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## **BOARD GENDER AND FIRM VALUE: AN EMPIRICAL ANALYSIS**

***Abstract.** Corporate board structure and its impact on firm value creation process is one of the most debated issues in corporate finance, especially diversity characteristics such as gender, race or culture. The aim of the paper is to test if gender diversity within corporate management improves corporate value. Using a sample of 9680 companies from G8 countries for the year 2012, we found statistically significant positive relationships between the presence of women on the board and firm value, as measured by Tobin's  $Q$ . As expected, the number of women directors on boards is more important rather than the presence of women on boards. The results are robust for different subsamples and estimation methods provide important evidence that firms with women directors have greater value.*

***Keywords:** women directors, board, Tobin's  $Q$ , insiders, corporate governance.*

**JEL classification: G34; G32; G31; G30.**

### **1. Introduction**

Gender equality is enclosed in the European Treaties and represents one of the EU's main tasks, being also a necessary condition for the achievement of the objectives of the EU's 2020 growth strategy, which is based on knowledge, competences and innovation. Despite the important progress during the last decades, gender inequalities still persist in leadership positions.

The statistics demonstrate that in the corporate sector, women are outnumbered by men in leadership positions, being the focus of seething public debate in Europe. Various research studies show that companies with a higher representation of women in leading positions deliver stronger financial performance and improved corporate governance and, on the other hand, the under-utilisation of women can be considered a loss of economic growth and wasted potential.

According to the European Commission report, entitled "Women and men in leadership positions in the European Union", "women accounted in April 2013 for 16.6% of board members of large publicly listed companies in the 27 EU Member States" (the data for Croatia had not been enclosed at the date of the report). The report shows that the share of women has risen by an estimated 2.3 percentage points in 12 months and nearly 5 percentage points since October 2010 (11.8%).

The many benefits associated with gender balance on boards has determined some national governments to initiate legislative measures to encourage or enforce change, also having the support of social partners, companies and other stakeholders, in order to break down the barriers that enables women to have access to leading positions.

The aim of the paper is to test if gender diversity within corporate management improves corporate value, meaning if there is difference in the financial characteristics of companies with a greater number of women on boards. Using a sample of 9680 companies from G8 countries for the year 2012, we found that firms with women directors have greater value. Secondary, we found that there are country particularities in corporate governance characteristics.

The paper is organized as follows. Section 2 highlights theoretical considerations regarding the impact of gender diversity (women on boards) on value creation process. Section 3 briefly describes data collection, variables used in empirical model, summary statistics and methodological framework. Empirical results and robustness tests are reported in section 4, whilst section 5 summarizes the conclusions of the paper.

## **2. Literature review**

There has been considerable research on the impact of gender diversity on business and is no clear motivation to why gender diversity matters, because usually data and interpretations are objective, while the interpretation of the results may be subjective.

Ultimately, many public bodies involved themselves into supporting the increase of women percentage as directors on boards, by setting mandatory targets (Norway, Italy, France, Denmark, Germany) or simply recommendations referring to board diversity, in order to provide better corporate governance. Also, one can notice the initiatives meant to support companies by different institutions or advocacy groups or even real actions developed by companies themselves (KPMG in UK, Ferrovial in Spain, and DONG Energy in Denmark).

Credit Suisse Research Institute's 2012 report entitled "Gender diversity and corporate performance", in testing the performance of 2,360 companies globally over the last six years, showed that companies with one or more women on the board have delivered higher average returns on equity, lower gearing, better average growth and higher price/book value multiples over the period 2005-2011. Their research suggested that a specific

consequence of greater board diversity for shareholders is one of reduced volatility – manifested as enhanced stability in corporate performance and in share price returns.

Catalyst Inc (2007) showed that Fortune 500 companies with more women on their boards outperform their competitors with return on sales 4 percentage points higher and return on equity 4.8 percentage points higher.

Similarly, Deszõ and Ross (2007) investigated 1500 American companies in the period: 1992 – 2006 and demonstrated the “strong positive association between Tobin’s Q, return on assets, and return on equity, on the one hand, and the participation rate (of female top management) on the other.”

There is a significant literature body that supports the idea that there is no causation between improved gender diversity and the increase in profitability and stock price performance. Instead, the appointment of more women on boards may be a market signal for a focus on corporate governance and that the company is already running in a proper manner.

