

Board Gender Diversity, Audit Committee and Financial Performance: Evidence from
Nigeria

By

Marian Chijoke-Mgbame*, Agyenim Boateng*^a & Chijoke Oscar Mgbame*

*Leicester Castle Business School, De Montfort University, Leicester, UK

*^a Address for Correspondence:

Professor Agyenim Boateng
Leicester Castle Business School,
De Montfort University, Leicester, UK
The Gateway, Leicester LE1 9BH
Email: Agyenim.Boateng@dmu.ac.uk

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Abstract

This paper considers the effects of female representation and the proportion of female representation on corporate boards and audit committees on financial performance in an African context where institutions are weak. Employing a panel of 77 firms, our results show that female board representation exerts a positive and significant influence on firm financial performance. The study also finds 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 indicates that the inclusion of females on the audit committee 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 in the effects of board gender diversity on firm outcomes in both the academic and practitioner milieu (see, Dezsó and Ross, 2012; Hillman et al., 2007; Liu et al., 2014; Perryman et al., 2016). The interests stem from the persistent under-representation of women in the upper echelons of corporate boards around the world. The above is against the backdrop that, apart from higher numbers of women with strong academic achievements (see, Grosser and Moon, 2008; OECD, 2015; Karam and Jamali, 2013), scholars such as Gilligan (1982); Chonko and Hunt (1985); and Ferrell and Skinner (1988) document that men and women differ in terms of ethical attitudes and behaviour. Drawing on social categorisation theory, Gilligan (1982) asserts that women tend to approach and solve ethical dilemmas in terms of relationships, care and compassion. In contrast, men approach such issues in terms of justice, rules and rights. Indeed, Chonko and Hunt (1985) and Ferrell and Skinner (1988) found that women managers focus more on

the ethical aspects of decisions compared to men, suggesting that women may enter business careers with values which are different from their male counterparts.

The above arguments suggest that how firms are managed and monitored by corporate boards that have women members, may be different in that different standards of ethical judgement may be applied to firm decision-making, with implications for overall economic outcomes. It is therefore not surprising that numerous studies have attempted to explain the need to recruit female directors and how increasing female board representation may have an impact on firms' economic outcomes. However, prior empirical studies on the impact of female board representation have produced mixed results (see, Carter et al., 2003; Rose, 2007; Carter et al., 2010; Post and Bryon, 2015; Isidro and Sobral, 2015). On one hand, studies such as Carter et al. (2003), Erhardt et al. (2003), Campbell and Minguez-Vera (2010); Nguyen and Faff (2012) and Reguera-Alvarado, de Fuentes and Laffarga (2017) found the inclusion of women on corporate boards to exert a positive and significant influence on firm performance. On the other hand, other studies report lower accounting returns or an insignificant effect of female board representation on performance (see, Rose, 2007; Darmadi, 2011; Minguez-Vera and Martin, 2011; Carter et al., 2010). In a meta-analysis of 170 studies over the period of 1989-2014, Post and Bryon (2015) found the effects of female board representation on firm financial performance for 100 studies to be positive, whereas in 70 studies the effects on financial performance were insignificant.

Against the backdrop of conflicting results documented above, it is also pertinent to point out that prior empirical studies have focused predominantly on developed countries in Europe and North America (see, Carter et al., 2003; Rose, 2007; Campbell and Minguez-Vera, 2008; Adams and Ferreira, 2009; Gregory-Smith et al., 2014; Liu et al., 2014; Conyon and He, 2017). Relatively little attention has been given to firms in developing countries, with the exception of a few studies, of which Liu et al. (2014) in China; Gyapong et al.

(2016) in South Africa and Nguyen et al. (2015) in Vietnam are prominent. Yet developing countries, particularly those in Sub-Saharan Africa, such as Nigeria, are patriarchal societies (Wadesango et al., 2011; International Finance Corporation, 2019), where men still dominate decision-making at both domestic and organisational levels. More importantly, African countries have weak legal and institutional frameworks (Chijoke-Mgbame and Mgbame, 2018; Nakpodia et al., 2018); Agyei-Boapeah et al. (2020), with no explicit gender equality provision for corporate activities. Both formal (i.e., legal and regulatory) and informal (i.e., culture) institutions in Sub-Saharan Africa are weak and under-developed due to political instability, poor political leadership, conflicts and wars (United Nations Economic Commission for Africa, 2009; Nakpodia et al., 2018; International Finance Corporation, 2019; Agyei-Boapeah et al., 2020). For example, apart from a few Sub-Saharan African countries, such as Kenya and South Africa, legal institutions rarely support women at work (Hughes et al., 2017). In a similar vein, despite progress made in recent years, most African cultures continue to distinguish between female and male roles, thereby implicitly defining the expected behaviours of females and males. Thus, cultural barriers which give preferences to men in terms of education and make women play supportive role to men, as pointed out by Asuncion-Lande (1979) in the Mexican context, are still prevalent in Africa¹. Consequently, institutional environments in Africa minimise gender roles and reinforce gender inequality and stereotypes (Chizema et al., 2015). This may explain why 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 market economies with well-established institutions to developing country firms.

¹ In Nigeria, due to the male dominance influenced by culture, women are mostly under-represented in corporate boards (International Finance Corporation, 2019).

