

FEMALE CEOS AND DEFAULT RISK IN LISTED FAMILY FIRMS¹

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Abstract

Purpose: This study examines the effect of female CEO board members on listed family firms' corporate default risk, integrating Upper Echelons Theory with Social Role Theory and the SEW approach, and proxying default risk with the Black-Scholes-Merton model. It also searches for possible differences attributable to the type of female CEO.

Design/methodology/approach: The study is applied to a longitudinal sample of listed US family firms. After a preliminary analysis of the main descriptive, several models are estimated with the system GMM estimator, which is a panel data estimator. The models are dynamic, including the lagged value of the dependent variable. In addition, the model estimation is repeated with a different measure of default risk, for robustness.

Findings: The research findings show that default risk diminishes in the presence of a female CEO, whose reduction is even greater if she is a family member. The results are proven to be robust to the measure for proxying default risk.

Originality: This study primarily contributes to the existing literature by exploring a possible link between female CEOs, particularly those with a family affiliation, and a lower level of default risk in family firms. It also provides practical implications for policymakers, who would be advised to promote conditions enabling women to contribute towards family business viability. In addition, the study offers encouragement for family business owners to value the potential of their female family members in company succession processes.

Keywords: Female CEOs, Listed Family Firms, Upper Echelons Theory, Black-Scholes-Merton (BSM) model.

1. Introduction

The Global Financial Crisis and the recent Covid-19 pandemic have thrown a spotlight on firms' indebtedness and ability to adapt to adverse conditions. Default risk is a combination of factors related to a company's performance, debt level, and capacity for resource generation, which can be used as a measure of its economic situation (Abinzano et al., 2021). Controlling the default risk is vital to reduce default costs and prevent bankruptcy.

It is widely accepted that family-owned businesses are an essential part of the economy (Morck & Yeung, 2003), not only in countries where family ownership is generally predominant, but also in the United States, where it accounts for more than 70% of listed companies (Sirmon & Hitt, 2003). The contribution of family firms to gross domestic product is between 70% and 90% (GDP; Family Firm Institute, 2009) in global terms, and 57% in the case of the US (Villalonga & Amit, 2009). This dominance explains the increasing attention that scholars have devoted to these companies (Rovelli et al., 2021).

The literature on family businesses generally assumes an inverse relationship between family ownership and default risk, based on the assumption of a positive association between family owners and risk aversion. Indeed, it is widely argued that the non-economic motives behind family owners' decision-making results in a cautious approach to business (McConaughy et al., 2001). They are more risk-averse and tend to be less dependent on debt than non-family firms. However, their aversion to risk will depend on several factors, including the economic situation the family business is facing. At times, the controlling family may take somewhat irrational risks to ensure that company control remains in the hands of the family (Hiebl, 2012).

There are few studies in the literature exploring a direct relationship between family ownership and default risk. Recently, Abinzano et al. (2021), in a study conducted on US firms, approximating default risk with the Black-Scholes-Merton model, found that, *ceteris paribus*, family ownership reduces the firm's default risk, although they also identified that this reduction effect is modified both by the proportion and type of institutional investors.

However, we must bear in mind that family business scholars are increasingly aware of family business' heterogeneity (Miller & Le Breton-Miller, 2021). One of the causes of this heterogeneity stems from gender issues. More particularly, the role of women in

family firms has enlarged the body of family business literature (Martinez-Jiménez, 2009; Cruz et al., 2019). Although the research on the role of women on the boards of family businesses is quite limited, some studies find a positive association between the presence of female directors and the level of professionalisation of family SMEs (Songini and Gnan, 2009) or the improvement of the ROA of family companies (Amore et al., 2014), while others find a negative association (Mínguez-Vera & Martin, 2011) or no effect (Martín-Ugedo and Mínguez-Vera (2014). The presence of women on boards has also attracted the attention of practitioners. Ernst & Young (2015) published a report entitled “Women in leadership”, in which it was suggested that the percentage of women directors in family firms will increase in the near future. Similarly, PricewaterhouseCoopers (2016) published the “PwC Next Generation Survey 2016” regarding the role of the next generation of female leaders in the family business context.

However, although the presence of women on boards is generating interest in practitioners and researchers, the effect of female CEOs on family firms’ default risk has not been studied. Thus, building upon the Upper Echelons Theory (UET) and integrating it with Social Role Theory and the Socio-emotional Wealth (SEW) approach, the objective of this paper is to analyse, among a sample of publicly listed US family firms, whether the presence of a female CEO on the board of directors translates into lower corporate default risk. We will also be looking for possible differences in the effects on default risk attributable to the type of female CEO (family vs. non-family affiliated). Our claim is that, while the presence of a female CEO will tend to reduce default risk, her reduction will be even stronger if she is also a family member because her advantage in terms of legitimacy and power on the board will enable her to pursue family interests (Cruz et al., 2019).

