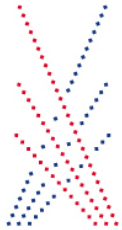

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Board Gender Diversity and Firm Performance: Evidence from a Non-mandated Environment

Abstract

This paper considers the effects of female representation and the size of female representation on corporate board and audit committee on financial performance in an African context where institutions are weak. Employing a panel of 77 firms, our results show that gender diversity exerts a positive and significant influence on firm financial performance. We also find that the performance effect of gender diversity is stronger for firms with two or more female directors, suggesting that building a critical mass of female representation enhances firm financial performance. Further analysis suggests that the inclusion of females in the audit committee (a committee as required by law in Nigeria) appears to have a positive impact on firm financial performance. Our results are robust after controlling for endogeneity and the use of alternative measures of board gender diversity.

1. Introduction

The past decade has witnessed increasing interests on the effects of board gender diversity on firm's outcomes in both academic and practitioner milieu (see, Dezso and Ross, 2012; Hillman et al., 2007; Liu et al., 2014; Perryman et al., 2016). The interests stem from a number of factors including social, ethical and human capital considerations (Hillman et al., 2007). For example, from the standpoint of human capital, Dezso and Ross (2012) argue that the representation of women on corporate boards may facilitate access to a wider pool of human capital which bring additional perspective to board monitoring role and decision-making with positive implications for firm performance. In contrast, Campbell and Minguez-Vera (2008) theorize that, if the appointment of women to the board is driven by social and ethical pressures for greater equality of female and male, then the effectiveness of the board may be weakened thereby exerting a negative influence on firm value.

Against the backdrop of the conflicting theoretical explanations regarding the effects of female board representation on firm performance, a number of empirical studies have investigated the subject, predominantly in the context of advanced market economies such as

U.S. and the UK (see. Carter et al., 2003; Rose, 2007; Cambell and Minguez-Vera, 2007; Adams and Ferreira, 2009, Gregory- Smith et al., 2014; Liu et al., 2014; Conyon and He, 2017). Relatively little attention has been given to developing countries. Yet developing countries, particularly those in Africa such as Nigeria are patriarchal society (Wadesango et al., 2011), where the men still dominate decision-making at both domestic and organisational levels. More importantly, developing countries have weak legal and institutional framework (Chijoke-Mgbame and Mgbame, 2018; Nakpodia et al., 2018), with no explicit gender equality provision for corporate activities, unlike countries such as Italy, Belgium, Norway, and France. Indeed, African countries are ranked low in the global gender index compiled by the World Economic Forum (2018). It is therefore difficult to generalise the findings obtained from studies based on advanced developed economies with well-established institutions to developing economy firms.

In this study, we examine the effects of female representation and the size of female representation on corporate board and audit committee on financial performance in an African context where institutions are weak and a large segment of women are confined to bringing up their children and household domestic activities. Thus, this paper distinguishes between the mere presence of women on board and the size of women on board to test the extent to which they impact on firm financial performance. We do so by employing a panel dataset of 77 listed companies on the Nigerian Stock Exchange (NSE) over the period of 2008-2016. Although, the recently revised Nigerian corporate governance code does not provide any explicit recommendation for female representation in public companies, however, the National Gender Policy requires 35% female representation in the president's cabinet[12]. The above suggests that

[1] In 2015, the current president swore in 36 ministers with only 6 women amongst them and half of the women were designated junior ministers. The appointment was against the 35% affirmative action required in the National Gender Policy of 2006.

[2] There is currently only 16% women representation in the cabinet.

there is increasing recognition of the important role of women in Nigeria. Figure 1 provides evidence on the rising trends of female representation on corporate boards of firms listed in the NSE. As the figure shows, the female representation has seen a steady rise over the 2008-2016 period. Nigeria, therefore, provides a suitable setting in the African context to test the effect of female board representation on firm financial performance.

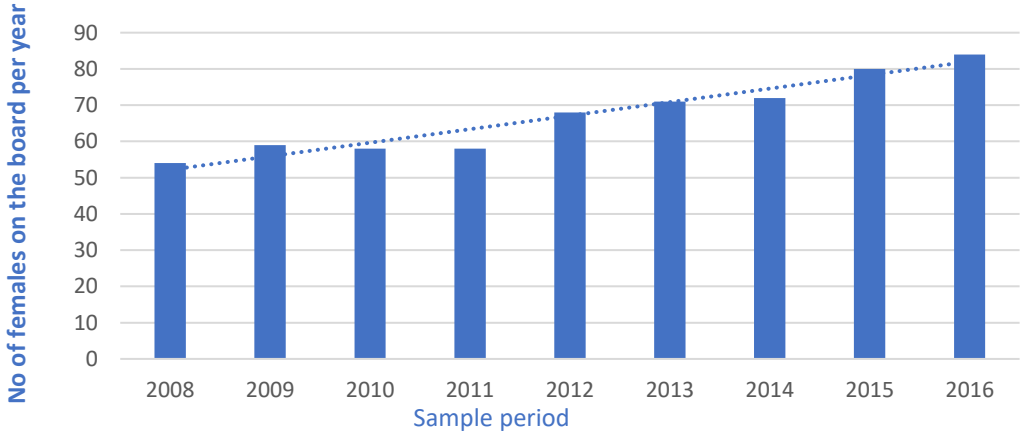

Figure 1. Number of female directors
on Nigerian corporate boards from 2008- 2016

Our results show that gender diversity exerts a positive and significant influence on firm financial performance. We also find that the performance effect of gender diversity is stronger for firms with two or more female directors, suggesting that building a critical mass of female representation enhances firm financial performance. Further analysis suggests that the inclusion of females in the audit committee (a committee as required by law in Nigeria) appears to have a positive impact on firm financial performance. Our results are robust after controlling for endogeneity and the use of alternative measures of board gender diversity.

This work makes a number of contributions to the literature. First, the study adds to the current body of literature on boardroom gender diversity and firm performance. Most studies that examine the effect of board gender on firm performance tend to focus on developed countries with well-functioning institutions. In contrast, this study provides evidence from a developing country context where institutions and corporate governance practices are weak and the

equality of women in corporate activities remains an important issue yet under-researched. Second, the last decade has seen considerable debates on the need to increase female representation on corporate boards and political governance worldwide for social and ethical reasons. Against this backdrop, it is imperative to assess whether such a policy is associated with an increase in firm value or not because shareholder wealth maximisation is the primary goal of a firm. Moreover, such evidence is important for formulating clear corporate policies for greater female participation in corporate activities in developing countries where women have been marginalised for centuries. Simply, the results obtained in this study can provide lessons to other developing countries, especially Africa, in developing better corporate governance practices. Lastly, we differentiate between female representation on the board and female participation on the board which is the appointment of females into the board committee to which few studies in developing countries such as Gyapong et al. (2016) have ignored. This is important in that it adds additional evidence regarding the female representation to a specific task at a committee level.