Adams and Ferreira (2009) investigated the impact of greater gender diversity on 1,939 US stocks between 1996 and 2003. By using two different techniques to handle reverse causation, they found statistically significant negative effects on profits and stock value due to the appointment of more women on boards.

Farrell and Hersch (2005), by using 300 companies from top Fortune 500 in the period 1990 and 1999, showed that firms with strong profits (ROA) are more likely to appoint female managers, but, instead, the presence of female managers does not influence corporate performance.

Kangtao Ye, Ran Zhang and Zabihollah Rezaee (2010), using a large sample of Chinese listed firms, showed that earnings quality proxies, including earnings persistence, the accuracy of current earnings in forecasting future cash flows, the association between earnings and stock returns, and the absolute magnitude of discretionary accruals do not differ significantly for companies with female and male top executives.

Smith, Smith, and Verner (2006) used the panel data technique on 2500 Danish firms to explore performance measures and found out that female outside directors determine negative effects, while female inside directors determine positive effects.

One can also notice the opposite literature body, that spreads the idea that an increased number of women on boards has a positive effect on corporate performance and governance.

Katherine Phillips et al (2006) have studied the impact of gender diversity in team working process and concluded that, when working in a gender diverse team, the participants tend to prepare harder, the results are positive and quicker and also problem solving, due to the fact that the minority involvement increases the result performance as a whole.

David A. Carter et al. (2003) examined the relationship between board diversity and firm value for Fortune 1000 firms. After controlling for size,

industry, and other corporate governance variables, the authors found significant positive correlation between the proportion of women on boards and firm value and also that the proportion of women on boards increases with firm size and board size, but decreases as the number of insiders increases.

Erhardt, Werbel, and Shrader (2003) investigated 112 large companies for five years and found a significant positive correlation between gender and minority representation on boards and return on assets (ROA) and return on investment (ROI).

Bonn (2004) showed a positive relationship between the proportion of female directors and book-to-market ratio in Australian firms, while Nguyen and Faff (2007) found a positive correlation between gender diversity and Tobin's Q. Campbell and Minguez-Vera (2008) found a significant positive relationship between the gender composition on boards and Tobin's Q in Spanish firms. Luckerath-Rovers (2010) found a significant positive relationship between female board representation and return on equity by investigating Dutch companies.

Following the same idea, if the team result is better than the sum of the individual inputs, then the team adds value. On the other side, diversity may bring tension and conflicts to the decision-making process. Phillips et al (2006) showed that even though the diverse groups were more likely to produce a better result for the company, "their confidence in that result was lower and the working environment was perceived to be more difficult".

Other studies (Jackson et al (2003) have shown that the effects of conflict, communication and tension can surpass the potential positive effects brought on by different points of view.

A study of Canadian companies by Brown and Anastasopoulos in 2002 entitled "Not Just the Right Thing, but the "Bright" Thing", showed that boards with three or more women performed better in terms of corporate governance than companies with all male executives. The study also found that the more gender-diverse boards focus on better communication to employees, engage in customer satisfaction, and consider diversity and corporate social responsibility.

Adams and Ferreira (2009) suggested that gender diversity improves corporate performance of firms with weak governance but, for firms with strong corporate governance, gender diversity only results in "over-monitoring", which can lead to inefficient management, lower profits and worsen the stock price. The ultimate challenge for management is to develop the positive effects, while covering the pitfalls.

### **3. Data and methodology**

In order to test the relationship between corporate governance and firm value we focus our analysis on industrial companies from "G8" region. Our selection is motivated by the fact that most multinational companies are headquartered in this region and thus such companies are likely to have a higher diversity in board structure, in terms of gender, racial and cultural composition.

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For these companies, data were collected from Osiris database provided by Bureau van Dijk (BvD), version 154.

The Osiris Database include around 80.000 listed and major unlisted/delisted companies and several selection criteria were applied which worth to be noticed. First, we have eliminated firms with missing data for directors and financials or non-normal data, i.e. negative assets. Second, since data for directors are not available annually, we have focused our analysis for the year 2012. Thus, the final data set is a cross-section sample consisted out of 9680 companies.

