Brazilian large family firms & non-Family firms: bridging regional context and top management team gender diversity

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Abstract The importance of family businesses in the global economic landscape is widely acknowledged, and initial progress has been made in exploring the interrelationship between family businesses and the contexts in which they operate. This study investigates the influence of family businesses, geographic location, and gender diversity within Brazilian companies. For this purpose, it uses an extensive database, encompassing over 2.8 million active Brazilian companies, and employs the Atalanta algorithm to identify family businesses. Using a logit model, the results reveal significant differences in gender diversity between family and non-family businesses, as well as variations between urban and rural areas. Theoretical contributions include advances in understanding the importance of the regional context in the management of family businesses, as well as expanding the debate on gender diversity in such business contexts. Practically, family businesses can adopt more inclusive policies to enhance their performance, especially in regions where gender diversity is still limited. Regional public policies that encourage inclusion could also promote the development and long-term sustainability of family businesses.

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Zusammenfassung Die Bedeutung von Familienunternehmen im globalen wirtschaftlichen Umfeld ist weithin anerkannt und es wurden erste Fortschritte bei der Erforschung der Wechselwirkungen zwischen Familienunternehmen und den Kontexten, in denen sie tätig sind, erzielt. Diese Studie untersucht den Einfluss von Familienunternehmen, geografischer Lage und Geschlechterdiversität in brasilianischen Unternehmen. Zu diesem Zweck wird eine umfangreiche Datenbank verwendet, die mehr als 2,8 Mio. aktive brasilianische Unternehmen umfasst. Dabei wird der Atalanta-Algorithmus eingesetzt, um Familienunternehmen zu identifizieren. Mithilfe eines Logit-Modells zeigen die Ergebnisse signifikante Unterschiede in der Geschlechterdiversität zwischen Familien- und Nicht-Familienunternehmen sowie Unterschiede zwischen städtischen und ländlichen Räumen. Auf der theoretischen Ebene leistet die Abhandlung einen Beitrag, indem sie sowohl Fortschritte beim Verständnis der Bedeutung des regionalen Umfelds für die Führung von Familienunternehmen erzielt als auch hierzu eine Debatte über Geschlechtervielfalt in Geschäftskontexten integriert. Für die Praxis werden für Familienunternehmen inklusivere Politiken empfohlen, um ihre Performance zu steigern, insbesondere in Regionen, in denen die Geschlechterdiversität noch begrenzt ist. Eine inklusionsfördernde Regionalpolitik könnte ferner eine Entwicklung und langfristige Nachhaltigkeit von Familienunternehmen unterstützen.

Abbreviations
GDP   Gross Domestic Product
IBGC Brazilian Institute of Corporate Governance
IBGE Brazilian Institute of Geography and Statistics
TMT   Top Management Team

1 Introduction

Understanding how family businesses influence the regional context in which they operate, as well as reflecting on how this context influences various aspects of family business, is a topic that has increasingly attracted the attention of researchers in the fields of family businesses and regional studies in recent years (e.g., Basco 2015; Karlsson 2018; Basco and Suwala 2020; Ricotta and Basco 2021). It is interesting to note that the impetus for this interrelationship formally can be traced back to Astrachan (1988, p. 165) recognition that local culture has a significant impact on family businesses: "Family businesses acquired in a manner that is at odds with the local culture will suffer, while firms that are acquired and managed in harmony with the local culture will have a higher level of morale and long-run productivity." Although it addresses a situation of change when a family business is acquired, this reflection draws attention to something much broader that directly or indirectly affects all kinds of companies, including family businesses: the cultural and regional context in which they are embedded.

There is a clear effort in the literature to better understand the effects that the regional context in which family businesses operate can have on these businesses (see Basco and Suwala 2021; Ricotta and Basco 2021; Arteaga and Basco 2023;

Adjei et al. 2025), as well as studies focusing on the implications of family businesses for the contexts in which they are embedded, such as in terms of economic growth, employability, productivity, and more (see Karlsson 2018; Baù et al. 2019; Amato et al. 2020; 2023a). Moreover, it is recognized that the study of regionalities and family businesses assumes a bidirectional nature; in other words, while family businesses influence their context, they can also be shaped by it (Basco et al. 2021; Basco 2024). In addition, the newest studies combine cultural and regional contexts (Basco et al. 2021, Skaf et al. 2024).

For instance, Karlsson (2018) studied Swedish companies and observed that employment growth rates in the country vary between family and non-family businesses, with this discussion also extending to rural-urban contexts. In another study, also with Swedish firms, Baù et al. (2019) found that family businesses benefit more from embeddedness than non-family businesses, with this effect being even greater for business growth when these companies are located in rural settings. Similarly, Amato et al. (2023a), in their study of Spanish manufacturing firms, observed that family businesses are more sensitive to the regional context than non-family businesses when it comes to productivity. Unlike the previous studies, this research did not focus on the rural-urban axis but instead applied a composite indicator of regional competitiveness. Finally, Skaf et al. (2024), in addition to discussing gender diversity and women's empowerment as elements linked to the continuity of Lebanese family businesses, emphasized that the effect of this relationship is greater when these family businesses are located in rural areas.

Thus, it is acknowledged that recent literature has made efforts to advance the discussion on regional aspects and family businesses. However, this body of work predominantly focuses on regional contexts in the Global North (e.g., Europe, US) (see exceptions Basco et al. 2021) and/or discussions related to the economic circumstances. Against the background, the present study sheds new light by including both additional variables beyond the traditional economic perspective and a cultural and regional context from emerging countries. An example would be the recognition of gender diversity as a variable that, on the one hand, may be linked to the internal strategies and policies of companies, as emphasized by Skaf et al. (2024) (endogenous factor), while on the other hand it may reflect the context in which the company operates, as a cultural trait (exogenous factors).

Therefore, the present study draws attention to the theme of regional context and top management team (TMT) gender diversity in family businesses in developing countries, particularly, in Brazil. This acknowledges that family businesses play globally a fundamental role in the economy, significantly impacting market and regional development (Basco 2024; Suwala et al. 2024). Brazil is no exception and 90% of companies have a family profile[1], these businesses generate more than half of the GDP and employ 75% of the workforce (KPMG 2021). The country's vast

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[1] The term "family profile" is used as an umbrella and refers to the heterogeneity perceived in this classification. In other words, these 90% encompass for instance, small businesses that were born within a family, or a couple, even to companies listed on the stock exchange, or multinationals that had or maintain their origin linked to one or more families. The idea here is to recognize the variability of profiles within this type of business, while being united by common element of the family.

geography and socio-economic transformations, particularly the urbanization driven by industrialization in the 1960s and 1970s, have reshaped its economic landscape (Ignazzi 2015). This process led to significant male migration from rural areas to urban centers, driven by opportunities in construction, manufacturing, and services, while agricultural modernization reduced labor demand in rural areas (Ignazzi 2015; Nascimento et al. 2018). These changes have created distinct challenges and opportunities for family businesses across different regions and from a gender perspective manifold discussions.

The relevance of discussing regional context and gender diversity in Brazil stems from the fact that these themes may present their own culturally embedded profiles, and unique (regional) characteristics of developing countries. For example, Ahrens et al. (2024b) recognizes that in countries such as Brazil, for instance, female representation in senior positions is significant and reflects an ever-evolving cultural and regional context. Welsh et al. (2018) address that women entrepreneurs in emerging economies can mitigate the challenges of accessing financial resources by leveraging family support (Welsh et al. 2018). It is interesting to note how local cultural norms and traditions play a crucial role in including women in leadership positions, especially in regions where patriarchal values still predominate (Hofstede et al. 2010; Motta and Gomes 2022) and scarcity of resources is a reality.

In addition, Hofstede et al. (2010) observed that in Brazil, although there is a predominant national culture that reinforces the traits of high-power distance, collectivism, high uncertainty avoidance, a short-term focus, and a more indulgent and feminine profile (Hofstede et al. 2010), this profile can vary across the different (five) Brazilian regions. This variation can be explained by cultural and historical heritage. Thus, institutional, economic, and geographical factors are important elements to consider in the analysis of regionality (Basco et al. 2021). In this paper, the regional context is investigated by dividing Brazil into urban and rural regions. State capital cities are classified as "urban" regions, while all other cities are considered "rural" (see Fig. 1), in accordance with the IBGE (2023) approach. This distinction reflects the lower population density of rural areas in contrast to urban areas, which have a higher concentration of resources and population (IBGE 2023; Karlsson 2018).