The rest of the paper is organised as follows; the next section presents the hypotheses. Thereafter, section 3 presents the data and methodology. The penultimate section presents the results and discussion. Lastly, section 4 concludes the study.

2. Literature Review and Hypothesis development.

2.1 Ethical and Economic Arguments for Female Boardroom Representation

Prior literature (e.g., Pfeffer and Salancik, 1978; Robinson and Dechant, 1997; Brammer et al., 2007; Campbell and Minguez-Vera, 2008) suggest that the theoretical arguments for greater female representation in corporate boardrooms can be grouped and classified into two broad taxonomies, namely, ethical and economic. Scholars who justify the female representation on corporate boardroom from social and ethical standpoint argue that it

is immoral for women to be excluded from corporate boards by virtue of their gender (Carver, 2002; Brammer et al., 2007; Campbell and Minguez-Vera, 2008). They advocate for increased female representation to achieve a more equitable and fairer society. Brammer et al. (2007) therefore argue that firms should see greater women representation not as a means to increase firm financial performance directly, but rather as a positive and desirable end in itself.

In contrast, economic arguments for greater female representation are premised on the notion that greater female representation leads to improved competitive advantage and consequently increase in firm financial performance (Robinson and Dechant, 1997). Drawing on the resource dependency theory to support the economic argument for greater female representation, Pfeffer and Salancik (1978) contend that the economic performance of a firm depends on the amount of resources (e.g., human capital) available to the firm and how these firms effectively utilise these resources to gain competitive advantage. It is thus argued that women generally tend to bring distinctive leadership qualities and skills to the boardroom such as caring, risk averseness, co-operation and less radical decision-making which can lead to improved firm financial performance (Jianakoplos and Bernasek, 1998; Adams and Ferreira, 2009; Croson and Gneezy, 2009; Liu et al., 2014). Empirical evidence provided by Adams and Ferreira (2009) shows that women have significantly higher attendance at corporate board meetings, while Liu et al., (2014) suggest that female directors are better prepared for board meetings which significantly improve the quality of board meetings, discussion process and consequently firm performance. Similarly, Daily et al. (1999); Bernardi et al. (2009) and Carter et al. (2010) suggest that the presence of women on boards provide an environment where different dimensions regarding corporate decisions are presented to enable critical analysis of complex problems and innovative solutions adopted and hence better firm performance. To others, gender diversity does not only add to the firm's external legitimacy but also promotes greater understanding of the market place by matching a firm's board diversity to the diversity

of its potential customers and employees, thereby increasing the market share of a firm (Brammer et al., 2007; Isidro and Sobral, 2015).

In a similar vein and from the agency theory perspective (Jensen and Meckling, 1976; Fama and Jensen, 1983), the board of directors has a primary responsibility of monitoring executive manager to mitigate agency costs. This monitoring responsibility is even more effective when the board is gender diverse (Carter et al, 2003). This is because gender diversity may increase board quality and independence (Carter et al., 2003; Adams and Ferreira, 2009), engenders a variety of perspectives to help evaluate alternatives available to solve problems (Campbell and Minguez-Vera, 2008). From the two theoretical perspectives, the relationship between female board representation and a firm financial performance remains unclear and an empirical question and this study attempt to shed lights on this subject in a developing country context.

2.2 Hypothesis development

2.2.1 Gender diversity and firm financial performance

On the empirical front, prior studies regarding the association between gender diversity and firm performance have produced mixed and inconclusive results. On one hand, some studies have found gender diversity to exert a negative influence on firm performance. Prominent among them are the studies of Adams and Ferreira (2009); Ahern and Dittmar (2012); Bohren and Staubo (2016). These authors argue that increased female representation may lead to heightened interpersonal conflicts, thereby creating in- and out-groups. According to Jehn, Northcraft and Neale (1999), such social categorisation tendencies may lead to mistrust, impair team processes, and thereby exerting a negative influence on firm financial performance. Unlike the above, some studies like Rose (2007); Chapple and Humphrey (2014) find no effect of gender diversity on firm performance. In contrast, studies such as Campbell

and Minguez-Vera (2008); Jurkus et al. (2011); Liu et al., (2014) found a positive relationship between gender diversity and firm financial performance. For example, using a sample of fortune 500 firms, Jurkus et al. (2011) find that gender diverse management team reduce agency costs. Similarly, Campbell and Minguez-Vera (2008) found that gender diversity has a positive effect on firm financial performance of Spanish firms. Employing a sample of Chinese firms, Liu et al., (2014) found a positive association between board gender diversity and firm performance. In another study, Nguyen et al. (2015) have rendered some support for the positive relationship between board gender diversity on firm performance in the context of Vietnamese firms. In fact, Gul et al. (2011) argue that a gender diverse board can be a partial substitute for weak corporate governance. Adams and Ferreira (2009) reinforce this point and indicate that the effect of gender diversity on firm performance is stronger in environments with weak legal and institutional framework. Consistent with the above argument, we expect companies on the NSE which operate in an environment characterised by weak legal institutions and poor governance environment to benefit from a gender diverse board. Consequently, we hypothesize that:

Hypothesis 1: Board gender diversity is positively associated with the financial performance of firms listed on the Nigerian Stock Exchange.

2.2.2 Female participation and financial performance

Given the complexity, size and enormous responsibility of the board oversight role, recent corporate governance practices recommend boards to set up committees in order to facilitate decision making and enhance the effectiveness of the board. For example, the UK governance code requires boards to have a remuneration committee, a nomination committee, an audit committee and a risk committee for banks and financial institutions. In the US, listed companies are required to have compensation, nomination and audit committees. Evidence suggests that the three most common board committees are the compensation committee, the

nomination committee and the audit committee, (Green and Homroy, 2018). These committees are delegated with clearly defined responsibilities. For example, the Audit committee deals with audit related issues such as the appointment of auditors, maintaining sound internal control processes with the aim of improving the overall performance of the firm. Given the specific duties of a board committee, it is important that the composition of the board committees be examined, especially as major board decisions are delegated to the board committee, (Dalton et al., 1998; Green and Homroy, 2018). The appointment of board members to board committees therefore provide an insight into the specific function of an individual director on the board (Klein, 1998). It is therefore important that studies go beyond examining the relationship between the composition of the board and firm performance but to understand how the make-up of such committees may affect performance as this could provide a clearer picture of the corporate board effect on firm performance (Klien, 1998).

