included to account for heterogeneous influences on the gender pay gap. Table 3 also reports the number of observations and R-squared values at the bottom of each model.

In all models, the main independent variable, *DWLeader* exhibits the expected negative sign and is statistically significant at the 5% level (hereafter referred to as "level"). This result indicates that, on average, an increase in the proportion of women on the board of directors is associated with a reduction in the gender pay gap of 0.28% to 0.38%, ceteris paribus. This finding supports Hypothesis 1, suggesting that greater female representation in corporate leadership is associated with narrower gender pay disparities.

Models (2) and (3) report negative and statistically significant coefficients for *public_ownership* at the 1% level. These findings indicate that, on average, an increase in public ownership, compared to family-ownership firms, is associated with a decrease in the gender pay gap of 0.25% to 0.28%, ceteris paribus. This result supports Hypothesis 2a, which posits that public ownership is associated with greater gender equity within corporate boards. In addition, Model (3) inserts the interaction term, *DWLeader* × *public_ownership*, that exhibits a negative sign and is statistically significant at the 1% level. This suggests that an increase in female board representation in publicly owned enterprises is associated with an additional decrease in the gender pay gap of 0.18%, ceteris paribus. This novel result aligns with Hypothesis 2b, indicating that the combination of board diversity and public oversight strengthens gender equity outcomes in firms with significant public ownership.

Conversely, Models (5) and (6) include *family_ownership* as an independent variable. These variables yield positive coefficients, statistically significant at the 1% level. This implies that, on average, an increase in family involvement in corporate boards is associated with a 0.18% increase in the gender pay gap, ceteris paribus.

Furthermore, Model (6) evaluates the interaction term *DWLeader* × *family_ownership*, which yields a positive and statistically significant coefficient at the 1% level. This finding indicates that, on average, a higher proportion of women on the boards of family-owned firms is associated with a 0.12% increase in the gender pay gap, ceteris paribus. This result provides empirical support for Hypothesis 3b, highlighting the potential for structural or cultural constraints in family-owned businesses to counteract the positive impact of female board representation on pay equity.

To facilitate the interpretation of these interaction effects, Figure 6 graphically illustrates the predicted gender pay gap across ownership

types, conditional on the presence or absence of women leadership. The figure clearly shows that in publicly owned enterprises, the gender pay gap decreases more substantially when at least one woman holds a leadership position, supporting the amplifying effect of public ownership on gender equity outcomes (Hypothesis 2b). Conversely, in family-owned firms, the presence of female leaders is associated with a higher predicted gender pay gap, reflecting the potential for structural or cultural dynamics within these firms to dampen or reverse the equity-promoting effects of gender-diverse leadership (Hypothesis 3b). This visualization complements the statistical evidence presented in Models (3) and (6) of Table 3 by illustrating how the marginal effect of female leadership on the gender pay gap varies significantly depending on the firm's ownership structure.

Additional control variables were included to account for boards, the firm's features, and the firm's operational/financial risk.

Board_independence exhibited the expected negative sign and was statistically significant at both the 5% and 1% levels. On average, boards with independent members are associated with a reduction in the gender pay gap of 0.12% to 0.19%. Also, *Board_dimension* displayed the expected negative sign and was statistically significant at the 1% level. On average, larger boards are associated with a reduction in the gender pay gap of 0.20% to 0.25%.

The *firm_age* had the anticipated negative sign but was not statistically significant, while the size of the firm is proxied by the *firm_total_assets*, which also showed the expected negative sign, though it too was not significant.

Then, the coefficients for firm operational and financial risk, *EBITDA*, *ROA*, and *Leverage*, showed unexpected positive signs, but they were not statistically significant.

Lastly, the *ESG_score*, with the expected negative sign, was statistically significant at the 1% level. On average, higher ESG score performance is associated with a reduction in the gender pay gap of 0.31% to 0.43%, all else being equal.