Another aspect of the board diversity-firm performance nexus, which appears interesting, but has been ignored by researchers, is the effect of female participation on board committees on firm financial performance (Green and Homroy, 2018). It is argued that female representation on board committees constitutes real participation and reflects female integration in the governance mechanisms that are likely to have more direct effect on firm performance (Adams, Hermalin and Weisbach, 2010; Guo and Masulis, 2015). This is because scholars (e.g., Guo and Masulis, 2015; Green and Homroy, 2018) contend that most of the board work is carried out through committees, hence how board committees are composed may affect the functioning of a firm and its financial performance.

In this study, we examine the effects of female board representation on financial performance in an African context, where a large segment of women are confined to bringing up their children and performing domestic household activities as has historically been the case in most countries across the globe (see, Adler, 1993; Hughes et al., 2017). Thus, this paper distinguishes between the mere presence of females on a board, the proportion of female representation on the board and their participation on committees, to test the extent to which they impact on firm financial performance. In particular, the examination of the effects of female participation at board committee level in Africa on financial performance is significant in that corruption appears pervasive at corporate and societal levels in many African countries (Transparency International, 2018). Audit committees² are therefore charged to reduce malfeasance and enhance firm financial performance. The analysis of female representation on audit committees therefore helps us to explicitly account for the role of women in firm performance.

²Audit Committee is the only board committee required by the Nigerian Code of Corporate Governance to be present in all listed firms.

The analysis is undertaken by employing a panel dataset of 77 listed companies on the Nigerian Stock Exchange (NSE) over the period 2008-2016. Although the recently revised Nigerian code of corporate governance does not provide any explicit recommendation for female representation in public companies, the National Gender Policy requires 35% female representation³ in the cabinet⁴ of the president of the republic. The policy suggests an increasing recognition of the important role of women in Nigeria. The 2016 survey carried out by DCSL Corporate Services Limited provides further evidence on the rising trends of female representation on the corporate boards of firms listed on the NSE. According to the survey, the proportion of women on the corporate boards of firms in the manufacturing sector increased from 8% in 2013 to 12% in 2014 and 2015 of the 132 firms surveyed. Similarly, the proportion of women on the corporate boards in sectors such as oil and gas, publishing and financial services increased over the 2013-2015 period. According to DCSL (2016), the average proportion of female board representation in 2015 constituted about 14% of firms listed on NSE. Nigeria, therefore, provides a suitable setting in the African context to test the effect of female board representation on firm financial performance.

Our results show that female representation exerts a positive and significant influence on firm financial performance (measured by both ROA and Tobin's Q). We also find the performance effect of gender diversity to be stronger for firms with two or more female directors, suggesting that building a critical mass of females on the board enhances a firm's financial performance. This finding therefore supports the conclusions drawn by Torchia et al. (2011); Joecks et al. (2013) and Liu et al. (2014) which indicate that the presence of three or more females in the boardroom leads to improvement in firm performance, measured by

³ Women only make up 16% of the current Nigerian cabinet.

⁴ In 2015, the current president swore in 36 ministers with only six 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.

return on equity. Further analysis suggests that female representation on the audit committee (a committee required by the Nigerian Code of Corporate Governance) appears to have a positive impact on a firm's financial performance. Our results are robust after controlling for endogeneity and the use of alternative measures of board gender diversity.

This paper makes several contributions to the literature. First, the study adds to the current body of literature (e.g. Liu et al., 2014; Gyapong et al., 2016; and Nguyen et al., 2015), 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 one which is under-researched.

Second, the last decade has seen some considerable debates on the need to increase female representation on corporate boards and in national governance worldwide for social and ethical reasons (see, Campbell and Miguez-Vera, 2008; Grosser and Moon, 2008; Brammer et al., 2007). Against this background, it is imperative to explore whether greater representation of women is associated with an increase in firm value, because shareholder wealth maximisation is the primary goal of a firm. Such an investigation will not only inspire confidence in the society and key stakeholders at the forefront in the fight for gender equity, but will provide a clear case for female representation beyond ethical and social considerations. In short, 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. The results obtained in this study can provide lessons to other developing countries, especially those in Africa⁵, in developing better corporate

⁵ Sub-Saharan African countries share common political and economic objectives and aspirations expressed, for example, through the African Union, the Lagos Plan of Action for Economic Development of Africa, and the treaty establishing the Economic Community of West African States. Sub-Saharan African countries share a common history, social structure, weak institutions, similar political and economic problems (Boateng, 2001;

governance practices. Lastly, we differentiate between female representation on the board and female participation on board committees, which most studies in developing countries have ignored (Gyapong et al., 2016). This is important in that it adds additional evidence regarding the contribution of female representation in key specific tasks at a committee level to the overall financial performance of a firm.

The rest of the paper is organised as follows: the next section reviews the relevant literature and develops the hypotheses of the study. Section 3 presents the data and methodology. Section 4 reports and discusses our results. Section 5 provides the conclusions of 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 Miguez-Vera, 2008) suggests that the theoretical arguments for greater female representation in corporate boardrooms can be grouped and classified into two broad taxonomies, namely, social equity/ethical and economic perspectives. Scholars who justify the female representation on corporate boards from a social equity and ethical standpoint argue that it is immoral for women to be excluded from corporate boards by virtue of their gender (Brammer et al., 2007; Campbell and Miguez-Vera, 2008). These authors advocate for increased female representation to achieve a more equitable and fairer society. Brammer et al. (2007) therefore argue that firms should see greater female representation as a positive and desirable end in itself. From this perspective, female board representation is primarily seen as a vehicle to mitigate discrimination and curb moral injustice at the top level

United Nations Economic Commission for Africa, 2009). Hence the results of this study provide lessons to other Sub-Saharan Africa Countries.

of firm management. Consistent with the above argument, Campbell and Minguez-Vera (2008) theorize that, if the appointment of female directors to the board is driven by social and ethical pressures for greater equality of females and males, then the effectiveness of the board may be weakened thereby reducing firm value. Other studies, such as Rose (2007) and Sealy (2010), disagree and extend the social equity and ethical perspective by arguing that board gender diversity not only adds legitimacy but also provides a positive signal of a firm's image and reputation, which are important for long-term success. Thus, gender diversity adds to the firm's external legitimacy and promotes greater understanding of the market by matching a firm's board diversity to the diversity of its potential customers and employees, thereby increasing the firm's market share (Brammer et al., 2007; Isidro and Sobral, 2015).

