



Regional labor market integration of women and the share of women in management: are family firms different?

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Abstract The underrepresentation of women in management positions remains a significant barrier to achieving gender equality. While previous research has examined how national institutional contexts influence women’s career choices, the role of regional contexts has been largely overlooked. This study addresses this gap by analyzing how regional institutions affect the share of women in management roles within mid-sized firms. We argue that stronger regional labor market integration for women facilitates their progression into management positions, thereby increasing their representation in firms’ leadership. Furthermore, we differentiate between family and non-family firms, suggesting that regional institutional effects are less influential in family firms. To assess the regional labor market integration of women, we develop an indicator comprising three key components: the female employment ratio, the childcare participation rate, and the proportion of fathers receiving parental allowance. Analyzing a large sample of mid-sized German firms (50 to 500 employees) across 400 regions, our regression results show that regional labor market integration significantly affects women’s representation in management. However, this effect is weaker in family firms compared to non-family firms. These findings suggest that research on women in management and their influence on firm outcomes should account for the role of regional institutions.

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1 Introduction

The underrepresentation of women in high-earning positions, particularly top management roles, continues to be a significant barrier to closing gender pay gaps and achieving gender equality (Fortin et al. 2017). Over the past decade, research examining the factors influencing women's representation in leadership has expanded substantially (e.g., Fernandez-Mateo and Fernandez 2016; Yao 2023). On a national level, both sociocultural factors (e.g., Carrasco et al. 2015; Gao et al. 2016; Grosvold and Brammer 2011) and political institutions (e.g., Grosvold et al. 2016; Terjesen et al. 2015) play important roles in shaping women's presence in leadership by influencing the opportunities and obstacles women encounter in their career progression. These institutional factors are closely intertwined with individual-level factors, such as women's human capital and family responsibilities, which further influence the pool of female executive candidates (Yao 2023). Research shows that robust political institutions that facilitate women's integration into the labor market can unlock their employment potential by addressing both structural and personal challenges (Bauernschuster and Schlotter 2015; Lundborg et al. 2017; Müller and Wrohlich 2020; Zimmert 2023).

So far, a regional perspective has remained largely underexplored. Research has so far overlooked how regional institutional contexts within a country influence the acceptance of women in management roles. The focus on national-level institutions and the neglect of regional contextual factors can lead to inconsistent findings and may limit both theoretical and empirical predictability (Amato et al. 2021). Most studies examining the relationship between the representation of women in management and firm outcomes, such as financial performance (e.g., Dezsö and Ross 2012), do not account for regional context, even though it significantly shapes the conditions and challenges women face in the workplace (Gao et al. 2016). For instance, regional differences in perceptions of family responsibilities and gender roles can profoundly affect these dynamics (Gao et al. 2016). A particularly striking example is Germany, where historical divergences in national family policies between East and West Germany have led to notable regional differences in gender-related outcomes (Müller and Wrohlich 2020).

Our study examines the relationship between regional institutions and the representation of women in management positions, with a focus on mid-sized firms. Drawing on institutional theory (e.g., Carrasco et al. 2015; Grosvold et al. 2016; Terjesen et al. 2015), we argue that regional labor market integration of women facilitates their pursuit of management careers, thereby increasing their presence in leadership roles. By focusing on regional labor market integration as a key factor influencing the supply of female candidates for management positions, we pose the following first research question: "To what extent does the regional labor market integration of women influence their representation in management positions?"

It is also important to consider firm-level factors as contingency factors. For example, ownership structure and organizational form (Yao 2023) could be important factors influencing the relationship between regional context and gender composition in management boards. In this regard, previous research indicates that family firms are often more deeply influenced than non-family firms by their local roots and regional embeddedness (Baù et al. 2019, 2021). Additionally, family and non-family firms tend to differ in their objectives, with family firms placing greater emphasis on the socioemotional aspects of the business (e.g., Berrone et al. 2012; Gómez-Mejía et al. 2007; Lohe and Calabrò 2017) and having a preference for family over non-family members (Chrisman et al. 2012; Kragl et al. 2023; Vandekerckhof et al. 2015; Zhang and Ma 2009). Based on these differences we shall argue that family and non-family firms differ in the selection process for management roles and the importance attached to gender. We shall also argue that differences between family and non-family firms influence how regional institutions impact the share of women in firms' management roles. Specifically, we ask: "To what extent does the influence of regional labor market integration of women on the representation of women in management differ between family and non-family firms?"

To assess the regional labor market integration of women, we create an indicator that includes three components: the regional employment ratio of women, the regional childcare participation rate, and the regional proportion of fathers receiving parental allowance. Using a sample of 24,989 mid-sized German firms across 400 regions, our regression analysis reveals that regional labor market integration of women has a significant positive effect on women's representation in management. However, this effect is less pronounced in family firms compared to non-family firms. Based on these findings, we conclude that research on women in management should incorporate the role of regional labor market institutions, as they appear to play a crucial role in shaping the supply of potential female candidates for management positions and influencing gender role biases.

Our study makes contributions to at least two research streams. First, we contribute to the literature on institutional factors influencing the representation and role of women in management and leadership positions (e.g., Carrasco et al. 2015; Gao et al. 2016; Grosvold et al. 2016; Grosvold and Brammer 2011; Terjesen et al. 2015; Yao 2023). Our findings demonstrate that, in addition to national institutions, regional institutions also play a crucial role in shaping women's representation in management. In this regard, our study also connects to regional studies on gender differences and gender equality across regions (e.g., Müller and Wrohlich 2020; Pistrui et al. 2000; Zimmert 2023).

Second, our research contributes to the family business literature, particularly on the role and representation of women in management positions within family firms (e.g., Amore et al. 2014; Campopiano et al. 2017; Overbeke et al. 2013). Our results suggest that family firms are less influenced by regional institutional factors than non-family firms when making decisions about the gender composition of their management teams. This finding also adds to the literature on the relationship between family firms and their regional environment (e.g., Baù et al. 2021; Stough et al. 2015), highlighting that strong local embeddedness does not necessarily mean family firms are influenced by regional institutions in all business decisions.

2 Background and literature review

The literature review is divided into four sections. The first section covers research on institutions affecting women's labor supply, including political, sociocultural, and economic factors at national and regional levels. The second section examines how these institutions influence women's representation in leadership roles, distinguishing between management positions (daily operations) and board/committee roles (strategic oversight) (Yao 2023). The third section explores management selection in family firms, while the fourth one focuses on women's representation in the management of family firms and the corresponding work environment.

2.1 Relationship between institutions and women labor supply

This section presents research on institutions influencing women's labor supply, defined as their workforce participation, including the hours they are willing and able to work at various wage levels. Overall, the literature highlights the availability of childcare services as an important institution that increases women's participation in the labor market. Research has shown that the availability of childcare increases women's participation in the labor market in Germany, a country historically characterized by low female employment rates (Bauernschuster and Schlotter 2015; Müller and Wrohlich 2020; Zimmert 2023). Bauernschuster and Schlotter (2015) examine a 1996 policy reform granting legal entitlement to kindergarten for children aged three until school entry. They find that increasing public childcare attendance positively affects maternal employment. With a focus on regions in West Germany, Müller and Wrohlich (2020) find that the relationship between early childcare and labor market participation is primarily driven by part-time employment among mothers with medium-level qualifications. The effect is most pronounced among mothers with medium-level education levels, while mothers with high or low education levels show no response to the childcare expansion. Zimmert (2023) investigates the impact of expanding subsidized early childcare starting in 2013 on maternal labor market outcomes while accounting for regional differences. Based on annually collected survey data from the German Microcensus, they find that the reform is positively related to women's employment rates and increases both agreed and preferred working hours. Additionally, the findings indicate that the reform's effects are particularly pronounced among non-single and more highly educated mothers.

Andresen and Havnes (2019) find that cohabiting mothers in Norway increase their full-time employment when their 2-year-olds attend childcare, especially when they were employed part-time before the reform. From a cross-national perspective, Budig et al. (2012) show that parental leave and public childcare increase mothers' earnings in cultures supportive of maternal employment but have weaker or negative effects in cultures favoring the male breadwinner and female caregiver model. The effects of work-family policies thus seem to be shaped by the cultural context leading to variation across countries.

