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Publication metadata

Title: Women on boards, sustainability reporting and firm performance

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Journal: Sustainability Accounting, Management and Policy Journal

DOI/Link: <http://dx.doi.org/10.1108/SAMPJ-07-2015-0055>

How to cite this post-print from LAUR:

Arayssi, M., Dah, M., & Jizi, M. (2016). Women on boards, sustainability reporting and firm performance. Sustainability Accounting, Management and Policy Journal, DOI, 10.1108/SAMPJ-07-2015-0055, <http://hdl.handle.net/10725/4819>

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Women on boards, sustainability reporting and firm performance*

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To cite this document:

Mahmoud Arayssi, Mustafa Dah and Mohammad Jizi, (2016), "Women on boards, sustainability reporting and firm performance", Sustainability Accounting, Management and Policy Journal, Vol. 7 Iss. 3 pp. 376 – 401

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*The authors thank Professor Carol Adams (the Editor) and Professor Giovanna Michelon (the Associate Editor) and the two anonymous reviewers for their valuable and constructive comments, which indeed assisted in enhancing the clarity and the quality of the paper.

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Abstract

Purpose – As pressures mount for women directors on corporate boards (WDOCB) from different stakeholders, companies become more interested in finding out how WDOCB impact sustainability disclosure. The purpose of this paper is to investigate the effect of gender diverse boards on the association between sustainability reporting and shareholders' welfare.

Design/methodology/approach - This paper examines the implications of women on board for firm-related factors, particularly environmental, social and governance (ESG) disclosure and firm performance. The firms studied are all listed in the FTSE 350 index between 2007 and 2012. We use Bloomberg social disclosure score and apply panel data through a regression model.

Findings - The results reveal that the presence of women on the board of directors favorably influence on firm's risk and performance through promoting firm's investment in effectual social engagements and reporting on them. The desirable effect of WDOCB on the ESG-performance relationship leads to increased risk-adjusted and buy-and-hold abnormal returns and reduced firm risks, measured by both volatility of returns and systematic risk.

Originality/value - The research contributes to the literature on the relationship between women participation on corporate boards and firm's good citizenship and enhanced shareholders' welfare. The empirical findings contribute to providing statistical and economical validity to the U.K corporate governance code 2014 recommendation on the importance of board gender diversity for effective board functioning.

Keywords Environmental social and governance Disclosure, Women board directors, Risk, Firm Value.

JEL Classification G32, J16

Paper type Research paper

1. Introduction

Recently, firms have experienced heightened levels of economic, legal, and ethical social responsibilities (Bellringer *et al.*, 2011). This is why corporate social responsibility (CSR) has lately received more attention and has become an essential factor in most firms' business plans and agendas (Camilleri, 2015; Kend, 2015). Stakeholders, especially shareholders, require more information regarding the firm's involvement in social and environmental functions. Therefore, many firms are now endorsing their commitment to sustainable activities by voluntarily publicizing any social, environmental, and governance information in their annual reports as well as on their corporate websites. Yet, the literature offers diverse confirmation on the success of social and environmental releases and whether they strengthen shareholders' welfare (see El Ghouli *et al.*, 2011; Griffin and Mahon, 1997; Orlitzky, 2001; Orlitzky *et al.*, 2003; Margolis and Walsh, 2003; Murray *et al.*, 2006). This paper investigates the importance of female participation on the firms' board of directors. We argue that women participation on corporate boards enhances firm's environmental, social and governance (ESG) disclosure and favorably influence on the ESG-firm performance relationship. In addressing the importance of communication for effective board functioning, the UK corporate governance code of 2014 encourages board diversity in order to facilitate constructive dialogue. The code highlights the significance of diverse views in the board room for effectual stakeholders' engagement and strategy delivery. Changing gender dynamics on corporate boards introduce wider range of perspectives, attributes and skills in board discussions, which improve board performance. Increasing the representation of women is an opportunity to acquire talents from a larger pool of working population who are likely to be more stakeholder-oriented and aligned with the market needs.

Our research aims at providing empirical evidence on the importance of board gender diversity in promoting firm's good citizenship and enhancing shareholders welfare. In doing so, our empirical findings tend to contribute in providing statistical and economical validity to the code's recommendation. This is likely to encourage firms to have positive steps toward improving female participation in the boardroom to grasp the opportunity of achieving better performance and corporate governance. Johnson *et al.* (1996) and Pearce and Zahra (1992) discuss that gender and race are frequently considered representations of different views, and fresh perspectives on complex issues, that persons bring to firms. Therefore, the spirit of maintaining gender balance is to achieve good business sense and maintain strong ties with key stakeholders which are the catalyst for business sustainability.

We assume that higher levels of women participation enhance the firm's governance and improve corporate decision making. This paper proposes that the governance structure and the quality of board monitoring have an impact on the interaction between the firm's engagement in social and environmental activities and shareholders' interest. That is, the increase in female participation on corporate boards of directors significantly increases the value of sustainability-related investments. Bear *et al.* (2010) suggest that women directors play a significant role in the choice of CSR activities. This may reflect an increase in the number of social activities that are disclosed or an increase in the quality of CSR activities. Given that women are more socially conscious investors than males (see, Nilsson 2009, Schueth 2003 and Sparkes 2002), one would expect greater percentage of women on corporate boards to have a positive impact on the level and quality of ESG disclosures. This helps to promote the firm as a good citizen. Additionally, investors need not sacrifice returns when investing in a socially responsible way. Galbreath (2011) proposes that women on the board of directors promote long-term sustainability projects such as engaging in and reporting on socially-responsible investments. Our findings confirm the direct relationship between the participation of women directors and ESG disclosure. Firms with higher women participation on corporate boards seems to be more inclined toward spending and reporting on social and environmental related activities and/or selecting potentially effective social projects.^[i]

Accordingly, we proceed to inspect the efficacy of the reported positive influence of increased women participation on ESG disclosure efficiency. The efficiency of reporting is measured by its effect on the firm's risk and return. That is, an increase in the efficiency of reporting increases the firm's performance and lowers its risk. Compared to low gender diverse boards, our results suggest a significant decrease in the firm's risk level at high levels of women on the board.^[ii] Hence, gender board diversity encourages valuable ESG reporting. Enhanced board monitoring transmits positive signals to stakeholders regarding the firm's CSR orientation and, thus, benefits shareholders' welfare through its positive impact on the firm's risk and performance. In addition, we observe a significant appreciation in the effect of ESG disclosure on firm value at high WDOCB relative to low women participation on boards.^[iii]

This research adds to the growing body of literature on the effects of governance and board diversity on ESG disclosure and firm performance. We complement Bear *et al.* (2010) by documenting the impact of corporate governance (through the participation of women on board) on the welfare effect of CSR disclosures. This paper breaks from the existing literature

by showing that an increase of women on boards enhances the level and efficiency of ESG disclosure, which in turns has desirable consequences on the corporate performance as measured in terms of decreasing stock return volatility and increased returns. In addition, we deduce that improving the efficiency of ESG reporting, through WDOCB, strengthens the signaling of the firm's ability to generate future cash flows.