We contribute to the literature in several ways. Firstly, we build on the UET by integrating it with Social Role Theory to analyse the effect of board leadership by a female CEO. The general underlying premise of our study is that the most powerful and most important corporate decision-makers are CEOs; their personality, preferences, and leadership style will thus have a profound influence on the organisations they lead (Hambrick & Mason, 1984). Consequently, we focus on the influence of female CEOs, rather than that of female directors in general.

Secondly, we contribute to the scant existing literature on the relationship between gender diversity and default risk. Previous literature makes no distinction between female CEOs, who belong to the highest echelons of power, and other female directors whose influence over the firm may be more limited. Examples include Cao et al. (2015) who, using both the Black-Scholes-Merton's distance-to-default measure and Shumway's (2001) model, found that default risk in non-financial US companies was reduced by a female board presence; Fields et al. (2012), using the cost of debt as a measure of default risk, failed to find a relationship, whilst Grassa (2016), using a sample of Islamic and Southeast Asian banks, revealed that female board presence boosts corporate credit ratings. However, these papers offer a general analysis of the role played by gender diversity, without considering the potential influence of women on corporate decisions. In addition, several studies closely related to our paper have recently examined the effects of female executives and directors on different firm-level outcomes (Liu, 2018; Harris et al., 2019; Huang & Kisgen, 2013). Previous research has also explored the relationship between gender diversity and other measures of firm risk. Some researchers use risk measures such as debt covenants (Fields et al., 2012), portfolio risk (Berger et al., 2014), volatility (Faccio et al., 2016) or total, systematic, and idiosyncratic risk (Sila et al., 2016). Others, such as Palvia et al. (2015), analyse whether financial institutions are involved in default, but they do not assess a specific measure of default.

A third contribution of this paper is to the family business literature, since, to the best of our knowledge, it is the first to study the influence that female CEOs can have on default risk in family businesses, companies in which women are considered a fundamental part of the board (Martinez-Jiménez, 2009); however, their influence is usually in the family rather than the business sphere (Cesaroni & Sentuti, 2014). We combine Social Role Theory and the SEW approach and integrate the two with Upper Echelons Theory. Our paper contributes to the inclusion of gender issues by enriching the literature's knowledge of family business dynamics (Martinez-Jimenez, 2009). We also respond to a call by several researchers for more nuanced insights into the role of two rarely analysed factors: power and legitimacy in the relationship between the board of directors and firm performance (Finkelstein, 1992). We study these factors in the context of family businesses and verify the presence of distinctive board dynamics (that is, the female CEO's family relationship), which the literature has so far failed to address.

The remainder of the paper is structured as follows. Section 2 presents the development of the research hypotheses. Section 3 describes the database, the sample selection, the model and variables, and the selected estimation technique. Section 4 shows the results obtained for the effect of female CEOs on default risk, whilst Section 5 presents some robustness checks. Finally, Section 6 is devoted to the discussion and conclusion of the results, which includes the main implications, limitations, and lines for future research.

2. Hypotheses Development

2.1 Female CEOs and credit risk

Various factors determine the characteristics of listed family firms, generally making them more risk averse and less dependent on external resources, thereby leading to the assumption that they have a lower credit risk, as has been proven in the literature (Abinzano et al., 2021).

Within this somewhat uniform context, the underlying premise for hypothesising a link between default risk and CEO gender is based on Hambrick and Mason's (1984) Upper Echelons Theory. This theory predicts that the strategic decisions of the company are at least partially influenced by the preferences and characteristics of the managers, who are responsible for the decision making.

The idea of CEO gender as a potential contributing factor in default risk stems from widely documented gender-related differences in risk preferences and tolerance based on Social Role Theory. Eagly's (1987) Social Role Theory argues that gender stereotypes develop from the gender division of labour, which defines a society. In Western societies, the nurturing role was usually assigned to women, while more powerful paid employment was entrusted to men. Such a division of labour also attributes different skills to men and women. The theory suggests that, in a given context, women will generally act more communally and men more instrumentally (Eagly, 1987). Some of the differentiating characteristics attributed to women are higher conservatism (Palvia et al., 2015), lower overconfidence (Levi et al., 2014), higher risk aversion (Vandergrift & Brown, 2005), and better monitoring skills (Upadhyay & Zeng, 2014). Indeed, there has been long debate as to the relationship between female board presence and firm performance. Some authors support a positive effect; showing that the presence of women directors improves performance (Martín-Ugedo & Míguez-Vera, 2014), that it enriches the decision process with more information and debate (Francoeur et al., 2008), that it increases transparency

in financial reports (Gul et al., 2011), and that it boosts market penetration by enabling understanding between customers and employees (Brammer et al., 2007). These benefits are particularly relevant in countries with fewer external corporate governance mechanisms and more limited shareholder protection (Chong & Lopez-de-Silanes, 2007). Other scholars portray a more negative picture, arguing that women generally exhibit less willingness than men to engage in competitive markets or activities (Niederle & Vesterlund, 2007) and that their performance weakens under competitive pressures (Gneezy & Rustichini, 2004). There is, however, one stream of literature that postulates that women involved in a “male” discipline or culture present the same level of overconfidence (Deaves et al., 2009) or the same level of risk aversion (Matsa & Miller, 2013) as men. Abdel-Khalik (2014) even finds that women have a higher risk-tolerance threshold than men. Berger et al. (2014) also discover that the portfolio risk in a sample of financial institutions increases with the proportion of female executives. They attribute this result to the lower expertise of women at the executive level. Thus, the effect of female directors on different aspects of corporate performance remains unclear.