Despite their relevance, there is still a significant gap in the literature regarding the understanding of the interactions between family firms, gender diversity in the top management team (TMT), and geographic location (rural vs. urban) within regional contexts in general, such a diverse one as in Brazil in particular. Thus, this article seeks to answer the research question: "How do family firms and gender diversity relate to geographic location in Brazil?". Specifically, it (1) acknowledges the importance of addressing the impact of family businesses in relation to geographic location (rural-urban context), particularly from an economic perspective, (2) examines the cultural aspects related to TMT gender diversity within family businesses, and (3) explores the Brazilian regional differences between family and non-family firms, considering both exogenous factors, such as geographic location, and endogenous factors, such as gender diversity. It is expected that given the complexities outlined above, Brazil provides an ideal context for exploring the intersection of family businesses, regional diversity, and gender roles due to its large geographic

Fig. 1 Brazil's administrative regions. (Note. The map was created according to the IBGE organization of the big regions, on the MapChart website. Source: Authors' own elaboration)

extent. Investigating how these dynamics influence family businesses offers valuable insights into the socio-economic realities of a developing South American nation. Furthermore, this research provides an opportunity to understand how family businesses navigate these structural shifts, especially regarding gender dynamics, and contributes to the broader discourse on regional environment and economic sustainability.

To address this research question, an extensive database from Moody's Orbis Generics encompassing over 2.8 million active Brazilian companies, was analyzed using a logit model. The contributions of this study are multiple. Theoretically, it enriches the literature on family businesses by incorporating both regional and cultural contexts. In addition to examining exogenous aspects—such as how rural-urban location influences whether a company is family-owned or not—it also investigates endogenous factors, such as gender diversity policies, and the impact of local regional culture (Hofstede et al. 2010) on these practices. As such, this research advances the existing literature on that aspects (Karlsson 2018; Baù et al. 2019;

Amato et al. 2023a; 2023b; Basco 2024; Skaf et al. 2024). Moreover, the study also provides the perspective of an emerging country, responding to the call by Skaf et al. (2024) to investigate contexts beyond European and US-American realities.

The research also provides an opportunity to better understand the Brazilian market in terms of family businesses. This is important for both practical and public policy purposes, as well as for future research. Given the research technique employed and the extensive database, this is the first study, as far as can be observed, to carry out such mapping. The study also offers practical insights for managers and policymakers, highlighting the need for differentiated regional strategies that take into account local specificities to promote the inclusion and competitiveness of family firms in Brazil and beyond.

The structure of the article is as follows. Section 2 derives hypotheses from a literature review and discourses linking family firms, gender diversity and geographic location. Section 3 explains the methods and models, section 4 presents the results, before section 5 concludes with a discussion, elaborating on theoretical, practical and policy implications and addressing the limitations of the investigation.

2 Literature review and hypotheses

2.1 Family firms in cultural and regional contexts

Family firms are prominent economic actors globally (Basco 2024), that represent an overwhelming majority (accounting for 85% of all companies) due to their extensive presence in most countries (Basco and Suwala 2021; Suwala et al. 2024). Despite their importance in the global economy and considerable focus within academic research, a universally accepted definition of "family firms" remains elusive (Daspit et al. 2021). This lack of consensus poses challenges for researchers, particularly when attempting comparative analyses and generalizations across studies (Diaz-Moriana et al. 2018). In this sense, the Atalanta algorithm (version V28b) (see section 3.2 for further explanation) provides an alternative measure for identifying family firms and offers advantages in capturing both publicly-traded and privately-held family-owned companies.

Whereas the various characteristics that highlight the internal heterogeneity of family firms, such as family ownership (Diaz-Moriana et al. 2018), the long-term perspective associated with the age of the company (Aiello et al. 2023), gender diversity, and other aspects related to the internal environment of these organizations are well explored (Banno et al. 2020), external environments or various contexts (social, institutional, cultural, regional) gained recently much more attention (e.g. Soleimanof et al. 2018, Selcuk and Suwala 2020, Basco et al. 2021, James et al. 2021). On of these discourses that has gained prominence in recent years and that reinforces aspects related to the heterogeneity of family firms is regional context. Basco and Suwala (2021) and Adjei et al. (2025) have outlined various types of regional contexts (spatial factors, spatial settings, spatial scales among many others) including impacts of the location on family firms (urban-rural, for instance) and how family firms affect locations or even allows them to influence the regional

context in which they operate (Basco 2015; Baù et al. 2019; Karlsson 2018; Albers and Suwala 2021, Amato et al. 2023a; Arteaga and Basco 2023). In particular, Karlsson (2018) observed that average growth varies between family and non-family businesses when analyzing the metropolitan, urban, and rural contexts. Still focusing on the growth literature, but now from a perspective that also explores the concept of embeddedness, Baù et al. (2019) found that family businesses perceive a greater effect of embeddedness on their growth line, and this is even more pronounced for companies located in rural areas. Skaf et al. (2024) went even a step further and combined regional and cultural contexts, also the purpose of our study, by exploring gender diversity and female empowerment in the performance of family businesses in different regions of Lebanon, and among the results, they found that family businesses located in rural regions have better results, which they attribute to greater openness to a gender diversity strategy. In sum, this literature not only presents cultural and regional contexts as a source of heterogeneity of family firms, but also trying to combine these internal and external contexts.

2.2 Brazilian regions

Rural and urban regions have differences related to factors such as financial resources, size and scale constraints, competition, human capital, as well as the cultural characteristics and contextual diversities in which businesses are embedded (Brewton et al. 2010). The Brazilian context, for instance, has great diversity in terms of climatic conditions, vegetation, ethnicity, languages spoken, food, music, social rituals, and economic development (Hofstede et al. 2010), where the specificities of family businesses operating in urban and rural areas can be strongly influenced by these factors. In addition, much of Brazilian culture is the result of the integration and absorption of different civilizations (Hofstede et al. 2010). In the same vein, the most striking characteristics of Brazilian culture are the high distance from power—where hierarchical structures are accepted and power inequalities are often seen as normal and unchallenged—a short-term orientation and a strong aversion to uncertainty (Chu and Wood 2008).

The cultural landscape of Brazil was profoundly shaped by the arrival of enslaved Africans, who contributed to various traditions, including musical, religious, and culinary practices, followed by another wave of cultural influence from European and Asian immigrants—such as Germans, Italians, Spaniards, Japanese, Lebanese, and Syrians (Hofstede et al. 2010). This multicultural heterogeneity played a crucial role in transforming Brazil's economic and cultural identity, establishing it as a country known for embracing diversity, which can be seen in the country's overall culture as well as in its regional variations (Hofstede et al. 2010).

Brazil is a federation of 26 states and the Federal District, where the capital, Brasília, is located. According to the latest IBGE census (2022), the country has a population of over 203 million inhabitants. The country is divided into five administrative regions: Central-West, North, Northeast, South, and Southeast, each with its own unique geographical and cultural characteristics. This regional division facilitates the management of Brazil's diverse economy, social programs, and in-

frastructure development, and reflects the country's vast size and varied landscape. These regions are more clearly illustrated in Fig. 1.