The remainder of the article is organized as follows: Section 2 reviews the literature. Section 3 presents the data and descriptive statistics. Section 4 reports our empirical results. Section 5 concludes.

2. Literature Review

Many studies concerning gender diversity and firm performance focus on the gender diversity within boards of directors. Particularly helpful in this regard, are two well-known theories – agency theory and stakeholder theory; the former suggests having more WDOCB not to have any corporate financial consequences, while the latter predicts business (especially social) welfares from promoting females to senior executive situations. In appraising the CEO's work, female directors might advance the interests of workers and other stakeholders who affect and are affected by the company's profitability (Kramer *et al.*, 2006). Therefore, from an agency-theoretic standpoint, when the complete influence of gender variety on a corporate board is considered, it is unclear whether supporting larger female participation advances or retracts corporate governance and, consequently, company's profitability.

To further illustrate the agency theory perspective we look at the effect of the board's variety on investors reactions. Post and Byron (2014) shows that female board representation increases accounting returns, especially in countries with stronger shareholder protection, and raises monitoring and strategy involvement in the board. Lee and James (2007) insist that investor reactions to the announcements of female CEOs are significantly pessimistic comparing to men's declarations. According to Catalyst (2000) and Daily *et al.* (1999), there exists a small number of women in the executive ranks, suggesting that the 'glass ceiling', an apparent obstacle that only allows women to advance to specific ranks in the firm, still impedes high-achieving women, relative to the most senior levels of the company.

On the other hand, stakeholder theory argues that the success of the firm is determined by maintaining good relationships with its society, respecting society values and responding to their societal obligations and concerns (Branco and Rodrigues 2006, Foote *et al.*, 2010). Sustainability reporting forms part of the dialogue between a firm and its stakeholders reflecting firms respect and commitments to society on one hand (Gray *et al*

1995), and demonstrating the mutual exchange of benefit on the other hand (Bear et al., 2010). Wide range of previous researches evidenced CSR disclosure impact on firm's reputation, risk level and performance (Lourenco et al., 2012; Cormier et al., 2011; El Ghouli et al., 2011; Salama et al., 2011; Godfrey et al., 2009; Scholtens 2008). Moreover, long term investors value firms environmental and social profile when building their trading decisions, due to the buffer of goodwill and competitive advantage social reporting provides to the firm particularly when facing challenging events (Rupp et al., 2006; Godfrey et al., 2009). El Ghouli et al. (2011) and Richardson et al. (1999) for example, argue that communicating social information reduces firm's cost of capital and improves firm's performance as it reduces future cash flows uncertainty. Therefore, reporting on firms' social and environmental activities assists in the management of agency conflicts and strengthens the link with key stakeholders (Arvidsson, 2010).

The high percentage of women on boards of directors contributes to more effective corporate governance through a variety of board processes, as well as through entity interactions as stated by Terjesen *et al.* (2009). Mallin and Michelon (2011) find that women directors enhance sensitivity towards others and their consideration of the multiple interests of stakeholders is able to improve the service role of the board of directors. Mallin *et al.* (2013) find that monitoring mechanisms raise the chance that firms commit to CSR and increase their performance. Michelon and Parbonetti (2012) find that corporate governance enhances the heterogeneity of sustainability disclosures in US and European firms. Walls *et al.* (2012) examine the interaction between ownership and board and its relevance for environmental concern; additionally, they inspect the critical effect on ownership management and board management on environmental power. It appears that women directors contribute to some main organizational outcomes as they occupy direct roles as leaders, counselors, and network members as well as indirect roles as symbols of change and opportunity for new women.

Disclosure studies demonstrate that revealing voluntary information aims at increasing transparency, thus facilitating decisions about investments (Meek *et al.*, 1995), and reducing the agency and the informational costs in financial markets (Jensen and Meckling, 1976; Poshakwale and Courtis, 2005; Cormier and Gordon, 2001; Verrechia, 2001). Upgraded disclosure serves stock participants with more detailed information, assists them with shrinking the uncertainty gap, reducing stock return volatility and raising stock price (Kothari *et al.*, 2009; Bushee and Noe, 2000). Moreover, Richardson *et al.* (1999) argue that equity value is a reflection of financial and non-financial information in efficient markets. A

broader disclosure base helps in shrinking the uncertainty gap and encouraging dealing in the security, which generates positive returns (Kim and Verrechia, 1994). Expanded disclosure practice encourages investors to change stock valuation given the available information, which leads to stock price improvement (Healy *et al.*, 1999; Jizi *et al.*, 2016). In this context, Cormier *et al.* (2011) argue that CSR disclosure can cut information asymmetry between the management and external stakeholders because it lessens overall stock market asymmetry. Moreover, firms with higher social and environmental engagements witness relatively reduced systematic risk (Salama *et al.*, 2011).

Previous research points out the existing positive link between gender diversification on the board, and stock price value (Gul *et al.*, 2011). Studies proved that this mixture improves stock price value as a result of rising voluntary public disclosures in large firms and increasing the incentives for private information collection in small firms. Kang *et al.* (2009) assert the positive investors' insights of gender matters especially in the Asian context; precisely, Singapore investors generally react optimistically to the appointment of women directors. However, they are less receptive when these women directors also assume the CEO position. This welcoming reaction of investors increases the diversity of board members, since it maintains and/or increases the independence of the corporate board. Supporting this, Liu *et al.* (2013) show that the percent of women directors in China has a significant and positive impact on firm performance calculated by the return on sales and the return on assets (ROS and ROA). On the other hand, Srinidhi *et al.* (2011) state that insignificant unusual returns are documented on the announcement date of a woman added to the board, however they find that women on boards increase the monitoring in firms, as evidenced by a higher earnings quality.