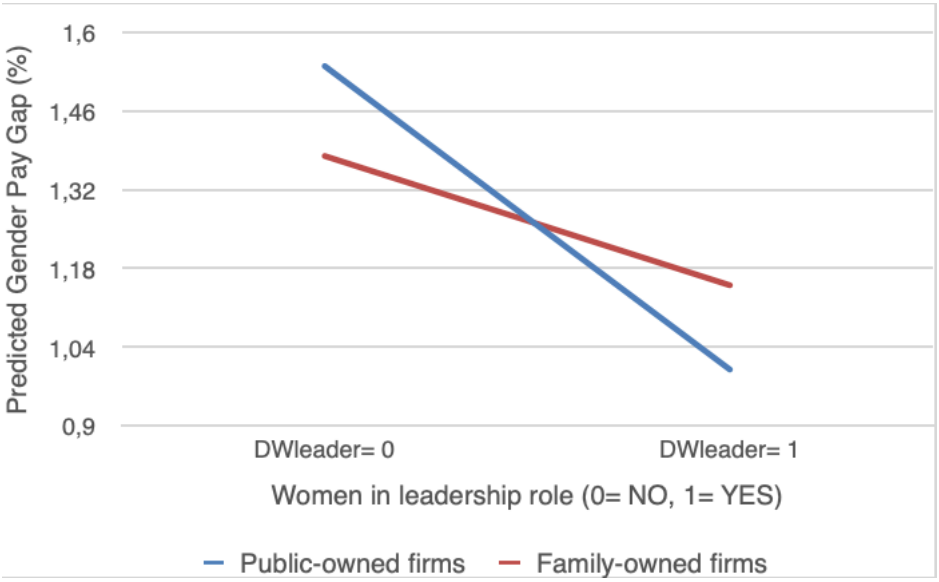
Table 4. *Main estimated results with High Dimensional Fixed Effects (HDFE)*

GP_gap (%)	(1)	(2)	(3)	(4)	(5)	(6)
DWLeader	-0.38**	-0.37**	-0.36**	-0.38*	-0.32***	-0.29***
	(0.18)	(0.18)	(0.16)	(0.19)	(0.05)	(0.03)
Public_ownership		-0.29***	-0.26***			
		(0.09)	(0.09)			
DWLeader × Public_own			-0.18***			
			(0.02)			
Family_ownership					0.21	0.18***
					(0.13)	(0.02)
DWLeader × Family_own						0.13***
						(0.03)
Board_independence	-0.12**	-0.12**	-0.11***	-0.20***	-0.18***	-0.11**
	(0.06)	(0.05)	(0.04)	(0.03)	(0.03)	(0.05)
Board_dimension	-0.35	-0.32	-0.28***	-0.26***	-0.21***	-0.20***
	(0.53)	(0.54)	(0.04)	(0.06)	(0.05)	(0.05)
Firm_age		-0.29***	-0.26***		-0.19	-0.18***
		(0.09)	(0.09)		(0.29)	(0.02)
Firm_total_assets		-0.01	-0.03		-0.01	-0.06
		(0.00)	(0.00)		(0.02)	(0.03)
EBITDA	0.03	0.03	0.02	0.01	0.01	0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.00)	(0.00)
ROA	0.14	0.17	0.18	0.14	0.10	0.08
	(0.14)	(0.15)	(0.18)	(0.13)	(0.10)	(0.08)
Leverage	0.33	0.12	0.27	0.13	0.11	0.12
	(2.03)	(2.09)	(2.29)	(0.12)	(0.17)	(0.02)
ESG_score	0.01	0.00	-0.43***	0.00	0.00	-0.32***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)
Constant	0.91***	1.53***	1.54***	0.91***	1.33***	1.38***
	(0.06)	(0.10)	(0.11)	(0.06)	(0.05)	(0.11)
Firm Effects	YES	YES	YES	YES	YES	YES
Region Effects	YES	YES	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES	YES	YES
Firm × Year Effects	YES	YES	YES	YES	YES	YES
Region × Year Effects	YES	YES	YES	YES	YES	YES
Firms (ID)	75	75	75	75	75	75
Observations	1,050	1,050	1,050	1,050	1,050	1,050
R-squared	0.91	0.92	0.92	0.91	0.92	0.92

Source: Authors' elaboration.