On the other hand, the economic arguments for greater female board representation are premised on the notion that greater female representation leads to improved competitive advantage and consequently an increase in firm financial performance (Robinson and Dechant, 1997; Mattis, 1997; Burke and Kurucz, 1998; Hillman et al., 2007; Cassell, 1997). Drawing on resource dependency theory to support the economic argument for increased 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 it, and how these firms effectively utilise these resources to gain competitive advantage. In the context of board diversity literature, resource dependency theory contends that female representation on corporate boards may facilitate access to a wider pool of human capital which brings additional skills and perspectives to the board's monitoring role and decision-making, with positive implications for firm performance (Mattis, 1997; Burke and Kurucz, 1998; Hillman et al., 2007; Cassell (1997) and Dezso and Ross (2012) concur, and indicate that gender diversity may increase innovative behaviour in the boardroom because a variety of perspectives may emerge when board directors differ in terms of knowledge, experience and

skills (Campbell and Minguez-Vera, 2008; Griffin et al., 2019). More specifically, it is argued that women generally tend to bring distinctive leadership qualities and skills to the boardroom, such as caring, high standards of ethical judgement, risk averseness, co-operation and less radical decision-making, which can lead to improved firm financial performance (Dawson, 1997; 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 improves the quality of board meetings, discussion processes and consequently firm performance. Similarly, Daily et al. (1999), Bernardi et al. (2009) and Carter et al. (2010) suggest that the presence of females on corporate boards provides an environment where different perspectives regarding corporate strategies are presented to enable critical analysis of complex problems and adoption of innovative solutions, and hence better firm performance.

In a similar vein and from an agency theory perspective (Jensen and Meckling, 1976; Fama and Jensen, 1983), the board of directors has a primary responsibility for monitoring executive management to mitigate agency costs. The monitoring responsibility is even more effective when the board is gender diverse (Carter et al., 2003; Ye et al., 2019). This is because gender diversity may increase board quality and independence (Carter et al., 2003; Adams and Ferreira, 2009; Adams and Kirchmaier, 2016), and engender a variety of perspectives to help evaluate alternatives available to solve problems (Campbell and Minguez-Vera, 2008).

Whilst the theoretical perspectives outlined above offer conflicting explanations regarding the effect of female board representation on firm performance, critical mass theory adds a new dimension to the female board representation-firm performance nexus (see

Kanter, 1977; Terjesen et al., 2009; Joecks et al., 2013). According to Kanter (1977), a low level of female representation on the board represents only token appointments and thus has no significant effect on board tasks and firm outcomes. Consequently, Kanter (1977) theorizes that a qualitative change will occur when the female board representation reaches a critical mass. Essentially, Kanter (1977) and Granovetter (1978) suggest that women as minorities in male-dominated boards, have little or no chance of influencing organisational outcomes until they reach a certain threshold or critical mass. Past empirical efforts in sociology and organizational behaviour literature, for example Konrad & Kramer (2006) and Konrad et al. (2008), have reported a clear shift in dynamism in the boardroom in the presence of three or more women. The studies of Torchia et al. (2011); Joecks et al. (2013) Liu et al. (2014) have rendered some support to critical mass theory, suggesting that the presence of three or more women normalizes women's presence in the boardroom beyond tokenism, thereby leading to positive and significant impacts on corporate decisions and outcomes.

From the above theoretical perspectives, the relationship between female board representation and firm financial performance appears unclear and remains an empirical question, and this study attempts to shed light on this subject in a developing country context.

2.2 Hypothesis development

2.2.1 Female representation and firm financial performance

As pointed out earlier, prior studies utilising ethical and economic theoretical perspectives have reported mixed and inconclusive results regarding the association between female representation and firm performance (Larker et al., 2007; Campbell and Minguéz-Vera, 2008; Gul et al., 2011; Adams and Ferreira, 2009; Ahern and Dittmar, 2012). However, drawing from social categorisation and resource dependency theories, we argue that

increasing female board representation may exert a positive influence on firm financial performance for the following reasons. First, social categorisation theory underscores the point that women are different from men in terms of qualities such as affiliation and attachment, cooperativeness and ethical behaviour (Gilligan, 1982; Dawson, 1997). This point is consistent with the conclusion drawn by Akaah (1989), which indicates that female marketing executives tend to exhibit higher standards of ethical judgement compared to men. Researchers such as Grant (1988) have rendered some support to the view that unique female qualities such as ethical attitudes impact positively on the economic outcomes of a firm. Others disagree and find female board representation to exert a negative influence on firm performance (Catalyst, 1998; Burgess and Tharenou, 2002; Francoeur et al., 2008). For example, the studies of Adams and Ferreira (2009), Ahern and Dittmar (2012) and Bohren and Staubo (2016) argue that increased female representation may lead to heightened interpersonal conflicts, thereby creating in- and out-groups. According to Jehn et al. (1999), such social categorisation tendencies may lead to mistrust and impair team processes, thereby exerting a negative influence on firm financial performance. However, Dubinsky and Levy (1985) and Kidwell et al. (1987) found no significant relationship between ethical attitudes in male and female managers' firm managerial decision-making. Taken together the research suggests that the effects of female ethical attitudes remain an empirical question.