2.2 Relationship between institutions and women in management and leadership positions

Research on the effects of socio-cultural and economic institutions on management roles is limited compared to studies on board positions (Yao 2023). In a systematic review, Yao (2023) identifies three categories of factors influencing gender equality in top management and board roles: situation-centered, social-system-centered, and person-centered antecedents. Situation-centered factors include firm size, location, ownership structure, employee gender equality, corporate practices, and organizational culture. Social-system-centered antecedents involve sociocultural and economic institutions, which intersect with person-centered factors like women's human capital and family responsibilities, impacting the pool of female executive candidates.

Yao (2023) notes that institutional theory (Powell and DiMaggio 2012) is the dominant framework for studying women in leadership. This theory suggests that organizations are shaped by their institutional environments, which include both formal institutions (e.g., laws) and informal ones (e.g., sociocultural norms) (North 1990). According to Meyer and Rowan (1977), organizational practices reflect these societal norms, which may be assumed, publicly supported, or legally mandated (Starbuck 1976).

On board level, culture (Carrasco et al. 2015; Grosvold and Brammer 2011), family policies, government (Grosvold et al. 2016; Grosvold and Brammer 2011; Terjesen et al. 2015), gender equality initiatives (Terjesen et al. 2015), economy and education (Grosvold et al. 2016) are related to the share of women on boards. Building on institutional theory, Terjesen et al. (2015) investigate aspects of the institutional environment on the establishment of gender quotas on corporate boards. They argue that three institutions increase the likelihood of a country establishing board gender quotas: family policy welfare provisions, a left-leaning government, and a history of gender equality initiatives. They recommend that future research should explore regional institutions to build on recent work in economic geography. For instance, the German cities of Nuremberg and Berlin have each launched initiatives to increase gender representation on boards, distinguishing them from the rest of Germany (Terjesen et al. 2015). Grosvold et al. (2016) apply neo-institutional theory to investigate how national institutions influence the share of women on boards of public companies across 23 countries. They argue that a country's institutional context shapes the challenges and constraints women encounter, consequently impacting their board and management participation. The results indicate that institutions related to family, education, economy, and government affect the proportion of board seats held by women. Similarly, Grosvold and Brammer (2011) explore the role of national institutions as precursors to the presence of women on corporate boards. Their empirical analysis reveals that about half of the variation in the representation of women on corporate boards across different countries can be attributed to institutional factors, with legal and cultural institutions being the most influential ones. Furthermore, countries with a civil-law heritage tend to have a lower share of women on their boards despite having more robust legislative measures aimed at safeguarding women's employment rights and career opportunities.

Carrasco et al. (2015) explore how cultural institutions may shape the social roles assigned to men and women, reinforcing gender stereotypes that could influence a firm's decision to appoint women to its board of directors. Using institutional theory, the study reveals that two cultural aspects of a country negatively influence the representation of women in corporate boards: acceptance of unequal power distribution and high masculine societal values. Amore et al. (2014) examine whether gender interactions at the top of the corporate hierarchy influence corporate performance. Analyzing a comprehensive dataset of family-controlled firms in Italy, the study finds that women directors significantly enhance the operating profitability of women-led companies. The findings also reveal that the positive impact of women's leadership on profitability is weaker in firms located in regions with prevalent gender prejudices and in larger firms.

Gao et al. (2016) investigate how regional gender discrimination affects the underrepresentation of female executives in large corporations. Using China's male-to-female birth ratio as a proxy for discrimination, they find that firms in regions with higher levels of discrimination are less likely to appoint women to executive positions. Moreover, in these regions, female executives face higher risks of dismissal and receive lower compensation compared to their male counterparts. This study highlights the critical role regional gender biases play in hindering women's corporate advancement. The findings emphasize the value of regional-level research in understanding how sociocultural institutions influence gender diversity in leadership roles (Terjesen et al. 2015).

2.3 Management selection decisions in family firms

Family firms often favor family over non-family managers to protect their socioemotional wealth, mitigate expropriation risks (Burkart et al. 2003; Lin and Hu 2007), and reduce agency costs (Fang et al. 2016, 2017). Burkart et al. (2003) model succession decisions in founder-owned firms, where founders choose between appointing a professional manager or a family member and determining public ownership levels. When nonpecuniary control benefits are high, family firms prioritize retaining control. The model suggests professional managers are generally more competent than heirs but acknowledges the risk of insider expropriation depending on shareholder protections. Lin and Hu (2007) analyze factors influencing the choice between family and non-family CEOs. Their study shows that firms with low skill requirements and high expropriation risks favor family CEOs. In contrast, firms needing specialized expertise benefit from non-family CEOs. Fang et al. (2017) examine small and medium-sized firms and find that family owners may avoid hiring non-family managers to preserve socioemotional wealth and minimize agency costs. Nevertheless, in industries with easier monitoring, the benefits of non-family managers can outweigh these concerns.

Family firms often prefer family managers to achieve family-centered goals, with the extent of this preference influenced by the level of family involvement in the organization. Vandekerckhof et al. (2015), in their study of private family firms in Belgium, examine how factors like innovativeness, internationalization, and firm size, affect the appointment of non-family managers. Their research highlights that

when socioemotional wealth is a priority, the positive influence of these organizational characteristics on hiring non-family managers weakens. Zhang and Ma (2009) identify cultural, institutional, and market factors influencing the professionalization of Chinese family businesses at different levels. They suggest that strong family-centered values reduce the likelihood of hiring professional managers. Chrisman et al. (2012) find that family firms often prioritize non-economic, family-centered goals, with family influence mediating the link between family involvement and these goals. In small firms, concentrated ownership and management allow family members to shape organizational priorities more directly. Salvato et al. (2012), studying large Italian firms, show that while family firms may hire professional managers as CEOs, career paths differ significantly between family and non-family CEOs.

Family-centered non-economic goals shape family firms' expectations of non-family managers (Blumentritt et al. 2007; Hiebl 2014) and influence the work environment (Chrisman et al. 2014; Kragl et al. 2023). Blumentritt et al. (2007), through interviews with 27 family members and non-family CEOs, identify key factors for successful non-family CEO appointments. These include a blend of business and interpersonal skills, strong support from family councils and boards, and the ability to manage family dynamics. Hiebl (2014), applying the resource-based view, examines hiring criteria for non-family CFOs in family firms. Based on interviews, he highlights four key factors: education, expertise, career path, and interpersonal skills. Family firms particularly value CFOs with external experience who can enhance firm resources while adapting to family governance practices. Kragl et al. (2023) offer a theoretical model explaining the multitasking challenge of balancing economic and non-economic tasks in family firms. They find that incentive pay distorts efforts toward economic goals for all managers, though less so for family managers. When economic and non-economic tasks complement each other, this distortion is reduced. The study concludes that family managers excel in non-economic goals and can outperform non-family managers, despite weaker economic skills or overall abilities, with goal interdependence moderating their relative performance (Kragl et al. 2023). Chrisman et al. (2014) argue that family-centered non-economic goals and bounded rationality limit small- and medium-sized family firms' ability and willingness to hire and adequately compensate non-family managers. These non-economic goals result in less attractive compensation, limited career advancement, and unrealistic performance expectations, deterring high-quality candidates. Bounded rationality further hampers non-family managers' ability to meet expectations once hired. As a result, family firms fail to fully achieve both their economic and non-economic objectives (Chrisman et al. 2014).

2.4 Women in the management of family firms and work environment in family firms

The representation of women in family firms often depends on the specific context. Campopiano et al. (2017) review the growing literature on women's involvement in family firms using a drivers-behaviors-outcomes framework. The study highlights increasing interest in the features, norms, relationships, and governance issues

shaping four key areas of women's involvement in family firms: succession, entrepreneurial entry, career dynamics, and women's overall presence. It is suggested that future studies should explore women's involvement in family firms across different countries, industries, and time periods. Such research could investigate how political, economic, social, and technological factors shape women's roles in family firms. Furthermore, examining the influence of cultural norms and traditions on women's participation in family firms could provide valuable insights into regional and national variations. Overbeke et al. (2013) present a model outlining the paths daughters take to succession in family businesses in the U.S., based on a study of supply and demand factors that impact daughter succession. They explore the contextual elements that shape the selection and self-selection of successors, drawing on gender theory and the theory of planned behavior. Their findings show that daughters' lack of awareness regarding the possibility of succession, often driven by deeply ingrained gender norms, hinders their advancement. However, these gender norms can be challenged when a critical event occurs, followed by mentoring, which helps daughters navigate the path to leadership. Curimbaba (2002) examines the professional experiences of female heirs in various family businesses across three states in the Brazilian Southeast. It was observed that the career opportunities within the family business structure often led to women being considered only as a last resort when no male family members were available. Dyer and Whetten (2006) examine the extent to which family and non-family firms differ in social responsibility, using data from the S&P 500 for the period 1991 to 2000. Their findings reveal that family firms demonstrate greater social responsibility than their non-family counterparts across multiple dimensions including gender equality initiatives. This tendency appears to stem from the family's concern for maintaining a positive image and reputation, as well as safeguarding their assets (Dyer and Whetten 2006).

