

Female Board Members in Family Firms Does Critical Mass Drive Debt Level?

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Abstract

This study empirically investigates if a presence of a consistent female representation in the boardroom (i.e., a critical mass) affects leverage in family firms. Employing a sample of 268 Italian manufacturing firms for the period 2016-2018, the regression analysis show that the presence of - at least - three women in the boardroom significantly decreases firm's leverage. Results are robust to both, different measures of leverage and presence of women on board. These findings confirm the risk aversion of women and support the idea that a significant presence of women in the board is a useful instrument in risk monitoring. Our results are useful for policy makers – interested in the adoption of rules on gender quotas - in identifying the minimum number of women in the board needed to produce a statistically significant impact on performance and shed new light on the relationship between corporate governance characteristics and capital structure in concentrated-ownership companies.

Keywords: Board composition, Family firms, Board gender diversity, Critical mass, Leverage, Italy

JEL Classifications: G30, G32, M10, M14

1. Introduction

Since the work of Modigliani and Miller (1958), many scholars have tried to identify the optimal level of leverage (i.e., the relative amount of debt in the capital structure) a firm should take on. Existing literature reveals that corporate governance variables as board size and board composition affect firms' financing choices (Bacci et al., 2018; Rossi et al., 2018).

Debt may be considered both as a monitoring tool for agency costs (Jensen, 1996) and a proxy for risk attitudes of the firm (Faccio et al., 2016). In the former role, debt may prevent the generation of discretionary cash flow by managers. From the latter perspective, debt can incentive financial risk-taking. However, when it comes to family firms, debt seems to act mainly as a control mechanism together with the board of directors (Rossi et al., 2018).

This study employs a sample of 268 Italian companies to test whether the presence of a consistent female representation in the boardroom (i.e., a critical mass) affects firm's leverage in family firms. Our findings are consistent with this hypothesis and contribute to the literature in two ways. First, our research helps to understand whether the presence of a critical mass on the board of directors improves corporate board monitoring effectiveness. Second, focusing on Italian family firms, our analysis adds evidence to the literature questioning if family firms operating in a concentrated-ownership environment, like Italy, employ debt to mitigate agency costs or expropriate minority shareholders (Faccio et al., 2010).

The remaining sections of the paper are organized as follows: section 2 presents the literature review and the research hypothesis, section 3 describes the research design, section 4 presents the empirical findings and section 5 concludes the paper.

2. Literature review and Hypothesis Development

Prior literature recognizes that the board of directors performs a significant monitoring function for the opportunistic behaviour of managers (Fama, 1980; Fama & Jensen, 1983). The board composition can mitigate agency costs and affect financial decisions (Coles et al., 2008; Jensen, 1993).

A recent stream of literature has stressed the relationship between the presence of women on board and firm performance (Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Arena et al., 2015; Campbell & Mínguez-Vera, 2008). The research also discusses the relationship between female representation in the boardroom and corporate decisions (Miller & del Carmen Triana, 2009; Richard et al., 2004; Torchia et al., 2011).

Other studies have addressed the relationship between gender diversity and risk aversion. Most of these studies have focused on the banking industry, revealing that – in personal finance and investment attitudes – women are more risk-averse than men (e.g., Barber & Odean, 2001; Charness & Gneezy, 2012; Maxfield et al., 2010). Little research has investigated the relationship between gender diversity on board and risk attitudes of firms (Adams & Funk, 2012; Faccio et al., 2016; Sila et al., 2016). Furthermore, higher female board participation and their more active intervention in meetings can ensure improved and more conservative firm management concerning financial decisions. In that regard, scholars showed that a greater number of women on boards mitigates agency costs (Adams & Ferreira, 2009; Bianco et al., 2015) and information asymmetries (Abad et al., 2017) and improves the level of non-financial disclosure (Ben-Amar et al., 2017; Husted & Sousa-Filho, 2019) and the earnings quality (Srinidhi et al., 2011).