In the context of Nigeria, we expect firms listed on the NSE, which operate in an environment characterised by weak legal institutions and poor governance environment, to benefit from a gender-diverse board. This is because gender diversity may serve as a governance mechanism to ameliorate the weaknesses in the institutions and corporate governance systems. Indeed, researchers such as Huse and Solberg (2005) and Adams and Ferreira (2009) contend that female directors improve the quality of public disclosure through effective monitoring of executive management's actions, and demand greater

accountability from senior managers for poor performance. Gul et al. (2011) and Adams and Ferreira (2009) therefore argue that a gender-diverse board can be a partial and, in some cases, stronger substitute for weak corporate governance mechanisms in environments with weak legal and institutional frameworks. In light of the above argument, we hypothesise that:

Hypothesis 1: Female board representation is positively associated with the financial performance of listed firms in Nigeria.

2.2.2 Female representation on audit committee and financial performance

Given the complexity, size and enormous responsibility of the board oversight role, corporate governance codes and practices require boards of listed firms to set up standing committees to facilitate decision-making and enhance the effectiveness of the board. Board committees come in different forms such as a compensation committee, a nomination committee, an audit committee and a risk committee. These committees are charged with specific tasks and functions and are key to effective governance and corporate decision-making (Adams, 2003). According to Billmoria and Piderit (1994), board committees may serve as a vehicle and structure for effective governance by facilitating the performance of key specific tasks and addressing corporate concerns. Indeed, Jiraporn et al. (2009) and Kesner (1988) argue that board effectiveness is achieved through board committees and that many important decisions of the board are initiated at the committee level. Prior empirical research by Klien (2002) found that an independent audit committee is negatively associated with earnings management, while the work of Dechow et al. (1996) shows that firms without an audit committee are likely to commit financial fraud. Similarly, Osma and Noguera (2007) find that the presence of a nomination committee reduces earnings manipulations.

Despite the importance of board committees, relatively little systematic research exists on the effects of female representation on board committees on firm financial performance,

with the exception of studies by Carter et al. (2010), based on US firms, and Green and Homroy (2018) for European firms. Yet, resource dependency theory suggests that how board committees are composed is important for firm governance and performance (Dalton et al., 1998; Green and Homroy, 2018; Shivdasani and Yermack, 1999; and Guo and Masulis, 2015). Emphasising the importance of the composition of the board committee, Klein (1998) argues that membership of board committees is indicative of the specific role played by each director on the board, hence it constitutes a more accurate test of the relationship between board composition and board effectiveness. Klein (1998) therefore considers committee membership to be a proxy for the duties of a director. Regarding female representation, Green and Homroy (2018) contend that the appointment of women to board committees is done for the obvious benefits of ensuring the effective functioning of the committees. In their recent study, Green and Homroy (2018) found female representation on board committees to have an economically meaningful positive effect on performance. Similarly, the examination of the number of females on compensation committees by Carter et al. (2010) in the US context found a positive and significant effect on firm financial performance.

In the context of Nigeria, listed companies are required to have audit committees to deal with issues relating to the appointment of auditors, maintaining sound internal control processes and mitigating fraud, with the aim of improving the overall efficiency and performance of the firm. In line with the arguments put forward by Kesner (1988), Klein (1998) and Adams et al., (2008), we argue that, since the audit committees are set up to perform specific functions, females appointed to these committees should have the requisite expertise and should be actively involved in carrying out the mandate of the committee. As a result, it is expected that female directors appointed to serve on audit committees may have a stronger and greater direct impact on the effective operation of internal control, managerial efficiency and ability to take action to mitigate fraud that may have a significant influence

on corporate financial performance. Thus, women appointed to the audit committee should possess some distinguishing qualities/abilities⁶, consistent with the arguments in social categorisation and resource dependency theories, which may positively affect the performance of the firm rather than for the sake of the firm's image. To test the effects of female representation and participation on the board committee activities, we examine the effects of female participation on audit committees – the only board committee required by the governance code in Nigeria⁷. In the light of the above arguments, we hypothesise that:

Hypothesis 2: The female representation on audit committees is positively related to the financial performance of listed firms in Nigeria.

3. Data and Method

Our sample covers all firms listed on the 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 companies' annual reports; the latter were obtained from their respective websites.

3.1 Variable measurement

3.1.1 Dependent variables

To measure financial performance, we use both accounting and stock market-based measures of performance, namely, return on asset (ROA) and Tobin's Q. ROA captures the efficient use of a firm's asset. However, as an accounting measure, ROA can be affected by

⁶ A review of the profiles of some of the female board members in the sample from the internet and the annual reports showed that, the majority of them have at the minimum a master's degree, international degrees and exposure, professional qualifications and have served on several boards.

⁷ Section 30(1) of the Nigerian 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".

accounting conventions and manipulated by management. Tobin's Q, on the other hand, captures the market expectations of the future profitability of the firm and is not easily manipulated. Prior studies examining the relationship between corporate governance and firm performance have used either or both ROA and Tobin's Q as proxies for financial performance (Carter et al., 2010; Liu et al., 2014; Isidro and Sobral, 2015). Consequently, this study uses both measures of financial performance to ensure the robustness of our results.