Brazil's five administrative regions exhibit significant cultural, economic, and demographic diversity. The Central-West features vast plains, including the Pantanal wetland and the Cerrado savannah, and houses Brasília, the national capital. According to Hofstede et al. (2010, p. 348) a "borderline region of settlers, is less formal". The North, Brazil's largest but least populated region, retains strong indigenous influences (Hofstede et al. 2010) and an agrarian cultural orientation due to its geographical isolation and developmental disparities relative to the Southeast, the country's most industrialized area (Caldas 2006). The Northeast boasts a rich cultural heritage, with a large Afro-Brazilian population (Hofstede et al. 2010). It is one of the most populous regions in Brazil and has a diverse cultural identity. According to Hofstede et al. (2010) this region is less hierarchical, more formal, and more caring as compared to the others. Additionally, the 'masculinized' aspect of Northeastern society is the result of a past of social conflicts, isolation, and overcoming the difficulties imposed by nature in the Northeastern hinterland (Mello 2023). As in the case of the North region, the Northeast presents cultural traits more associated with the traditional values inherited from the colonial period and from political oligarchies (Caldas 2006). In contrast, the South, influenced by European culture, which values work, stability, and long-term orientation (Lenartowicz et al. 2003) is highlighted by Hofstede et al. (2010, p. 347) as "more hierarchical, less formal, more individualist, and more masculine (achievement-oriented)" region. Finally, the Southeast stands as Brazil's most populous and economically advanced region, hosting major cities like São Paulo and Rio de Janeiro, which act as financial and cultural hubs driving national development. The cultural diversity of the Southeast is the result of a long history of immigration and industrial development (Caldas 2006), which is also addressed by Hofstede et al. (2010, p. 347) as "urban, industrial, densely populated, and ethnically mixed, is less masculine and also shorter term-oriented" region. Additionally, it is important to highlight that, beyond the regional divisions, each Brazilian state is further segmented into capital and rural areas (IBGE 2022, 2023), adding another layer of complexity when analyzing industrialization, economic development, and cultural aspects within the Brazilian context. For instance, cities such as Brasília, São Paulo, and Rio de Janeiro, along with other state capitals, benefit from federal institutions and universities, enhancing public services and infrastructure (Turner and Turner 2009). Table 1 offers some regionally segmented descriptives with regard to demographic, macroeconomic, and labor market indicators in Brazil, providing insights about population densities, GDP per capita, and workforce distribution across these regions amongst others.

In summary, Table 1 shows that the Southeast is the most economically developed and densely populated region, with the largest concentration of companies and employees. In contrast, the North and Northeast are the most economically disadvantaged regions, with lower population densities and wages. These regional differences provide crucial context for the urbanization and labor market variations that are fundamental to understanding the distribution and impact of family firms across Brazil.

Table 1 General information about Brazil

Description	Total	Central-West	North	Northeast	South	Southeast
Population density—total	23.86	10.14	4.51	35.21	51.91	91.76
Population density—urban	475.37	307.07	76.60	2667.66	2270.09	6444.97
Population density—rural	18.61	6.61	3.17	27.96	45.72	70.04
Average GDP per capita—total	42,557.62	61,414.63	28,482.31	21,202.27	52,171.94	49,516.96
Average GDP per capita—urban	45,015.11	54,208.19	31,330.25	27,783.39	50,052.46	61,701.27
Number of companies	9,431,239	797,921	430,723	1,457,933	1,878,007	4,866,655
Average monthly salary (R$)	3542.19	4555.72	3188.76	2739.51	3307.36	3756.86
Number of salaried employees	50,223,399	4,548,999	2,766,868	8,883,326	8,622,255	25,401,951
Ratio of female employees	45.3	43.8	45.8	45.1	46.6	45.1

N number of observations, *population density* inhabitants/km2, *GDP* gross domestic product, *R$* Brazilian currency

Source: 2022 IBGE census, except for the GDP per capita, which refers to 2021 (IBGE 2023, 2024).

2.3 Family firms, spatial gender distribution and urbanization processes in Brazil

In Brazil, an emerging country according to IBGE's data 90% of companies established in Brazil are family-owned, accounting for more than half of the GDP and employing 75% of the Brazilian workforce. Recently, a survey of 279 privately-held Brazilian companies revealed that most family companies are still run by the first and/or second generations, indicating that these businesses face a greater risk of discontinuity as they move into the third and fourth generations (IBGC 2019), that is, as they advance in age. The historical, political, and social aspects associated with the Brazilian urbanization process, which started more intensively between the 1960s and 1970s, driven by the industrialization process, have been a dominant force in reshaping the country (Montgomery 2024). This period saw a massive migration of men from rural areas to urban centers, driven by opportunities in construction, manufacturing, and services, while at the same time the modernization in agriculture reduced the demands of labor in rural regions, further incentivizing male migration to cities in search of better living conditions and economic prospects. As a result, these trends have profoundly altered rural and urban landscapes, particularly affecting family businesses operating in these regions. Another interesting phenomenon observed in Brazil's recent history relates to migration between Brazilian regions. For example, the migration from the Northeast to the Southeast region of the country has gained prominence and is the focus of numerous discussions (Pereira and Lourenço 2021).

An interesting point related to migration between regions, highlighted by Pereira and Lourenço (2021), is that this phenomenon, motivated by economic aspects, also has an impact on the discussion of gender. In other words, while historically the Northeastern man migrated to another region in search of better living conditions for his family, the Northeastern woman, who remained in her native place, assumed the role of providing for and managing the home, and often this also implies supporting the family itself, instigating, for example, the need for an entrepreneurial profile (Pereira and Lourenço 2021). These aspects only reinforce the complexities and richness of the Brazilian context for discussing how elements related to the regional environment can affect family businesses, thus shaping configurations and behaviors.

Therefore, in addition to the challenge of sustaining business continuity and recognizing that family businesses are one of the main economic actors, regardless of whether they are in developed or developing countries (Basco 2018; Pieper et al. 2021), the importance of understanding the factors associated with longevity is highlighted, such as gender diversity and recognizing how regional aspects can affect family businesses.

It is interesting to observe that as these firms transition across generations, the role of women in leadership positions has received increasing attention (Samara and Lapeira 2023). According to Ahrens et al. (2024b), who developed a study to see gender diversity within different countries over the world, Austria leads the world in the percentage of women in leadership roles across both family and non-family businesses (44.1%), while Brazil ranks fifth with 42.8% female representation in leadership positions. The significant representation of women in high-level positions

in Brazil can be attributed to the above mentioned cultural and regional factors that reflect a constantly evolving context.

2.4 Hypotheses development

The regional context can be approached by various measures and proxies (Basco and Suwala 2020), such as the geographical distance/proximity, the distribution of factors or proxies of the economic environment, whereby some locations are characterized by an abundance of important factors for business growth, such as labor, capital, and financial resources while others are not (Backman and Palmberg 2015). Although many studies on the regional context have focused on environmental conditions and local attributes (exogenous factors) (e.g. Amato et al. 2020, 2023a), the characteristics of businesses (endogenous factors) are also important, as they play a crucial role in economic growth (Aiello et al. 2015; Basco 2015, 2024). Among the types of businesses present in the Brazilian regions, family firms have shown significant representation, both in the number of organizations and in the GDP (Ferreira and Ferreira 2017; Balán et al. 2022).

Therefore, given the positive impact that family businesses can have on regional development, it is important to consider both exogenous factors—geographic location—and endogenous factors—gender diversity—that may be associated with the regional and cultural contexts of these organizations (Basco 2015; Baù et al. 2021; Bird and Wennberg 2014, Skaf et al. 2024). In the next section, the exogenous aspects investigated in this research will be discussed.

2.4.1 Exogenous factors influencing the location of family firms

The central focus of previous studies on the regional context is the examination of exogenous and endogenous factors that permeate particular spaces or territory (Basco 2015; Basco and Suwala 2021). Exogenous factors are generally linked to geographical aspects, as regions are diverse and complex, with an uneven distribution of economic activity and development within a country (Basco 2015; Baù et al. 2019; Basco et al. 2021; Amato and Patuelli 2023). For instance, in large and diverse countries such as Brazil, these variations can be analyzed in terms of urban and rural classifications, leading to significant disparities in resource availability, market size, and social infrastructure (Hofstede et al. 2010; Aiello et al. 2015).

Such geographic diversity directly influences productivity and competitiveness, since firms in urban areas often benefit from access to shared resources, robust infrastructure, and larger markets (Bird and Wennberg 2014, Amato et al. 2023a). Furthermore, as Basco (2024) highlights, family businesses have a distinctive ability to perceive and assess opportunities and risks compared to their non-family counterparts. This advantage allows them to leverage local and regional externalities more effectively, leading to better rent appropriation and a stronger alignment with local contexts (Amato et al. 2023b).