Few studies have investigated the relationship between women on board and corporate debt levels. Huang & Kisgen (2013) find that women issue less debt than male directors. Authors claim that their results are consistent with the risk-aversion theory. Alves et al. (2015) find a significant relationship between board composition and capital structure. The research shows that independent and women directors lead to a reduction of the short-term debt level and that the presence of more women on board drives firms to finance their investments mainly with either medium- and long-term debts or equity.

When it comes to family firms, research regarding board gender diversity is less copious. Literature mainly focuses on two main issues. The first concerns the determinants of the presence of female directors and the role of family ownership and family ties as drivers of their appointment, while the other regards the way the existence of female directors affects corporate strategies and, consequently, the performance of the family firms (Memili & Dibrell, 2019).

Several studies (e.g., Bianco et al., 2015; Sheridan & Milgate, 2005) identify family ownership as a potential driver of the presence of female directors. Family firms' boards are generally expected to be more gender diversified since such companies tend to recruit directors belonging to the owning family. Family affiliation makes, therefore, woman's appointment more likely. Researchers observed the positive relationship between family affiliation and board gender diversity in more developed

countries as Italy (Bianco et al., 2015; Songini & Gnan, 2009), France (Nekhili & Gatfaoui, 2013), Spain (Martín-Ugedo & Mínguez-Vera, 2014; Mínguez-Vera & Martín, 2011), UK and USA (Saeed et al., 2016), Switzerland (Ruigrok et al., 2007), and Australia (Sheridan & Milgate, 2005).

Much of the literature analyses listed family firms, except for Mínguez-Vera & Martín (2011) and Martín-Ugedo & Mínguez-Vera (2014), who employ a sample of Spanish small and medium enterprises (SMEs), and Songini & Gnan, (2009), who studied Italian SMEs. Their findings highlight the higher presence of female directors on board belonging to family firms compared to those who are not, suggesting family businesses are more inclined to hire women as board members.

Research concerning the Italian and French contexts stressed some characteristics of women appointed as directors. Bianco et al. (2015), analysing a sample of Italian listed family businesses, found that family-affiliated female directors are less likely to have an academic education when compared to other female directors. Similarly, studying French family firms, Nekhili & Gatfaoui (2013) and Singh et al. (2015) found female directors with family ties tended not to have a university degree or past executive experiences. These findings suggest family firms tend to rely on family ties when picking women directors rather than their competencies. Educational level and working experience may be relevant for potential non-family female board members (Memili & Dibrell, 2019). Furthermore, family-affiliated female directors from both the Italian and French family firms held multiple directorships (Bianco et al., 2015; Nekhili & Gatfaoui, 2013). The reason may consist of the networks of family firms sharing one or more directors to strengthen their linkages and increase social capital (Lester & Cannella, 2006).

As mentioned before, a growing stream of literature stressed the relationship between board gender diversity and firm performance. Little research has addressed this issue in the field of family businesses. Amore et al. (2014), applying a sample of Italian family firms, found that female directors positively affect profitability only in female-led firms. Thus, the presence of other women on the board of directors seems to foster female leaders' performance by creating a more beneficial and collaborative environment.

The influence of female directors on performance also depends on board functioning and, consequently, on corporate strategies. Regarding the board functioning, results are not favourable. Vandebek et al. (2016) pointed out that the presence of female directors with family ties may create group fault lines that are harmful to the board's cooperation and effectiveness. The study of Bianco et al. (2015) revealed that the presence of family-affiliated female directors negatively influenced the frequency of board meetings and presented lower board meeting attendance than male directors. In interpreting this result, the authors argue that they are the consequence of the appointment of family-affiliated women with low levels of education and experience and relatively limited participation in business activities. Concerning the strategy side, Songini & Gnan (2009) have shown a positive relationship between the involvement of women in governance and management and the level of professionalization of family SMEs about incentives and reporting systems. They also showed that this relationship was not observable in non-family SMEs. This gap between family and non-family firms emphasizes how women with family ties strive to legitimize themselves through the introduction of tools aimed at monitoring and evaluating results (Memili & Dibrell, 2019).