3.1.2 Independent variables

Our main variable of interest is female representation, which is measured as a percentage of women on the board (Female Directors). Following the studies of Adams and Ferreira (2009), Ahern and Dittmar (2012) and Liu et al. (2014), we compute the variable as the number of females on the board divided by the total number of board members as a percentage⁸. To measure female participation, we use the percentage of females on the audit committee⁹ (Fem_AuditCom). 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 use a dummy variable (D_FemAuditCom) of 1 if there is at least one female on the audit committee and zero otherwise (Green and Homroy, 2018).

3.1.3 Control variables

To account for other factors that could affect firm financial performance, we include a number of control variables that have been used in previous studies. These include the following firm-and board-specific characteristics, namely, board size, board independence, firm age, size of audit committee, CEO gender, leverage, firm size, ownership and volatility. The size of the board has been shown to have effect on the performance of the firm (Carter

⁸ As a robustness check, we employ other measures of female representation. (please see section 4.4)

⁹ For the purpose of this study, we focus on the audit committee as this is the committee that is statutorily required by the Nigerian Code of Corporate Governance. An audit committee is consistently available for all firms in the sample period.

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 requires boards to have a sufficient number of independent directors on the board¹⁰. We measure board independence (BoardInd) 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 on 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 financial leverage (Leverage) 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 assets. 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

¹⁰ The Nigerian Code of Corporate Governance 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”.

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 ways in which the dependent and independent variables were measured are shown in Table 1.

[Insert Table 1 about here]

3.2 Model

To test the hypotheses of the study, we use ordinary least squares (OLS) and fixed effect regression models and further test the robustness of the results using dynamic Generalised Method of Moments (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. Our baseline model to examine the relationship between the female board representation and the firm financial performance is specified as:

$$Performance_{it} = \alpha_0 + \beta_1 FemaleDirector_{it} + \sum_{i=1}^n \gamma_i Controls_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

Where performance is our dependent variable, which refers to two financial measures, namely, return on asset and Tobin's Q. *Female Director* is the independent variable representing female representation on corporate boards. *Control Variables* refers to a vector of control variables, namely, board size (BoardSize), board independence (BoardInd), the audit committee size (AuditCom), CEO gender, firm age, financial leverage (Leverage), firm size, percentage of foreign ownership (ForeignOwn) and stock price volatility (Volatility). Year fixed effect δ is included to help mitigate endogeneity concerns from omitted variables.

The error term is $\varepsilon_{i,t}$, and we cluster model standard errors at the firm level to account for serial correlation of the error term.

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 estimate the model as:

$$Performance_{it} = \alpha_0 + \beta_1 Fem_AuditCom_{it} + \sum_{i=1}^n \gamma_i Controls_{it} + \delta_t + \varepsilon_{it} \quad (2)$$

Where performance refers to two financial measures, namely, return on asset and Tobin's Q. Fem_AuditCom captures female participation, which represents female representation on audit committee. *Control Variables* refers to a vector of control variables, namely, board size (BoardSize), board independence (BoardInd), the audit committee size (AuditCom), CEO gender, firm age, financial leverage (Leverage), firm size, percentage of foreign ownership (ForeignOwn) and stock price volatility (Volatility). Year fixed effects δ is included to help mitigate endogeneity concerns from omitted variables. The error term is $\varepsilon_{i,t}$, and we cluster model standard errors at the firm level to account for serial correlation of the error term.

3.3 Summary statistics

Table 2 presents the descriptive statistics for the main 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 a maximum value of 42.86%. The table also shows that approximately 60% of the observations have at least one woman on the board. The average board size is nine, with the highest number being 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 is an average of six members on the committee, with a maximum size of eight. About 39.7% of the female directors in our sample are members of the audit committee, suggesting that women play a significant role in the audit committees of firms.

[Insert Table 2 about 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 the board and the percentage of women on the audit committee. The correlation results for the independent variable reveal low correlation coefficients, with the highest being 0.59, suggesting that multicollinearity is unlikely to be an issue. 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 about here]

4. Results and discussion

4.1 Female board representation and financial performance

Table 4 presents the estimates from the OLS and FE regarding the effects of female representation on firm financial performance using both ROA and Tobin's Q. Regarding the effect of female board representation, we document that female representation has a positive and statistically significant relationship with ROA and Tobin's Q at the 1% level under the OLS in columns 1 and 3, and at the 5% level under the fixed effect approach in columns 2 and 4.

The results that female board representation improves firm financial performance lend support to the resource dependency theory and social categorisation theory, suggesting that female directors are not only important resources to the firm but come with distinctive qualities which tend to bolster firm performance. The finding that female board representation in Nigeria exerts positive and significant influence on firm performance supports the findings of previous studies in developed countries such as Campbell and Minguez-Vera (2010); and Reguera-Alvarado, de Fuentes and Laffarga (2017) in the Spanish market; Rose (2007) in the Danish market and Adams and Ferreira (2009) in the US market. This finding may be explained by the fact that gender-diverse boards are associated with diverse pools of resources such as knowledge, skills and experience which contribute to stronger monitoring, serving as a substitute for the weak institutional framework in Nigeria, thereby increasing firm performance. Thus, consistent with the argument put forward by Gul et al. (2011), it is plausible that in an environment characterised by weak corporate governance and institutions, female board representation may partially offset the weaknesses and help improve firm performance.