The literature emphasizes that urban and rural areas differ based on factors such as size, population density, and economic activity. Karlsson (2018) and Sieger et al. (2023) noted that rural areas generally have lower population and business densities,

which often leads to limited access to resources and fewer economic opportunities. Conversely, Goschin et al. (2020) and Basco et al. (2021) describe urban areas as having higher density and a greater concentration of resources, which supports more diverse economic activities and provides businesses with broader opportunities for growth.

In this sense, we agree with the arguments of Hoogstra and van Dijk (2004) that resources tend to be unevenly distributed across space. For instance, Backman and Palmberg (2015) emphasizes that rural regions often face a shortage of essential resources, such as qualified labor and financial capital, or at least have a less diverse availability of these factors of production compared to urban areas, which tend to be larger, more densely populated, and provide more favorable conditions. For this reason, the present study, like other studies in the same field, follows an urban-rural classification based on access to resources (see Karlsson 2018).

Historically, businesses have concentrated in urban centers, particularly capital cities, due to the abundance of resources, larger markets, and greater business opportunities (Goschin et al. 2020; Sieger et al. 2023). These areas often serve as cultural and social hubs, which can enhance a business's reputation and visibility (Amato et al. 2023b). These urban centers often serve as focal points for cultural consumption and social interaction, enhancing the visibility and reputation of the businesses operating within them (Goschin et al. 2020).

It is interesting to note that at the same time that previous literature shows that the majority of the population is predominantly concentrated in urban areas, it is emphasized that family businesses play a crucial role in the rural economy, primarily due to their historical, social, and cultural connections (Bird and Wennberg 2014; Backman and Palmberg 2015; Sieger et al. 2023). These connections provide family businesses with a significant competitive advantage in rural areas, allowing them to create, develop, and allocate tangible and intangible resources more effectively (Backman and Palmberg 2015). Thus, when successful, family firms can contribute significantly to both the development of the local economy and the cultural cohesion of the area (Bosworth 2012; Bird and Wennberg 2014; Nulleshi and Kalonaityte 2022).

However, family firms in Brazil have followed a unique path. Brazil experienced rapid urbanization, particularly in the 20th century, which led to a sharper divide between urban and rural areas (Caldas 2006; Hofstede et al. 2010). While capital cities emerged as hubs of economic growth and infrastructure, attracting family businesses seeking access to larger consumer markets and essential resources (Chu and Wood 2008; Sieger et al. 2023), smaller cities and rural areas (classified as rural in Brazil by the IBGE) still play a pivotal role. Many family firms remain deeply rooted in these regions, contributing to the local economy through traditional industries such as agriculture and small-scale manufacturing (Bosworth 2012; Bird and Wennberg 2014; Backman and Palmberg 2015; Amato and Patuelli 2023; Sieger et al. 2023).

The rural exodus is a reality in most countries of the world (Baudin and Stelter 2022). This is also the case in Brazil, which is reflected, for example, in the high demographic density of the state capitals in each region (see Table 1). In this sense, considering the number of family businesses operating in rural regions according to

Table 1, it is interesting to observe the representativeness of this type of business for local development, specifically in the generation and distribution of income. Thus, it is empirically confirmed that family businesses play an important role in the local economy, particularly in rural areas (e.g. Westhead and Cowling 1998). Given the above, it is expected that family firms will be more prevalent in rural areas compared to urban areas, as suggested in H1.

H1 Firms located in rural areas have a higher probability of being family firms.

2.4.2 Endogenous factors in family firms

The literature highlights the pivotal role of family businesses and family entrepreneurship in supporting the economy by creating jobs, contributing to GDP, and improving societal living standards (Félix and David 2019). While exogenous factors such as the regional context play a role, endogenous factors such as gender diversity are also crucial in determining organizational outcomes across different regions of Brazil. In recent years, the relationship between gender diversity and family business performance has become an increasingly important area of research, but despite progress, full gender equality in both society and organizations remains a work in progress (Rodríguez-Ariza et al. 2017; Welsh et al. 2018).

Gender diversity is particularly important in family businesses, as these firms often have a higher representation of women in leadership roles compared to their non-family counterparts (Ernst and Young 2015). This representation is facilitated by the generally supportive environment of family firms, which can encourage female family members to assume leadership roles and, in turn, offer them unique opportunities for advancement (Campopiano et al. 2019). However, studies on gender diversity within family firms, especially in Brazil, remain relatively scarce, with limited empirical evidence (Maseda et al. 2022; Rachmawati et al. 2022).

The impact of female leadership on organizational performance, particularly in family firms, is complex and controversial. While some studies suggest mixed outcomes for gender-diverse boards, others find positive links between women in leadership and company performance, highlighting their role in mitigating opportunistic behavior (García-Meca and Santana-Martín 2022) and strengthening entrepreneurial orientation within family firms (Rachmawati et al. 2022; Skaf et al. 2024). As more women lead organizations, this visibility institutionalizes gender diversity, reduces gender barriers, and normalizes female entrepreneurship within society.

Studies indicate that organizations with greater representation of women in leadership roles cultivate humane, equitable, and performance-oriented cultures (Bajdo and Dickson 2001). In recent years, research has also recognized women's strengths in global leadership skills, including their propensity for diversity, empathy, and intercultural diplomacy, which are essential for building successful entrepreneurial teams and sustaining businesses (Vecchio 2002; Javidan et al. 2016; Adapa and Sheridan 2019). Increasing women's representation in leadership positions is crucial for achieving gender equality, as outlined in the Sustainable Development Goals (SDGs). Women leaders prioritize inclusivity and social protection, contributing to

higher environmental, social, and governance (ESG) standards and inclusive economic growth (Salazar and Moline 2023).

The study by Maseda et al. (2022) that attempts to review the literature on women's involvement in family businesses, not only highlights the significant increase in both the quantity and diversity of topics related to this subject but also underscores the growing interest in the field. This emphasizes the importance of recognizing the role and implications of women's participation in this business model and what it means for society at large. As further highlighted by the Small Business Survey (BEIS 2018) in the UK for example, the proportion of women's participation in family businesses tends to be higher (22.6) than in non-family businesses (14.4%). As more family businesses integrate these gender-diverse leadership skills, they not only achieve greater resilience, but also strengthen their organizational cultures and position themselves to thrive in increasingly diverse and interconnected markets. Therefore, analyzing whether this trend also holds true in the Brazilian context is crucial, as it provides a comparative perspective with previous studies while advancing knowledge by offering evidence from an emerging country with a specific socio-economic and cultural profile. Based on the above discussion, the following hypothesis is proposed:

H2   There is a positive relationship between gender diversity and family businesses.

National and regional specificities play a crucial role in determining how companies in emerging economies respond to competitive pressures. As Hatum (2006) argues, while these specificities are increasingly acknowledged, organizational studies often fail to consider the importance of national, regional and local differences as key elements shaping companies' actions. It is essential to recognize that the structure and functioning of companies and markets are not uniform across countries. These differences are largely influenced by the dominant social institutions within each country, such as the state and the financial system.

Motta and Gomes (2022) applied Hofstede's model of national culture to explore cultural differences across Brazil's five regions. Their study revealed significant variations in these cultural dimensions within the country. For instance, the Indulgence dimension was found to be prominent across all regions, with the highest levels in the North. The Individualism dimension was more pronounced in the South and Southeast, suggesting a more individualistic culture in these areas. In contrast, the North and Northeast had higher levels of Power Distance, indicating a greater acceptance of hierarchical structures. In addition, Uncertainty Avoidance was strongest in the Central-West, while Long-Term Orientation was most evident in the South (Motta and Gomes 2022).

These regional cultural differences are particularly relevant when analyzing the dynamics of family businesses. Parada et al. (2016) acknowledge both the importance of understanding the characteristics and behaviour of family firms and the role of women therein from a context-specific Latin America perspective. Additionally, recent studies have highlighted that the influence of women in leadership positions in family firms can be complex and context dependent. Research indicates that regional and cultural differences significantly influence business practices, including

gender diversity (Ricotta and Basco 2021; Maseda et al. 2022; Samara and Lapeira 2023; Basco 2024; Skaf et al. 2024).