What is surprising is that previous scholars addressing the impact of female directors on corporate boards have generally only counted women’s presence in the boardroom, neglecting the fact that the position held by the woman, that is, her degree of power, is crucial if she is to have any influence (Ragins & Sundstrom, 1989). Indeed, Zelechowski and Bilimoria (2003) found that the presence of women on boards of directors can be ineffective unless they also have the power to influence decisions that promote strategic change. This may explain the lack of consensus in the few papers that specifically study women’s effect on different measures of default risk, where a negative effect (Cao et al., 2015; Grassa, 2016) and no association (Fields et al., 2012) have both been found.

Thus, in this paper, we focus on female CEOs because they are both the most influential figures and the main decision-makers in the company, as pointed out by Palvia et al. (2015). Consequently, the integration of both theories is fundamental, since Social Role Theory assumes a behavioural difference between men and women and Upper Echelon Theory supports this difference in the upper strata of the organisation, which is where the CEO can actually influence decision-making.

Few studies have analysed the role of female CEOs in outcome variables. They include Faccio et al. (2016) and Huang & Kisgen (2013), who both show that companies led by

female CEOs present lower leverage ratios; Fields et al. (2012), who show that companies led by female CEOs present lower debt covenants; and Huang & Kisgen (2013) and Levi et al. (2014), who show that female-led companies are involved in fewer M&A deals. These empirical results might suggest that the presence of female CEOs on their board reduces firms' default risk by reducing the risk in strategic decisions.

Thus, based on Upper Echelons Theory and Social Role Theory, we posit the following general hypothesis:

Hypothesis 1. Female CEOs reduce default risk in listed family firms.

2.2 Family vs non-family affiliated female CEOs in family firms

Failure and exit in family businesses depend not only on financial performance but also on non-economic objectives (Revilla et al., 2016). The SEW approach encompasses the family's non-economic goals, which Berrone et al. (2012) break down into five dimensions: family control and influence, identification of family members with the firm, social ties, emotional attachment of family members, and family dynastic succession. Thus, from this perspective, the family's objective will be to protect the firm in all these dimensions by pursuing only low risk-taking activities (Lardon et al., 2017). The potential gain from a risky project is outweighed by the potential loss of SEW. Family firms are known for a risk-avoidance preference born out of a deep concern for firm survival (Boubaker et al., 2016), long-term orientation (Miller et al., 2008), undiversified assets (Muñoz-Bullon et al., 2018), and attachment to the business (Welsh & Zellweger, 2010). Family firms will, by their very nature, be more risk-averse than non-family firms (Naldi et al., 2007). Accordingly, we see that the preferences of company members who belong to the family may differ from those who do not.

As previously mentioned, in addition to their role as family members, some scholars have studied female family directors of family businesses in order to analyse their effect on performance (Cruz et al., 2010), but the results have been confused by the different roles played by women on the board. Not all women who are part of the family have the same power or legitimacy to make decisions, which is why this paper focuses on women CEOs, whose position, according to Upper Echelon Theory, legitimises them to impose their decisions on the board and within the company. Consequently, the legitimacy of these women is given by their condition as family members and their position in board

leadership. Being a member of the family confers a unique "right" to involvement in the firm's decisions (Cruz et al., 2010). In fact, Finkelstein (1992) highlighted the relevance of family affiliation as a main justification of power in management positions. Female CEOs who belong to the family have a natural legitimacy, since their competencies are certified by the key role they play within the firm and their deep tacit and internal knowledge of the company. Their CEO status enables them to make decisions at board meetings without their presence being disparaged as a mere consequence of their family affiliation. It also gives female directors structural power. As Finkelstein (1992, p. 509) points out: "Managers who have a legislative right to exert influence are influential".

This is why we see it necessary to integration of SEW theory with Upper Echelon Theory in order to include family affiliation as another influential factor in the cultural differences and preferences of female CEOs. We posit that female CEOs with a family affiliation will be able to persuade other board members to adopt their own risk-avoiding preferences, and thus contribute to safer decision-making based on higher risk aversion and the desire to protect SEW, all of which will reduce default risk.

Therefore, the role of female CEOs as board members and their impact on default risk in listed family firms is likely to vary according to whether they are or are not affiliated with the family. In other words, their role will not be uniform in all cases, but will differ according to their family affiliation status (family-affiliated vs non-family-affiliated). In line with previous studies adopting an Upper Echelons perspective in a family business setting (De Massis et al., 2015), we argue that the effect of family-affiliated female CEOs is further influenced by the non-economic motivating factors inherent in family members. Hence, we propose the following hypothesis:

Hypothesis 2. The capacity of a female CEO to reduce corporate default risk in listed family firms is greater when she is a family member.