Employees perceptions of the work environment (Barnett and Kellermanns 2006; Kang and Kim 2020; Samara et al. 2021) and the availability of family-friendly work policies (Memili et al. 2023) are influenced by the unique characteristics of family firms. In a conceptual study, Samara et al. (2021) examine the common assumption that family employees receive higher compensation than their non-family counterparts. This can harm perceptions of fairness among non-family employees, potentially leading them to reduce their efforts to restore a sense of equity. The authors explore how socioemotional priorities within families, combined with the cultural context (collectivist or individualist), influence which group benefits from uneven compensation. In collectivist cultures, there is a strong obligation to prioritize the financial well-being of family members, often favoring family employees. Conversely, in individualist cultures, the desire for family prominence may lead to favoring non-family employees. Kang and Kim (2020) investigate whether family firms invest more in employee relations than non-family firms. Using state-level variations in gift, inheritance, and estate taxes as an exogenous shock to family control, the results show that family firms, particularly those with a founder as CEO or a family member on the board, treat their employees better. This better treatment aims to mitigate labor-related conflicts and protect the family's reputation. Family firms, especially in the early stages and in labor-intensive industries, invest more in employee relations due to the benefits of family oversight. Barnett and Kellermanns

(2006) propose a theoretical model exploring how non-family employees' perceptions of the fairness of human resource practices are affected by family influence in family firms. Key human resource areas include practices such as employment, performance evaluation, promotion, and compensation. According to their framework, low levels of family influence have minimal impact on the perception of fairness, moderate levels generally improve perceptions of fairness, and high levels often negatively affect the perception of fairness in decision-making processes and outcomes. Danes and Olson (2003) conducted a study involving 391 family-business-owning couples in which the husband is the business owner. They aim to explore the wife's involvement in the business, the tensions arising within the business, and how those tensions influence family business success. Their findings show that 57% of wives participated in the business, with only half of them receiving direct financial compensation. Outcomes related to business and family success varied depending on the level of inclusion tensions experienced. Preliminary evidence indicated a threshold at which business tensions begin to adversely affect business success. Memili et al. (2023) investigate the accessibility of family-friendly work practices in family firms compared to non-family firms. Family-friendly work practices include flexible work schedules and organizational resources to provide support to family members (e.g., Moshavi and Koch 2005; Swody and Powell 2007). Grounded in social exchange theory, the study finds that although family-friendly work practices are present in both family and non-family firms, limited employee participation in non-family firms restricts access to these practices. Employee participation encompasses workplace practices that enable employees to contribute their input on work-related matters (Memili et al. 2023).

3 Hypotheses development

3.1 Regional labor market institutions and the share of women in management

Building on institutional theory (e.g., Carrasco et al. 2015; Grosvold et al. 2016; Terjesen et al. 2015), we shall argue that regional labor market integration of women enables them to follow management careers increasing their share in the management of firms. Subtle societal norms often channel women into specific career paths or hinder their professional success, particularly when motherhood is involved (Carrasco et al. 2015; Lundborg et al. 2017). However, there are certain regional factors that enable women to pursue their career ambitions and facilitate their integration into the regional labor market, such as the availability of childcare (Bauernschuster and Schlotter 2015; Müller and Wrohlich 2020; Zimmert 2023). The effects of childcare simultaneously depend on whether the surrounding culture is supportive of maternal employment or not (Budig et al. 2012). Additionally, this suggests that firms enhance the representation of women in management in response to growing normative and coercive pressures. Thus, regional views on gender roles shift and encourage firms to adapt to their regional environment. We focus on mid-sized firms, as they are less likely to be driven by concerns about meeting specific gender quotas (Dyer and Whetten 2006) and are also more likely to be influenced by the

particularities of the regional environment. In examining the proportion of women in management, we include all individuals in managerial positions, irrespective of their family or marital status. This approach acknowledges societal biases and stereotypes about women (Gao et al. 2016), particularly the widespread assumption that women will inevitably prioritize family responsibilities at some point, regardless of whether they intend to have children. Focusing on the regional labor market integration of women as a factor influencing the supply of potential candidates of women for management positions, the following hypothesis is posed:

H1: A stronger regional labor market integration of women has a positive relationship with the share of women in the management of mid-sized firms.

3.2 The moderating effect of family firm status

We further distinguish between family and non-family firms, arguing that the selection process for management roles in family firms is mainly determined by the preference for family members (Kragl et al. 2023), rather than the regional labor market supply of women. It is important to consider firm-level antecedents of gender representation in management such as a firm's ownership or organizational structure (Yao 2023), which can present important contingency factors. Family and non-family firms differ in their goals, with family firms prioritizing family control over the firm, preserving family identity and generational succession (Berrone et al. 2012; Gómez-Mejía et al. 2007; Lohe and Calabrò 2017). To pursue family-centered non-economic goals, family firms frequently prioritize the selection of managers based on their familial connections (Chrisman et al. 2003, 2012, 2014; Lin and Hu 2007; Vandekerckhof et al. 2015), possibly over the gender of the candidate (Curimbaba 2002).

Further, evidence suggests that family firms are more likely than non-family firms to offer employee-friendly (Kang and Kim 2020) and family-friendly work practices (Memili et al. 2023). Also, family firms demonstrate greater social responsibility in addressing gender equality issues (Dyer and Whetten 2006). Overall, these practices may reduce the influence of regional institutions on women's career advancement and the share of women in management. Thus:

H2: The relationship between regional labor market integration of women and the share of women in the management of mid-sized firms is weaker in family versus non-family firms.

4 Data and empirical model

4.1 Data sources and sample

We utilize the Orbis database from Bureau van Dijk to analyze the management and ownership structures of the firms in our dataset. Additionally, we draw on the

Inkar database, developed by the Federal Institute for Research on Building, Urban Affairs, and Spatial Development, to obtain region-level data for Germany.

The Orbis database contains data on over 400 mio. companies worldwide, including details on ownership structures and management characteristics such as gender. To create our sample, we use data on German companies from the 2022 Orbis dataset. Family firm status is determined using data from 2020 to 2022, which is appropriate since this status typically remains stable over short periods. Our sample focuses on medium-sized companies with 50 to 500 employees, as defined by IfM Bonn. We limit our analysis to firms whose global ultimate owners are based in Germany. Ultimate owners are shareholders with the highest direct or total ownership percentage, representing the top-ranking entity within a company's corporate group. Focusing on firm-level ultimate owners is essential when examining the proportion of women in management positions, as these owners significantly influence the strategic direction of their subsidiaries. Furthermore, firm-level owners often establish the overarching corporate culture, values, and diversity policies that shape leadership inclusion and cascade throughout their subsidiary network. These policies are important in promoting the inclusion of women in leadership roles across multiple entities within the portfolio.

The Inkar database offers approximately 600 indicators, providing up-to-date regional statistics on a wide range of important topics, including education, demographics, labor markets, the economy, housing, transportation, and the natural environment. It also contains data on the availability and distribution of public and private facilities and services across central locations and municipalities in Germany. Moreover, the database includes around 50 key indicators aligned with the Sustainable Development Goals (SDGs). For our analysis, we use regional data at the NUTS 3 level, encompassing Germany's 400 administrative districts and independent cities. The variables were collected for the year 2020 except for the variable *share of fathers receiving a parental allowance*, which was only available for the year 2018.

4.2 Variables

4.2.1 Dependent variable

The variable *share of women in management* reflects the percentage of senior female managers within each firm. An advantage of the contacts database in ORBIS is its standardized classification of job titles, which harmonizes data from various sources. This standardization enables the identification of specific roles across boards, committees, and departments. To achieve this alignment, ORBIS manually matches original job titles to standardized positions, considering the context of each country rather than relying solely on keyword parsing. As a result, identical job titles may be classified into different standardized positions, while multiple distinct titles may be grouped under the same standardized role. For instance, the highest-ranking executive in a firm might be titled chief executive officer (CEO), president, or managing director, depending on the company's size and organizational structure.