Despite the beneficial effects of the inclusion of women on the board of directors regarding information asymmetry, disclosure, earnings quality, agency costs, and capital structure, questions arise on why they are still a minority. According to the critical mass theory by Kanter (1977), at least 35% of directors should be women in order to affect board decisions. If this percentage is not met, women on board are just tokens – that is, mere representatives of the gender – exerting only a marginal role in the organization. Kramer et al. (2006) observe that a critical mass of three or more women generates a change in board decision-making and improves the quality of corporate governance. Schwartz-Ziv (2017), investigating Kanter's theory of critical mass, obtained similar findings. The study reveals that the presence of at least three female directors makes them more participative and effective in meetings.

Based on previous consideration, the following research hypothesis is formulated:

Hypothesis 1: The presence of a critical mass of women on the board of directors decreases corporate leverage in family firms.

3. Research Design

3.1 Sample Selection

Our initial sample includes 500 benchmark Italian family firms identified by the 10th edition of the AUB Observatory, the Italian Observatory on the Family Businesses (Corbetta et al., 2018). These are medium and large-sized family-controlled companies that have shown economic-financial performances higher than the median of their sector in terms of growth, profitability, and indebtedness. Companies were classified as family firms if: (a) one or two families hold at least 50% of the capital (if unlisted); (b) one or two families hold at least 25% of the capital (if listed); (c) the firm is controlled by another legal entity which satisfies one of the two criteria stated above.

By considering that manufacturing is a traditional industry for Italian family firms due to the long term orientation of these companies (Bacci et al., 2018), we have selected all the manufacturing firms from the 500 benchmark firms for the period 2016-2018. After deleting companies with missing firm-year observations, our final sample consists of 268 family firms for a total of 816 firm-year observations. Financial and corporate governance data are from the Italian Digital Database of Companies (AIDA - Bureau Van Dijk).

Table 1: Breakdown of the sample by industrial sector

Industrial sector	Frequency	%
Chemical	13	4.85
Electronics	25	9.33
Fashion	42	15.67
Food and beverage	44	16.42
Furniture	13	4.85
Machinery	45	16.79
Metallurgy	26	9.70
Paper and print	4	1.49
Pharmaceutical	11	4.10
Rubber and plastic	13	4.85
Transports	9	3.36
Other manufacturing	23	8.58
Total	268	100.00

Table1 shows the breakdown of the sample by industry. As shown in the table, fashion, food and beverage, and machinery industries hold the highest percentage of companies, followed by the electronics and metallurgy sectors.

3.2 Description of Variables and Regression Model

To test our hypothesis, we estimate the following regression model:

$$Leverage_{i,t} = \beta_0 + \beta_1 CriticalMass_i + \beta_2 Profitability_{i,t} + \beta_3 Size_{i,t} + \beta_4 BoardSize_t + \beta_5 CEOGender_t + \beta_6 Group_{i,t} + \beta_7 FamGen_t + \beta_8 NonFamMemb_t + \beta_9 Capex_{i,t} + Industry\ dummies + \varepsilon_{i,t} \quad (1)$$

where *Leverage* is the debt-to-equity ratio of the firm *i* at time *t*; *CriticalMass* is a dummy equal to 1 if there are at least three women in the boardroom, 0 otherwise; *Profitability* is the return on assets ratio; *Size* is the natural logarithm of total assets; *Boardsize* represents the number of members

on the board of directors; *CEOGender* is a dummy variable equal to 1 for female CEO, 0 for male CEO; *Group* is a dummy variable equal to 1 if the business belongs to a group of companies, 0 otherwise; *FamGen* accounts for the generation managing the business; *NonFamMemb* represents the percentage of non-family members in the boardroom; *Capex* is a proxy of the firm's investments computed as the difference between tangible fixed assets at the time t and their value at $t-1$; *Industry dummies* are dichotomous variables identifying the industry of each firm according to the ATECO 2007 codes – the Italian classification of economic activities operated by the Italian National Institute of Statistics (ISTAT).