Overall, our results indicate that how the board is composed is an important governance mechanism and that gender diversity generates quality decision-making at group level and enhances firm financial performance. Our results provide some support to the studies of Liu

et al. (2014) in China and Nguyen et al. (2015) in Vietnam, who reported a positive and significant relationship between board gender diversity and firm value. Hypothesis 1 is therefore supported.

[Insert Table 4 about 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's Q. It is important to point out that the negative effect of board independence appears insignificant across all the regressions in columns 1-4. This appears surprising in that it was expected that board independence would enhance a board's monitoring role over executive management and hence increase 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).

4.2 Female representation on audit committee and financial performance

Next, in Table 5 we examine the effect of female participation on board audit committees on financial performance. To measure female participation, we use the percentage of females on the audit committee. A number of researchers (e.g., Kesner, 1988; Carter et al., 2010) argue that, if firms merely appoint women to the corporate board just to bolster the firm's reputation or fulfil ethical responsibility (Usman et al., 2018; Chapple and Humphrey, 2014), then we should not expect women to be appointed to board committees. This is because board committees are charged with specific responsibilities and provide an

important means of effective governance and decision-making. Thus, research evidence suggests that most of the board's important decisions are initiated at the committee level (Kesner, 1988). Yet, Carter et al. (2008) indicate that there is little direct evidence of the effects of female representation on board committees on financial performance, and we test this in hypothesis 2. Our results in Table 6, columns 2 and 4, indicate a positive and significant relationship between the proportion of females on the audit committee and firm financial performance (ROA: $\beta = 0.056$, $p < 0.05$; and Tobin's Q: $\beta = 0.041$, $p < 0.05$). The results indicate that a 1% increase in the percentage of women in the audit committee increases ROA by 0.056% and Tobin's Q by 0.041%. The results provide support for hypothesis 2. Our results suggest that female representation on the audit committee exerts a positive and significant effect on firm financial performance. In terms of economic magnitude, the results suggest that female representation is economically meaningful for Nigerian firms. Specifically, a one standard deviation increase in female representation on the audit committee leads to an increase in firm performance by 0.017 for ROA and 0.091 for Tobin's Q.¹¹ This suggests that female participation provides a stronger effect on the financial performance of Nigerian firms. The findings may be explained by the fact that the membership of such committees constitutes a proxy for specific functions to be performed by each director. Consequently, given the special nature and smallness of the board committee, directors appointed to the committee may have specific and specialist skills to exert a stronger and direct impact on decisions made by the committee, thereby influencing firm performance. Our results are consistent with those provided by Green and Homroy (2018) for European firms. Theoretically, the results are in tandem with the arguments of resource dependency theory.

¹¹ Following Green and Homroy (2018), we calculate economic impact as the standard deviation of Fem_AuditCom multiplied by the coefficient of Fem_AuditCom and then divide by the standard deviation of ROA (Tobin's q).

[Insert Table 5 about here]

4.3 Addressing endogeneity concerns

So far, we have employed firm fixed effect regressions, but the use of a fixed effects approach may not explicitly address some other sources of endogeneity, namely, simultaneity and reverse causality (Wintoki et al., 2012). Using the fixed effects method would potentially control for the unobservable firm-specific factors but it would not totally 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 effects, in particular (Wintoki et al., 2012). Liang et al. (2013) share a similar view and contend that a key concern for any analysis of board effect is the endogeneity of board structure. The regression of board characteristics on corporate financial performance that underlies the ‘board effect’ argument is an example of a regression that is likely to suffer from all three endogeneity problems – omitted variables, reverse causality and measurement error. 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 stakeholders 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 and the performance of the firm. Another example is that 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 an 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. Following prior studies on gender diversity such as Bennouri et al. (2018) and Liu et al. (2014), we employ the dynamic GMM estimator. The GMM estimation technique was first proposed by Arellano and Bond (1991) and then developed by Arellano and Bover (1995) and Blundell and Bond (1998). In this model, suitable instruments are chosen from the regression equation and the lagged dependent variable is included in the regression equation. The GMM estimator controls for time-invariant unobserved heterogeneity and 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. Columns 1 and 2 of Table 6 show that the coefficients of female directors are positive and statistically significant at 5% and 1% levels, thereby corroborating our earlier findings in Table 5. Regarding the effects of female representation on the audit committee (participation), we document the same findings reported in Table 5 which indicate that female participation in audit committee leads to improved financial performance of Nigerian firms.

[Insert Table 6 about here]

4.4 Robustness tests

To check the robustness of our results reported in Tables 4 and 5, we conduct further tests using alternative proxies for female board representation. First, we follow Liu et al. (2014) to measure female board representation employing a dummy variable, At least 1 fem,

taking the value of 1 when there is at least one female on the board and zero otherwise. Second, we use the dummy variable, At least 2fem, which takes the value 1 when there are at least two women 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 theory¹² (Granovetter, 1978; Kanter, 1977)¹³. The results presented in table 7 confirms our earlier results on female representation on the board. Next, we check the robustness of the results relating to female representation on the audit committee (female participation) reported in Table 5. As is evident in column 3 and 6 of Table 7, we find a significant positive effect of female representation on the audit committee (*DFemAuditCom*) on firm financial performance (ROA: $\beta = 0.043$, $p < 0.05$, Tobin's q: $\beta = 0.045$, $p < (0.01)$). This confirms our earlier results that female representation on board committees enhances firm financial performance.