As far as firm value is concerned, Campbell and Minguez-Vera (2008) show that diversity of the board has a positive impact on the firm's value, therefore, implying that the most important focus for Spanish companies should be the balance between women and men. Carter *et al.* (2003) find that the board diversity on Fortune 1000 firms improves shareholder's value. On the other hand, Dezsö and Ross (2012) claim that female representation in top management leads to better firm performance only to the degree that a company is focused on innovation as part of its strategy. Arguably female directors behave in a different way than male directors, and the effectiveness of the board is consequently influenced by the gender diversity of its directors (Adams and Ferreira, 2009). Colaco *et al.* (2011) discuss the diversity of board and say that it can lead to more autonomous oversight and advanced quality decision making; after all, women proved that they are active members

in both formal and informal governance activities and that they have abilities that could be transferred into positions on boards of larger organizations and that could shift from charitable settings to profit settings. Zhang *et al.* (2013) assert that the latter occurs, since the positive relation between the high proportion of women on the board and better CSR performance (as measured by the Fortune magazine FAMA data supplemented by the KLD social ratings for companies) within the firm's industry exists. Siciliano (1996) finds that a greater diversity in board members was able to enhance the collective performance and mission of the firm but did not affect donations.

In addition, women leaving a board increase the possibility of another woman being added to the board. Dalton and Dalton (2010) confirm that to acquire legality to the progress of women is a major ground of institutional theory of certain organizational practices because once adopted, these practices will be highly resistant to change.

Bear *et al.* (2010) explore the positive liaison between the number of women on the board of directors and CSR using KLD; they underline that the percentage of women on the board is positively associated with elevated communication and corporate reputation. In this paper, we use a model similar to the one in Bear *et al.* (2010) with the difference that our ESG proxy is first, a more reliable one than Fortune's World's Most Admired Companies List, and second, a weighted average disclosure score, not related to social reputation. We analyze several, more extensive than Bear *et al.* (2010), models to assess the contribution of women on social disclosures and to show how they both combine to enhance the firm's performance and lower its risk.

3. Data and Descriptive Statistics

Firm's social responsibility is the voluntary interaction between the firm and its stakeholders by addressing their social and environmental concerns through their business activities (Reverte, 2009). The signaling power and influence of firm's social and environmental profile is most likely determined by the effective communication of the firm's social and environmental engagements to the largest group of stakeholders and the level of involvement, which mirrors acknowledgment to society and unselfishness (McWilliams and Siegel, 2001; Godfrey *et al.*, 2009). Our study make use of Bloomberg ESG disclosure score which is based on the extent of environmental, social, and governance information a firm reveals in their published material to collect information on firms comprised in the FTSE 350 index. The score is a weighted average disclosure score considering the effectiveness of firms' reported ESG engagements rather than the volume of disclosed information^{iv}. Therefore, if a firm has

low social and environmental involvements but exaggerated in reporting on them, the score will not account for the volume of reported information but the type and significance of involvement, and consequently the score will be low. Therefore, the score is measuring the content of ESG disclosure. Better disclosure content enhances transparency which assists in reducing the uncertainty gap, reducing the cost of capital and return volatility as well as enhancing stock price (Kothari et al., 2009). Therefore, firms with better disclosure practice have better stock prices, as revealing the type of information that helps investors' better forecast future cash flows tends to reduce uncertainty and facilitate the prediction of future returns (Gelb and Zarowin 2002).

Our sample period is from 2007-2012. The score ranges from 0.1 for firms that disclose a minimum level of ESG information to 100 for firms that disclose on all the data points collected by Bloomberg. Bloomberg ESG disclosure score allocates different weights to every collected data point according to its social impact. For example, green gas emission material has a larger weight compared to other reported materials. The score is tailored for each industry to assess a given firm in relation with the data related to its particular industry sector.

Bloomberg is also used to collect data on the percentage of women serving on corporate boards. We account for firm risk through the calculation of both the volatility of the firm's returns and systematic risk. **Volatility** is the standard deviation of the daily logarithmic price movements. Systematic risk is measured by **Beta**. In a given year, firm **Beta** is the slope coefficient of regressing the firm's daily excess return on the market risk premium. Daily data on stock prices and market risk premium are obtained from the University of Exeter Business School's website.

Firm performance is measured by calculating both the risk-adjusted returns (**AR FF**)^v and the daily buy and hold abnormal return (**BHAR**). **AR FF** is computed based on the Fama and French (1996) 3-factor model in realized returns. For a given firm *i* in a certain year *t*, the following regression model was used to compute the risk-adjusted returns:

$$r_{id} - r_{fd} = \alpha_i + \beta(r_{Md} - r_{fd}) + sSMB_d + hHML_d + \varepsilon_{id} \quad (1)$$

where the intercept (α_i) represents the firm's abnormal return (**AR FF**), r_{id} is the return of firm *i* in day *d* in a certain year. r_{fd} is the simple daily T-bill rate. $r_{Md} - r_{fd}$, SMB_d , and HML_d denote the market risk premium, size factor, and book-to-market factor respectively. We

obtain the daily factors, constructed following Gregory (2013), from the University of Exeter Business school's website.^[vi] Furthermore, in a given year t , the daily buy-and-hold abnormal returns (**BHAR**) for firm i are computed by:

$$\mathbf{BHAR\ Return}_{it} = [\prod_{n=1}^N (1 + r_{in}) - 1] - [\prod_{n=1}^N (1 + r_{mn}) - 1] \quad (2)$$

Where r_{it} is the firm i 's total daily return (including dividends), r_{mt} is the total market daily return, N is the number of trading days for firm i in year t .

Bloomberg provides two categories of key control variables that we use in this paper: financial and governance characteristics. Following contemporaneous literature (Bear *et al.*, 2010; Murray *et al.*, 2006; El Ghouli *et al.*, 2011; Jizi, 2015; Godfrey *et al.*, 2009; Makni *et al.*, 2009), we choose a set of variables to control for firm performance. Fundamental financial control variables include logarithm of total assets, market-to-book value, return on assets, leverage. Prior literature into firm social responsibility clearly identifies employee related issues as a core part of the firms' CSR policies (see e.g. Gray *et al.*, 1995; Branco and Rodrigues, 2006; Scholtens, 2008; Holder-Webb *et al.*, 2009). Moreover, the UN Principles for Responsible Investment and the Global Reporting Initiative (GRI) clearly identify employee issues as a vital part of CSR policies and CSR disclosure. Larger employees' size might increase the probability of employees' claims and legal issues that might impact on estimating the prospected cash flows and their current value when valuing stocks. Consequently, socially responsible firms are less subject to future penalties resulting, for example, from employees' disputes (Waddock and Graves, 1997). We therefore controlled for the number of employees, as firms with larger employees size are likely to be more inclined toward more sustainable initiatives.