In our study, senior management positions include CEOs, chief officers of specific departments, and other high-ranking executives. Chief officers represent the top tier of management, holding significant influence within the company due to their high-stakes decision-making responsibilities, demanding workloads, and substantial compensation. Executives encompass second-tier roles, such as financial or marketing executives, who oversee specific functional areas within the organization. For the calculation of our dependent variable, we exclude third-tier management positions.

Before aggregating person-level data to the firm level, we ensure that duplicate entries are removed when individuals hold multiple roles. Gender is determined based on the biological sex assigned at birth. If this information is unavailable, gender is inferred from the individual's salutation.

4.2.2 *Independent variable*

Our independent variable *regional labor market integration of women* is composed of three items: women's employment ratio, childcare rate for young children, and share of fathers who receive a parental allowance. First, the women's employment ratio (e.g., Bauernschuster and Schlotter 2015) provides an important metric for assessing the participation of women in the labor force. It indicates the number of women who are employed and contributing to social insurance schemes compared to the total population of working-age women in a specific region. This measure compares different regions and tracks change over time, offering insights into the effectiveness of labor policies (Oppenheimer 1997). Second, the childcare rate for young children (Müller and Wrohlich 2020; Zimmert 2023) is defined as the share, in percentage terms, of children under 3 years that are enrolled in daycare facilities and publicly funded daycare centers, as a percentage of the total number of children in the corresponding age group. Third, the share of fathers who receive a parental allowance in % is composed of fathers as parental allowance recipients divided by parental allowance recipients and multiplied by 100. Parental allowance support is available to both fathers and mothers for up to 14 months, with the freedom to divide this period between the partners. The parental allowance covers up to 67% of pre-birth employment income, with a cap of €1800 per month. Thus, this dimension not only evaluates the impact of family policy welfare provisions but also examines whether both fathers and mothers are taking advantage of these opportunities in an equal manner. To compare the measured values concerning their relative position in the distribution, each item undergoes a z-transformation. The variable regional labor market integration of women is calculated as the average of the three transformed items.

4.2.3 *Moderating variable*

Family firm status, our moderating variable, is determined using the ATALANTA algorithm developed by Ahrens et al. (2021). This algorithm classifies family businesses based on specific ownership and governance thresholds. Grounded in the literature on German family firms, it typically identifies a family business when individuals or family entities hold at least 50% ownership, or 25% ownership com-

bined with owner-management (Ahrens et al. 2018). Additionally, the algorithm incorporates a 5% ownership threshold used in the U.S. literature (e.g., Cannella et al. 2015), allowing classification as a family firm if ownership is spread among a maximum of ten individuals (each holding at least 5%, totaling 50%) or five individuals (each holding at least 5%, totaling 25%). The ATALANTA algorithm aligns with established definitions of family firms (Chua et al. 1999), which do not require a direct link to the company founder and permit multiple, unrelated families to influence a firm's strategic direction. By considering these criteria, the algorithm can detect nuanced and non-obvious family influence within complex corporate structures.

4.2.4 Control variables

Additionally, the analysis controls for six variables on the firm-level. First, to account for industry-specific effects, the NACE Rev. 2 classification system is used to control for *industry* differences. For example, the presence of women management (e.g., Blum et al. 1994) or preference for non-family managers in family firms varies across industries (e.g., Fang et al. 2017). Second, this analysis uses the logarithm of the *number of employees* as an indicator of firm size and includes it as a control variable. Third, based on previous literature, the logarithm of *firm age* (e.g., Yao 2023) is included. Fourth, the analysis controls for the logarithm of *assets* (e.g., Kang and Kim 2020). Fifth, the dummy variable *listed* (e.g., Yao 2023) controls for differences between listed and unlisted or delisted companies. Public or quoted companies typically have higher decision-making bodies such as boards of directors, while private companies may not have formal boards and usually have one or more managers. A listed company refers to one with equity capital that is publicly traded on a stock exchange. A delisted company is one whose equity was previously listed but no longer has any listed security representing its capital. Sixth, it is necessary to control for the legal form (*private limited company*) (e.g., Memili et al. 2023). Reporting, disclosure requirements, and incorporation procedures are generally less stringent for private limited companies than for public limited companies. Furthermore, the transfer of shares in private companies is typically more complicated.

Also, the analysis includes five region-level control variables. First, *West Germany* controls for differences between West Germany and East Germany due to the distinct historical, economic, and social contexts that shaped these regions before and after reunification. After World War II, West Germany followed a capitalist market economy, while East Germany was a socialist state with a centrally planned economy. Consequently, gender roles (Pistrui et al. 2000) and availability of child-care (Zimmert 2023) vary across regions. Second, *population density* serves as an additional control variable as it offers a broad measure of regional population distribution and differentiates between urban and rural areas (Gómez-Mejía et al. 2011; Zimmert 2023). Third, this analysis also uses the *share of foreigners* to control for other diversity dimensions, integration, and labor market dynamics. Schmidt-Catran and Spies (2016) find that as the proportion of foreigners at the region-level rises, native-born populations become more hesitant to support welfare programs. Foreign

nationals also encompass stateless individuals and those with an undetermined nationality. Individuals who hold both German and another nationality are classified as German nationals. Members of stationed armed forces, diplomatic and consular staff, and their families are excluded from these statistics. Since January 1st, 2000, children of foreign parents are granted German citizenship if one parent has been habitually resident in Germany for eight years and holds a residence permit or has held a permanent residence permit for three years. Fourth, as regional development is tied to the share of women in leadership (Grosvold et al. 2016), the variable *GDP* captures the economic output of a region. Fifth, *self-employment rate* controls for labor market trends. For women in particular, self-employment could be an alternative to part-time work and labor-market inactivity (Georgellis and Wall 2005). Table 1 provides a brief description of the variables.

4.3 Regression model

We test our hypotheses using an OLS regression with standard errors clustered at the regional level. This approach accounts for potential correlations between firms within the same region, reducing the risk of underestimating standard errors. Firms in the same region may be influenced by shared regional characteristics, such as cultural norms around gender roles. The OLS regression model for the interaction regression (H2) using the share of women in management positions as dependent variable y_i can be expressed mathematically as follows:

$$\begin{aligned}
 y_i = & \beta_0 + \beta_1 \text{regionallabormarketintegration} + \beta_2 \text{familyfirmdummy} \\
 & + \beta_3 \text{regionallabormarketintegration} \times \text{familyfirmdummy} + \beta_4 \log(\text{teamsize}) \\
 & + \beta_5 \log(\text{employees}) + \beta_6 \log(\text{assets}) + \beta_7 \log(\text{firmage}) + \beta_8 \text{listed} \\
 & + \beta_9 \text{privatelimited} + \beta_{10} \text{westgermany} + \beta_{11} \text{populationdensity} \\
 & + \beta_{12} \text{foreignersshare} + \beta_{13} \text{GDP} + \beta_{14} \text{selfemployment} \\
 & + \beta_{15-n} \text{industrydummy} + \epsilon_i,
 \end{aligned}$$

where β_0 describes the constant, β_i describes the respective coefficient of the independent or control variable, and ϵ_i is the error term of the firm observation i .

As a robustness check, we employ a multilevel mixed-effects generalized linear model with variance estimators. This model accommodates intragroup correlation and relaxes the assumption of independent observations, offering additional confidence in the reliability of our results.