Prior studies have underscored the importance of board committees and suggested that these committees are important for a firm's overall performance. It has, therefore, become mandatory for firms to have standing committees. To test the effects of board committees, a number of empirical investigations have been carried out on the association between board committees and firm outcomes as well as the composition of such committees and firm outcomes. For instance, Sun and Cahan (2009) find that, for firms with a high quality compensation committee, CEO cash compensation tends to be associated with accounting earnings. Klien (2002) provide evidence that an independent audit committee is negatively associated with earnings management. Dechow, Sloan, and Sweeney (1996) show that firms without an audit committee are likely to commit financial fraud. Similarly, Osma and Noguer (2007), find that the presence of a nomination committee reduces earnings manipulations. While Liao et al. (2015) show that the presence of an environmental committee increases green house gas disclosure.

There is little evidence in the literature on the effect of a gender diverse board and firm performance with the exception of Carter et al., (2010) for US firms and Green and Homroy (2018) for European firms, there is no study in a developing country context. There are however gaps in the literature on the effect of a gender diverse board committees on firm performance. Despite the rising female representation on boards, Kesner (1988) note that women are less likely to be appointed to boards except they have the potential to make meaningful contributions. Similarly, Green and Homroy (2018) argue that if women are merely appointed to the board to fulfil regulatory requirements, then the appointment of females to the committee suggests that there are apparent benefits such as competitive advantage to be derived.

The same may be the case for the Nigerian context where the men dominate corporate boards, and hence women appointed to the committee ought to have potentials for making meaningful contributions to the firm. To test the effects of women representation and participation on the board committee activities, we examine the effects of women participation on audit committee - the only board committee required by the governance code in Nigeria[3]. Consequently, we examine the effect of a gender diverse audit committee as a measure of female participation on firm performance in Nigeria. We argue that because there is no official recommendation on the number of women on corporate boards in Nigeria, we expect women appointed to the audit committee to possess some distinguishing qualities/abilities[4] that can positively affect the performance of the firm.

Hypothesis 2: The women representation on audit committees is positively related to the financial performance of firms listed on the Nigerian Stock Exchange.

[3] Section 30(1) of the code of corporate governance states that 'every public company is required under Section 359 (3) and (4) of the CAMA to establish an audit committee'.

[4] A physical review of the profiles of some of the female board members in the sample from the internet and the annual reports show that majority of them have at the minimum a master's degree, international degrees and exposure, professional qualifications and have served on several boards.

3. Data and Method

Our sample covers all firms listed on the Nigerian Stock Exchange (NSE) for the period 2008-2016. We exclude all financial firms because of the nature of the regulation of these firms which may affect some of the governance practices. We also exclude firms with missing variables, resulting in a final sample of 692 firm-year observations for 77 firms. The financial data for the study was collected from Thomson Reuters Eikon and board data was collected from Bloomberg and the annual reports. The annual reports of the companies were obtained from their respective websites. The source of all data, as well as definitions are reported in Table 1.

3.1 Variables

3.1.1 Dependent variables

To measure performance, we use both accounting and stock market-based measures of performance, namely, return on asset (ROA) and Tobin's q to ensure the robustness of our results. Although ROA captures the efficient use of a firm's asset, it can be affected by accounting conventions and can be manipulated by management. Tobin's q, on the other hand, captures the market expectations of the future profitability of the firm and it is not easily manipulated. Prior studies, (Carter et al., 2010; Liu et al., 2014; Isidro and Sobral, 2015) have used either or both measure as proxies for firm performance.

3.1.2 Independent Variable

Our main variable of interest is female representation which is measured as a percentage of women on board (%FemaleBoard**).** Following the studies of Adams and Ferreira (2009); Ahern and Dittmar (2012); Liu et al. (2014), we compute the variable as the number of women on the board divided by the total number of board members as a percentage. To capture female

participation, we use the percentage of female in the audit committee[5] as our second independent variable (%FemalAuditCom). In line with the study of Green and Homroy (2018), this is calculated as the number of women in the audit committee divided by the number of audit committee members. We also employ another proxy that has been used in the literature to capture gender diversity. In particular, we use a dummy variable (at_least_1female) of 1 if there is a female on the board and zero otherwise. To measure the size of female representation, we use a dummy variable (at_least_2female) of 1 if there are 2 or more female on the board and zero otherwise (Liu et al., 2014 and Sila et al., 2016). This measurement does not only capture the presence but also the size of female representation in line with the critical mass theory (Granovetter, 1978; Kanter, 1977)[6]. For female participation, we use a dummy variable (DFemaleAuditCom) of 1 if there is at least one female in the audit committee and zero otherwise (Green and Homroy, 2018).

3.1.3 Control variables

To account for other factors that could affect firm performance over time, we include a number of control variables consistent with recent studies. We include the following firm-specific characteristics. The size of the board has been shown to have an effect on the performance of the firm, (Carter and Cheng, 2008). We measure board size (BoardSize) as the number of directors on a firm's board. Similarly, the extent to which a board is independent can affect the performance of the firm (Liu et al., 2015). This is because theory suggests that board independence is key to effective monitoring, and the corporate governance code in Nigeria

[5] For the purpose of this study, we focus on the audit committee as this is the committee that is statutorily required by the Nigerian Governance code. An Audit committee is consistently available for all firms in the sample period.

[6] The critical mass theory posits that an increased number of women directors results in the build-up of critical mass that can substantially contribute to firm innovation and performance.

requires boards to have a sufficient number of independent directors on the board[7]. We measure board independence (BoardIndep) as the percentage of independent directors on the board. Given that the audit committee is the only statutorily required board committee for corporate boards in Nigeria, we control for the size of the audit committee as this may affect the performance of the firm. Researchers such as Carter et al. (2010) also document that, the audit committee is one of the relevant committees required by most governance codes. We measure the audit committee size (AuditCom) as the number of directors in the audit committee (see, Green and Homroy, 2018). We also control for the CEO gender. This is a dummy variable taking the value of 1 when the CEO is a male and zero otherwise. Next, we control for firm-specific variables such as age, leverage, firm size, foreign ownership and volatility. The age of the firm has been shown to affect its performance (Liu et al., 2014; Conyon and He, 2017). We, therefore, control for firm age (FirmAge) measured as the number of years a firm has been listed on the NSE (Chun et al., 2008). Similarly, and in line with prior studies (Nguyen et al, 2015) we control for leverage as the amount of debt in the capital structure which may affect the performance of the firm. We estimate leverage (Lev) as the ratio of a company's total debt to total assets. Following Campbell and Minguez-Vera (2008) and Bennouri et al. (2018), we control for firm size (FirmSize) measured as the natural log of total asset. To account for the potential effect of foreign ownership on firm performance, we use the percentage of foreign ownership measured as a dummy variable with a value of 1 when there is a foreign owner with a stake of more than 20% and zero otherwise. Lastly, we control for the volatility of the stock price as a measure of the riskiness of the firm. In addition, we include year and industry dummies as control variables. The way in which the dependent and independent variable were measure are shown in Table 1.