Governance control variables include percentage of independent directors, CEO duality, board size, board average age and number of board meetings. According to Raheja (2005), an informal appointment process slants commitments of insiders and prevents them from being independent from the CEO, despite them representing a significant basis of firm-specific information for the board. Duality is supposed to decrease the performance (Carty and Weiss, 2012) since it results in a perceived loss of checks and balances and abuse of power in firms where executives are also board members. Large boards suffer from problems of poor communication and decision-making that undermine their effectiveness. The average age of board members is expected to decrease the alterations in firm policies. A smaller number of board meetings is supposed to increase the price to book value of the firm (see

Vafeas, 1999) since this may lead to loss of communication between board members and may signal less efficiency.

Table 1. Variable Definitions

Variable name	Variable descriptions
ESG disclosure	The firm's weighted average disclosure score measuring the extent of environmental, social and governance information
Board Independence	The number of independent directors on the board to the total number of directors
CEO Duality	A dummy variable: 1 if the chairman of the board of directors is also the CEO and 0 otherwise
Beta	The slope coefficient of regressing the firm's daily excess return on the market risk premium
Volatility	The standard deviation of the daily logarithmic price movements
AR FF	The firm's abnormal return measured following Fama and French (1996) 3-factor model
BHAR	The firm's abnormal daily buy-and-hold return
Log Assets	The logarithm of total assets in the corresponding year
Market-to-Book	The market value of equity (market capitalization) divided by the book value of equity
ROA	Net income over total assets
Leverage	Debt divided by the total assets
Board Size	Number of directors on the board
Percentage Women on Board	The number of women directors to the total number of directors on the board
Log Employees	The logarithm of total employees in the corresponding year
Board Average Age	The average age of the directors on the board

Table 1 defines the variables used in this study. Table 2 describes the studied variables. We find that the mean of the percentage of women on board is 8.89% and its standard deviation is 8.95%. The mean of the board independence is 54.57% and its standard

deviation is 12.5%. The ESG disclosure score has a mean of 30.88 and a standard deviation of 12.53. These results suggest that, on average, FTSE 350 firms are not efficiently allocating their social spending to effective social activities since the disclosure score is a weighted average score and ranging from 0 to 100. Table 3 presents the Spearman correlation matrix. Table 3 doesn't suggest any serious multicollinearity in our regressions. The highest correlation (**-0.65**) is between leverage and ROA.^{vii}. We use industry and year dummies to control for the industry and year specific characteristics. There are ten different industry groups in the Bloomberg data pertaining to the FTSE 350 firms. We also apply White robust standard errors to adjust for heteroskedasticity.

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.
ESG Disclosure	30.883	12.532
Board Independence	54.57	12.500
CEO Duality	0.024	0.152
Log Assets	9.379	0.826
Market-to-Book	4.020	32.080
ROA	0.071	0.150
Leverage	0.521	1.221
Board Size	11.390	7.422
Volatility	37.466	17.600
Percentage Women on board	8.894	8.948
Board Average Age	56.181	3.395
Log Employees	8.522	1.999
AR FF	9.670	32.836
Beta	0.914	0.442
BHAR Return	0.097	0.438

Table 3. Correlation matrix

	ESG Disclosure	Per.Women on Board	Board Independence	CEO Duality	Log Assets	Log Employees	ROA	Lev	Market-to-book	Board Size	Board Average Age
ESG Disclosure	1										
Per. Women on Board	0.2474	1									
Board Independence	0.3001	0.1922	1								
CEO Duality	-0.0165	0.0229	-0.0019	1							
Log Assets	0.583	0.2458	0.3881	-0.0296	1						
Log Employees	0.4032	0.1834	0.2329	-0.0009	0.4958	1					
ROA	-0.0301	-0.0495	-0.0324	0.0073	-0.2482	0.0067	1				
Lev	0.0779	0.1002	0.0561	-0.0104	0.2616	0.0501	-0.6537	1			
Market-to-book	-0.0297	0.0655	0.0388	-0.0039	-0.016	0.0137	0.0151	0.0267	1		
Board Size	-0.2939	-0.1662	-0.1168	0.0475	-0.4012	-0.1269	0.0867	-0.0426	0.0285	1	
Board Average Age	0.2066	-0.0777	0.2477	0.099	0.2863	0.1685	-0.0292	0.0245	0.019	-0.1224	1

The first hypothesis attempts to relate the WDOCB to the ESG disclosure. We expect that women have a positive effect on ESG disclosures (see Terjsten et al., 2009; Mallin and Michelin, 2011; Bear et al., 2010). The second hypothesis tests the effect of ESG disclosures combined with the effect of WDOCB on firm risk. Women are believed to work with ESG disclosures to reduce firm risk in line with Daily and Dalton (2003), Dalton and Dalton (2010), Cormier et al. (2011), Kothari *et al.* (2009) and Bushee and Noe (2000). The third hypothesis we test in this paper investigates the interaction of WDOCB with ESG disclosures on firm's risk and return. Women are expected to work with ESG disclosures to increase firm returns (see Kramer et al., 2006; Liu et al. 2013; Post and Byron, 2014; Campbell and Minguez-Vera, 2008; Dezso and Ross, 2012; Kothari *et al.*, 2009; Bushee and Noe, 2000).

4. Women on Board and the Efficiency of Social Disclosure

4.1 Women on Board of Directors and Social disclosure

The presence of women on corporate boards is said to better the oversight of management activities, because of the increased heterogeneity among the board, with top management teams, and the CEO (Bear *et al.*, 2010; Adams and Ferreira, 2009; Erhardt *et al.*, 2003; Kramer *et al.*, 2006; Gul *et al.*, 2011; Fields and Keys, 2003). That is, gender diversity of the board may play a significant role in aligning managerial and shareholders' interests. As stakeholders are holding firms more liable towards social well-being, women directors may start noticeable social disclosure and expenditure to stimulate the firm's social responsibility.

We begin by investigating the impact of women on board on ESG reporting. Table 4 presents a regression of social disclosure on female participation on corporate boards and several control variables. Using the percentage of women on board of directors (**Percentage Women on Board**), our findings demonstrate that higher women participation on boards strengthen sustainability reporting. Hillman *et al.* (2002) suggest that women on boards of directors are more probable to support specialists and civic leaders, therefore, being more sensitive to CSR missions. Hence, firms with higher gender diversity on the board support more charitable causes (Wang and Coffey, 1992; Williams, 2003), more positive office settings (Bernardi *et al.*, 2006; Johnson and Greening, 1999) and higher ranks of eco-friendly CSR (Bear *et al.*, 2010). Therefore, our results suggest that women on board intensify ESG disclosure.

Our results also recommend reduced board size helps firms reveal more information. The smaller number of directors on the board eases communication among participants and contributes to make each of them more responsible and dedicated (Ahmed *et al.*, 2006; Dey,

2008; Dallas, 2002; Walls *et al.*, 2012). Accordingly with Jizi *et al.* (2014), Arora and Dharwadkar (2011) and Haniffa and Cooke (2005), we show that gainful firms engage in extra ESG actions and disclosure as they are probable to access more resources. Dividing the profits between them and their society, firms try to placate influential stakeholders and signal their social responsibilities.