5 Results

5.1 Descriptive results

The final sample consists of 24,989 mid-sized firms in Germany. On average, 23.49% of management positions in these firms are held by women. Notably, family firms constitute 84% of the sample, which indicates a strong representation of this type of

Table 1 Description of Variables

	Description	Source and year of observation
<i>Firm-level variables</i>		
Share of women in management positions	The share of women in top management positions in % equals women in top management positions divided by the total number of individuals in top management positions multiplied by 100. Gender is based on the biological sex assigned at birth or salutation	ORBIS, 2021
Family firm status	Binary variable determined by the ATALANTA algorithm (family firm = 1, non-family firm = 0)	ORBIS, 2020–2022
Management team size	Total number of individuals in top management positions	ORBIS, 2021
Number of employees	Number of employees within the firm	ORBIS, 2020
Assets	Total assets as the sum of fixed assets and current assets, subtracted by unpaid contributions on subscribed capital and subtracted by the deficit not covered by equity capital	ORBIS, 2020
Firm age	Difference between the incorporation year of the company and the reference year	ORBIS, 2020
Listed company	Companies with listed equity capital. Securities are mainly represented by shares (listed = 1, unlisted or delisted = 0)	ORBIS, 2020
Private limited company (legal form)	Binary variable (private limited company = 1, public limited company = 0)	ORBIS, 2020
Industry	73 NACE Rev. 2 classifications of economic activities in the EU	ORBIS, 2020

Table 1 (Continued)

	Description	Source and year of observation
<i>Region-level variables</i>		
Regional labor market integration of women	The variable is composed of three items: women's employment ratio, childcare rate for young children, and fathers who receive a parental allowance	INKAR, 2020
Women employment ratio	Share in % of women in employment subject to social insurance contributions per 100 women of working age (15 to under 65 years) in the place of residence	INKAR, 2020
Childcare rate for young children	Share in % of children under 3 years of age in daycare facilities and publicly funded daycare centers as a percentage of children in the corresponding age group	INKAR, 2020
Share of fathers receiving parental allowance	The share of fathers who receive a parental allowance in % is composed of fathers as parental allowance recipients divided by parental allowance recipients and multiplied by 100. A basic parental allowance is available to both fathers and mothers for up to 14 months, with the freedom to divide this period between them	INKAR, 2018
West Germany	Binary variable (West Germany = 1, East Germany = 0); Bremen, Hamburg, Saarland, Schleswig Holstein, Rhineland-Palatinate, Hesse, North Rhine-Westphalia, Baden-Württemberg, Lower Saxony and Bavaria account for West Germany. Brandenburg, Berlin, Mecklenburg Western Pomerania, Saxony-Anhalt and Thuringia account for East Germany	INKAR, 2020
Population density	Inhabitants per km ²	INKAR, 2020
Share of foreigners	Share of foreigners in the population in %	INKAR, 2020
GDP	Gross domestic product (GDP) is absolute in millions of euros	INKAR, 2020
Self-employment rate	Self-employed per 100 employed persons in %	INKAR, 2020

business in our sample. This high percentage of family firms suggests that the findings have sufficient external validity and could be reflective of broader trends within similar organizational contexts. In Germany, the private sector is predominantly made up of family businesses, with 90% of companies being family-controlled and 88% of private companies managed directly by their owners (Gottschalk et al. 2023). On average, a firm has approximately four people holding management positions. The average firm size is relatively small, with a mean of approximately 122 employees. Notably, 98% of firms are classified as private limited companies, and very few have publicly traded equity.

As mentioned before, the variable regional labor market integration of women is calculated from three items, which are not standardized for the descriptive statistics. The mean average of regional labor market integration of women is 39.18, with a standard deviation of 5.19. The women's employment ratio reaches an average of 58.53%, while the regional average childcare rate for young children is 35.46%. 23.55% of parental allowance recipients in Germany are fathers. Most firms in the sample are in West Germany (82%) and densely populated regions, as the average population density is 987.66 inhabitants per square kilometer. Table 2 presents some sample descriptives:

Maps of Germany are generated using mapchart.net to provide a clearer visualization of the regional distribution. Figure 1 illustrates the average percentage of women in top management positions across NUTS 3-level regions. The classification of the average share is based on the percentile distribution. Regions in the 99th percentile, with a threshold of 30.8% or higher, include Frankfurt Oder (Branden-

Table 2 Descriptive Statistics

<i>Firm-level variables</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Share of women in management positions in %	23.49	29.79	0	100
Family firm dummy	0.84	–	0	100
Management team size	3.76	2.87	1	44
Number of employees	121.81	87.48	50	500
Assets (in millions €)	13.9	89.4	0	7280
Firm age	32.65	29.70	0	499
Listed company dummy	0.00	–	0	1
Private limited company dummy	0.98	–	0	1
<i>Region-level variables</i>				
Regional labor market integration of women	39.18	5.19	25.26	54.09
Women employment ratio in %	58.53	4.37	45.08	71.40
Childcare rate for young children in %	35.46	10.99	16.77	67.51
Fathers receiving parental allowance in %	23.55	3.63	10.96	32.41
West Germany dummy	0.82	–	0	1
Population density per km ²	987.66	1204.16	35.58	4789.84
Share of foreigners in %	13.05	5.93	2.24	36.94
GDP (in millions €)	24.4	38.4	1.15	157
Self-employment rate in %	9.17	1.892	2.37	14.74

N = 24,989 firms from 400 regions

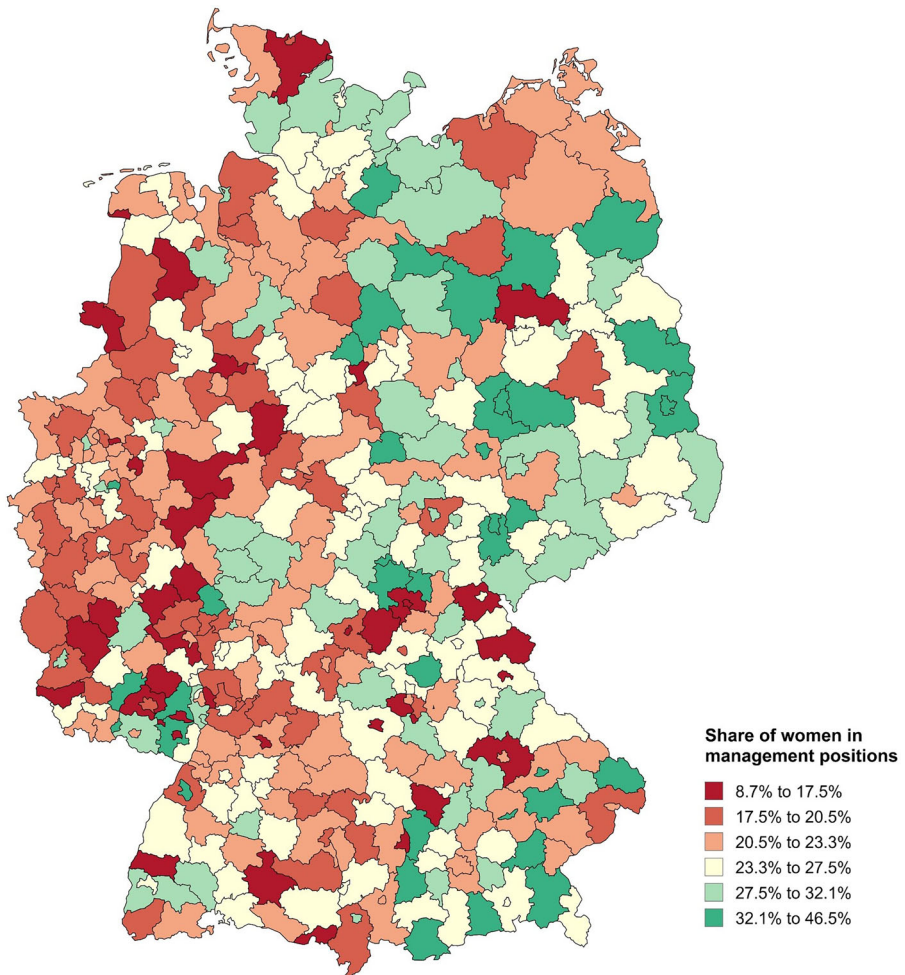


Fig. 1 Percentage of Women in Management Positions across Regions

burg), Garmisch-Partenkirchen (Bavaria), Altenburger Land (Thuringia) and Kusel (Rhineland-Palatinate). Regions with an above-average share of women in management positions appear to be concentrated in Brandenburg and Saxony. In contrast, most regions in North Rhine-Westphalia seem to have a below-average representation of women in management positions. Regions within the 1st percentile with a share of women in management positions of 11.9% or below include Ansbach (Bavaria), Salzgitter (Lower Saxony), Augsburg (Bavaria) and Herne (North Rhine-Westphalia).