[7] The Nigeria Corporate governance code section 5.5 a (i) defines an independent director as a "non-executive director whose shareholding directly or indirectly does not exceed 0.1% of the company's paid up capital".

(Insert Table 1 here)

3.2 Model

To test our hypothesis, we use ordinary least squares (OLS) and fixed effect regression models and further test the robustness of the results using dynamic GMM. We begin our analysis with the OLS regression model, but the nature of our data is such that there may be time-invariant firm characteristics that may affect both firm performance and the extent of gender diversity of the board. We, therefore, run a second regression using the firm fixed effect estimation. However, using the fixed effects method would potentially control for the unobservable firm-specific factors but it would not alleviate the endogeneity problem (Istaitieg and Rodriguez, 2006). To mitigate the distortions caused by fixed effects, and the endogeneity problem, we also use dynamic GMM. Endogeneity in the form of simultaneity and reverse causality is a source of serious concern in studies relating to corporate governance and board characteristics in particular (Wintoki et al., 2012). For instance, women may be attracted to or self-select to well-performing firms or well-performing firms may be more inclined to appoint female directors in order to satisfy stakeholder and legitimise their activities (Chapple and Humphrey, 2014). The unclear direction of causality is a common form of endogeneity affecting research on board characteristics and firm performance (Adams and Ferreira, 2009). It is therefore possible that there are some observable and unobservable factors that could simultaneously affect both the gender diversity of the board as well as the performance of the firm. For example, the size of a firm may determine the size of the board which may at the same time influence the number of women appointed to the board (Bennouri et al., 2018). One strategy to address these forms of endogeneity is to use the instrumental variable in the form of a two-stage least squares regression (2SLS). This method is however plagued with the problem of identifying suitable instruments in the regression estimation. In addition, our dependent

variable is dynamic in nature such that past realisation of firm performance may affect current performance. Consequently, Schultz et al., (2010), Wintoki et al., (2012) and Cicero et al., (2013) suggest the use of a dynamic GMM model. In this model, suitable instruments are chosen from the regression equation as well as the inclusion of the lag dependent variable in the regression equation. The GMM estimator controls for time-invariant unobserved heterogeneity, simultaneity as well as reverse causality, hence, it is likely to give a more efficient result. It also reduces the bias that may arise from the use of a small sample. Our baseline model to examine the relationship between the female board representation and the firm financial performance is specified as follows:

$$\boldsymbol{FirmPerformance_{it} = \gamma Board\_Gender\_Diversity_{it} + \beta_1 Control\_Variables_{it} + Industry\_dummy_{it} + Year\_Dummy_{it} + \varepsilon_{it}} \quad \textbf{(1)}$$

To investigate the effect of female participation on firm performance, we estimate the baseline regression using the percentage of women on the audit committee. We also use an alternative measure of female participation as a robustness check. We estimate the model as:

$$\boldsymbol{FirmPerformance_{it} = \pi Committee\_Gender\_Diversity_{it} + \beta_1 Control\_Variables_{it} + Industry\_dummy_{it} + Year\_Dummy_{it} + \varepsilon_{it}} \quad \textbf{(2)}$$

3.3 Summary statistics

Table 2 presents the descriptive statistics of the key variables. ROA has mean and median values of 13.29 and 13.43 respectively. Regarding Tobin's q, the table shows that the mean value is 2.33. The mean percentage of female directors on the boards for the sample period is 9.88% with a median of 10% and values ranging from 0 to 42.86%. There's no board with equal gender population. The table also show that approximately 60% of the observations have at least one woman on the board and 21% have at least two or more women on the board. The average number of board size is 9 with the highest number of 19. On average, non-executive directors account for 64% of total directors. With a median of 67%, this indicates that more than half of the sample have independent boards. With respect to the audit committee, there are on average 6 members in the committee with only 8% having women in the audit committee. The median percentage of females in the audit committee is 0% suggesting that

less than or equal to half of the audit committee have no woman. In terms of firm age, firms in the sample are on average 25 years. We observe that the size of the firms in the sample is on average 16.5 which is very close to the median of 16.11 and not too far from the maximum of 20.71. We winsorize the variables at the 1% level. The lag of the dependent variables and control variables have been utilized in the analysis.

(Insert Table 2 here)

Table 3 reports the Pearson's correlation amongst the variables. We find a statistically significant positive correlation between ROA and the percentage of women on board and the percentage of women in the audit committee. The correlation results for the independent variable reveal low correlation coefficients with the highest being 0.59, suggesting that multicollinearity is not an issue in the model. This was confirmed by the results of the variance inflation factor (VIF) test which indicate that the highest VIF is 1.57 with an average of 1.30, well below the recommended threshold.

(Insert Table 3 here)

4. Results and discussion

4.1 Female board representation and financial performance

Table 4 presents the results of the effects of gender diversity (female representation) on firm financial performance using both ROA and Tobin's q based on two analytical approaches, namely, OLS, and fixed effects. Regarding the effect of female board representation, we

document a positive and statistically significant relationship with ROA and Tobin's q at the 1% level under the OLS in columns 1 and 4; and 5% level under the fixed effect approach in columns 2 and 5 respectively. The results provide support for hypothesis 1. The results that female board representation improves firm financial performance may be explained by the fact that boards are not only the most influential factor that determines the strategic direction and decision making but facilitates the monitoring of executive management (Finkelstein and Hambrick, 1996). It is therefore argued that the presence of women directors helps a board to carry out its strategic functions because they bring with them knowledge, skills and experience which may lead to stronger monitoring and increase in firm value. Overall, our results indicate that gender diversity generates quality decision making at group level and enhance firm financial performance. To address the endogeneity problem often associated with any analysis relating to the board effect (Liang et al., 2013), we further employ dynamic GMM. Columns 3 and 6 of Table 4 show that coefficients are positive and statistically significant at 5% and 1% levels indicating that the results are robust to endogeneity concerns and reverse causality.

(Insert Table 4 here)

Regarding the control variables, our regression results suggest that board size, CEO gender, firm age and volatility have a positive and significant influence on firm financial performance consistent with prior literature (Peni, 2014; Khan and Vieito, 2013). However, leverage and board independence exert a negative effect on firm financial performance as measured by ROA and Tobin Q. It is important to point the negative effect of board independence appears insignificant across all the regressions in columns 1-6. This appears surprising in that it was expected that board independence tends to enhance board monitoring role over executive management and hence increase in firm value but this appears not to be the case. However, the

negative effect of board independence on firm financial performance renders some support to the findings of Agrawal and Knoeber (1996); and Bhagat and Black (2002).