In family businesses, local traditions and cultural norms can have a significant impact on the inclusion of women in leadership roles (Hofstede 2003; Welsh et al. 2018). As Fèlix and David (2019) point out, the impact of women in leadership on firm performance is not uniform, but rather contingent upon a range of factors, such as the firm's size, age, and regional characteristics. For example, in regions where patriarchal values dominate, there may be less acceptance of women in leadership roles, leading to fewer opportunities for female leaders to positively influence organizational outcomes. For example, Adapa and Sheridan (2019) elaborate on the downsides of women's careers in Malaysian SME accounting firms. They reveal within a qualitative study the multiple oppressions women face in their daily working routines due to gendered work practices, competitive pressures, stereotypical beliefs, ethnic influences, and family business dynamics within this specific cultural context. Similarly, the study by Pirakatheeswari (2015) highlights the barriers women face in developing entrepreneurial initiatives, given that India is traditionally a male-dominated society.

In this sense, Rachmawati et al. (2022) and Samara and Lapeira (2023) highlight that gender diversity varies considerably across regions and cultures, which is particularly relevant in regions with strong traditional values that might limit female representation in leadership positions. In Brazil, this issue may be even more pronounced given the country's high levels of masculinity, as identified by Hofstede's cultural dimensions theory (Hofstede 2001; 2003; Hofstede et al. 2010). The deep-rooted traditional gender roles that exist in certain regions of Brazil may lead to lower levels of gender diversity in family businesses, particularly in leadership positions.

Recent research by Skaf et al. (2024) supports this view, concluding that the location of a family firm can moderate the relationship between gender diversity and firm performance, as well as reflecting the cultural aspects of each region through its management structure (gender diversity in the TMT). This finding underscores the importance of considering the regional context when analyzing the interplay between gender diversity and family business dynamics. Thus, the present study aims to analyze whether Brazil, due to its continental dimensions and cultural, economic, and social diversity, exhibits different behaviors regarding gender diversity in family businesses across its various regions. Based on the above discussion, the following hypothesis is proposed:

H3 There are significant differences among Brazilian regions in the relationship between gender diversity and family businesses.

3 Data and empirical strategy

3.1 Data

The data collection considers all Brazilian firms in Moody's Orbis Generics database, using cross-sectional data for 2020. Orbis is a valuable resource for financial analysis of private companies, covering approximately 180 million entities, including individuals, banks and insurance companies worldwide. The database provides a comprehensive range of information for each company, including i. financial information in historical series up to 10 years; ii. information on groups and relationships between companies (shareholding and shareholdings up to the tenth level); iii. historical shareholder data; iv. complete company details (name, address, telephone number, e-mail, description of the business, year of incorporation, number of employees); v. information on company ownership (position currently held, positions held in the past, relationship analysis up to the third level). In order to have a comprehensive understanding of the industrial sectors of Brazilian firms, all United States Standard Industrial Classification (US SIC) codes are included; moreover, only organizations with 12 months of accounting data are included to avoid seasonality effects. In addition, TMT data are included to highlight the main features of the firms' boards, especially in terms of gender diversity. The result is an initial sample of 2,810,081 active Brazilian firms, for which we apply the Atalanta algorithm in version 28b (Ahrens et al. 2024a) to detect family firms.

3.2 Variables

This section presents the different variables used in the models to test the hypotheses. Table 2 provides an overview of the variables used in each model.

Family firm Family firms are identified using Ahrens et al. (2024a) algorithm Atalanta in version 28b, whose data source is Orbis. The classification distinguishes between (1) family and (0) non-family firms based on specific criteria. These criteria include ownership thresholds—where ownership is held by individuals or other family firms associated with the focal firm—as well as ownership-management thresholds, such as 50% ownership by family members or 25% ownership plus management involvement, linguistic comparisons based on management, ownership, and firm names; it also includes legal form information, sector information (e.g., government authorities are not family firms by default) and a database of manually researched and validated family firms.

Since Atalanta relies on this information, this identification is suitable for larger firms that are legally required to disclose it (Ahrens et al. 2024a). Specifically, larger firms fulfill two of the following three criteria: (1) total assets greater than € 12 million, (2) sales revenue greater than € 6 million, (3) annual average of 50 employees.

In particular, the algorithm also checks these criteria worldwide and across complex company holding structures (taking into account complex layers of ownership, etc., as the family may indirectly exert influence over the firm). The application

Table 2 Variable Definitions

Variable name	Type of var.	Description of the variable	Data source
Family firm	Dependent var.	Binary variable, scoring 1 for family firms and 0 for non-family firms	ORBIS
Rural	Independent var.	Binary variable rural, scoring 1 for rural area and 0 for the urban area	Brazilian National Postal Service (Correios)
Industry	Control	Categorial variable indicating the type of industry in which the firm operates	ORBIS
Population density	Control	Numeric variable obtained from the ratio between the population and the square area of each region	2022 IBGE census
Region	Control	Categorical variable indicating which region the firm is situated in	ORBIS
Firm age	Control	Numeric variable obtained by the temporal difference between 2024 and the firm's date of birth	ORBIS
TMT female ratio	Dependent var.	Numeric variable calculated by the mean of gender composition within the board, where female is 1 (TMT female ratio)	ORBIS
Family firm X Region	Independent var.	Numeric variable calculated by interaction of family firm variable and region variable	ORBIS

Source: Authors' own elaboration.

of this version of the algorithm finally determined that out of the above 2,810,081 Brazilian firms, 1,645,618 are family firms. Using the binary outcome of the above algorithm, the binary variable *family firm* is measured. This variable is used as the dependent variable in H1 and as the independent variable in H2.

Regional variables   The geographical locations of Brazilian firms are collected using the postal code retrieved from the ORBIS data, categorized according to the IBGE database. Specifically, we identify five Brazilian regions: Central-West, North, Northeast, Southeast, and South, all characterized by both urban and rural areas (Baù et al. 2019; Phillipson et al. 2019). While the categorical variable *region* is used as a control variable, we take the binary variable *rural*, where 1 is rural area and 0 is urban area, as an independent variable for H1 and as a control variable for H2 and H3. In particular, considering the Brazilian data and historical aspects, we define urban areas as the capitals of each Brazilian state, due to their concentration of resources and infrastructure, while rural areas include the remaining cities and the countryside, which tend to have lower resource availability and smaller business ecosystems (IBGE 2023).

The classification of areas as rural or urban follows the organization of postal codes (CEP) established by the Brazilian National Postal Service (Correios). According to this classification, postal codes are categorized into "Capital" (referring to major urban centers) and "Interior," which includes rural and small municipalities. This distinction allows for a more precise mapping of firm locations based on their postal code, which facilitates the differentiation between urban and rural environments in the article analysis.

Firm information   Top Management Team (TMT) data from Moody's Orbis are considered to understand the relationship between being a family firm and board gender diversity. The TMT consists of individuals who serve on the executive board or hold the rank of at least chief officer, following the operationalization from previous literature (e.g., Michel & Hambrick 1992; Belderbos et al. 2022). Gender diversity is calculated as the ratio of females to the total number of TMT members, where the more women there are in the TMT, the closer it is to 1 (*TMT female ratio*). This variable is used as the dependent variable for hypotheses H2 and H3. In addition, the Standard Industry Code at the 3-digit level is added to control for industry-specific differences across samples (Riefolo et al. 2025). We also control for firm age (Riefolo et al. 2025). Firm size was initially considered in the model but was excluded due to convergence issues in the logit estimation, given the high collinearity with firm age and industry. To ensure robust estimation, the model specification was adjusted to exclude firm size while retaining theoretically relevant predictors.

3.3 Empirical strategy

For the purposes of the analysis, we rely on cross-sectional analyses performed in 2020, as audited balance sheet information is not (yet) fully available.