[Insert Table 7 about here]

5. Conclusion

This study provides new insights into the relationship between board gender diversity and financial performance of firms 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, the results of our panel regression estimates indicate that female representation on corporate boards has a positive effect on firm financial performance. Our results show that the relationship between female board representation and the firm financial performance becomes stronger when the number of female directors

¹² 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.

¹³ We do not include a check for at least three women as the observations with at least three women are very small.

increases to two or more, suggesting that building a critical mass of female representation enhances firm financial performance. We also find that the appointment of females to the audit committee significantly increases a firm's financial performance. Overall, the findings of the study support both the social categorization theory and the resource dependency theory, suggesting that female representation on corporate boards serves as a critical resource which strengthens the board's oversight role and improves firm performance. Our results are robust after controlling for endogeneity and the use of alternative measures of board gender diversity.

The results of our study have a number of practical implications for policy makers and firms in developing countries where institutions and governance systems are weak. Our results clearly imply that female representation does not only enhance firm value but may also add to the voices advocating for more women participation in public and private sectors. More specifically, the results demonstrate that female representation and participation at board and committee levels reduces agency costs, increases legitimacy and enhances effective monitoring, leading to positive and economically meaningful effects on firm performance. Thus, female representation on the board serves to augment weak corporate governance systems which appear pervasive in sub-Saharan African countries. Policy makers in Nigeria and sub-Saharan African countries should therefore focus on corporate governance reforms to facilitate women's participation in corporate activities by adopting policies such as a quota for women on corporate boards. In particular, civil societies in African countries should take active steps in influencing changes in aspects of social institutions and practices that promote the marginalisation of women and create an enabling environment where more women are appointed to corporate boards by merit. The results of our study also imply that, apart from the moral justification of equal rights for including women in corporate boardrooms, there are economic benefits to be derived from female

representation. This clearly suggests that corporate governance reforms to increase female representation in all aspects of economic, social and political activities require urgent attention in Africa.

Whilst the findings are shown to be robust, limitations of the study should be noted. Despite the fact that our proxies for female board representation and participation have been extensively used in prior studies (e.g., Carter et al., 2010; Green and Homroy, 2018), similar to prior archival studies of this nature, the proxies may not fully capture the board's participation. Moreover, as a single country study, this paper provides some interesting lessons to other developing countries around the world; nevertheless, more studies appear warranted. Future studies may investigate whether board representation and participation operationalised in the present study also affect firm financial performance by employing cross-country data. In particular, we urge an extension of this study to other sub-Saharan African and other developing countries using a cross-country study.

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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	Thomson Reuters Eikon
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.	Thomson Reuters Eikon
Percentage of women directors (Female representation)	Female Director	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)	Fem_AuditCom	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	BoardSize	This is the number of directors on the board	Annual reports and Bloomberg
Board Independence	BoardInd	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	CEO gender	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	Thomson Reuters Eikon
Firm Size	FirmSize	This is the natural log of the firm's total assets	Thomson Reuters Eikon
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	Thomson Reuters Eikon

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
Female Director	690	9.88	10	9.88	0	42.86
Fem_AuditCom	689	8.35	0	11.58	0	60
D_FemAuditCom	692	0.397	0	0.490	0	1
BoardSize	690	8.92	9	2.47	4	19
BoardInd	690	64.48	66.67	15.56	16.67	93.33
AuditCom	690	5.52	6	0.85	3	8
FirmAge	675	24.78	26	12.30	1	52
Leverage	691	0.77	0.6	1.50	0	17.98
FirmSize	691	16.15	16.11	1.77	11.13	20.71
Volatility	639	42.57	43.30	15.53	0.80	174.62

Table 3: Pearson Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11
1 ROA	1										
2 Tobin's q	0.29***	1									
3 Female Director	0.07**	-0.06	1								
4 Fem_AuditCom	0.10***	-0.01	0.59***	1							
5 BoardSize	0.17***	-0.02	-0.03	0.039	1						
6 BoardInd	-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 FirmAge	0.25***	0.05	-0.00	0.02	0.12***	-0.01	0.18***	1			
9 Leverage	-0.41***	0.65***	-0.10***	-0.07*	-0.10**	-0.05	0.07*	-0.024	1		
10 FirmSize	0.25***	0.27***	0.03	0.05	0.45***	-0.09**	0.43***	0.10***	-0.27***	1	
11 Volatility	-0.01	-0.12***	0.16***	0.16***	0.033	0.07*	-0.054	-0.13***	-0.11***	-0.11***	1

Note: *, **, and *** represent significance at 10%; 5% and 1% level respectively. All variables are defined in Table 1

Table 4: Effects of Female Representation on Financial Performance

	Panel A (ROA)		Panel B (Tobin's q)	
	OLS (1)	Fixed Effect (2)	OLS (3)	Fixed Effect (4)
Female Director	0.049*** (0.003)	0.024** (0.011)	0.029*** (0.007)	0.027** (0.012)
BoardSize	0.538*** (0.061)	0.162** (0.069)	0.164* (0.092)	0.127** (0.050)
BoardInd	-0.001 (0.001)	-0.005 (0.004)	-0.002 (0.004)	-0.006 (0.005)
AuditCom	0.011 (0.034)	0.023 (0.021)	0.046 (0.088)	0.114* (0.062)
CEO gender	0.136* (0.081)	0.151*** (0.030)	1.630*** (0.330)	0.714*** (0.228)
FirmAge	0.040** (0.018)	0.021*** (0.008)	0.026*** (0.006)	0.007* (0.004)
Leverage	-0.187*** (0.048)	-0.044* (0.026)	0.178 (0.179)	0.026 (0.125)
FirmSize	0.019 (0.036)	0.016 (0.022)	0.059 (0.045)	0.026 (0.031)
ForeignOwn	0.498 (0.743)	0.357 (0.489)	0.205 (0.135)	0.044 (0.095)
Volatility	0.078* (0.045)	0.043** (0.019)	-0.017*** (0.005)	-0.009*** (0.003)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	No	Yes	No
Observations	641	567	641	567
R ²	0.202	0.268	0.206	0.278