Next, we examine the effect of female participation on corporate boards in Table 5. To measure female participation, we use the percentage of females in the audit committee. The assumption here is that if firms merely appoint women on the corporate board just to bolster the firm's reputation or to fulfil ethical responsibility (Usman et al., 2018; Chapple and Humphrey, 2014), then we should not expect women to be appointed to board committees. However, as committees are charged with specific responsibilities, it is assumed that women who are appointed into the committee of corporate boards have special qualities that can improve the decision process of the committee. Thus, we expect the committee gender diversity to have a positive effect on the performance of the firm. From the table, the results reported in columns 3 and 6, indicate a positive and significant relationship between the proportion of women on the audit committee and firm financial performance (ROA: $\beta = 0.058$, $p<0.01$; and Tobin's Q: $\beta = 0.032$, $p<0.05$). The results indicate that a 1% increase in the percentage of women in the audit committee increases ROA by 0.058% and Tobin's Q by 0.032%. The results provide support for our hypothesis 2. The results suggest that female participation exert a significant effect on firm performance. One plausible explanation is that by nature, board committees are smaller, have specific and specialist functions and projects to execute and are likely to influence vital and specific aspects of decision-making process that have clear effects on firm financial performance. Also, for such women to be appointed to board committees, they must have some distinguishing qualities that can influence firm performance. Our results are consistent with those provided by Green and Homroy (2018) for European firms.

(Insert Table 5 here)

Robustness checks

To check the robustness of our baseline results reported in Tables 4 and 5, we conduct further tests using alternative proxies for board gender diversity. First, we follow Liu et al., (2014) to measure board gender diversity as a dummy variable ***(at_least_1fem)*** taking the value of 1 when there is at least one female on the board and zero otherwise. Secondly, we use the dummy variable ***(at_least_2fem)*** equal 1 when there are at least two women on the board and zero otherwise[8]. Next, to check the robustness of the results reported on audit committee diversity (female participation) reported in Table 6, we include a dummy variable equal 1 when there is at least one woman on the audit committee and 0 otherwise.

In column 3, we report the results for audit committee diversity. We find a significant positive effect of board committee diversity *(DFemAuditCom)* on firm performance ($\beta = 0.043$, $p \leq 5\%$). As with the earlier results, the coefficient is larger for audit committee diversity when compared to the board level diversity. This confirms our earlier results that when women are given the opportunity to participate in the board by being appointed to the board committee, firm performance is likely to increase. In panel B when we use Tobin's Q as our dependent variable, we obtain qualitatively similar results to those obtained in panel A.

(Insert Table 6 here)

4. Conclusion

This study aims to provide some insights into the relationship between board gender diversity and firm performance in a developing country context where corporate governance systems and institutions appear weak. Utilising a panel dataset of 77 Nigerian listed companies over the period of 2008-2016. Our evidence suggests that firms with at least one female on board perform better than those without female on the board. Thus, we document that the presence

[8] We do not include a check for at least three women as the observations with at least 3 women are very small.

of females on corporate boards has a positive effect on firm performance measured by return on assets. Further analysis demonstrates that when the number of women increases, financial performance increases. We also find that the appointment of women on audit committees significantly increase a firm's performance. The results are robust after controlling for endogeneity and the use of alternative measures of board gender diversity. The overall findings of the study support both the agency theory and the resource dependency theory.

Our study, therefore, provides practical implications for developing countries where institutions and governance systems are weak. Our recommendation is that the Nigerian policy makers, regulators and corporate decision makers should provide an enabling environment where more women are appointed to corporate boards by reforming the corporate governance systems. Our study suggests that apart from the moral justification of equal rights, there are economic benefits to be derived from female representation. The results of the study can be extended to other sub-Saharan African countries using a cross-country study.

References

Adams, R.B. and Ferreira, D. (2007). A theory of friendly boards. *The journal of finance*, *62*(1), pp.217-250.

Adams, R.B. and Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial economics*, *94*(2), pp.291-309.

Agrawal, A., and Knoeber, C. R. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis*, 31, pp. 377–397.

Ahern, K.R. and Dittmar, A.K., (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *The Quarterly Journal of Economics*, *127*(1), pp.137-197.

Arellano, M. and Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), pp.277-297.

Arellano, M. and Bover, O., 1(995). Another look at the instrumental variable estimation of error-components models. *Journal of econometrics*, *68*(1), pp.29-51.

Brammer, S., Millington, A. and Pavelin, S. (2007). Gender and ethnic diversity among UK corporate boards, Corporate Governance: An International Review, 15(2), 393-403.

Bennouri, M., Chtioui, T., Nagati, H. and Nekhili, M., (2018). Female board directorship and firm performance: What really matters? *Journal of Banking & Finance*, *88*, pp.267-291.

Bernardi, R.A., Bosco, S.M. and Columb, V.L. (2009). Does female representation on boards of directors associate with the 'most ethical companies' list? *Corporate Reputation Review*, *12*(3), pp.270-280.

Bhagat, S.,and Black, B. (2002). The non-correlation between board independence and long-term firm performance. *Journal of Corporation Law*, *27*(2), pp.231–273.

Bøhren, Ø., & Staubo, S. (2016). Mandatory gender balance and board independence. *European Financial Management*, *22*(1), 3-30.

Campbell, K. and Mínguez-Vera, A., (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, *83*(3), pp.435-451.

Carter, D.A., Simkins, B,J. and Simpson, W.G. (2003). Corporate governance, board diversity, and firm value, *Financial Review*, 38, pp.33-53.

Carter, D.A., D'Souza, F., Simkins, B.J. and Simpson, W.G., (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, *18*(5), pp.396-414.

Carter, D. and Cheng, S., (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, *87*(1), pp.157-176.

Chapple, L., & Humphrey, J. E. (2014). Does board gender diversity have a financial impact? Evidence using stock portfolio performance. *Journal of business ethics*, *122*(4), 709-723.

Chijoke-Mgbame, A.M. and Mgbame, C.O. (2018). Discretionary environmental disclosures of corporations in Nigeria. *International Journal of Disclosure and Governance*, *15*(4), pp.252-261.

Choi, S. B., Park, B. I., and Hong, P. (2012). Does ownership structure matter for firm technological innovation performance? The case of Korean firms. *Corporate Governance: An International Review*, *20*(3), pp. 267-288.

Chun, H., Kim, J.W., Morck, R. and Yeung, B., (2008). Creative destruction and firm-specific performance heterogeneity. *Journal of Financial Economics*, *89*(1), pp.109-135.

Cicero, D., Wintoki, M.B. and Yang, T., (2013). How do public companies adjust their board structures?. *Journal of Corporate Finance*, *23*, pp.108-127.

Claessens, S.,and Yurtoglu, B. B. (2013). Corporate governance in emerging markets: A survey. *Emerging markets review*, *15*, 1-33.

Conyon, M.J. and He, L., (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research*, *79*, pp.198-211.

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*(2), 448-74.

Daily, C.M., Certo, S.T. and Dalton, D.R., (1999). A decade of corporate women: Some progress in the boardroom, none in the executive suite. *Strategic management journal*, *20*(1), pp.93-100.