Notes: The dependent variable of the gender pay gap is expressed as a percentage (%). * p<0.05, ** p<0.01, *** p<0.001. All estimates include firm, country, and year fixed effects and related interactions.

Figure 6. *The effect of women's leadership and ownership on the gender pay gap (%)*



Source: Authors' elaboration.

Note: The figure illustrates the interaction effects between female leadership (DWLeader) and ownership structures on the gender pay gap. Predicted values are derived from Models (3) and (6) in Table 3, holding other covariates at their sample means.

4.2 Robustness Check

To ensure the robustness of the main findings, the analysis was extended using the one-step System Generalized Method of Moments (System GMM) estimator, as developed by Arellano and Bover (1995) and Blundell and Bond (1998), which accounts for potential endogeneity, firm-specific heterogeneity, and the dynamic nature of the gender pay gap. Table 5 reports the estimated coefficients. Across all specifications (Models 7–12), the lagged dependent variable (GP_GAP_{t-1}) is positive and statistically significant at the 1% level, with coefficients ranging from 0.68 to 0.80. This result confirms the strong persistence of gender pay disparities over time within firms.

The coefficient of *DWLeader* is consistently negative across specifications. It is statistically significant at the 10% level in Model (7) and at the 5% level in Models (8), (9), (11), and (12), with the strongest effect in Model (12). This reinforces the idea that women's leadership is associated with a narrowing of the gender pay gap.

In terms of ownership structure, *public_ownership* displays mixed effects: it is statistically insignificant in Models (7) and (8), but in Model (9), it becomes negative and significant at the 5% level, suggesting a modest but meaningful influence when controls are fully included. More notably, the interaction term between *DWLeader* × *public_ownership* is large, negative, and statistically significant at the 1% level in Model (9), indicating that women's leadership in public-owned firms is particularly effective in reducing the gender pay gap.

Conversely, *family_ownership* shows a positive and weakly significant association with the gender pay gap in Model (10) (0.79, $p < 0.10$), but it becomes insignificant in Models (11) and (12). The interaction term *DWLeader* × family_ownership in Model (12) is positive (1.14) but statistically insignificant, suggesting that female leadership may not exert the same influence in family-owned firms, possibly due to more traditional or opaque governance norms.

Among board-related controls, *board_independence* consistently shows a negative relationship with the gender pay gap, although statistical significance is only reached at the 10% level in Model (8). This suggests that the independence of the board may modestly enhance gender equity. In contrast, *board_dimension* exhibits a robust and significant negative effect across all models, with coefficients ranging from -0.05 to -0.09 and significance at the 5% or 1% level. Larger boards may be more diverse and better positioned to enforce pay transparency and equity norms.

Regarding firm characteristics, *firm_age* is positive but statistically insignificant in all models. *firm_total_assets*, a proxy for firm size, is consistently positive and highly significant at the 1% level in Models (8), (9), (11), and (12), indicating that larger firms tend to have a wider gender pay gap, potentially due to more complex compensation structures.

For the firm's operational features, *EBITDA* and *ROA* are positive in Models (9) and (12), but statistically insignificant, suggesting that firm profitability does not systematically explain pay differentials. Leverage, however, is significantly positive and highly significant in both models where it is included (Models 9 and 12), with coefficients around 2.96 and 2.77, respectively, implying that more indebted firms may exhibit less equitable pay practices, possibly due to cost constraints. Importantly, *ESG_score* has a negative and statistically significant effect at the 10% level in Models (9) (-1.22) and (12), underscoring the role of sustainability-oriented firms in advancing gender equity.