Table 1 provides descriptive statistics for entire sample. The average size (turnover) of the firms in our sample is \$2.9 billion and value is not created since Tobin's Q is lower than 1. The average board is made-up of 15.8 directors with the mean age of the directors around 48.86 years, of whom, on average, 9.7% are insiders and 8.8% are women.

**Table 1. Descriptive statistics for sample**

VARIABLE	MEAN	MEDIAN	SD	# Observations
Tobin's Q	0.943	0.690	1.006	9680
% of women on board	0.088	0.063	0.107	9680
% of insiders on board	0.097	0.000	0.197	9680
# of directors	15.786	12.000	13.398	9676
Age of directors	48.856	54.000	15.845	9680
Profitability (ROA)	0.024	0.041	0.146	9680
Debt Ratio	0.518	0.514	0.252	9680
Firm size	2,912,346	304,004	14,500,000	9680

Source: Authors' calculations

Table 2 provides a breakdown for variables of interest (Tobin's Q, % of women on board, % of insiders on board) by country.

**Table 2. Breakdown by country**

Country	# Firms	Tobin's Q		% Women		% Insiders		Total directors	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Canada	769	0.900	1.085	0.076	0.107	0.099	0.198	13.681	11.845
Germany	520	0.942	0.947	0.090	0.105	0.093	0.183	16.598	14.069
France	493	0.910	0.929	0.092	0.105	0.109	0.217	16.937	16.295
Great Britain	825	0.998	1.147	0.090	0.114	0.117	0.222	14.681	12.812
Italy	194	0.896	0.961	0.095	0.114	0.102	0.194	17.557	16.858
Japan	3160	0.913	0.950	0.085	0.104	0.095	0.194	15.157	12.351
Russia	248	0.867	0.817	0.085	0.098	0.092	0.190	18.270	15.230
USA	3471	0.978	1.034	0.092	0.108	0.092	0.193	16.527	13.753

Source: Authors' calculations

As can be observed, the highest average firm value is recorder in Great Britain (0.998) whereas the lowest average firm value is recorder in Russia (0.87). In terms of number of directors, the lowest average board is recorded in Canada (13.7) and the highest average board is recorded in Russia (18.3). The presence of women on board is high in countries such as Italy (9.5%) and France (9.2%) while in Canada is the lowest (7.6%). Shareholders are most involved in the management process in Great Britain (11.7% from board directors) and less involved in Russia or USA (9.2%). This statistical results lead to the preliminary conclusion that for each country cultural characteristics play a dominant role in explaining board diversity.

In terms of methodology, we use regression analysis in order to examine the effects of board of director gender on firm value. In this respect, we regress a proxy of firm value against proxies of board of director gender as follows:

$$\text{Firm value} = \beta_0 + \beta_1 \text{Gender} + \sum \beta x + \varepsilon \quad (1)$$

where Tobin's Q is a proxy for "firm value", defined as total market value of firm (enterprise value) to total book assets value; "gender" is variable of interest for which we use as proxy both the percentage of women on the board (% of women on board) and a dummy variable indicating the presence of women on the board (women director on board); "x" is a vector of controls.

For the purpose of robustness and following previous studies, we decide to include several corporate control variables: board size (natural logarithm of the number of directors), the percentage of insiders on the board, firm size (natural logarithm of turnover), profitability (return on assets) and debt ratio (total debt to total assets). Firm value, profitability and debt ratio are winsorized at 99<sup>th</sup> percentile values for dealing with outliers. Given the different characteristics across countries country effects is included in our model.

As a benchmark, we start our estimations by using OLS regressions for each proxy of gender. Second, instead of least square criterion we use the least absolute deviation with respect to variations from the median, formerly known as median regressions. According to the main of the paper, the estimation leads us to testing the following hypothesis:

$$H_0: \text{"Board of directors gender does not affect firm value } (\beta_1=0)\text{"}$$

It's worth to be noticed that either rejection (especially the negative case) or failure to reject the null hypothesis is not equivalent with the state that women make poor directors. Rather it could be seen as a strategy used to improve the appearance regarding gender discrimination.