Dalton, D.R., Daily, C.M., Ellstrand, A.E. and Johnson, J.L., (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal*, *19*(3), pp.269-290.

Damodar, N.G., (2004). *Basic Econometrics*, Tata McGraw-Hill Publishing Company Limited, New Delhi.

Dechow, P.M., Sloan, R.G. and Sweeney, A.P., (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary accounting research*, *13*(1), pp.1-36.

D'Mello, R. and Miranda, M., (2010). Long-term debt and overinvestment agency problem. *Journal of Banking & Finance*, *34*(2), pp 324-335.

Dezsö, C.L. and Ross, D.G., (2012). Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal*, *33*(9), pp. 1072-1089.

Fama, E. F., & Jensen, M. C. (1983). Agency problems and residual claims. *The journal of Law and Economics*, *26*(2), 327-349.

Finkelstein, S. and Hambrick, D. (1996) *Strategic Leadership: Top Executives and their Effects on Organizations*. Minneapolis, MN: West.

Granovetter, M. (1978). Threshold models of collective behaviour, American Journal of Sociology, 83, 6, 1420-1443.

Green, C.P. and Homroy, S., (2018). Female directors, board committees and firm performance. *European Economic Review*, *102*, pp.19-38.

Gregory-Smith, I., Main, B.G. and O'Reilly III, C.A., (2014). Appointments, pay and performance in UK boardrooms by gender. *The Economic Journal*, *124*(574), pp.F109-F128.

Guest, P.M., (2009). The impact of board size on firm performance: evidence from the UK. *The European Journal of Finance*, *15*(4), pp.385-404.

Gul, F.A., Srinidhi, B. and Ng, A.C., (2011). Does board gender diversity improve the informativeness of stock prices?. *Journal of Accounting and Economics*, *51*(3), pp.314-338.

Gyapong, E., Monem, R.M. and Hu, F., (2016). Do women and ethnic minority directors influence firm value? Evidence from post-apartheid South Africa. *Journal of Business Finance & Accounting*, *43*(3-4), pp.370-413.

Hillman, A.J., Shropshire, C. and Cannella Jr, A.A., (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal*, *50*(4), pp.941-952.

Istaitieh, A and Rodriguez, J.M. (2006). Factor-product markets and firm's capital structure: A literature Review, *Review of Financial Economics*, Vol. 15, No. 1, pp. 49-75

Isidro, H. and Sobral, M., (2015). The effects of women on corporate boards on firm value, financial performance, and ethical and social compliance. *Journal of Business Ethics*, *132*(1), pp.1-19.

Jehn, K.A., Northcraft, G.B., and Neale, M.A. (1999). Why differences make a difference. A friel‌d study of diversity, conflict, and performance in workgroups, Administrative Science Quarterly, 44, 741-763.

Jensen, M.C. and Meckling, W.H., (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), pp.305-360.

Jianakoplos, N.A. and Bernasek, A. (1998). Are women more risk averse? Economic Inquary, 36, 620-630.

Jurkus, A.F., Park, J.C. and Woodard, L.S., (2011). Women in top management and agency costs. *Journal of Business Research*, *64*(2), pp.180-186.

Kanter, R.M. (1977). Some effects of proportions on group life. *American Journal of Sociology*, 82(5), pp.965-990.

Kesner, I.F., (1988). Directors' characteristics and committee membership: An investigation of type, occupation, tenure, and gender. *Academy of Management journal*, *31*(1), pp.66-84.

Khan, W. A., and Vieito, J. P., (2013). CEO gender and firm performance. *Journal of Economics and Business*, *67*, pp.55-66.

Klien, A. (2002). Audit committee, board of director characteristics, and earnings management, *Journal of Accounting and Economics*, 33, pp. 375-400.

Klein, A., (1998). Firm performance and board committee structure. *The Journal of Law and Economics*, *41*(1), pp.275-304.

Liang, Q., Xu, P., & Jiraporn, P. (2013). Board characteristics and Chinese bank performance. *Journal of Banking & Finance*, *37*(8), 2953-2968.

Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *The British Accounting Review*, *47*(4), pp.409-424.

Liu, Y., Miletkov, M.K., Wei, Z. and Yang, T., (2015). Board independence and firm performance in China. *Journal of Corporate Finance*, *30*, pp.223-244.

Liu, Y., Wei, Z. and Xie, F., (2014). Do women directors improve firm performance in China? *Journal of Corporate Finance*, *28*, pp.169-184.

Nakpodia, F., Adegbite, E., Amaeshi, K. and Owolabi, A., (2018). Neither principles nor rules: Making corporate governance work in Sub-Saharan Africa. *Journal of Business Ethics*, *151*(2), pp.391-408.

Nguyen, T., Locke, S. and Reddy, K., (2015). Does boardroom gender diversity matter? Evidence from a transitional economy. *International Review of Economics & Finance*, *37*, pp.184-202.

Osma, B.G. and Noguer, B.G.D.A., (2007). The effect of the board composition and its monitoring committees on earnings management: Evidence from Spain. *Corporate Governance: An International Review*, *15*(6), pp.1413-1428.

Peni, E., (2014). CEO and Chairperson characteristics and firm performance. *Journal of Management & Governance*, *18*(1), pp. 185-205.

Perryman, A. A., Fernando, G. D., & Tripathy, A. (2016). Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. *Journal of Business Research*, *69*(2), 579-586.

Pfeffer, J., and Salancik, G., (1978). *The external control of organizations: a resource-dependence perspective*. NewYork: Harper & Row.

Robinson, G. and Dechant, K. (1997). Building a business case for diversity, Academy of Management Executive, 11, pp.21-30.

Rose, C., (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review*, *15*(2), pp.404-413.

Schultz, E.L., Tan, D.T. and Walsh, K.D., (2010). Endogeneity and the corporate governance-performance relation. *Australian journal of Management*, *35*(2), pp.145-163.

Sila, V., Gonzalez, A. and Hagendorff, J., (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, *36*, pp.26-53.

Sun, J. and Cahan, S., (2009). The effect of compensation committee quality on the association between CEO cash compensation and accounting performance. *Corporate Governance: An International Review*, *17*(2), pp.193-207.

Torchia, M., Calabro, A. and Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass, Journal of Business Ethics, 102,2, 299-317.

Usman, M., Zhang, J., Farooq, M.U., Makki, M.A.M. and Dong, N., (2018). Female directors and CEO power. *Economics Letters*, *165*, pp.44-47.

Wadesango, N., Rembe, S. and Chabaya, O., (2011). Violation of women's rights by harmful traditional practices. *The Anthropologist*, *13*(2), pp.121-129.

World Economic Forum (2018). Global Gender Gap Report. https://www.weforum.org/reports/the-global-gender-gap-report-2018. Accessed December 18, 2018.