The diagnostic tests reported at the bottom of Table 5 confirm the appropriateness of the System GMM specification. The AR(1) test shows expected first-order autocorrelation in differenced residuals (p-values < 0.05), while the AR(2) test fails to reject the null hypothesis of no second-order correlation ($p > 0.6$ in all models), confirming model consistency. The Hansen test

p-values (ranging from 0.082 to 0.204) suggest that the instruments used are valid and not overidentified. Collectively, these results support the robustness of the main conclusions and confirm the stability of the estimated relationships across alternative dynamic specifications.

Table 5. *Estimated results with one-step System GMM*

GP_gap (%)	(7)	(8)	(9)	(10)	(11)	(12)
Lagged GP_gap (t–1)	0.71***	0.69***	0.68***	0.80***	0.75***	0.77***
	(0.09)	(0.09)	(0.09)	(0.10)	(0.11)	(0.10)
DWLeader	-1.35*	-1.91**	-1.15*	-1.06	-1.65**	-2.32**
	(0.74)	(0.76)	(0.59)	(0.64)	(0.68)	(1.12)
Public_ownership	0.90	0.39	-.051**			
	(0.61)	(0.53)	(0.02)			
DWLeader × Public_own			-2.77***			
			(0.58)			
Family_ownership				0.79*	-0.38	0.00
				(0.47)	(0.45)	(0.47)
DWLeader × Family_own						1.14
						(1.15)
Board_independence	-0.62	-0.79*	-0.71	-0.49	-0.69	-0.58
	(0.52)	(0.48)	(0.50)	(0.44)	(0.43)	(0.44)
Board_dimension	-0.06**	-0.08***	-0.09***	-0.05**	-0.08***	-0.08***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Firm_age		0.01	0.02		0.01	0.01
		(0.04)	(0.05)		(0.04)	(0.04)
Firm_total_assets		0.02***	0.02***		0.03***	0.04***
		(0.01)	(0.01)		(0.01)	(0.01)
EBITDA			0.02			0.66
			(0.63)			(0.61)
ROA			0.67			1.10
			(0.08)			(0.86)
Leverage			2.96***			2.77***
			(0.89)			(0.87)
ESG_score			-1.22*			-0.79*
			(0.67)			(0.48)
Constant	28.39***	29.89***	32.27***	16.56*	26.44***	18.72**
	(7.84)	(8.16)	(9.33)	(8.86)	(9.72)	(8.85)
Firm Effects	YES	YES	YES	YES	YES	YES
Region Effects	YES	YES	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES	YES	YES
Firm × Year Effects	YES	YES	YES	YES	YES	YES
Region × Year Effects	YES	YES	YES	YES	YES	YES
Observations	975	975	975	975	975	975
AR(1) p-value	0.012	0.015	0.018	0.005	0.011	0.019
AR(2) p-value	0.768	0.806	0.789	0.626	0.678	0.641
Hansen (p-value)	0.185	0.168	0.202	0.157	0.082	0.204
# Instruments	47	51	61	45	49	59
# Groups (Firms)	75	75	75	75	75	75

Notes: $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All models are estimated using the one-step System GMM estimator. The lagged dependent variable is included to account for the dynamic structure of the gender pay gap. All models include firm, region, and year fixed effects, as well as firm × year and region × year interactions. Endogenous variables are instrumented using appropriate lags of their levels and differences. The Arellano-Bond test for AR(1) in first differences rejects the null hypothesis of no first-order serial correlation, as expected. The AR(2) test fails to reject the null hypothesis of no second-order autocorrelation, supporting model validity. The Hansen J test p-values suggest that the overidentifying restrictions are valid and are not overfitting the model. *Source: Authors' elaboration.*

5. Discussions and Conclusion

The primary objective of this study was to analyze the impact of women's leadership and the interaction between different ownership structures, specifically family and public ownership, on the gender pay gap. Furthermore, the moderating role of female leadership within these ownership contexts was examined. The findings yield three main empirical insights.