Table 4. Women Participation and Social disclosure

Table 4 presents a regression of ESG disclosure on our two measures of women participation and several control variables. Our sample period is from 2007-2012. The dependent variable is Bloomberg's ESG disclosure score which is based on the extent of disclosed environmental, social, and governance information. The score varies from 0.1 for firms that disclose a minimum level of social information to 100 for firms that disclose on all the data points collected by Bloomberg. Industry and year dummies are included to control for industry and year specific characteristics. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Dep. Var. = ESG Disclosure
	(2)
Women on Board	0.1688*** (0.035)
Board Independence	0.0569** (0.0269)
CEO Duality	0.9393 (1.8197)
Board Average Age	-0.0295 (0.0952)
Log Assets	6.7275*** (0.5562)
Log Employees	0.8357*** (0.18)
Market-to-Book	-0.0086*** (0.0028)
ROA	7.1103** (3.0762)
Leverage	0.3279 (0.5642)
Board Size	-0.1359*** (0.0476)
Intercept	-46.4578*** (5.8264)
Industry Dummies	YES
Year Dummies	YES
Adj. R-Squared	0.4362
Number of Observations	1018

On the other hand, we find a negative relationship between the firm's market-to-book ratio and CSR reporting. More poised firms about their future growth are less worried about

meeting stakeholders' concerns through ESG accomplishments. In line with previous literature, firms with larger size (whether measured by total assets or number of employees), feel more stakeholders' pressures, and are expected to have larger impact on communities (Barnea and Rubin, 2010; Reverte, 2009), consequently they invest in a larger variety of ~~CSR~~ ESG actions to satisfy stakeholder groups.

4.2 Efficiency of Social Disclosure

While women participation on corporate boards encourages social investments and reporting on them, as evidenced in the previous section, we now turn to examining whether the positive association between women on corporate boards and social disclosure is valuable to stockholders. The participation of women members on corporate boards may enhance the efficiency of social disclosure for several reasons. First, the participation of women directors is expected to encourage the effectiveness of the firm's monitoring. This promotes corporate decision making and, consequently, the usefulness of fund allocation towards leader ventures, among which are leading social ventures. Stakeholders form different perceptions of different social ventures and, have different response to disclosures on dissimilar ventures (Richardson and Welker, 2001). Therefore, since social spending is gradually perceived as cost effective and an investment in the corporate reputation (Arayssi, 2010), higher levels of board monitoring may help direct the firm's societal spending towards importantly visible ventures. Second, improved monitoring enhances the investors' opinion about the consistency of CSR disclosure. Third, CSR reporting may deliver information about the financial stability of the firm and its future prospects. Lys *et al.* (2013) show that larger CSR spending signals the soundness of the firm's financial situation and its future cash flows to investors. Only financially sound firms who expect excess future cash flow may participate in marginal social investments. Subsequently, ESG signaling power may be enhanced by the higher participation of women on the board of directors since disclosures could be perceived as more reliable and truthful. Consequently, we analyze the effect of women on corporate boards on the efficiency of social disclosure. That is, an increase in ESG disclosure is deemed efficient if it reduces firm's risk and improves firm's return.

4.2.1 Women on Board of Directors, Social Disclosure, and Firm Risk

Table 5 examines the influence of women on board on the relationship between ESG reporting and firm risk. We quantify firm risk through both the standard deviation of daily stock returns (**Volatility**) and the firm's systematic **risk (Beta)**. The percentage of women

directors on boards is used to measure the level of women participation on the board. Since the introduction of an interaction variable between female participation and ESG disclosures may raise multicollinearity concerns, we substitute these variables with their deviation from the mean.⁸ Table 5 column (1) highlights a negative relationship between ESG disclosure and the firm's volatility. Also, a significant inverse relation is evidenced between women participation and firm risk. This is in line with the literature that finds women can enhance decision making as a wider variety of perspectives and issues are measured and a comprehensive range of outcomes and stakeholders' needs is evaluated (Daily and Dalton, 2003; Dalton and Dalton, 2010). In column (2), an interaction variable between women participation and ESG disclosure is introduced. ESG disclosure's estimated coefficient is not significant, suggesting that ESG reporting has no significant effect on firm risk at low levels of women participation. In contrast, the disclosure and women participation interaction variable is negative and significant. Hence, as women participation on corporate boards rise, an increase in ESG reporting diminishes the firm's return volatility. We generally obtain similar results when using beta to measure risk in columns (3) and (4). However, in column (3), we do not find a substantial relationship between ESG disclosure and the firm's systematic risk.

Our findings demonstrate the positive effect of board monitoring on the value of ESG reporting. Cormier *et al.* (2011) show an opposite effect of social disclosure on firm risk. Cormier *et al.* (2011) propose that the higher social and environmental disclosure leads to a lower management-investor information asymmetry. Hence, ESG reporting promotes the firm's good citizenship image and reputation. This may lift investors' confidence in the firm's management. Societal spending could also provide stakeholders with favorable information regarding the firm's future prospects. Either of these factors may cause an opposite influence of ESG reporting on firm risk. However, our results propose that the ESG-risk negative correlation only happens at high levels of women participation on corporate boards. That is, firm risk decreases when investors see the disclosed social information as reliable and dependable. This occurs when firms display a sound participatory (Eagly *et al.*, 2003), communal (Rudman and Glick, 2001), and democratic (Eagly and Johnson, 1990) environment; this result may boost the board' capacity to effectively deal with CSR. The leverage is significantly and negatively related with beta. A possible explanation of this result may be related to the effect of acting in a socially responsible manner and borrowing at cheap interest rates (as necessitated in the post global finance crisis era) which reduces the risk of the corporation (see McGuire *et al.*, 1988).