Wintoki, M.B., Linck, J.S. and Netter, J.M., (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, *105*(3), pp.581-606.

Appendix 1

Table 1
Variable Definitions.

Variable	Symbol	Definition	Source
Return on Asset	ROA	This is taken as a ratio and calculated as Earnings Before Interest and Tax, Depreciation and Amortisation (EBITDA) divided by Total Assets	Datastream
Tobin's q	Tobin's q	This is the sum of market value of stocks plus the book value of debt divided by total assets.	Datastream
Percentage of women directors (Female representation)	%FemBoard	This is number of women on board directors divided by the total number of directors on the board taken as a percentage	Annual Report
Percentage of women directors on the audit committee (Female participation)	%FemAuditCom	This is number of women on the audit committee divided by the total number of directors on the audit committee taken as a percentage	Annual Report
Board Size	BSize	This is the number of directors on the board	Annual reports and Bloomberg
Board Independence	BIndep	This is the number of independent directors on the board divided by the total number of directors on the board taken as a percentage	Annual reports and Bloomberg
Audit Committee size	AuditCom	This is the number of directors on the audit committee	Annual Report
CEO gender	CEOgender	This a dummy variable with a value of 1 if the CEO is a man or zero otherwise.	Annual Report

Firm Age	Firmage	This is the number of years a firm has been listed on the NSE	Annual Report
Leverage	Lev	This is the book value of debt divided by total assets	Datastream
Firm Size	Fsize	This is the natural log of the firm's total assets	Datastream
Percentage of foreign ownership	%ForeignOwn	This is a dummy variable with values of 1 if there is a foreign owner with an interest greater than or equal to 20%	Annual report
Volatility	Volatility	This is the annualised volatility of the firm's stock price	Datastream

Table 2
Summary Statistics

	Obs	Mean	Median	Std. Dev.	Min	Max
ROA	686	13.29	13.43	37.84	-149.69	172.05
Tobin's q	692	2.33	1.32	5.20	0.01	65.24
%FemBoard	690	9.88	10	9.88	0	42.86
at_least_1fem	690	0.60	1	0.49	0	1
at_least_2fem	690	0.21	0	0.41	0	1
%FemAuditCom	689	8.35	0	11.58	0	60
DFemAuditCom	692	0.397	0	0.490	0	1
BSize	690	8.92	9	2.47	4	19
BIndep	690	64.48	66.67	15.56	16.67	93.33
AuditCom	690	5.52	6	0.85	3	8
CEO gender	691	0.05	0	0.22	0	1
FirmAge	675	24.78	26	12.30	1	52
leverage	691	0.77	0.6	1.50	0	17.98
FSIze	691	16.15	16.11	1.77	11.13	20.71
%Foreign Own	692	0.50	0	0.50	0	1
Volatility	639	42.57	43.30	15.53	0.80	174.62

Table 3
Pearson's Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	ROA	1												
2	Tobin's q	0.29***	1											
3	%FemBoard	0.07**	-0.06	1										
4	%FemAuditCom	0.10***	-0.01	0.59***	1									
5	BSize	0.17***	-0.02	-0.03	0.039	1								
6	BIndep	-0.03	-0.04	-0.07*	-0.12***	0.11***	1							
7	AuditCom	0.15***	0.05	0.08	0.04	0.31***	0.03	1						
8	CEO gender	0.08**	0.01	0.25***	0.07*	-0.06	-0.04	-0.20***	1					
9	Firmage	0.25***	0.05	-0.00	0.02	0.12***	-0.01	0.18***	-0.03	1				
10	Leverage	-0.41***	0.65***	-0.10***	-0.07*	-0.10**	-0.05	0.07*	-0.05	-0.024	1			
11	Fsize	0.25***	0.27***	0.03	0.05	0.45***	-0.09**	0.43***	-0.22***	0.10***	-0.27***	1		
12	%ForeignOwn	0.16***	-0.06	-0.06	0.05	0.14**	0.09**	0.20***	-0.13***	0.34***	-0.09**	0.18***	1	
13	Volatility	-0.01	-0.12***	0.16***	0.16***	0.033	0.07*	-0.054	0.01	-0.13***	-0.11***	-0.11***	0.02	1

This table presents the correlation coefficients. *, **, *** represent significance at 10%, 5% and 1% levels respectively. All variables are defined in Table 1

Table 4
The Effect of Female Representation on firm performance

	Panel A (ROA)			Panel B (Tobin's q)		
	OLS	Fixed Effect	GMM	OLS	Fixed Effect	GMM
	(1)	(2)	(3)	(4)	(5)	(6)
ROA_{t-1}			0.559***			
			(0.015)			
Tobin's q_{t-1}						0.564***
						(0.010)
% FemBoard	0.049***	0.024**	0.032**	0.029***	0.027**	0.014***
	(0.003)	(0.011)	(0.007)	(0.007)	(0.012)	(0.002)
BSize	0.538***	0.162**	0.184***	0.164*	0.127**	0.460***
	(0.061)	(0.069)	(0.049)	(0.092)	(0.050)	(0.130)
BIndep	-0.001	-0.005	-0.016	-0.002	-0.006	-0.003**
	(0.001)	(0.004)	(0.100)	(0.004)	(0.005)	(0.002)
AuditCom	0.011	0.023	0.027*	0.046	0.114*	0.032
	(0.034)	(0.021)	(0.016)	(0.088)	(0.062)	(0.055)
CEO gender	0.136*	0.151***	0.369***	1.630***	0.714***	0.659***
	(0.081)	(0.030)	(0.082)	(0.330)	(0.228)	(0.125)
FirmAge	0.040**	0.021***	0.037*	0.026***	0.007*	0.003
	(0.018)	(0.008)	(0.020)	(0.006)	(0.004)	(0.002)
Lev	-0.187***	-0.044*	-0.013*	0.178	0.026	0.216**
	(0.048)	(0.026)	(0.008)	(0.179)	(0.125)	(0.099)
FirmSize	0.019	0.016	0.178	0.059	0.026	0.025
	(0.036)	(0.022)	(0.171)	(0.045)	(0.031)	(0.020)
%ForeignOwn	0.498	0.357	0.578	0.205	0.044	0.300***
	(0.743)	(0.489)	(0.688)	(0.135)	(0.095)	(0.099)
Volatility	0.078*	0.043**	0.092***	-0.017***	-0.009***	-0.027***
	(0.045)	(0.019)	(0.032)	(0.005)	(0.003)	(0.003)
Year effect	Yes	No	Yes	Yes	No	Yes
Observations	641	567	567	641	567	567
R^2	0.202	0.268		0.206	0.278	
AR (1)			0.001			0.000
AR (2)			0.689			0.634
Hansen J test of over-identification			0.466			0.434

Note: This table presents the regression results for board gender diversity. The dependent variables are ROA and Tobin's q for Panel A and Panel B respectively. All variables are defined in Table 1. The first–order serial correlation AR (1) test is significant, the AR (2) test is not significant, which means we fail to reject the null hypothesis of no second-order serial correlation. The Hansen J test of over-identification is not significant, which means that we fail to reject the null hypothesis that the instruments employed are valid. Robust standard errors are in parentheses. *, **, *** represents significance at 10%, 5% and 1% level respectively.