Main analysis To assess the hypothesized relationships, the logit model is selected to address the binary nature of the dependent variable of H1 (rural) and the proportional quality of the dependent variable of H2 and H3 (TMT female ratio). Compared to other models that allow the assessment of the relationships with dependent variables with a binary or ratio nature, the logit model allows non-linear relationships between the predictors and outcomes, making it a better option than the linear probability model, and provides odd ratios from the coefficients, providing easily interpretable information about the relationship between the dependent and independent variables compared to models such as the probit model. The model aims to fit the following equation:

$$\log(\frac{P\,(Y=1)}{1-P\,(Y=1)}) = \beta_0 + \beta_n * indvar + \gamma * controls + \epsilon \tag{1}$$

where $P\,(Y=1)$ represents the possibility of Y being 1, *indvar* denotes the key independent variable(s) of interest, *controls* includes a vector of control variables that account for other factors that might influence the dependent variable, β_0 is the intercept, β_n is the coefficient representing the effect of the independent variable(s) on the log odds of Y, and ϵ is the error term. To address potential heteroskedasticity—where the variance of the error term might differ across observations—we estimate the model using robust standard errors, which adjusts the standard errors to be consistent even when the assumption of homoskedasticity is violated. This ensures that the inference drawn from the estimated coefficients (i.e., significance tests and confidence intervals) is valid even in the presence of heteroskedasticity.

Robustness check We use the propensity score matching method in line with Leuven and Sianesi (2018) to perform nearest neighbor matching, where propensity scores are estimated using a logistic regression model (logit). This allows us to capture the causal relationship between the variables and address potential selection bias between groups. Specifically, each observation in the treated group (rural or family firms) is matched 1:1 with its nearest neighbor in the control group (urban or non-family firms) based on the propensity score. This propensity score is calculated using a logit regression that predicts the likelihood of being in the treated group (rural or family firms), conditional on the control variables included in the model. By the matching propensity scores, we ensure that the treatment and control groups are comparable with respect to the observed covariates. This allows us to estimate the average treatment effect on the treated (ATT) by comparing the outcome between matched pairs from the treated and control groups.

To more rigorously match the observations, we add firm size, as measured by the number of employees (Zona et al. 2019), and firm age. Moreover, to assess whether the relationship still holds with an alternative definition of industry classification, we use NACE (European Classification of Economic Activities) Rev. 2, which provides a statistical framework for classifying industries comparable to the Standard Industry Code used in the main analysis.

While the number of observations drops significantly as a result of the matching process—due to the exclusion of unmatched observations and fewer observations

due to the added controls—this approach enhances the rigor of our results. The reduction in sample size is a trade-off for improved balance between the treatment and control groups, thereby increasing the robustness of our findings relative to the results from the initial regression analysis.

4 Results

Table 3 contains descriptive statistics with information on the variables presented in total, between family and non-family firms, and between rural and urban firms. The variables include the number of observations and measures such as mean, standard deviation, minimum and maximum. Table 4 presents the descriptive statistics of the five regions of Brazil. Table 5 shows the correlation between the variables used in the analyses. VIF (Variance inflation factor) check of the models conclude that the model does not suffer from multicollinearity.

It is observed that 59% of the companies in the study sample are composed of family firms, and the regions of Brazil that had the highest average of family firms were the Central-West and the Southeast, with 60% for each. It is also verified that 49% of the companies are located in rural areas, and the Northeast region had the highest average in terms of companies located in rural areas (54%).

Regarding gender diversity, 44% of the total observations show the presence of gender diversity in top management. Considering only family firms, this percentage increases to 46%, while in non-family firms this percentage is only 24%. It is observed that the five regions of Brazil present a close average among them, with the Southeast presenting the highest percentage (45%).

From Table 6, we can see that the capitals of the Brazilian states concentrate 796,324 family firms, accounting for 50.15% of the family firms in the sample. Now analyzing this distribution across the Brazilian regions, it is noticeable that, with the exception of the Southeast region, in all others there is a prevalence of family firms concentrated in rural areas, that is, firms headquartered in rural zones or small towns, in other words, outside the capitals. Analyzing the percentages of the presence of family firms between rural and urban areas, it can be seen that this type of firm reaches the highest proportion in rural areas in all five Brazilian regions. This reinforces the representativeness of family firms, especially in rural areas. Specifically, when considering the ratio between urban and rural family firms, it is noted that the Central-West, North and South regions follow a trend of greater presence of family firms in rural areas and have lower population densities compared to the Northeast and Southeast.

The Northeast stands out for its high demographic density, but it also shows a higher concentration of family firms in rural areas (highest index of 0.85). The Southeast region, however, is the only one in the country to show more family firms in urban areas (capitals) compared to other regions, thus increasing the country's overall average due to its representativeness. Thus, the results suggest in line with H1 that despite the difference in population density, family firms are significantly more populated in rural areas compared to urban areas.

Table 3 Descriptive statistics

Variables	Total					Family firms					Non-family firms					Rural (non-capital firms)					Urban (capital firms)				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
1 Family firm	2810,081	0.59	0.49	0.00	1.00	1,645,618	1.00	0.00	1.00	1.00	1,164,463	0.00	0.00	0.00	0.00	1,330,312	0.59	0.49	0.00	1.00	1,371,354	0.58	0.49	0.00	1.00
2 Rural	2,701,666	0.49	0.50	0.00	1.00	1,587,571	0.50	0.50	0.00	1.00	1,114,095	0.48	0.50	0.00	1.00	1,330,312	1.00	0.00	1.00	1.00	1,371,354	0.00	0.00	0.00	0.00
3 TMT female ratio	1,178,781	0.44	0.49	0.00	1.00	1,090,609	0.46	0.50	0.00	1.00	88,172	0.24	0.38	0.00	1.00	565,984	0.44	0.49	0.00	1.00	575,021	0.44	0.49	0.00	1.00
4 Firm age	2,805,741	6.50	10.72	0.00	129.00	1,644,557	6.50	3.56	0.00	129.00	1,161,184	15.00	11.68	0.00	105.00	1,330,115	6.33	10.60	0.00	129.00	1,371,132	6.63	10.83	0.00	121.00

N number of observations, *SD* standard deviation, *Min* minimum, *Max* maximum, *TMT* top management team

Source: Authors' own elaboration.

Table 4 Descriptive statistics by regions of Brazil

Variables	Central-West					North					Northeast					South					Southeast				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
1 Family firm	237,196	0.60	0.49	0.00	1.00	101,709	0.57	0.50	0.00	1.00	415,966	0.55	0.50	0.00	1.00	505,056	0.58	0.49	0.00	1.00	1,441,739	0.60	0.49	0.00	1.00
2 Rural	237,196	0.53	0.50	0.00	1.00	101,709	0.50	0.50	0.00	1.00	415,966	0.54	0.50	0.00	1.00	505,056	0.50	0.50	0.00	1.00	1,441,739	0.47	0.50	0.00	1.00
3 TMT female ratio	97,489	0.43	0.49	0.00	1.00	36,730	0.41	0.49	0.00	1.00	160,698	0.42	0.49	0.00	1.00	204,662	0.43	0.49	0.00	1.00	641,426	0.45	0.49	0.00	1.00
4 Firm age	237,158	6.12	10.27	0.00	71.00	101,708	6.46	10.33	0.00	58.00	415,951	6.98	10.98	0.00	98.00	505,008	7.02	11.31	0.00	95.00	1,441,422	6.21	10.51	0.00	129.00

N number of observations, *SD* standard deviation, *Min* minimum, *Max* maximum, *TMT* top management team

Source: Authors' own elaboration.

Table 5 Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Rural	1.000								
(2) Family firm	0.014***	1.000							
	(0.000)	–							
(3) TMT gender ratio	0.001	0.118***	1.000						
	(0.585)	(0.000)	–						
(4) Central-West region	0.025***	0.009***	–0.005***	1.000					
	(0.000)	(0.000)	(0.000)	–					
(5) North region	0.003***	–0.008***	–0.013***	–0.061***	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	–				
(6) Northeast region	0.040***	–0.029***	–0.018***	–0.132***	–0.084***	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	–			
(7) South region	0.007***	–0.008***	–0.007***	–0.149***	–0.095***	–0.205***	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	–		
(8) Southeast region	–0.050***	0.025***	0.025***	–0.332***	–0.212***	–0.456***	–0.513***	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	–	
(9) Firm age	–0.014***	–0.667***	–0.114***	–0.011***	0.000	0.020***	0.024***	–0.027***	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.451)	(0.000)	(0.000)	(0.000)	–

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6 Urban-rural comparison between family firm ratio and population density

Description	Total N	%	Central-West N	%	North N	%	Northeast N	%	South N	%	Southeast N	%
Companies	2,701,666	100	237,196	8.8	101,709	3.8	415,966	15.4	505,056	18.7	1,441,739	53.4
Family firm—urban	796,324	–	66,514	60.0	27,929	55.0	105,852	55.3	145,341	57.6	450,688	58.9
Family firm—rural	791,247	–	76,316	60.4	29,820	58.5	124,462	55.4	147,258	58.3	413,391	61.1
Family firm ratio	–	58.8	–	60.2	–	56.8	–	55.4	–	57.9	–	59.9
Urban/Rural												
Family firm	1.01		0.87		0.94		0.85		0.99		1.09	
Population density	25.54		46.46		24.16		95.41		49.65		92.02	

Source: Authors' own elaboration

The results of the regressions are reported in Table 7. It is worth noting that the three regressions in Table 7 control for region, using the Central-West region as the reference region. Thus, the coefficients of the other regions (North, Northeast, Southeast, South) indicate the difference in impact in relation to the Central-West region.