Regions in the 99th percentile, with a threshold of 30.8% or higher, include Frankfurt Oder (Brandenburg), Garmisch-Partenkirchen (Bavaria), Altenburger Land (Thuringia) and Kusel (Rhineland-Palatinate). Regions with an above-average share of women in management positions appear to be concentrated in Brandenburg and

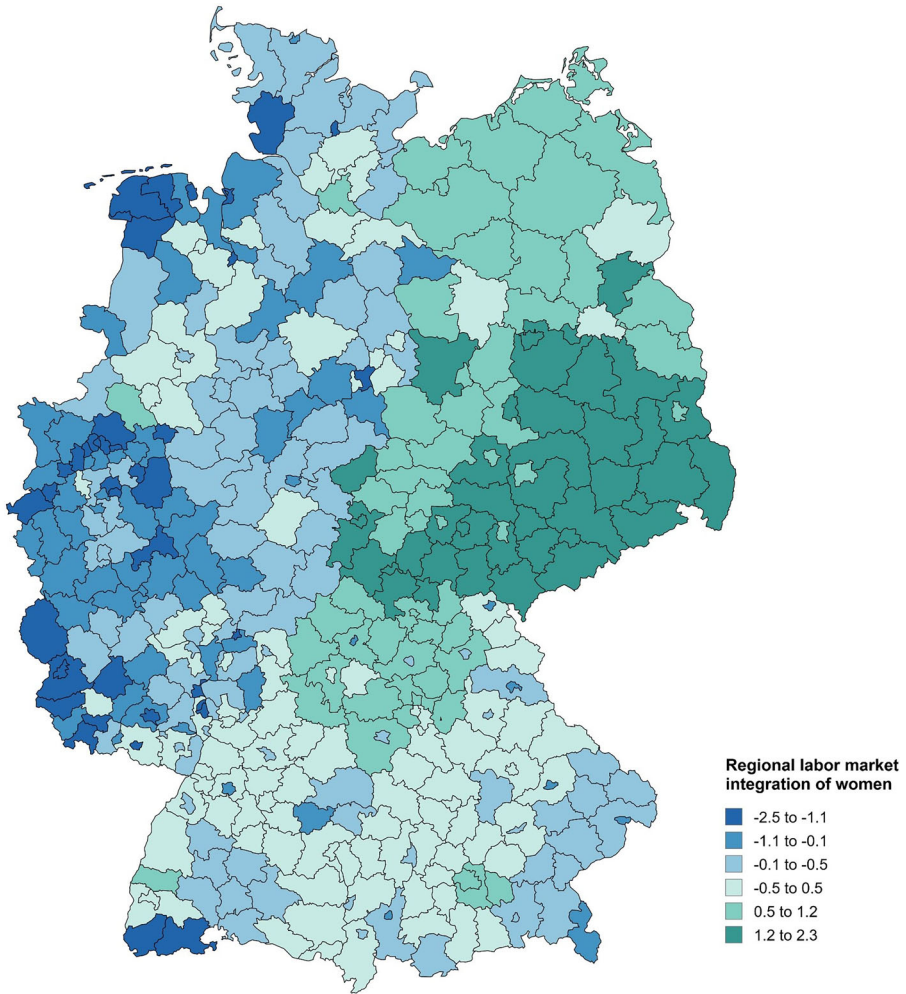


Fig. 2 Regional Labor Market Integration of Women across German Regions

Saxony. In contrast, most regions in North Rhine-Westphalia seem to have a below-average representation of women in management positions. Regions within the 1st percentile with a share of women in management positions of 11.9% or below include Ansbach (Bavaria), Salzgitter (Lower Saxony), Augsburg (Bavaria) and Herne (North Rhine-Westphalia).

To enable meaningful comparisons and conclusions based on relative position rather than absolute values, the items of regional labor market integration of women undergo a z-transformation. Figure 2 illustrates the regional labor market integration of women across NUTS 3-level regions. The classification of the average share is based on the percentile distribution as well. Regions in the 99th percentile, with a threshold of 1.9 or higher, include Hildburghausen (Thuringia), Greiz (Thuringia), Bautzen (Saxony), and Saxon Switzerland (Saxony). All these top four regions

are in East Germany. Regions within the 1st percentile with regional labor market integration of women of -1.98 or below include Gelsenkirchen (North Rhine-Westphalia), Duisburg (North Rhine-Westphalia), Frankenthal (Rhineland-Palatinate) and Bremerhaven (Bremen). Figure 2 shows the strong regional contrast: women and mothers in the East have experienced much better integration into the labor market than their counterparts in the West. This divergence stems from the historical differences in family policies due to the country's division (Müller and Wrohlich 2020).

The following overview of the average share of women in management positions and sample distribution across industries is based on the NACE main sections. Consistent with numerous previous studies, the human health and social work activities sector has the highest average percentage of women in management positions (34.65%), followed by the education sector with 30.74%. On the other end of the spectrum, the information and communication sector shows the lowest share of women in management positions (19.23%), with the water supply, sewerage, waste management, and remediation activities sector being close behind at 20.05%. The distribution across industries confirms the pattern of market segregation, where women are more likely to work in different occupations and industries compared to men (Blau and Kahn 2017; Reskin and Bielby 2005). The sample for this study is predominantly drawn from the manufacturing industry, the wholesale and retail trade, repair of motor vehicles and motorcycles industry, as well as the human health and social work activities sector. For a detailed breakdown of the distribution of women in management positions, refer to Table 3.

On average, family firms strongly dominate the construction (97.1%), wholesale and retail trade, repair of motor vehicles and motorcycles (95.6%), manufacturing

Table 3 Average Share of Women in Management Positions in Industries

Industry	N	Share (%)	SD
Human health and social work activities	3188	34.65	40.53
Education	402	30.74	38.44
Accommodation and food service activities	930	26.33	35.05
Other service activities	607	24.70	32.47
Administrative and support service activities	2538	23.66	33.87
Arts, entertainment and recreation	309	22.47	33.88
Electricity, gas, steam and air conditioning supply	238	21.86	20.63
Wholesale and retail trade; repair of motor vehicles and motorcycles	3689	21.40	25.83
Manufacturing	6731	21.39	22.92
Transportation and storage	1716	21.30	29.71
Professional, scientific and technical activities	1278	20.76	26.47
Construction	2085	20.06	27.11
Water supply; sewerage, waste management and remediation activities	262	20.05	23.54
Information and communication	1016	19.23	24.10
<i>Overall</i>	24,989	23.49	29.79

Table 4 Average Share of Family Firms in Industries

Industry	<i>N</i>	Share (in %)
Construction	2085	97.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	3689	95.6
Manufacturing	6731	93.7
Administrative and support service activities	2538	91.0
Accommodation and food service activities	930	90.8
Transportation and storage	1716	90.7
Information and communication	1016	86.5
Professional, scientific and technical activities	1278	85.4
Water supply; sewerage, waste management and remediation activities	262	70.2
Other service activities	607	66.2
Arts, entertainment and recreation	309	65.0
Human health and social work activities	3188	45.8
Education	402	43.5
Electricity, gas, steam and air conditioning supply	238	8.4
Overall	24,989	83.96

(93.7%), administrative and support services (90.1%), and accommodation and food service industries (90.8%). Family firms make up only 8.4% of the electricity, gas, steam and air conditioning supply industry. The share of family firms in the education industry (43.5%) as well as the human health and social work activities industry (45.8%) is notably low. Table 4 provides additional insights into the distribution of family firms across industries.

5.2 Regression results

Overall, the VIF analysis indicates that multicollinearity is not a concern. The table in the appendix provides a correlation analysis, showing that only industry control variables have VIF values exceeding 5. Aside from the industry dummies, the variable with the highest VIF (2.9) is the one controlling for West Germany. Due to the large number of industry dummies, we have opted not to report the VIF results. The full correlation analysis results can be found in Appendix.