3. Database and Methodology

3.1 Sample and Data Collection

In Table 1, we can observe the sample selection procedure leading to the final dataset. First, the data used in this research is a representative sample of US listed companies indexed in the Fortune 1000 from 2009 to 2013. Second, we have excluded those firms without information in the Compustat database and companies from the financial and government sector. This resulted in 616 firms in the dataset. The sample was drawn from

COMPUSTAT Global, which provides relevant information on firms' financial performance, size, age, and industry. Information about the presence of independent directors on the board was garnered from the Thomson Reuters database.

[Insert Table 1 about here]

Third, to accurately determine the status of family firms and family members' degree of influence on corporate governance, we manually analyse each firm's proxy statement. Family relationships are identified through the matching of surnames, and a number of keywords (e.g., father, mother, son, daughter, cousin). The same search strategy was used to determine the presence of female family-member directors. As suggested by Berrone et al. (2012) for publicly traded US family companies, the criteria for classification as a family business were that an individual or family group owned at least 5% of the shares, and at least one family member was on the board. The 5 percent cut-off is in line with that applied in prior studies for large publicly traded US firms, both in the corporate governance literature in general and in family firm research.

Fourth, details of the personal profiles of female directors, such as tenure or age, come from the manual inspection of proxy statements. After controlling for these criteria, our final panel data is formed by 152 listed US family firms (758 observations).

Data for the financial and market variables required to proxy default risk for the selected companies were drawn from the Refinitiv Datastream database. The availability of data for the calculation of the BSM measure also affected the sample size, reducing it to 137 companies. Finally, firms with no available data on the control variables of interest were removed. The final dataset comprises 503 firm-year observations for 115 companies for the study period.

3.2 Model and Estimation Technique

In analysing the relationship between female CEOs and default risk, our model starts from Abinzano et al.'s (2021) proposal for examining the relationship between default risk and family ownership. The model used to test Hypothesis 1 is expressed as follows:

$$\begin{aligned}
 DefaultRisk_{i,t} = & \beta_0 + \beta_1 DefaultRisk_{i,t-1} + \beta_2 Female_CEO_{i,t} + \\
 & + \varphi Control_variables_{i,t} + Sector_j + \eta_i + u_t + \varepsilon_{i,t}
 \end{aligned}
 \tag{1}$$

where the dependent variable, $DefaultRisk_{i,t}$, is the default risk of firm i in year t proxied by the BSM measure (for a detailed explanation of the measure see Vassalou and Xing, 2004). $DefaultRisk_{i,t-1}$ denotes the firm's default risk in the previous year and $Female_CEO$ is a dummy variable that equals one if the firm is led by a female CEO, and zero otherwise. The model includes a set of variables: size, leverage, ROA, volatility, capital expenditures, the average tenure and average age of female board members, board size, and board independence. Finally, the model includes sector dummies and year dummies ($u_{i,t}$) to control for time heterogeneity, and a random disturbance term, $\varepsilon_{i,t}$.

Meanwhile, the model employed to test Hypothesis 2 is expressed as follows:

$$DefaultRisk_{i,t} = \beta_0 + \beta_1 DefaultRisk_{i,t-1} + \beta_2 Family_Female_CEO_{i,t} + \beta_3 Non - family_Female_CEO_{i,t} + \varphi Control_variables_{i,t} + Sector_j + \eta_i + u_t + \varepsilon_{i,t} \quad (2)$$

where $Family_Female_CEO_{i,t}$ is a dummy variable that takes the value one for firms led by a female CEO affiliated with the family, and zero otherwise; and $Non - family_Female_CEO_{i,t}$ is a dummy variable that takes the value of one for firms led by a female CEO who is not affiliated with the family, and zero otherwise. Since female and male CEOs are mutually exclusive groups, when there are no female CEOs, the male CEO effect is represented by the constant.

The hypotheses are tested with the system GMM estimator, which is a panel data estimator that uses instrumental variables and captures individual heterogeneity (individual effect, $\eta_{i,t}$). It is a consistent and efficient (Arellano & Bond, 1991) two-step estimator with robust standard errors controlling for two possible sources of endogeneity (Wooldridge, 2010): reverse causality and omitted variables. The third source of endogeneity, measurement error, is controlled for by using an appropriate proxy for default risk. We also employ a dynamic model specification including the lagged value of the dependent variable, since it is persistent over time. Our selected estimator therefore helps to control for autocorrelation, heteroscedasticity, and endogeneity (Khan et al., 2019).

4. Results

Table 2 illustrates the mean, standard deviations, and minimum and maximum values of the variables used throughout the study. It reveals that our main variable of interest, the dummy variable $Female_CEO$, has an average value of 4.97%, which is the proportion

of female CEOs in our sample. This figure is consistent with data provided by Faccio et al. (2016), who report that 4.8% of the Fortune 500 firms and only 3% of the top 145 Scandinavian companies have a female CEO. We are also able to observe that only 28% of the female CEOs in our sample are affiliated with the owning family. In terms of personal profiles, the data show an average age of 57.43 and an average length of experience in the company of 7.5 years. With respect to default risk, the BSM results indicate a 1.84% average probability of default for the companies in our sample. Furthermore, Table 3 displays the correlation matrix, which shows no significant relationship between default risk and the variables related to female CEOs. Overall, the correlations among the explanatory variables are not too high and the variance inflation factor is less than 5 for all the variables included in each model, thus ruling out multicollinearity.