Table 5. High Women Board Representation, ESG Reporting, and Firm Risk

Table 5 investigates the effect of high women representation on the association between ESG reporting and firm risk. The dependent variable is the firm's risk, as measured by both the volatility of returns (**Volatility**) and systematic risk (**Beta**). The ESG disclosure score is based on the extent of disclosed environmental, social, and governance information. The score varies from 0.1 for firms that disclose a minimum level of social information to 100 for firms that disclose on all the data points collected by Bloomberg. Since the introduction of an interaction variable between female participation and societal disclosures may raise multicollinearity concerns, we substitute these variables by their deviation from the mean i.e. ESG disclosure * Women on Board is computed as (ESG Disclosure - Mean ESG Disclosure) * (Percentage Women on Board - Mean Percentage Women on Board). Industry and year dummies are included to control for industry and year specific characteristics. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Dep. Var. = Volatility (1)	Dep. Var. = Volatility (2)	Dep. Var. = Beta (3)	Dep. Var. = Beta (4)
ESG Disclosure- Mean ESG Disclosure	-0.1053** (0.0448)	-0.1167 (0.0451)	0.0007 (0.0012)	0.0004 (0.0012)
Percentage Women on Board - Mean Percentage Women on Board	-2.7595*** (1.0253)	-2.6013** (1.0353)	-0.0441** (0.0221)	-0.0405 (0.0221)
ESG Disclosure * Women on Board		-0.1545** (0.0734)		-0.0044** (0.0018)
Board Independence	-0.0581 (0.0606)	-0.0562 (0.0608)	-0.0002 (0.0011)	-0.0002 (0.0011)
CEO Duality	-2.8381 (2.0172)	-3.775 (1.9557)	0.0534 (0.0592)	0.0457 (0.0599)
Board Average Age	0.0545 (0.155)	0.0691 (0.1553)	-0.0017 (0.0033)	-0.0014 (0.0033)
Log Assets	2.6095** (1.1549)	2.5982** (1.1551)	0.2386*** (0.0235)	0.2381*** (0.0235)
Log Employees	-0.4103 (0.2765)	-0.3862 (0.2774)	-0.0091 (0.0063)	-0.0083 (0.0063)
Market-to-Book	-0.0084* (0.0045)	-0.0092** (0.0046)	0.0001 (0.0001)	0.0001 (0.0001)
ROA	6.0475 (3.8852)	6.6055* (3.9736)	-0.0663 (0.1041)	-0.0528 (0.1054)
Leverage	0.7118 (0.6867)	0.7239 (0.6925)	-0.0661** (0.0272)	-0.0659** (0.0274)
Board Size	0.0059 (0.0714)	0.0071 (0.0712)	0.0046*** (0.0015)	0.0046*** (0.0015)
Intercept	9.9633 (12.644)	9.075 (12.6554)	-1.0149*** (0.2488)	-1.0320*** (0.2477)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Adj. R-Squared	0.3947	0.3969	0.3622	0.3661
Number of observations	975	975	994	994

4.2.2 Women on Board of Directors, Social Disclosure, and Firm Performance

We now examine whether the participation of women on corporate boards affects the association between ESG disclosure and firm value. We employ both the firm's daily buy and hold abnormal return (**BHAR**) and the Fama-French abnormal return (**AR FF**) to measure firm performance. Table 6 column (1) shows that CSR reporting has no significant impact on the firm's risk-adjusted return, whereas participation of women on board has a significant and negative effect on returns.^[9] Our results in Table 5 supported the argument suggesting that female directors are generally more risk-averse relative to their male counterparts. That is, Table 5 demonstrated that the participation of women on board reduced the firm's overall volatility and systematic risk. This may help explain the converse association between the participation of female directors and firm performance that is observed in Table 6. The presence of women on corporate boards may give more support to low risk – low return projects. This could have a negative effect on firm performance as firms may dismiss investing in risky positive NPV projects. We introduce an interaction variable between women on board and societal disclosure in column (2). Our findings highlight a negative and significant association between ESG disclosure and firm performance at low levels of board gender diversity. That is, when women do not participate on corporate boards or their presence is minimal, an increase in ESG reporting has a converse effect on shareholders' wealth. This indicates that when women participation on corporate boards is low, firms' sustainability reporting is perceived to be less reliable and consequently of low signaling power. Furthermore, we observe that the coefficient estimate of the interaction variable is significantly positive. This implies that high women participation on boards has a positive effect on the ESG-performance sensitivity. These results agree with Campbell and Minguez-Vera (2008), Carter *et al.* (2003), Liu *et al.* (2013), and Dezsö and Ross (2012). Relative to low levels of women participation on board, an increase in societal reporting amplifies firm value at high levels of gender diversity. In general, we find comparable results when using the daily buy-and-hold abnormal return (**BHAR**) to measure firm value.

These results reveal the non-reliability and low signaling strength of ESG disclosure at inferior levels of decision making. However, we emphasize the positive impact of increased women participation on the efficacy of ESG reporting. Stakeholders believe that ESG disclosure is more dependable and effective at higher decision making levels. That is, the presence of women among board members enhances the credibility and signaling capability of ESG disclosure. Thus, we suggest that social disclosure have a direct effect on

shareholders' wealth when women directors have relatively higher participation on corporate boards.

Table 6. High Women Participation, ESG Reporting, and Firm Performance

Table 6 investigates the effect of high women participation on the association between ESG reporting and firm performance. The dependent variable is the firm's performance, as measured by both Fama French's (1996) risk-adjusted returns (**AR FF**) and the daily buy-and-hold abnormal return (**BHAR**). The ESG disclosure score is based on the extent of disclosed environmental, social, and governance information. The score varies from 0.1 for firms that disclose a minimum level of social information to 100 for firms that disclose on all the data points collected by Bloomberg. Since the introduction of an interaction variable between female participation and societal disclosures may raise multicollinearity concerns, we substitute these variables by their deviation from the mean i.e. ESG disclosure * Women on Board is computed as (ESG Disclosure - Mean ESG Disclosure) * (Percentage Women on Board - Mean Percentage Women on Board). White robust standard errors account for any possible heteroskedasticity. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Dep. Var. = ARFF (1)	Dep. Var. = ARFF (2)	Dep. Var. = BHAR (3)	Dep. Var. = BHAR (4)
ESG Disclosure - Mean ESG Disclosure	-0.078 (0.1198)	-0.0385 (0.1173)	-0.0011 (0.0013)	-0.0007 (0.0013)
Percentage Women on Board - Mean Percentage Women on Board	-5.2930** (2.2211)	-5.6705** (2.2449)	-0.0597** (0.0255)	-0.0639** (0.0256)
ESG Disclosure * Women On Board		0.5066*** (0.1737)		0.0056** (0.0022)
Board Independence	-0.1456- (0.098)	-0.1553 (0.0978)	-0.0022* (0.0012)	-0.0023* (0.0012)
CEO Duality	-5.8183 (7.196)	-5.0184 (7.3781)	-0.0684 (0.085)	-0.0595 (0.0862)
Board Average Age	0.204 (0.3927)	0.1664 (0.3907)	0.0037 (0.005)	0.0032 (0.005)
Log Assets	-3.2978 (2.3594)	-3.2832 (2.3473)	-0.0347 (0.027)	-0.0346 (0.0268)
Log Employees	0.3114 (0.7234)	0.2123 (0.7223)	0.0048 (0.0097)	0.0037 (0.0095)
Market-to-Book	0.0143 (0.0089)	0.0166* (0.0092)	0.0001 (0.0001)	0.0001 (0.0001)
ROA	18.6114 (15.208)	17.2454 (14.9583)	0.212 (0.1339)	0.1968 (0.1341)
Leverage	3.5355 (2.7029)	3.5543 (2.6447)	0.0611*** (0.0233)	0.0613*** (0.0231)
Board Size	0.0793 (0.167)	0.0735 (0.1658)	0.0016 (0.002)	0.0015 (0.002)
Intercept	33.0667 (24.9763)	35.9572 (24.7644)	0.1961 (0.3062)	0.2283 (0.3073)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Adj. R-Squared	0.0368	0.0443	0.1197	0.1247
Number of Observations	1010	1010	1010	1010