First, a negative relationship emerges between women's leadership and the gender pay gap, indicating that greater women's participation on corporate boards contributes to reducing wage inequalities among employees. This evidence aligns with the existing literature, which suggests that the presence of women on boards can positively influence organizational practices, including gender pay equity. Although the immediate financial benefits of women board participation may not always be visible, the inclusion of a significant number of women in senior positions has the potential to profoundly shape corporate culture, strategic decision-making, and remuneration policies, ultimately fostering more equitable and inclusive outcomes (Cook et al., 2018; Biswas et al., 2021). Supporting this view, Segovia-Pérez et al. (2020) provide empirical evidence of the significant role of women's leadership in narrowing the gender pay gap. Similar conclusions are drawn by Bell (2005) and Shin (2012), who highlight the potential impact of female leadership on fostering a culture of pay equity.

Second, the analysis reveals differentiated effects of ownership structures on the gender pay gap. Consistent with the findings of Homroy and Mukherjee (2021), publicly owned enterprises are associated with a reduction in the gender pay gap, suggesting that public incentives and institutional oversight can promote fairer corporate policies. In contrast, family-owned enterprises tend to be linked to wider pay gaps, likely due to entrenched hierarchical structures that hinder progress toward gender equality, as observed by Yanadori et al. (2018).

Third, the study highlights contrasting moderating effects of women's board representation on the gender pay gap depending on the type of ownership. In publicly owned enterprises, an increase in women's presence on board is associated with a reduction in the gender pay gap, confirming the effectiveness of combining public regulation and inclusive leadership to promote gender equity. Conversely, in family-owned firms, even with women on boards, the gender pay gap tends to widen, indicating the persistence of deeply rooted cultural and familial biases that may neutralize the potential benefits of female leadership (Kulich et al., 2007).

Considering these findings, the study contributes to the broader debate on the gender pay gap, underscoring both theoretical and practical implications. From a theoretical perspective, it advances the understanding of how organizational ownership structures interact with gender dynamics to shape pay outcomes. Specifically, it extends prior research by demonstrating that the impact of women's leadership is not uniform across governance models but rather contingent upon the institutional and cultural characteristics of ownership types. This highlights the importance of contextualizing gender equity initiatives within broader corporate governance frameworks. From a practical standpoint, the study highlights the importance of legal and institutional mechanisms that promote women's access to senior roles. Strengthening the equal pay legislation, including the implementation of pay transparency mandates and anti-discrimination regulations in recruitment, promotion, and job assignments, can institutionalize equitable practices and reinforce the positive impact of female leadership on organizational outcomes. Furthermore, publicly owned enterprises should capitalize on their governance structures to embed diversity and equity principles into compensation policies and leadership pipelines. Additionally, governments may consider providing tax incentives or financial support to public firms that demonstrate sustained commitment to gender-equitable practices. Family-owned enterprises, however, should formalize compensation frameworks, promote transparent decision-making processes, and challenge rooted gender biases. Policymakers could support these efforts by offering targeted incentives to firms that implement inclusive CSR policies and demonstrate progress in promoting women's career advancement (Carlin et al., 2018; Heisler, 2021).

In addition, the promotion of sustainable cultural practices, such as public awareness campaigns and investments in educational programs for women, can facilitate access to traditionally male-dominated sectors, especially those related to STEM (Science, Technology, Engineering, and Mathematics), thereby contributing effectively to reducing the gender pay gap.

While this study offers valuable understanding, it is not without limitations. First, the study focuses on the ICT sector. Although this sector is particularly relevant due to its historically male-dominated workforce and

innovation-driven environment, the findings may not be generalizable to other industries. Comparative studies across industries would be valuable for assessing whether the observed relationships hold across diverse organizational and cultural contexts. Second, the study does not account for broader institutional and cultural contexts that may influence gender pay disparities. Factors such as national legislation on pay transparency, cultural attitudes toward gender roles, and labor market regulation can significantly shape both firm behavior and gender norms. Future research could adopt a comparative cross-national approach, integrating institutional theory to examine how macro-level conditions moderate the relationships observed in this study. Third, the work is grounded in empirical analyses that may not fully capture the underlying processes and organizational dynamics that shape gender pay disparities. Future research could adopt a qualitative methodology for enriching and contextualizing the findings of this quantitative study.

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