H1 asserts that rural areas have a significant concentration of family firms despite the difference in population density. Regression 1 attempts to answer this question by showing the logit regression between the probability of being a family firm and the rural area location. The results of regression 1 in Table 7 show a significantly positive

Table 7 Regression results controlling for region

Variables	(1)	(2)	(3)
	Family firm	TMT female ratio	TMT female ratio
Rural	**0.211441***	0.004860	–0.010216
	(0.000)	(0.255)	(0.528)
Region = North	–	–0.169229***	0.054359
		(0.000)	(0.292)
Region = Northeast		–0.113142***	0.097977***
		(0.000)	(0.005)
Region = South		0.072140***	–0.012962
		(0.000)	(0.702)
Region = Southeast		0.082911***	0.101274***
		(0.000)	(0.001)
Firm age		–0.003318***	–0.002972***
		(0.000)	(0.000)
Family firm		**0.182644***	0.216264***
		(0.000)	(0.000)
Family firm X rural		–	0.016277
			(0.332)
Family firm X North			–0.242240***
			(0.000)
Family firm X Northeast			–0.229106***
			(0.000)
Family firm X South			0.092691***
			(0.008)
Family firm X Southeast			–0.020238
			(0.516)
Constant		–1.477692	–1.590085
		(0.169)	(0.145)
Observations	2,692,651	1,140,627	1,140,627
R-squared	0.2640	0.1748	0.1749
Population density control	*Yes*	*No*	*No*
Industry control effect	*Yes*	*Yes*	*Yes*

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Authors' own elaboration

relationship between being in a rural area and being a family firm when controlling for population density ($\beta = 0.211441$, p-value < 0.001), suggesting support for H1.

H2 proposes a positive and significant relationship between gender diversity and being a family business. Consistent with H2, the results of regression 2 in Table 7 indicate a positive and significant relationship between gender diversity and family firms ($\beta = 0.182644$, p-value < 0.001). Similarly, the results of regression 3 in Table 7 also indicate a positive and significant relationship between gender diversity and family firms ($\beta = 0.216264$, p-value < 0.001). Based on these results presented, H2 cannot be rejected either.

According to H3, it is expected that there are significant differences among the regions of Brazil in the relationship between gender diversity and being a family business. The results of regression 3 in Table 7, controlling for region and controlling for family firms, show negative and significant interactions for the North ($\beta = -0.242240$, p-value < 0.001) and the Northeast ($\beta = -0.229106$, p-value < 0.001) and positive and significant interactions for the South ($\beta = 0.092691$, p-value < 0.01), but no significant result for the Southeast ($\beta = -0.020238$, p-value > 0.1), reflecting the cultural particularities of each locality.

The results of H3 indicate that gender diversity is significantly lower in the North region than in the Central-West. In the Northeast, gender diversity is also lower than in the Central-West, but the difference is slightly less pronounced compared to the North. Gender diversity in the South region is slightly greater than in the Central-West, indicating a positive effect. Similarly, gender diversity in the South is greater than in the Central-West. The Southeast region shows no significant difference from the Central-West region. Therefore, H3 cannot be rejected. In general, based on the evidence presented, none of the hypotheses of this study can be rejected.

Robustness check   Table 8 presents the results of the robustness check. The propensity score matching results support H2, indicating a stronger case for the hypothesized causal relationship. The significant difference between family and non-family firms (*difference* $= 0.282679$, $t = 1.89$) provides further support for this hypothesis.

In addition, the robustness of this finding was tested by incorporating region into the matching variables. After matching based on region, the results continue to show a significant difference between family and non-family firms (*difference* $= 0.261971$, $t = 2.07$), strengthening the model's support for the hypothesis. By incorporating region into the analysis, the model provides additional rigor and confidence in the findings. Moreover, by showing that the matching of regions increased the significance level of the model, the result also suggests that the region plays a role in the difference between family and non-family firms, thereby providing further support for H3.

5 Discussion and conclusion

The primary aim of this study was to explore the relationship between family businesses, geographic location, and gender diversity within Brazil. The findings revealed

Table 8 Propensity score matching results

Variables	(1)			(2)		
	Family firms	Non-family firms	Difference	Family firms	Non-Family firms	Difference
TMT gender ratio	0.472538	0.218786	0.253752***	0.472538	0.218786	0.253752***
	0.472538	0.189859	0.282679*	0.472538	0.210567	0.261971**
Regional match	No			Yes		
Firm-level covariates	Yes			Yes		
N	170,675			170,675		

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Authors' own elaboration

important insights into the location of family businesses, highlighting their presence in both rural and urban areas, and the gender diversity within these organizations.

Our results provide insights with regard to the spatial distribution of family businesses in Brazil, and with their presence distributed across both rural and urban areas. This distribution reflects different characteristics of the companies, which may be influenced by the regional context in which they operate. Interestingly, more than half of the (larger) family companies are still located in rural areas, which contrasts with the country's overall high urbanization rate (over 85%). This pattern can be explained by the fact that family businesses are more common in rural areas, where they tend to enjoy greater local competitive advantages, such as community ties and loyalty (Backman and Palmberg 2015). This evidence indicates that the proportionality observed regarding the presence of family businesses in the rural-urban context in Brazil aligns with findings from prior research. For instance, it highlights a higher concentration of these businesses in rural areas, consistent with Backman and Palmberg (2015), who reported 63%, and Skaf et al. (2024), who identified 56% of family businesses operating in rural regions.

This finding supports H1, which hypothesized that firms located in rural areas are more likely to be family businesses. Rural regions offer unique competitive advantages for family businesses, such as strong community ties, local loyalty, and greater access to traditional industries such as agriculture and small-scale manufacturing (Westhead and Cowling 1998; Bird and Wennberg 2014, Backman and Palmberg 2015). These insights challenge the common assumption that urbanization leads to the decline of family businesses in rural areas, emphasizing the importance of geographic location in shaping firm type, i.e., family status (Skaf et al. 2024).

The persistence of family businesses in Brazil's rural areas can be attributed to the unique social and economic dynamics of these regions. Despite Brazil's status as an emerging economy, the patterns of industrialization and urbanization underscore the continued prevalence of family businesses in rural areas, that is, in smaller cities, in regions outside the capitals. Their survival and success in these areas reflect their deep-rooted connections to the social and cultural fabric of the local community (Amato and Patuelli 2023; Amato et al. 2023b). Family firms in rural regions have greater access to localized resources and opportunities. In these areas, family businesses can leverage their social networks and cultural connections to achieve competitive advantages (Basco 2015; Basco and Suwala 2021).

This insight explains why family businesses are concentrated in rural areas, emphasizing the critical role of geography in shaping the structure and characteristics of these firms. Regional factors have a significant influence on their operations, particularly in areas with lower population density, reinforcing the importance of family businesses in driving both economic and social development in these communities (Basco 2015; Basco and Suwala 2021; Samara and Lapeira 2023).