[Insert Table 2 about here]

[Insert Table 3 about here]

Table 4 shows the results from the estimation of Models 1 and 2, which analyse the relationship between default risk and female CEOs. The first column shows the results excluding the female CEO effect; that is, including only the control variables.

[Insert Table 4 about here]

Column 2 of Table 4 analyses the effect of the presence of a female CEO by introducing the variable *Female_CEO*. The coefficient for this variable (-0.018) is negative and statistically significant, implying that the presence of a female CEO reduces default risk. Furthermore, there is no change in the sign of the coefficients of the remaining variables, although tenure and age are no longer significant. It is likely that the effects of both variables are now being captured by the fact that these women hold the position of CEO. We can see that the results obtained support Hypothesis 1 by confirming the predicted role of female CEOs in reducing default risk.

Column 3 of Table 4 presents the results for the effect of the female CEO being a family member. In this case, we consider two dummy variables, *Family_female_CEO* and *Non-family_female_CEO*, which, respectively, take a value of one when the female CEO is and is not a family member. The coefficients of *Family_female_CEO* (-0.046) and *Non-family_female_CEO* (-0.015) are negative and significant, which indicates that the effect

of the presence of a female CEO on default risk remains negative, although this effect is stronger if she is also a family member. These results support Hypothesis 2.

5. Robustness Checks

Although the literature has demonstrated the superiority of the BSM measure over the credit rating and accounting-based models as a measure of default risk and over other measures, such as CDS or the company's credit rating, in terms of data availability, Abinzano et al. (2022) determine that accounting-based measures, and more specifically Altman's Z-score, come closer to the market-based measures to measure default risk in family firms.

We subsequently repeat the analysis carried out in Section 4 using the classic Altman's Z-score as the default risk measure. Since our sample comprises family firms, the findings derived from Altman's Z scores must be similar to those obtained with the BSM model. Table 5 presents the results for the models estimated using Altman's Z as the proxy for default risk. The conclusions regarding the hypotheses formulated for the analysis are the same as with the BSM measure. Thus, the presence of a female CEO has a negative effect on default risk; that is, it increases the Z-score. Furthermore, this effect is stronger if the female CEO is also a family member.

[Insert Table 5 about here]

However, we find some differences with respect to the model's coefficients when the default risk is proxied by BSM. One of these differences is that the effect of volatility is positive, such that higher volatility indicates lower probability of default. This effect can be explained by the fact that Altman's Z score does not consider equity volatility, and therefore fails to capture the increase in default risk with higher levels of equity volatility.

6. Discussion and Conclusion

6.1 Discussion

This study analyses the impact of female CEOs on the default risk of listed family firms. It also explores possible differences in the effect on default risk driven by family affiliation vs. non-affiliation of the female CEO.

With respect to the first hypothesis, drawn, as mentioned, from Social Role Theory, we have shown that men and women's different characteristics can influence corporate

outcomes. In particular, we have ascertained that female CEOs reduce corporate default risk, under the premise that, in comparison to their male counterparts, they are more reluctant to take risky decisions. This adds to the findings of previous papers on the effect of female ownership and directors (including CEOs) on various firm outcomes related to default risk, such as leverage (Faccio et al., 2016, Huang & Kisgen, 2013), performance (Gneezy & Rustichini, 2004; Martín-Ugedo & Miguez-Vera, 2014), and mergers and acquisitions (Levi et al., 2014). Moreover, this result extends previous knowledge on the relationship between gender diversity and other risk measures (Berger et al., 2014; Faccio et al., 2016; Fields et al., 2012; Palvia et al., 2015; Sila et al., 2016), where there is no consensus on the effect of female directors on the firm's debt covenants, volatility, systematic risk, idiosyncratic risk, and portfolio risk. This result also enhances the mixed findings from the few papers that have studied the relationship between gender diversity and a direct measure of corporate default risk (Cao et al., 2015; Fields et al., 2012; Grassa, 2016), where there is no differentiation between female directors with power, such as CEOs, and other female board members. Consequently, our finding constitutes an enhancement of prior knowledge on the effect of gender diversity on several firm outcomes, various risk measures, and direct measures of default risk, where non-conclusive findings have previously been obtained.

Our second hypothesis states that the benefits of a female CEO leading a family firm are even greater if she is also a family member. Drawing on the SEW perspective, we have shown that the preservation of socio emotional wealth could lead to lower default risk in family firms led by family-affiliated female CEOs, who would tend to prioritise SEW goals over purely economic ones. This would include protecting their firm by avoiding risky decisions that might undermine family control. In addition, we propose that the influence of a family-affiliated female CEO is strengthened by combined power and legitimacy, facilitating an enhanced role in the firm's decision-making processes, where the dual role of woman and family member mitigates the effect on corporate credit risk. Our result supports the risk aversion view of family members (Naldi et al., 2007) in the context of the board of directors, as well as the role played by gender diversity.