5. Robustness Checks

Endogeneity is one of the main problems in empirical studies investigating the firm's social disclosure and its association to the firm's governance and value. We address this issue by (i) industry and year fixed effects in all of our regressions to control for industry and year specific characteristics, and/or (ii) using the two-step efficient generalized method of moments (GMM) estimator.¹⁰ Accordingly, in our GMM estimation, we use the one and two period lagged values of Percentage Women On Board and ESG Disclosure as their respective instrumental variables.¹¹ Moreover, we employ Hansen's test of over-identifying restrictions to test the joint null hypothesis that the instruments are valid.¹²

Given that board diversity is beneficial for firms' governance, one might argue that the relation between the presence of women on board and the efficiency of ESG disclosure is not a simple linear relationship and there is an optimal level of diversity. Therefore, we include the squared term of the percentage of women on board to account for any possible non-linearity between the participation of female directors and the efficiency of ESG disclosures.¹³ Furthermore, the inclusion of both the natural logarithm of total assets and the natural logarithm of employees in our regressions may raise multicollinearity concerns since both are generally used to proxy for firm size. However, Table 3 suggests that the two variables are not highly correlated as their correlation coefficient is 0.49. Nevertheless, in this section, we drop the natural logarithm of employees from our regressions.¹⁴ We also drop the board average age from our regressions since it contains a lot of missing values and, thus, significantly reduces the number of observations in our regressions.¹⁵

Accordingly, the one and two period lagged values of Percentage Women on Board is used as an instrument for Percentage Women on Board. The results are presented in Table 8. Confirming our previous results, Table 8 displays a positive and significant impact of female director participation on ESG disclosures. Furthermore, Hansen's J statistic fails to reject the null hypothesis, that the instrument percentage of women on board is valid.

Our analysis of the effect of women board participation on the efficiency of ESG disclosures examines the impact on stock returns. However, inspecting stock returns captures the impact of ESG reporting on the changes in firm value rather than firm value. Therefore, to improve the robustness of our results, Table 8 uses the natural logarithm of the firm's market capitalization to measure firm value (Black, 2001; Firer and Mitchell Williams, 2003). We also conduct a two stage least squares by using the one period lagged deviation of social disclosures from its mean, the one period lagged deviation of the percentage of women on

board, and their interaction as instruments. Consistent with our previous findings, Table 8 highlights a direct effect of the presence of women on corporate boards on the association between ESG disclosures and firm value. Moreover, our Hansen's test of over-identifying restrictions demonstrates that the joint null hypothesis cannot be rejected. This supports the validity of our instruments.

In unreported results, to ensure the robustness of our results, we use Women Participation Dummy to measure female participation on corporate boards. Women Participation Dummy is a dummy variable that takes a value of 1 if the percentage of women on the board of directors is greater than the yearly overall mean of women on the board of directors and 0 otherwise. However, the results are almost identical to those reported in this paper.

Table 7. Women Participation and Social disclosure (GMM)

Table 7 presents a two-step efficient generalized method of moments (GMM) regression of ESG disclosure on the percentage of women on corporate boards and several control variables. Our sample period is from 2007-2012. The dependent variable is Bloomberg's ESG disclosure score which is based on the extent of disclosed environmental, social, and governance information. The score varies from 0.1 for firms that disclose a minimum level of social information to 100 for firms that disclose on all the data points collected by Bloomberg. One and two period lagged values of Percentage Women on Board are used as instruments for Percentage Women on Board. Industry and year dummies are included to control for industry and year specific characteristics. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Dep. Var. = ESG Disclosure
	(1)
Women on Board	0.5178** (0.2182)
Women on Board squared	-0.0100 (0.0072)
Board Independence	0.0250 (0.0301)
CEO Duality	1.7862 (2.1658)
Log Assets	8.0713*** (0.5994)
Market-to-Book	-0.0450** (0.0195)
ROA	6.7105* (4.0022)
Leverage	-2.2109 (1.9909)
Board Size	-0.0526 (0.0569)
Intercept	-50.9127*** (5.0614)
Industry Dummies	YES
Year Dummies	YES
Adj. R-squared	0.4046
Hansen J statistic	1.299 (P-value = 0.25)
Number of Observations	841

Table 8. Percentage of Women on Board of Directors, ESG Reporting, and Firm Performance (GMM)

Table 8 presents a two-step efficient generalized method of moments (GMM) regression to investigate the effect of the percentage of women on the board of directors on the association between ESG disclosure and firm performance. The dependent variable is the firm's performance, as measured by the logarithm of the firm's market capitalization. The ESG disclosure score is based on the extent of disclosed environmental, social, and governance information. The score varies from 0.1 for firms that disclose a minimum level of social information to 100 for firms that disclose on all the data points collected by Bloomberg. Percentage Women on Board is the percentage of women serving on the firm's board of directors. We use the one and two period lagged values of Percentage Women on Board and ESG Disclosure as their respective instrumental variables. Since the introduction of an interaction variable between female participation and ESG disclosures may raise multicollinearity concerns, we substitute these variables by their deviation from the mean i.e. $\text{ESG disclosure} * \text{Women on Board}$ is computed as $(\text{ESG Disclosure} - \text{Mean ESG Disclosure}) * (\text{Percentage Women on Board} - \text{Mean Percentage Women on Board})$. Industry and year dummies are included to control for industry and year specific characteristics. Table 1 provides detailed information on all variables. White (1980) robust standard errors are computed to account for any possible heteroskedasticity. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Log Market Cap
	(1)
ESG Disclosure - Mean ESG Disclosure	0.0043*** (0.0017)
Percentage Women on Board – Mean Percentage Women on Board	0.0050 (0.0084)
ESG Disclosure * Women on Board	0.0003* (0.0002)
Women on Board	-0.0000 (0.0003)
Board Independence	0.0008 (0.0011)
CEO Duality	0.0789 (0.0523)
Log Assets	0.6645*** (0.0275)
Market-to-Book	0.0058*** (0.0020)
ROA	1.1146*** (0.2571)
Leverage	-0.4733*** (0.0819)
Board Size	-0.0064*** (0.0020)
Intercept	3.3431*** (0.2744)
Industry Dummies	YES
Year Dummies	YES
Adj. R-squared	0.7172
Hansen J statistic	3.452 (P-value = 0.33)
Number of Observations	780

6. Conclusion

This paper examines the effect of gender diversity on the efficacy of ESG disclosure. We suggest that participation of women on board is advantageous to the firm's societal conscience and improves the collective performance and the mission of the firm as it enhances shareholders' welfare. Our paper complements the existing literature by proposing that the favorable effect of ESG reporting occurs when firms enjoy an effective and gender diverse board structure, which results in better governance.