4. Empirical Findings

4.1 Descriptive Statistics

Table 2 provides the descriptive statistics of the variables in the analysis.

Table 2: Descriptive statistics

Variables	N	Mean	SD	Min	Median	Max
<i>Leverage</i>	802	1.008	0.731	0.048	0.810	3.840
<i>CriticalMass</i>	802	0.349	0.477	0.000	0.000	1.000
<i>Profitability</i>	802	0.108	0.071	-0.048	0.096	0.441
<i>Size</i>	802	18.706	1.713	14.612	18.463	27.746
<i>BoardSize</i>	802	6.188	4.140	1.000	5.000	27.000
<i>CEOGender</i>	802	0.096	0.294	0.000	0.000	1.000
<i>Group</i>	802	0.923	0.267	0.000	1.000	1.000
<i>FamGen</i>	802	1.930	1.040	1.000	2.000	10.000
<i>NonFamMemb</i>	802	0.482	0.316	0.000	0.500	1.000
<i>Capex</i>	802	4,64E+12	3,78E+13	11,408.000	19,333625.500	6,27E+14

The mean value of *Leverage* is 1.008, which means that the companies in our sample are financed almost in equal parts by owners and creditors. The mean value of *CriticalMass* is 0.349, indicating that about 35% of our sample firms has more than two women on their board of directors. Our average sample firm has a return on assets of 10.8% (*Profitability*) and 92% of them belong to a group of companies (*Group*). The average board size (*Boardsize*) is 6.188 with an average presence of non-family members (*NonFamMemb*) of 48.2%. Only 9.6% of companies has a female CEO (*CEOGender*) and they are run by the second generation on average (*FamGen*).

Table 3 reports the Pearson's correlation coefficients between all variables.

Table 3: Pearson's correlation coefficients

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Leverage	1.000									
(2) CriticalMass	-0.060	1.000								
(3) Profitability	-0.186*	-0.074*	1.000							
(4) Size	-0.035	0.277*	-0.306*	1.000						
(5) BoardSize	0.159*	0.498*	-0.133*	0.406*	1.000					
(6) CEOGender	0.070*	0.116*	-0.023	-0.075*	-0.069*	1.000				
(7) Group	-0.026	0.096*	-0.111*	0.221*	0.100*	-0.049	1.000			
(8) FamGen	-0.056	0.067	0.040	0.033	0.023	0.134*	-0.048	1.000		
(9) NonFam	0.031	0.286*	-0.092*	0.344*	0.463*	-0.015	0.101*	-0.055	1.000	
(10) Capex	-0.049	-0.005	-0.040	0.583*	0.123*	-0.037	0.034	0.008	0.020	1.000

* shows significance at the .05 level

The correlation among variables indicates that multicollinearity does not affect our analysis.

4.2 Multivariate Analysis and Robustness Checks

Table 4 reports the estimation results for the regression model described in Eq. (1), which verify whether the presence of a critical mass in the boardroom influences the leverage of family firms. Multicollinearity does not affect our results since the variance inflation factors (VIFs) are significantly below the threshold of 10 (Hair et al., 2014).

Table 4: Main results

Variables	(1)
<i>CriticalMass</i>	-0.258** (0.10)
<i>Profitability</i> ^a	-1.948*** (0.68)
<i>Size</i> ^a	-0.063 (0.04)
<i>BoardSize</i>	0.059*** (0.02)
<i>CEOGender</i>	0.294** (0.13)
<i>Group</i>	-0.065 (0.15)
<i>FamGen</i>	-0.044 (0.04)
<i>NonFamMemb</i>	-0.050 (0.15)
<i>Capex</i> ^a	0.000 (0.00)
<i>Industry Fixed Effects</i>	(Included)
<i>Constant</i>	2.375*** (0.80)
No. of Obs.	802
R-squared	0.148
Adjusted R-squared	0.126