6.2 Theoretical and Practical Implications

Regarding the theoretical implications, first, this paper integrates Social Role and SEW approaches with Upper Echelons Theory. Upper Echelons Theory states that

organisational performance is partially predicted by the characteristics of the top-level management team's managerial backgrounds. Our paper focuses on female CEOs, which is why we integrate Social Role Theory, since the decisions and social roles of women CEOs are shaped by societal values, which are in turn subject to various constraints. In our analysis of another very specific female CEO characteristic, namely, family affiliation, we consider it vital to draw upon socio-emotional wealth theory, since women CEOs' decisions will be influenced by their family roots; these, in turn, determine a priority system in which economic objectives rank lower than the need to preserve the family legacy and company reputation. Second, we also contribute to the recent literature on the heterogeneity of family businesses, by considering the female director as an important variable in terms of firm performance. Finally, we contribute to the theory by considering women's role in the management of the company, not only as a member of the board but also as the CEO of the company.

In addition, our research has some practical implications. First, although it was conducted on what is, *a priori*, a homogeneous sample (listed family firms), considering firm, individual, and industry control variables, the heterogeneity observed in the default risk scores indicates that gender in leadership makes a difference in terms of its influence on the board of directors. Female leadership is necessary to change the view that female directors have a mere token presence on the board; this is because, despite remaining a minority on the board, their leadership position enables them to be heard by other board members. Thus, there is a need for all firms to endorse the value of women in top board positions and actively incorporate more women into senior management, while influencing corporate decisions with a possible impact on the risk of business failure.

Second, specifically in relation to family firms, the family should encourage the presence of its female members in top board positions. This has been an important challenge since Lansberg (1988), with more recent studies still finding that male offspring are preferred as successors over female offspring (Aldamiz-Echevarría et al., 2017). Thus, daughters or sisters will not be considered as potential successors unless there is no alternative (Ip & Jacobs, 2006). The main reason is that the classic idea that the first-born son should take over the family business still persists in some companies. In fact, authors such as Martin (2001) showed that first-born daughters are still overlooked as potential company leaders. There have even been cases where it was considered preferable to sell the company or hire an external professional CEO (Bennedsen et al., 2007).

In fact, many studies claim that family businesses enhance their performance by outsourcing the CEO position (Miller et al., 2014, among others), effectively because it enables them to choose from a much larger talent pool, and possibly also because their objectives are focused more on financial results and less on socio-emotional factors, which sometimes prevents a long-term perspective.

Although the CEO outsourcing alternative can improve the performance of family businesses, they have been reluctant to adopt it because of a need to retain the family legacy. Our results suggest that female family leadership could be a good governance alternative. We show that by entrusting board leadership to a female family member, a family firm can lower its default-risk, and thus increase its chances of survival under family control. This should encourage family business entrepreneurs to hand companies over to their daughters to preserve the family legacy.

Third, compulsory gender quotas have proved effective, judging by the increase of female directors from 20.4% in 2017 to 29% in 2021, and from 21.7% to 29.8%, for the MSCI World and the MSCI World (US), respectively. We must also consider that the report includes both countries where gender quotas have been introduced and countries with no legislation on this matter. For instance, European countries, most of which have established mandatory board gender quotas, had the highest percentage of companies with at least 30% women directors (78.7%) and only 0.9% of companies had all-male boards. However, this gender quota policy did not serve to increase the number of women CEOs. The CEO's office remained mostly out of reach for women across all regions in 2021. However, for the first time between 2017 and 2021, the percentage of women CEOs in emerging markets (5.4%) slightly surpassed the percentage of women CEOs in developed markets (5.2%). (MSCI, 2021). Consequently, policy makers need to consider alternatives in order to increase the number of female CEOs, particularly ones that have both board presence and board power. Both the media and investors can play a part in this by persuading firms not only to promote women to the board but to give them decision-making power. The media have the means to drive gender diversity by inflicting reputational costs on firms showing a lack of women in leadership roles. In the case of investors, meanwhile, support for gender equality is part of a heightened sense of social responsibility, which is especially common in those of the millennial generation.

6.3 Limitations and Lines for Future Research

To conclude, we would like to note certain limitations of the study, some of which might provide an opening for future research. The first limitation could arise from the fact that, although the percentage of female CEOs in the sample is consistent with that of other work in the literature, such as Faccio et al. (2016) or Cruz et al. (2019), the number of female CEOs, particularly those affiliated with the family, is small. The size of the sample was restricted by the thoroughness of the process used to characterise the company's female members in terms of family affiliation and degree of influence, already described in section 3.1. Thus, caution is required when extrapolating the results, although it is vital to consider that the conclusions obtained in this work provide a basis for subsequent study. Therefore, having established a link between gender and family affiliation in female CEOs, the sample size could be enlarged for a more comprehensive analysis potentially including other aspects, such as female CEO training levels.