Model 1 in Table 6 focuses on firm and region-level control variables. Among the firm-level factors, the management team size ($coeff=5.5, p<0.001$) shows a significant positive impact. As mentioned before, the management team size is log-transformed. To gauge the magnitude of the influence of log-transformed variables, we multiply the coefficient by $\log(1.01)$. For example, the calculation $5.5 \times \log(1.01) = 0.024$ shows that a 1% increase in the size of the management team leads to approximately a 2.4% rise in the proportion of women in management positions. The log-transformed number of employees ($coeff=-1.58, p<0.01$) shows a significant negative impact on the share of women in management positions, indicating that a 1% increase in number of employees decreases the share of women in management positions by 0.68%. The results also show that log-transformed assets ($coeff=-1.37, p<0.001$) have a significant negative impact. A 1% increase in assets results

in a 0.59% decrease in the share of women in management positions. Listed companies ($coeff = -13.27, p < 0.001$) have a significant negative impact on the share of women in management positions, with the share of women in management positions decreasing by 13.27%. On the other hand, firms structured as private limited companies ($coeff = -9.81, p < 0.001$) have a significant negative impact on the share of women in management positions, decreasing the share of women in management positions by 9.81%. Older firms have a strong positive influence, with the log-transformed firm age variable ($coeff = 1.67, p < 0.001$) emerging as a highly significant predictor. A 1% increase in firm age increases the share of women in management positions by 0.72%. Regarding regional variables, most of them turn out to be insignificant. However, there are some noteworthy exceptions. For instance, being in West Germany ($coeff = -4.49, p < 0.001$) reduces the share of women in management positions by 4.49%. Meanwhile, a 1% increase in the regional self-employment rate ($coeff = 0.53, p < 0.001$) appears to increase the share of women in management positions by 0.53%.

Model 2 additionally introduces two independent variables: regional labor market integration of women and family firm status. The results show that the regional labor market integration of women has a positive and significant impact on the share of women in management positions ($coeff = 0.92, p < 0.01$), providing strong support for H1. However, the effect of family firm status on the share of women in management positions is not significant ($coeff = 0.17, p = 0.833$).

Model 3 adds the interaction between regional labor market integration of women and family firm status into the regression. The interaction variable shows a negative effect and is significant ($coeff = -3.46, p < 0.001$). As a result, H2, which anticipated a weakening effect, is supported. The p -values show that all three models are statistically significant. The R^2 in Model 3 shows that the model explains 7.5% of the variation in the dependent variable. Detailed results of these regression models can be found in Table 5.

Specifically, in family firms, the positive effect of women's labor market integration on the share of women in management positions is less pronounced. In other words, while women's labor market integration generally increases the share of women in management positions, this increase is smaller in family versus non-family firms. In Fig. 3, the marginal plot illustrates the interaction effect between women's labor market integration and family firms.

The multilevel mixed-effects generalized linear models with variance estimators incorporate the same variables as in the primary analysis, serving as a robustness check to validate our findings. The results remain consistent with those obtained from the OLS regression, where standard errors were clustered on the region-level, suggesting that the underlying relationships hold across different modeling approaches. This additional layer of analysis strengthens the evidence supporting H1 and H2 and reveals a significant negative interaction effect between regional labor market integration of women and family firm status. Table 6 presents comprehensive details regarding the robustness check:

Table 5 OLS Regression with Standard Errors clustered on the Region-Level

	Model 1	Model 2	Model 3
Share of women in management positions	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
<i>Independent variables</i>			
Regional labor market integration of women (H1)	–	0.92 (0.002)	3.82 (0.000)
Family firm dummy	–	0.17 (0.833)	0.27 (0.739)
Regional labor market integration of women × Family firm status (H2)	–	–	–3.46 (0.000)
<i>Firm-level control variables</i>			
Management team size	5.50 (0.000)	5.48 (0.000)	5.48 (0.000)
Number of employees	–1.58 (0.001)	–1.55 (0.001)	–1.52 (0.001)
Assets	–1.37 (0.000)	–1.38 (0.000)	–1.39 (0.000)
Firm age	1.67 (0.000)	1.70 (0.000)	1.66 (0.000)
Listed company dummy	–13.27 (0.000)	–13.24 (0.000)	–13.47 (0.000)
Private limited company dummy	–9.81 (0.000)	–9.76 (0.000)	–9.91 (0.000)
Industry (73 categories)	Included	Included	Included
<i>Region-level control variables</i>			
West Germany dummy	–4.49 (0.000)	–3.46 (0.000)	–3.25 (0.000)
Population density per km ²	–0.00 (0.730)	–0.00 (0.867)	–0.00 (0.992)
Share of foreigners in %	–0.00 (0.258)	0.11 (0.151)	0.10 (0.189)
GDP	0.01 (0.198)	–0.00 (0.057)	–0.00 (0.046)
Self-employment rate in %	0.53 (0.000)	0.53 (0.000)	0.52 (0.000)
Constant	19.71 (0.000)	17.73 (0.000)	18.12 (0.000)
R ²	0.074	0.074	0.075
Prob>F	0.000	0.000	0.000

N= 24,989 firms from 400 German regions

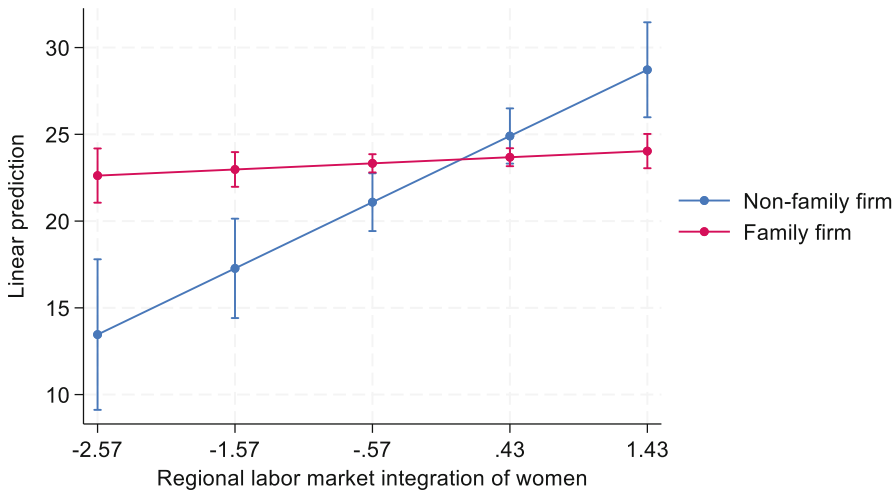


Fig. 3 Marginal Plot for Interaction Term

Table 6 Multilevel Mixed-Effects Generalized Linear Model

	Model 1	Model 2	Model 3
Share of women in management positions	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
<i>Independent variables</i>			
Regional labor market integration of women (H1)	–	0.92 (0.004)	3.84 (0.000)
Family firm dummy	–	0.18 (0.829)	0.27 (0.734)
Regional labor market integration of women × Family firm status (H2)	–	–	–3.46 (0.000)
<i>Firm-level control variables</i>			
Management team size	5.50 (0.000)	5.48 (0.000)	5.48 (0.000)
Number of employees	–1.57 (0.001)	–1.55 (0.001)	–1.51 (0.001)
Assets	–1.38 (0.000)	–1.39 (0.000)	–1.40 (0.000)
Firm age	1.68 (0.000)	1.70 (0.000)	1.66 (0.000)
Listed company dummy	–13.39 (0.000)	–13.31 (0.000)	–13.54 (0.000)
Private limited company dummy	–9.80 (0.000)	–9.76 (0.000)	–9.91 (0.000)
Industry (73 categories)	Included	Included	Included
<i>Region-level control variables</i>			
West Germany dummy	–4.75 (0.000)	–3.54 (0.000)	–3.28 (0.000)
Population density per km ²	–0.00 (0.757)	–0.00 (0.946)	0.00 (0.923)
Share of foreigners in %	0.10 (0.188)	0.12 (0.121)	0.11 (0.158)
GDP	–0.00 (0.144)	–0.00 (0.049)	–0.00 (0.042)
Self-employment rate in %	0.53 (0.000)	0.52 (0.000)	0.51 (0.000)
Constant	53.51 (0.000)	46.58 (0.000)	46.63 (0.000)
Variance on region-level	2.41	1.98	1.97
Variance of the distribution of the region-level u-intercepts	819.78	819.91	818.87
Prob > chi ²	0.000	0.000	0.000

N = 24,989 firms from 400 German regions

6 Discussion

6.1 Summary of main findings and interpretation

Our study seeks to answer two key research questions: “To what extent does regional labor market integration of women influence the share of women in management positions within firms?” and “How does the influence of regional labor market integration of women on the share of women in management differ between family and non-family firms?”. In doing so, we offer insights into how regional labor market institutions affect women’s progression to top management roles, while also examining the specific role that family firms play in this relationship.