^a Variables winsorised at the 1st and 99th percentiles

*, **, *** Significance at the 10, 5 and 1 % levels, respectively

Standard errors are indicated in parentheses

CriticalMass assumes the value -0.258 and it is statistically significant ($p < 0.05$). This confirms our hypothesis that the presence of at least three women on board leads to a reduction in the level of the *Leverage*. Our results highlight how achieving a critical mass could determine the reduction of the debt level since there is greater monitoring of agency costs instead of debt (Rossi et al., 2018). The critical mass can contribute to decreasing leverage also indirectly, through the well-known risk aversion of female directors respect to their male counterparts (Alves et al., 2015; Huang & Kisgen, 2013). Furthermore, the consistent number of women on board involves greater board heterogeneity. Gender-diversified boards could lead to more informed choices and consequently to less risky decisions (Adams & Ferreira, 2009).

According to prior literature (Amphenberger et al., 2013; Frank & Goyal, 2009; Lemmon et al., 2008), our findings confirm the existence of an inverse relationship between *Profitability* and *Leverage* in family firms.

Table 5 shows two statistical robustness tests, which confirm findings from the earlier analysis.

Table 5: Robustness Check

Variables	(2)	(3)
<i>WomenOnBoard</i>	-0.370* (0.22)	
<i>CriticalMass</i>		-0.061*** (0.02)
<i>Profitability^a</i>	-1.977*** (0.70)	-0.557*** (0.15)
<i>Size^a</i>	-0.073* (0.04)	-0.018** (0.01)
<i>BoardSize</i>	0.048*** (0.02)	0.012*** (0.00)
<i>CEOGender</i>	0.324** (0.14)	0.080*** (0.03)
<i>Group</i>	-0.081 (0.15)	0.002 (0.03)
<i>FamGen</i>	-0.041 (0.04)	-0.013 (0.01)
<i>NonFamMemb</i>	-0.066 (0.15)	-0.010 (0.03)
<i>Capex^a</i>	0.000 (0.00)	0.000 (0.00)
<i>Industry Fixed Effects</i>	(Included)	(Included)
<i>Constant</i>	2.620*** (0.79)	0.848*** (0.17)
No. of Obs.	802	802
R-squared	0.137	0.163
Adjusted R-squared	0.115	0.142

^a Variables winsorised at the 1st and 99th percentiles

*, **, *** Significance at the 10, 5 and 1 % levels, respectively
Standard errors are indicated in parentheses

In particular, we test the robustness of our outcomes applying a different measure of the representation of women in the board of directors (Column 2), employing the ratio of women on board over the board size (*WomenOnBoard*). Results are consistent with our previous findings, showing a negative and statistically significant relationship ($p < 0.10$) between *Leverage* and *WomenOnBoard*. We further test the robustness of the analysis, applying a different measure of *Leverage* (Column 3), given by the ratio between non-equity liabilities and total assets (Bacci et al., 2018). Results hold again, confirming that the presence of a *CriticalMass* ($p < 0.01$) contributes to the reduction of the debt level in family firms.

5. Conclusions

This paper contributes to the literature on board composition and debt level by investigating Italian family firms. To test the relationship between women on board and the leverage of the company, we rely on a sample of 268 benchmark Italian family firms identified by the 10th edition of the Observatory AUB Observatory.

We find that the presence of a critical mass of women has a negative impact on companies' debt level. This result shows the importance of having a critical mass of women in a board suggesting that the presence of women is a useful instrument in risk monitoring (Faccio et al., 2016). These findings are relevant for Italian family firms because they might be useful to improve their governance structure.

Given the little research in this field, future studies are needed and they can focus on corporate governance factors, such as the median age of the female directors, that can have an impact on companies' debt-equity choices. Furthermore, future studies might analyse the relationship between

board gender diversity and leverage with particular attention to different debt variables that might capture the impact of family firms' characteristics.

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