Secondly, although the rationale for Hypothesis 2 is founded upon the theory of SEW preservation by family members, we must bear in mind that the need to preserve "affective endowment" changes over generations. As pointed out by Berrone et al. (2012), the high level of SEW characteristic of first-generation family businesses decreases in subsequent generations. Consequently, the levels of SEW and risk-averse business management are not invariant across controlling generations. According to Arrondo-Garcia et al. (2016), the ratio of socioemotional to financial goals diminishes with successive generations. Thus, SEW preservation is less important in later generations, while interest in financial wealth increases as family ties weaken and differences among new family branches emerge.

Although it would be interesting to consider family-firm generation issues and whether the credit risk reduction resulting from the presence of a female CEO erodes with each successive generation, we must be aware that stratification by generations in our sample would significantly limit the number of observations. However, as a future line of research, it would be interesting to conduct such an analysis on a larger sample to further explore the importance of the generational process and, in addition, to verify whether the results for non-listed family companies obtained by the aforementioned studies also hold true for the case of listed companies.

In conclusion, this study analyses the role of female CEOs on default risk in listed family firms. The findings show that default risk diminishes in the presence of a female CEO and this reduction is even greater if she is a family member.

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Table 1. Sample Selection Procedure

Steps	Number of companies
1. Initial sample: Companies from the Fortune 1000	1,000
2. Only firms with information in Compustat and Thomson Reuters and exclusion of financial and government sector	616
3. Only family firms (definition of Berrone et al., 2012) and non- missing data on the personal profiles of female directors	152
4. Exclusion of firms with missing data for the BSM measure	137
5. Exclusion of firms with missing data for the control variables	115

This table displays the steps to obtain the final dataset and the number of companies that remain after each step.

Source: Author's own creation

Table 2. Summary Statistics

	Mean	Standard Deviation	Minimum	Maximum
1. Default Risk	0.0184	0.0823	0.0000	0.8383
2. Female_CEO	0.0497	0.2175	0	1
3. Family_female CEO	0.0139	0.1172	0	1
4. Non-family female_CEO	0.0357	0.1859	0	1
5. Size	15.3479	1.2766	12.1464	19.1373
6. Leverage	0.2254	0.1960	0.0000	0.9639
7. ROA	0.0580	0.0662	-0.3637	0.3912
8. Volatility	0.3438	0.2002	0.0838	1.8821
9. Capex	0.0384	0.0383	0.0000	0.3042
10. Av_tenure	7.5487	4.7404	0	28
11. Av_age	57.4374	6.5989	36	79
12. Board size	10.4254	2.1686	5	17
13. Indepboard	0.7587	0.1126	0.4285	0.9333

This table displays mean, standard deviation, maximum and minimum value of the variables included in the models. Size is measured as the natural logarithm of firm assets, Leverage as the ratio of debt to total assets, ROA represents the firm's profitability and is measured as the return on assets, Volatility is computed as the annualized standard deviation of the stock's returns for the past twelve months, and Capital expenditures are calculated as the ratio of interest expenses and cash dividends to total assets, in order to capture the firm's costs of funds; Avtenure_women is the average tenure of women directors; Avage_women is the average age of female board members; Boardsize, is the number of directors; Indepboard is the number of independent directors over the total number of directors.

Source: Author's own creation.

Table 3. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1. Default Risk												
2. Female_CEO	0.0173											
3. Family_female CEO	0.0583	0.5466***										
4. Non-family female_CEO	-0.0186	0.8266***	-0.0195									
5. Size	-0.1019**	-0.1201***	-0.1203***	-0.0625								
6. Leverage	0.3111***	0.0817**	0.0165	0.0865**	0.1732***							
7. ROA	-0.3785***	-0.0541	-0.0368	-0.0398	0.2114***	-0.2456***						
8. Volatility	0.6071***	0.0776*	0.1107***	0.0182	-0.2208***	0.1696***	-0.4391***					
9. Capex	0.1344***	0.0357	-0.0375	0.0678*	-0.0133	0.4213***	0.1429***	-0.0295				
10. Av_tenure	0.0339	-0.0922**	0.0651	-0.1489***	0.1204***	0.0234	-0.0207	-0.03	0.0355			
11. Av_age	0.0168	-0.1303***	-0.0233	-0.1378***	0.0415	-0.0792*	-0.0436	0.0152	-0.1857***	0.3859***		
12. Board size	-0.0251	0.0421	-0.0516	0.0849**	0.4783***	0.1408***	0.1843***	-0.1318***	0.0638	0.04	-0.1028**	
14. Indepboard	0.0158	-0.0278	-0.0862**	0.0247	0.037	-0.1133***	0.0099	-0.124***	-0.0471	-0.0053	-0.0215	0.0906**

This table displays the correlation between the variables included in the models. ***, ** and * denote coefficients significant at the 1, 5 and 10 per cent level, respectively.

Source: Author's own creation.