#### **4. Results**

In this section we will be presenting the results for the hypothesis tested regarding the relation between director's gender and firm value. In table 3 are highlighted comparisons between the two proxies used for director's gender, the percentage of women on the board (Model 1 and 2) and a dummy variable indicating the presence of women on the board (Model 3 and 4). According to

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the methodology employed, Model 1 and 3 use OLS estimation, whereas Model 2 and 4 use least absolute deviation estimation (median regression).

**Table 3. Estimates of the relationship between the effects on board of director's gender on firm value**

VARIABLES	MODELS			
	(1)	(2)	(3)	(4)
% of women on board	1.013*** (0.098)	0.809*** (0.060)		
Women director on board (1/0)			0.294*** (0.020)	0.204*** (0.012)
Board size	0.107*** (0.013)	0.066*** (0.010)	0.065*** (0.013)	0.043*** (0.009)
% of insiders on board	0.104** (0.046)	0.103*** (0.033)	0.111** (0.046)	0.117*** (0.030)
Firm Size	-0.043*** (0.007)	-0.013*** (0.004)	-0.046*** (0.007)	-0.015*** (0.004)
ROA	1.315*** (0.146)	0.989*** (0.053)	1.337*** (0.145)	1.038*** (0.048)
Debt ratio	0.031 (0.050)	0.159*** (0.028)	0.032 (0.049)	0.157*** (0.025)
Constant	0.953*** (0.080)	0.496*** (0.044)	1.025*** (0.080)	0.541*** (0.040)
R-squared (Pseudo R2)	0.057	0.037	0.066	0.041
Country Dummy	Yes	No	Yes	No
F-statistic	26.652***		36.008***	
RMSE	0.874		0.870	
# Observations	9347	9347	9347	9347

Robust standard errors in parentheses

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

Source: Authors' calculations

The estimated coefficients for the variables of interest as well as for several of the controls are statistically significant. The estimated coefficient for the percentage of women on board variable is ranging from 1.013 ( $p=0.000$  in OLS) to 0.809 ( $p = 0.000$  in MEDIAN) while the estimate for the dummy variable indicating the presence of women on the board variable is ranging from 0.294 ( $p=0.000$  in OLS) to 0.204 ( $p=0.000$  in MEDIAN). By comparing the coefficients for both gender proxies, one can argue that is more important the number of women directors in board rather than the presence of women on

board. These results reject the null and provide strong evidence of the positive association between firm value and the presence of women directors.

From the controls it is interestingly the contradictory results reported for firm size and profitability, i.e. negative and positive respectively associated with firm value. This lead to the conclusion that sales item individually is not critical for firm value but rather in conjunction with costs items, i.e. gross or net income. For the value creation process, it seems to be important the presence of shareholders on board as well as the board size. We also find that debt ratio is significant and positive in explaining Tobin's Q, which is consistent with trade-off theory of capital structure.

Because differences in firm value and corporate governance may be related to country characteristics and our sample is dominated by firms from USA (36%) and Japan (33%), we split the sample in three subsamples, i.e. USA, Japan and other countries. Again we examine both proxies for director's gender and make use of median regressions, the results being reported in table 4.

**Table 4. Robustness check**

VARIABLES	MODELS					
	USA	JP	OTHER	(4) USA	(5) JP	(6) OTHER
% of women on board	0.837*** (0.096)	1.037*** (0.110)	0.702*** (0.083)			
Women director on board (1/0)				0.193*** (0.019)	0.255*** (0.023)	0.171*** (0.021)
Board size	0.064*** (0.015)	0.057*** (0.018)	0.071*** (0.014)	0.039*** (0.014)	0.030* (0.017)	0.049*** (0.016)
% of insiders on board	0.182*** (0.054)	0.135** (0.060)	0.044 (0.045)	0.207*** (0.048)	0.150*** (0.056)	0.071 (0.050)
Firm Size	-0.007 (0.007)	-0.006 (0.008)	-0.018*** (0.005)	-0.010* (0.006)	-0.009 (0.007)	-0.019*** (0.006)
ROA	1.224*** (0.089)	1.013*** (0.093)	0.902*** (0.073)	1.172*** (0.078)	1.024*** (0.088)	0.930*** (0.081)
Debt ratio	0.113** (0.045)	0.133*** (0.050)	0.189*** (0.038)	0.116*** (0.039)	0.141*** (0.047)	0.243*** (0.043)
Constant	0.436*** (0.071)	0.426*** (0.087)	0.551*** (0.058)	0.493*** (0.062)	0.476*** (0.082)	0.554*** (0.065)
Pseudo R-squared	0.037	0.041	0.035	0.043	0.049	0.037
# Observations	3347	3102	2898	3347	3102	2898