Our results support hypothesis 1, confirming that regional labor market integration of women positively influences the share of women in management positions within mid-sized firms. This finding, along with the significant regional variation in women’s labor market integration in Germany, underscores the importance of

considering the regional context in research on gender in (top) management. Regional labor market integration of women is measured through indicators such as the women's employment ratio, childcare availability, and the proportion of fathers receiving a parental allowance. We identify a significant correlation between the three factors suggesting an interplay between them and pointing towards a deeper underlying institutional foundation. We would also go one step further and argue that the three actors support or complement each other in their respective impacts. For example, the availability of childcare may have a limited impact in regions where conservative views on maternal employment and traditional gender roles prevail. In addition to these findings, our study makes a methodological contribution by introducing regional labor market integration of women as a novel measure of regional gender roles.

Hypothesis 2 is also supported by our analysis. The positive effect of stronger regional labor market integration of women on the share of women in management positions in mid-sized firms tends to be weaker for family firms compared to non-family firms. This finding suggests a difference in how family and non-family firms approach management selection. We attribute these findings to family firms' unique emphasis on preserving long-term family control and influence, which may take precedence over external pressures to enhance gender representation. The focus on maintaining family control likely outweighs the benefits of increasing gender diversity in management. In line with this argument, we were also not able to find a significant direct effect of family firm status on women's share in management suggesting that family firms as such are not more or less likely to have women in management positions. This way, we contribute to the ongoing debate on whether company or government initiatives drive gender diversity in leadership (Garnitz and von Maltzan 2023). Family firms with their unique goals and visions as well as their unique firm and work culture seem not to move the needle and push women into management positions.

Additionally, hypothesis 2 and the negative interaction observed in our regressions may be explained by the concept of territorial or local embeddedness (Martínez-Sánchez et al. 2021), even though this may initially appear contradictory. The economic, social, and emotional ties that family firms have with their regions—referred to as territorial embeddedness—can provide them with locational advantages (Amato et al. 2022; Cucculelli and Storai 2015) or help mitigate challenges associated with regional remoteness (Baù et al. 2019). For example, Amato et al. (2023) found that territorially embedded family firms are less likely to downsize, attributing this to socially proximate relationships with the local community, based on shared values and a sense of belonging. These family firms tend to treat their employees as key stakeholders, especially in challenging times.

Our finding of a *weaker* effect of regional institutions on the share of women in management in family versus non-family firms can be explained by the fact that regional embeddedness primarily influences externally visible aspects of the firm, such as its reputation and relationship with local stakeholders, rather than its internal governance. Family firms are concerned with maintaining a positive image in the local community, but they are less affected by regional influences when it comes to their internal organizational practices.

6.2 Implications for practice

Our results suggest that policymakers can design, use, and leverage instruments that support the labor market integration of women to increase their representation in management and high-wage positions, thereby positively impacting regional gender equality. This could involve improving access to childcare, offering flexible work arrangements, supporting educational and professional development programs for women, and addressing cultural or structural barriers to workforce participation. Given the high demands placed on managers, women in leadership roles may require adequate support to succeed, such as the initiatives mentioned above. By promoting a more inclusive labor market, regional policymakers can help build a pipeline of qualified female talent, ready to advance into management positions. In this regard, our study supports companies in their argumentation that (regional) governments and policymakers should play an active role in advancing women into leadership positions. Specifically, there is a need for expanded childcare facilities and stronger incentives to promote a more equitable distribution of caregiving responsibilities (Garnitz and von Maltzan 2023).

Our results suggest that family firms should reflect on the underlying implications of their family goals. Women who perceive a firm as not prioritizing equal opportunities are less likely to apply for management roles within those firms (Fernandez-Mateo and Fernandez 2016; Storvik and Schøne 2008). Family firms should reflect on this and consider opening management positions specifically for qualified female non-family candidates—given they have the necessary qualifications and align with the vision and values of the firm and its owning family.

6.3 Limitations and further research

Although our study yielded insightful results for the debate on the factors that promote women in management, it suffers from some limitations. First, the regression models account for only a small portion of the variance in the dependent variable, which suggests that the models may not fully capture the complexities influencing the share of women in management positions. This limitation indicates that there may be significant factors not included in our analysis, which could provide additional insights into the dynamics of gender representation in management roles. Factors such as industry norms and demographic trends can, for example, play an important role in shaping gender dynamics in the workplace. Further, including additional lags in the analysis could provide deeper insights by capturing the potential long-term effects of women's prior participation in management roles on their future involvement. A second limitation of this study is that it does not include separate estimations for each component of the regional labor market integration of women. Including such analyses could help to identify which specific policy initiatives are most effective in driving the social and economic mobility of women in the workplace. Third, metrics such as the share of fathers receiving parental allowance and the childcare rate for young children are more closely related to the circumstances of mothers in management positions, rather than women in management overall. Since the data does not provide information on individuals' marital or family status, the

reliability of these measurements may be limited. However, employers may assume that women without children could potentially have children in the future. The impact of this assumption remains however unclear. Fourth, a limitation of this study is that it does not employ more advanced econometric techniques, such as difference-in-differences or regression discontinuity design. Thus, the ability to identify causal relationships and control for endogeneity issues—arising from unobserved factors that influence both regional integration policies and women's presence in management—is limited.

Despite these and other limitations, the significant impact of regional labor market integration for women suggests that additional institutional factors may merit further investigation. The findings of this study emphasize the importance of considering regional differences in how both fathers and mothers navigate opportunities provided by formal and informal institutions of their respective regions. Future research on the representation of women in top management positions and its impact should take such regional factors and variations into account, examining whether gender equality initiatives are equally accessible and utilized by both genders across different institutional contexts. Regional institutional factors also remain a crucial area for further exploration. For example, geographic variations in gender stereotypes may help to explain the differences observed in studies examining the relationship between women in leadership roles and the financial performance of (family) firms (Amore et al. 2014). To deepen our understanding of this issue, institutional theory, particularly the concept of institutional logic, could be applied to bridge the gap between research on regional economic development and family business studies (e.g., Rodríguez-Pose 2013). In this regard, future research could also dig deeper into our main family business finding and investigate why the positive relationship between regional labor market integration of women and their representation in management positions is notably weaker in family firms. A qualitative empirical approach could offer valuable insights into potential gender biases or resistance to non-traditional social roles, such as shorter maternity leaves, during the hiring process. Investigating this issue could reveal critical nuances in how organizational contexts and regional dynamics interact with each other in shaping women's career progression.

7 Appendix

Table 7 Correlation Analysis

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Share of women in management positions in %	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Regional labor market integration of women	0.046***	-	-	-	-	-	-	-	-	-	-	-	-
3 Family firm dummy	-0.051***	-0.009	-	-	-	-	-	-	-	-	-	-	-
4 Management team size	0.004	-0.014***	0.106***	-	-	-	-	-	-	-	-	-	-
5 Firm size	-0.016**	-0.021***	-0.186***	0.188	-	-	-	-	-	-	-	-	-
6 Assets	-0.082***	0.012*	-0.102***	0.469***	0.405***	-	-	-	-	-	-	-	-
7 Firm age	0.004	-0.101***	0.084***	0.409***	0.086***	0.332***	-	-	-	-	-	-	-
8 Listed company dummy	-0.012**	0.000	-0.024***	0.019***	0.034***	0.052***	-0.011*	-	-	-	-	-	-
9 Private limited company dummy (legal form)	-0.019***	-0.012*	0.027***	-0.036***	-0.070***	-0.112***	-0.022***	-0.231***	-	-	-	-	-
10 West Germany dummy	-0.061***	-0.648***	0.055***	0.055***	0.017***	0.023***	0.139***	0.007	-0.004	-	-	-	-
11 Population density per km ²	-0.000	0.011*	-0.057***	-0.112***	0.019***	-0.068***	-0.141***	0.026***	-0.049***	-0.130***	-	-	-
12 Share of foreigners in %	-0.028***	-0.333***	-0.013**	-0.055***	0.032***	-0.031***	-0.051***	0.024***	-0.045***	0.338***	0.733***	-	-
13 GDP	0.007	0.169***	-0.037***	-0.102***	0.006	-0.048***	-0.133***	0.023***	-0.041***	-0.236***	0.834***	0.528***	-
14 Self-employment rate in %	0.039***	0.235***	0.037***	0.002	-0.040***	0.023***	0.004	-0.014**	0.013**	-0.231***	-0.253***	-0.410***	0.016***

N = 24,989 firms from 400 regions; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Conflict of interest N. Welch, J.-P. Ahrens and J. Block declare that they have no competing interests.

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