Table 4. Female CEOs and Default Risk

Dep. var.: DefaultRisk _t	1	2	3
DefaultRisk _{i,t-1}	0.044*** (0.016)	0.027** (0.012)	0.051*** (0.012)
Female_CEO		-0.018** (0.009)	
Family_female_CEO			-0.046*** (0.013)
Non-Family_female_CEO			-0.015*** (0.004)
Size	0.000 (0.003)	0.002 (0.002)	0.002 (0.002)
Leverage	0.119*** (0.019)	0.120*** (0.015)	0.121*** (0.013)
ROA	-0.097*** (0.024)	-0.087*** (0.025)	-0.096*** (0.022)
Volatility	0.201*** (0.018)	0.236 *** (0.014)	0.233*** (0.014)
Capex	-0.073** (0.029)	-0.049** (0.023)	-0.036* (0.021)
Avtenure_women	0.002** (0.001)	0.001 (0.001)	0.001 (0.001)
Avage_women	-0.001** (0.001)	-0.001 (0.000)	0.000 (0.000)
Boardsize	-0.003** (0.002)	-0.002 ** (0.001)	-0.002* (0.001)
Indepboard	-0.168*** (0.033)	-0.130*** (0.024)	-0.120*** (0.024)
Const.	0.153** (0.072)	0.025 (0.049)	0.001(0.046)
z_1 (p-value)	(0.000)	(0.000)	(0.000)
z_2 (p-value)	(0.000)	(0.001)	(0.000)
z_3 (p-value)	(0.334)	(0.031)	(0.056)
<i>Specification tests</i>			
m_2 (p-value)	(0.634)	(0.638)	(0.693)
Hansen (p-value)	(0.861)	(0.843)	(0.851)

These models are estimated by the system GMM estimator. Robust standard errors are included in parentheses. The dependent variable is the probability of default given by the Black-Scholes-Merton model. Time and sector dummies are included although not reported. ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. The Hansen statistic, which detects over-identifying restrictions by testing for the absence of correlation between the instruments and the random disturbance, is an instrument validity test and is asymptotically distributed as χ^2 . m_2 is a test for the absence of second-order serial correlation between the residuals in first differences (m_2), which is asymptotically distributed as $N(0,1)$ and calculated as in Arellano and Bond (1991). We also include three Wald tests of the joint significance of the explanatory variables (z_1), the time dummy variables (z_2), and sector dummy variables (z_3), respectively. These statistics are asymptotically distributed as a χ^2 under the null hypothesis of no joint significance.

Source: Author's own creation.

Table 5. Female CEOs and Default Risk proxied by the Altman (1968) Z-score

Dep. var.: DefaultRisk _t	1	2	3
DefaultRisk _{t-1}	0.061*** (0.011)	0.080** (0.007)	0.048*** (0.010)
Female_CEO		0.330*** (0.095)	
Family_female_CEO			0.404*** (0.114)
Non-Family_female_CEO			0.351*** (0.078)
Size	-0.098*** (0.012)	-0.029* (0.016)	-0.067*** (0.013)
Leverage	-0.859*** (0.129)	-1.111*** (0.121)	-1.045*** (0.098)
ROA	0.546** (0.098)	-0.442** (0.203)	0.539** (0.244)
Volatility	0.212** (0.018)	0.587 *** (0.088)	0.332*** (0.086)
Capex	1.462*** (0.380)	2.101*** (0.331)	2.033*** (0.428)
Avtenure_women	0.000 (0.002)	-0.004* (0.002)	0.009*** (0.003)
Avage_women	0.006 (0.005)	0.014*** (0.004)	0.011*** (0.004)
Boardsize	0.006 (0.008)	0.015 *** (0.006)	0.016** (0.007)
Indepboard	-0.255* (0.144)	-0.604*** (0.070)	0.013 (0.131)
Const.	1.527** (0.355)	0.089 (0.324)	0.275 (0.381)
z_1 (p-value)	(0.000)	(0.000)	(0.000)
z_2 (p-value)	(0.002)	(0.000)	(0.000)
z_3 (p-value)	(0.075)	(0.259)	(0.043)
<i>Specification tests</i>			
m_2 (p-value)	(0.313)	(0.312)	(0.312)
Hansen (p-value)	(0.995)	(0.880)	(0.954)

These models are estimated by the system GMM estimator. Robust standard errors are included in parentheses. The dependent variable is the Altman's Z score. Time and sector dummies are included although not reported. ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. The Hansen statistic, which detects over-identifying restrictions by testing for the absence of correlation between the instruments and the random disturbance, is an instrument validity test and is asymptotically distributed as χ^2 . m_2 is a test for the absence of second-order serial correlation between the residuals in first differences (m_2), which is asymptotically distributed as $N(0,1)$ and calculated as in Arellano and Bond (1991). We also include three Wald tests of the joint significance of the explanatory variables (z_1), the time dummy variables (z_2), and sector dummy variables (z_3), respectively. These statistics are asymptotically distributed as a χ^2 under the null hypothesis of no joint significance.

Source: Author's own creation.