, * represent statistical significance at the 5% and 1% level respectively

Table 5
The effect of female participation on board committee on firm performance

	Panel A (ROA)			Panel B (Tobin's q)		
	OLS	**Fixed Effect**	**GMM**	**OLS**	**Fixed Effect**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
ROA_{t-1}			0.566***			
			(0.033)			
Tobin's q_{t-1}						0.607***
						(0.033)
% FemAuditCom	0.075*	0.056**	0.058***	0.060***	0.041**	0.032**
	(0.038)	(0.027)	(0.022)	(0.021)	(0.019)	(0.014)
BSize	0.187***	0.157*	0.152**	0.284***	0.178**	0.139***
	(0.063)	(0.089)	(0.070)	(0.041)	(0.087)	(0.020)
BIndep	-0.007**	-0.010	-0.011	-0.014**	-0.015	-0.007**
	(0.004)	(0.006)	(0.030)	(0.006)	(0.029)	(0.004)
AuditCom	0.042	0.023	0.021**	0.102	0.020	0.049
	(0.046)	(0.150)	(0.003)	(0.090)	(0.026)	(0.044)
CEO gender	1.742***	1.275***	0.348***	1.794***	1.348***	0.225***
	(0.333)	(0.192)	(0.073)	(0.325)	(0.493)	(0.063)
FirmAge	0.026***	0.029*	0.006*	0.027***	0.004**	0.008**
	(0.006)	(0.015)	(0.004)	(0.006)	(0.002)	(0.004)
Lev	-0.193	-0.133	-0.014*	0.222	0.346**	0.309***
	(0.225)	(0.169)	(0.009)	(0.183)	(0.147)	(0.107)
FSize	0.146	0.170	0.242	0.077	0.055	0.027
	(0.162)	(0.119)	(0.349)	(0.078)	(0.046)	(0.031)
Foreign owner	0.132	0.137	0.114	0.151	0.137	0.140*
	(0.170)	(0.126)	(0.158)	(0.134)	(0.126)	(0.078)
Volatility	0.023***	0.024**	0.012*	-0.018***	-0.013*	-0.035
	(0.001)	(0.012)	(0.006)	(0.006)	(0.007)	(0.038)
Year effect	Yes	No	Yes	Yes	No	Yes
Observations	641	567	567	641	567	567
R^2	0.209	0.266		0.196	0.253	
AR (1)			0.001			0.000
AR (2)			0.537			0.786
Hansen J test of over-identification			0.542			0.543

Note: This table presents the regression results for audit committee gender diversity. The dependent variable is ROA and Tobin's q for Panel A and Panel B respectively. All variables are defined in appendix 1. The first–order serial correlation AR (1) test is significant, the AR (2) test is not significant, which means we fail to reject the null hypothesis of no second-order serial correlation. The Hansen J test of over-identification is not significant, which means that we fail to reject the null hypothesis that the instruments employed are valid. Robust standard errors are in parentheses. *, **, *** represents significance at 10%, 5% and 1% level respectively. Robust standard errors are in parentheses. *, **, *** represents significance at 10%, 5% and 1% level respectively

Table 6

Robustness test: Alternative proxy for board and audit committee gender diversity.

	Panel A (ROA)			Panel B (Tobin's q)		
	Female representation		Female participation	Female representation		Female participation
	At least 1 female (1)	At least 2 females (2)	DFemale Audit Committee (3)	At least 1 female (4)	At least 2 females (5)	DFemale Audit Committee (6)
ROA_{t-1}	0.734***	0.674***	0.655***			
	(0.070)	(0.085)	(0.067)			
Tobin's q_{t-1}				0.580***	0.577***	0.507***
				(0.026)	(0.025)	(0.165)
at_least_1fem	0.014**			0.022**		
	(0.006)			(0.011)		
at_least_2fem		0.024**			0.028**	
		(0.011)			(0.013)	
DFemAuditCom			0.043**			0.045***
			(0.019)			(0.015)
BSize	0.022***	0.138**	0.162**	0.043***	0.131**	0.144***
	(0.005)	(0.065)	(0.069)	(0.015)	(0.059)	(0.047)
BIndep	-0.318	-0.255	-0.063	-0.297	-0.297	-0.378
	(0.203)	(0.248)	(0.039)	(0.363)	(0.307)	(0.257)
AuditCom	0.263**	0.148*	0.175**	0.022***	0.144***	0.182***
	(0.114)	(0.088)	(0.088)	(0.005)	(0.046)	(0.055)
CEO gender	0.142	0.198	0.308	0.767**	0.681*	0.662*
	(0.172)	(0.135)	(0.236)	(0.321)	(0.400)	(0.398)
FirmAge	0.037	0.019	0.053	0.004	0.002	0.040
	(0.024)	(0.036)	(0.087)	(0.012)	(0.005)	(0.04)
Lev	0.363*	0.526*	0.175	-0.136**	-0.204	-0.358*
	(0.198)	(0.308)	(0.310)	(0.059)	(0.147)	(0.120)
FSize	0.043	0.026	0.109	0.013	0.040	0.147
	(0.052)	(0.032)	(0.076)	(0.015)	(0.155)	(0.254)
%ForeignOwn	1.038***	1.328***	0.534	1.651***	1.060*	0.827
	(0.194)	(0.468)	(0.464)	(0.554)	(0.635)	(0.708)
Volatility	0.014***	0.072*	0.041**	-0.018**	-0.013**	-0.075*
	(0.004)	(0.040)	(0.019)	(0.009)	(0.007)	(0.038)
Year Effect	Yes	No	Yes	Yes	No	Yes
Observations	567	567	567	567	567	567
AR (1)	0.003	0.001	0.001	0.002	0.001	0.001
AR (2)	0.432	0.224	0.578	0.436	0.248	0.309
Hansen J test of over-identification	0.265	0.381	0.346	0.323	0.390	0.444

This table presents the regression results for the robustness test. All variables are lagged one year and are defined in appendix 1. The first–order serial correlation AR (1) test is significant, the AR (2) test is not significant, which means we fail to reject the null hypothesis of no second-order serial correlation. The Hansen J test of over-identification is not significant, which means that we fail to reject the null hypothesis that the instruments employed are valid. Robust standard errors are in parentheses. *, **, *** represents significance at 10%, 5% and 1% level respectively.