Regarding gender diversity, the study found a positive and significant relationship between gender diversity and being a family business (H2). These findings align with Campopiano et al. (2019) and Ernst and Young (2015). They argue that family businesses, driven by a long-term orientation and a focus on legacy, often provide more opportunities for women to ascend to leadership positions, mitigating the so-called loss of "female talent" (Meroño-Cerdán and López-Nicolás 2017). This dynamic

stands in contrast to non-family businesses, which may face more barriers to gender diversity due to their more formalized and less flexible organizational structures. Welsh et al. (2018) further support this by illustrating how family businesses often prioritize relational and communal values, creating opportunities for female leaders to ascend and influence organizational culture positively.

The impact of gender diversity in the organizational context of family businesses is complex, but is particularly relevant in the Brazilian context, where traditional gender roles continue to influence organizational structures in certain regions (Hofstede et al. 2010; Welsh et al. 2018). However, in family firms, the emphasis on preserving the business across generations may override these traditional norms, leading to greater inclusion of women in decision-making roles (Fèlix and David 2019). The presence of women in leadership positions is not only a reflection of the changing dynamics within family businesses, but also a driver of improved organizational outcomes (Cruz et al. 2022).

The findings are also consistent with Meroño-Cerdán and López-Nicolás (2017) and Skaf et al. (2024), who demonstrate that gender diversity in management is positively correlated with enhanced firm performance across both financial and non-financial dimensions. This positive impact can be attributed to the diverse perspectives and leadership styles that women bring, often resulting in more inclusive and supportive organizational cultures. Furthermore, the family nature of these businesses may help mitigate the conflicts and challenges typically associated with gender diversity in leadership, as family ties can foster cohesion and shared goals among male and female leaders alike (García-Meca and Santana-Martín 2022).

The third hypothesis of the study (H3) posited that the relationship between gender diversity and family business ownership is not uniform across Brazil's regions. Cultural, social, and economic disparities between regions play a crucial role in shaping gender dynamics in family firms. Literature often overlooks regional variations within countries, focusing instead on national trends (Dheer et al. 2014). In Brazil, as highlighted by Hofstede et al. (2010), there are significant cultural differences between regions. Our findings align with this perspective, emphasizing that the integration of women into leadership roles in family businesses varies depending on the specific Brazilian region under consideration.

The study confirms the finding that cultural heterogeneity of Brazil, as detailed by Motta and Gomes (2022) using Hofstede's cultural dimensions, plays a crucial role in shaping gender dynamics within family firms. For instance, in the North and Northeast regions, where cultural dimensions such as higher masculinity and greater power distance dominate, female representation in leadership is significantly lower compared to other regions, thereby limiting the potential benefits of gender diversity (Hofstede et al. 2010; Fèlix and David 2019; Motta and Gomes 2022). Conversely, the South and Southeast regions, which are characterized by more egalitarian values, provide a more favorable environment for women to thrive in leadership roles, thereby enhancing firm performance (Hofstede et al. 2010; Motta and Gomes 2022). These regional disparities highlight the importance of considering cultural and regional contexts when analyzing the dynamics of gender diversity in family businesses.

5.1 Implications

This study contributes to the literature at the intersection of regional studies and family business research (e.g. Basco et al. 2021, Amato and Patuelli 2023) by emphasizing the importance of the regional context in shaping organizational dynamics and highlighting the heterogeneity within these contexts (Basco and Suwala 2020). This is accomplished by regional context as an exogenous and gender diversity as an endogenous factor within the analysis through which this study offers a more comprehensive understanding of the factors that influence family firm characteristics. This approach is consistent with the growing recognition that organizational studies must move beyond a one-size-fits-all model to account for the diversity and complexity of business environments as (regional) contexts, particularly in emerging economies (Hatum 2006) and the call that regional studies need to acknowledge that family firms are diverse entities, not only in size, age and markets supplied (Suwala et al. 2024), by also in management and gender therein as our study accentuates.

This is the first known study to apply the Atalanta algorithm (version 28b) (Ahrens et al. 2024a) to classify Brazilian family and non-family firms. Additionally, it is the first to adopt a rural-urban perspective on these firms using a big data approach. The authors use the term "big data" to emphasize that the dataset represents a near-complete population rather than a sample, as well as to highlight the computational resources required for analysis, for which the authors employ a supercomputer with 4 TB of RAM, further being considered a big data approach in various definitions (De Mauro et al. 2015). Therefore, the study presents also empirical evidence on the spatial distribution of (non)family firms (rural and urban) in Brazil and their gender diversity.

Related to the regional context discussion, our findings shed light on the spatial distribution of family businesses in Brazil, revealing that more than half of the larger family businesses remain in rural areas and in some way, it challenges the common assumption that urbanization leads to a decline in rural family businesses, instead emphasizing the role of geographic location in shaping family business dynamics. This result raises important questions about the profile of these companies and the potential benefits that enable them to remain in rural regions despite the assumed resource limitations. It also invites further exploration of whether such limitations genuinely exist or may be mitigated by yet unidentified factors. In this context, our findings have practical, methodological, and public policy implications. First, they underscore the need to examine both family and non-family businesses to map economic activities in rural and urban regions of Brazil, identifying regional business profiles and management structures, including gender diversity. Second, they highlight the importance of further research, encouraging the use of diverse methodologies such as surveys and interviews to better understand why large family businesses 'prefer' or choose to remain in rural areas. Finally, from a policy perspective, the findings suggest that economic and social policies should be designed to support the continuity of family businesses in rural areas, ensuring the preservation of local economies.

In addition, the study provides insights into how family firms can adapt their management and governance practices to promote greater gender diversity from

the perspective of the regional and cultural particularities across the five different regions of the country, which can contribute to improved organizational performance. Family firms that recognize these dynamics can develop more inclusive policies and succession strategies that value diversity. Investors and managers can use the information from the study to make more informed decisions about investing in family businesses or specific regions. Companies with greater gender diversity and governance structures tailored to family dynamics may be viewed as more innovative and resilient. By adopting practices that promote diversity and taking into account the unique characteristics of family firms, companies can boost their competitiveness and improve their long-term sustainability and adaptability in an ever-evolving market.

Furthermore, the results on gender diversity can influence the creation of public policies that encourage inclusion and diversity in companies, especially in regions where diversity is lower. Policies targeted at family firms can be tailored to support the adoption of more inclusive practices. The implications related to geographic location can help policymakers identify regions that need greater support to promote gender diversity or to enhance the entrepreneurial sector, especially in the context of family firms. Moreover, targeted, situative, and contingent regional policies are important for supporting the family businesses that address path-dependences and context sensitivity (Tödtling and Trippl 2005).

5.2 Limitations and future research avenues

While the study provides valuable insights, it is not without limitations. First, the study is based on data from a specific sample, which may limit the generalizability of the results to other contexts. The results are specific to the Brazilian context, limiting generalization to other countries or regions with different economic, cultural or legal characteristics. They do, however, provide insights into the South American context, where the share and distribution of family companies in rural areas requires close attention, as the accelerated urbanization of the 1960s-1990s might have influenced the spatial patterns.

Second, because the data was collected at a single point in time, it may not reflect recent changes or trends, and it makes it difficult to analyze causality. The relationships identified are correlational rather than causal, which limits the ability to infer whether one variable influences another over time. Future research should address these gaps by exploring longitudinal data, expanding or differentiating the geographic categories (e.g. include all cities into the urban category), and examining the causal links between cultural dimensions, regional characteristics and organizational outcomes.

Moreover, although Hofstede's cultural dimensions have been suggested to explain regional differences in the tendency of family businesses to have greater female leadership, this study has not empirically tested them, leaving room for future research to explore Hofstede's framework in different regions and countries. In our work, we aim to highlight the existence of differences between regions that lead to the difference in tendencies but avoid establishing a relationship between each dimension to the difference in an exploratory manner. The finding calls for further investigation, especially given that studies such as Skaf et al. (2024) show that rural

areas sometimes outperform urban areas in terms of entrepreneurial performance. Future work could investigate such links to broaden the understanding of the underlying mechanism of the differences identified in this work.

A further distinction between family and non-family female workers is also crucial. Campopiano et al. (2019) emphasize that female family members often prioritize family-oriented interests, whereas non-family female employees are more likely to focus on firm-level goals. Differentiating these groups in future studies could provide a richer understanding of how gender dynamics interact with family firm governance and performance.

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