We show that an increase in the participation of women directors directly affects ESG disclosure. Women directors seem to promote social agenda in the boardrooms to enhance firm's social profile. We also show that women on corporate boards reduce the firm risk through ESG disclosure. Moreover, we demonstrate that ESG disclosure increases firm performance at high levels of women participation on boards. Our results indicate that firms operating in complex environments enjoy, for every combined 1% increase in the proportion of women officers and the level of ESG disclosure, positive and significant yearly abnormal returns (as measured by ARFF) of 0.5066%, which can intuitively be extrapolated to a 1.527% return over 3 years. The same 1% percent increase leads to a 0.1527 % significant decrease in risk (as measured by the volatility of returns), or 0.46% decrease in risk over 3 years. These findings are consistent with the stakeholder theory. On the other hand, having more women on corporate boards seems to generate significant negative excess returns in Table 6. This fits the standpoint of agency theory and signifies that firms with a high percentage of women in their governance systems generate enough worth to satisfy normal stock-market yields.

Therefore, ESG disclosure sends a positive signal to stakeholders regarding the firm's future growth expectations and financial position. The participation of WDOCB materially raises shareholders' welfare. Better decision making enhances the investors' perception towards the legitimacy and competency of the reported societal activities. That is, it elevates the signaling legitimacy and significance of sustainability reporting.

Given the UK corporate governance code 2014 recommendation on board diversity for better stakeholders' engagement, this research suggests that board gender diversity strengthens firm-stakeholders link through firm's acknowledgment to societal concerns and responding to their social obligations. Women directors help channel the firm's investments to worthy, effective social projects as found in Srinidhi *et al.* (2011). This paper highlights specific effects of gender diversity. Hence governments should provide more incentives,

perhaps in reduced taxation of income derived from social spending and reporting, as such activities are deemed beneficial to stockholders' welfare. This would recognize the firm's engagement in efficient sustainability projects as a legitimate and fairly rewarding investment outlet.

Future research should consider how committee membership influences the dynamics of diverse boards. For example, membership in more influential committees may afford some board members more say into management processes than others. Committee membership could improve or reduce the effect (as measured on abnormal returns and riskiness of the firm) that female directors have on board decision-making. Another interesting extension of the current study would be to see if the FTSE4GOOD companies included in the index show a significant difference in the percentage of women on boards when compared to other companies. Future research may also use several other important control variables like shareholder protection, board monitoring, return on equity, firm age, cross listing, other disclosure indices (environmental, economic, strategic, etc..) and proportion of community influential members of board of directors to investigate how they interact with women participation on the board and how these affect the risk and return of corporations.

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ⁱ Our measure of **social disclosure** is a weighted average of voluntary environmental, social, and governance disclosure. Accounting for industry specific characteristics, different social projects are assigned different weights given their societal impact. Hence, two firms might be investing the same amount of money on social activities but their social disclosure score may be different due to the effectualness of their social spending.

ⁱⁱ We measure risk using both the firm’s volatility of returns and systematic risk.

ⁱⁱⁱ We measure performance through the calculation of both the firm’s daily buy-and-hold abnormal return and Fama and French’s (1996) risk-adjusted return.

^{iv} Bloomberg issued an “Impact report” which provides a section on “ESG & Sustainable Finance”.

<http://www.bloomberg.com/bcause/customers-using-esg-data-increased-76-in-2014>

Additionally, Governance, and Accountability Institute, Inc. issued “2012 Corporate ESG/ Sustainability/ Responsibility Reporting” They define Bloomberg ESG disclosure score as follows:

“The proprietary Bloomberg ESG Disclosure scores are based on the extent of a company’s Environmental, Social, and Governance (ESG) disclosure. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance, with data such as Greenhouse Gas Emissions (GhGs) carrying greater weight than other disclosures. The score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector. Bloomberg Environmental, Social and Governance (ESG) products enable all investors across a range of asset classes to understand the risks and opportunities associated with potential investments or counterparties as the market continues to embrace ESG factors.” (p. 33)

^v AR stands for the adjusted or abnormal returns.

^{vi} <http://business-school.exeter.ac.uk/research/areas/centres/xfi/research/famafrench/files/>

^{vii} We have tested the Variance Inflation Factors (VIF) to further check the multicollinearity in the data and we found that all of our regressions have a VIF around 2, which suggests lack of collinearity between the selected variables under study.

⁸ This technique is employed whenever an interaction variable is introduced in our models.

⁹ In unreported results, using a t-test, we confirm that abnormal returns are significantly different than zero.

¹⁰ Our results are also robust to using the traditional two stage least squares (2 SLS) methodology. However, we opt for using the two stage GMM since its estimates are said to be more efficient, especially when the error terms are assumed not to be identically and independently distributed (i.i.d) and the equation is over-identified.

¹¹ Our results are also robust to using only the one period lagged values of Percentage Women On Board and Social Disclosure as their respective instrumental variables.

¹² Under Hansen's J Statistic, the null hypothesis is a joint hypothesis of the following: (i) instruments are uncorrelated with the error term, and (ii) excluded instruments are rightly excluded from the estimated model.

¹³ The inclusion of the squared term of the percentage of women on board in all of our previous regressions would not affect the results.

¹⁴ The presence or absence of the natural logarithm of employees does not affect any of the results presented in this paper.

¹⁵ Although our results are also robust to including board average age in our regressions, dropping this variable increases the number of observations reported in Tables 7 and 8 from 652/604 to 841/780 respectively. The presence or absence of board average age does not affect any of the results presented in this paper. Note that board average age has no significant effect on any of our dependent variables in all regressions. We employ this measure especially in this section since we are using the two lagged period instruments and, thus, already losing a significant number of observations.