Standard errors in parentheses

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

Source: Authors' calculations

Again, the main hypothesis is rejected and the highest association is recorded for companies from Japan. As country particularities in value creation process, it's worth to be noticed that firm size is not significant for companies

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from USA and Japan, whereas for companies from other countries is not important the presence of shareholders on board. These results lead to the conclusion that our hypothesis is robust to various subsamples.

Furthermore, several authors outlined the endogeneity issue in this relation, since board diversity could affect firm value but firm value could also affect board diversity (Carter et al., 2003). We tackle this issue by estimating simultaneous equations in Tobin's Q, % of women, board size and % of insiders on board using three stage least squares (3SLS) regressions, similar to Coles et al. (2008) and Bhagat and Black (2001). We motivate the 3SLS estimator usage because prior studies conclude that the 3SLS is consistent and in general is asymptotically more efficient than the 2SLS estimator (Mikhail, 1975). For the consistency of 3SLS estimation we have included two additional variables in equations system, natural logarithm of average age of the directors (Age) and natural logarithm of total assets (Firm size 2).

**Table 5. 3SLS Estimates of the relationship between the effects on board of director's gender on firm value**

VARIABLES	DEPENDENT VARIABLE			
	Tobin's Q	Women %	Board Size	Insiders %
% of women on board	4.468*** (1.377)		43.675*** (2.889)	
Board size	0.004 (0.047)			-0.036*** (0.007)
Firm Size	-0.046*** (0.007)			
ROA	1.323*** (0.083)		3.525*** (1.083)	-0.106* (0.055)
Debt ratio	0.087*** (0.026)			
Age		0.023*** (0.001)		
Firm Size2		0.003*** (0.001)	-0.117*** (0.038)	-0.008*** (0.002)
Tobin's Q		0.078*** (0.015)	-3.095*** (0.787)	0.118*** (0.041)
Constant	0.991*** (0.072)	-0.073*** (0.016)	2.830*** (0.834)	0.192*** (0.041)
Chi2	416.31***	605.06***	333.32***	211.95***
# Observations	9347	9347	9347	9347

Standard errors in parentheses

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

Source: Authors' calculations

Table 5 reports the parameter estimates for all sample where we find that the results are generally consistent with our main hypothesis. However, the magnitude for gender proxy seems to be four times higher (4.468) under 3SLS and board size is not important in value creation process. In comparison with 2SLS estimator used in prior studies, the coefficient for % of women on board represents only half from such value, i.e. 4.468 versus 9.426 reported by Carter et al. (2003). Since our results are qualitatively different under 3SLS, we can conclude that this method could not be subject to specification error and therefore the endogeneity issue is addressed.

Overall, our results are consistent with previous findings. As before, the estimates for gender proxy are significant and positive suggesting that firm value is increased by women directors. We also find that profitability and debt ratio are significant in explaining firm value, consistent with trade-off theory of capital structure. These results suggest that firms with women directors have greater value.

## **5. Conclusions**

An important driver in good corporate governance seems to be the relationship between board diversity and value creation process. In this respect, our main aim is to examine the effects of board of director gender on firm value for top 9680 companies from the most developed countries for the year 2012. Board of director gender is defined both as the percentage of women directors on board and a dummy variable indicating the presence of women on board.

Our most important finding is as follows. After controlling for other corporate governance drivers (number of directors, percentage of shareholders on board) and firm characteristics (size, profitability and debt ratio), we find statistically significant positive relationships between the presence of women on the board and firm value, as measured by Tobin's Q. We also find that that is more important the number of women directors in board rather than the presence of women on board. From controls, profitability and debt ratio are significant in explaining firm value, consistent with trade-off theory of capital structure.

The results are robust for different subsamples and estimation methods and suggest that firms are making a commitment to increasing the number of women on boards. However, such decisions could be seen as strategies used to improve the appearance regarding gender discrimination. Overall, our results provide important evidence that firms with women directors have greater value.

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