Note: This table presents the regression results of board gender diversity on financial performance. The dependent variables are ROA and Tobin's q for Panel A and Panel B respectively. All variables are defined in Table 1. Robust standard errors are in parentheses. *, **, *** represent significance at 10%, 5% and 1% level respectively.

Table 5: Effects of Female Participation on Board Committee on Financial Performance

	Panel A (ROA)		Panel B (Tobin's q)	
	OLS (1)	Fixed Effect (2)	OLS (3)	Fixed Effect (4)
Fem_AuditCom	0.075* (0.038)	0.056** (0.027)	0.060*** (0.021)	0.041** (0.019)
BoardSize	0.187*** (0.063)	0.157* (0.089)	0.284*** (0.041)	0.178** (0.087)
BoardInd	-0.007** (0.004)	-0.010 (0.006)	-0.014** (0.006)	-0.015 (0.029)
AuditCom	0.042 (0.046)	0.023 (0.150)	0.102 (0.090)	0.020 (0.026)
CEO gender	1.742*** (0.333)	1.275*** (0.192)	1.794*** (0.325)	1.348*** (0.493)
FirmAge	0.026*** (0.006)	0.029* (0.015)	0.027*** (0.006)	0.004** (0.002)
Leverage	-0.193 (0.225)	-0.133 (0.169)	0.222 (0.183)	0.346** (0.147)
FSize	0.146 (0.162)	0.170 (0.119)	0.077 (0.078)	0.055 (0.046)
ForeignOwn	0.132 (0.170)	0.137 (0.126)	0.151 (0.134)	0.137 (0.126)
Volatility	0.023*** (0.001)	0.024** (0.012)	-0.018*** (0.006)	-0.013* (0.007)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	No	Yes	No
Observations	641	567	641	567
R ²	0.209	0.266	0.196	0.253

Note: This table presents the regression results of the effects of audit committee gender diversity on financial performance. Dependent variables are ROA and Tobin's q. All variables are defined in Table 1. Robust standard errors are in parentheses. *, **, and *** represent significance at 10%; 5% and 1% level respectively.

Table 6: Dynamic Generalised Method of Moments Results

	Female Board Representation		Female Board Participation	
	ROA (1)	Tobin q (2)	ROA (3)	Tobin's (4)
ROA _{t-1}	0.559*** (0.015)		0.566*** (0.033)	
Tobin's q _{t-1}		0.564*** (0.010)		0.607*** (0.033)
Female Director	0.032** (0.007)	0.014*** (0.002)		
Fem_AuditCom			0.058*** (0.022)	0.032** (0.014)
BoardSize	0.184*** (0.049)	0.460*** (0.130)	0.152** (0.070)	0.139*** (0.020)
BoardInd	-0.016 (0.100)	-0.003** (0.002)	-0.011 (0.030)	-0.007** (0.004)
AuditCom	0.027* (0.016)	0.032 (0.055)	0.021** (0.003)	0.049 (0.044)
CEO gender	0.369*** (0.082)	0.659*** (0.125)	0.348*** (0.073)	0.225*** (0.063)
FirmAge	0.037* (0.020)	0.003 (0.002)	0.006* (0.004)	0.008*** (0.004)
Leverage	0.013* (0.008)	0.216** (0.099)	0.014* (0.009)	0.309*** (0.0107)
FirmSize	0.178 (0.171)	0.025 (0.020)	0.242 (0.349)	0.027 (0.031)
ForeignOwn	0.578 (0.688)	0.300*** (0.099)	0.114 (0.158)	0.140* (0.078)
Volatility	0.092*** (0.032)	0.027*** (0.003)	0.012* (0.158)	0.035 (0.038)
Year effect	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
Observations	567	567	567	567
AR (1)	0.001	0.000	0.001	0.000
AR (2)	0.689	0.634	0.537	0.786
Hansen J test of over-identification	0.466	0.434	0.542	0.543

Notes: This table presents the regression results of the effects of board and audit committee gender diversity on financial performance using dynamic GMM. Dependent variables are ROA and Tobin's q. All variables are defined in Table 1. To properly isolate the effects of females on board and audit committee, we entered these variables successively. 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. *, **, and *** represent significance at 10%; 5% and 1% level respectively.

Table 7: Robustness Test: Alternative Proxy for Board and Audit Committee

	Panel A (ROA)			Panel B (Tobin's q)		
	Female Representation	Female participation	DFemale Audit Committee	Female representation	Female participation	DFemale Audit Committee
	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*** (0.070)	0.674*** (0.085)	0.655*** (0.067)			
Tobin's q _{t-1}				0.580*** (0.026)	0.577*** (0.025)	0.507*** (0.165)
At least 1fem	0.014** (0.006)			0.022** (0.011)		
At least 2fem		0.024** (0.011)			0.028** (0.013)	
D_FemAuditCom			0.043** (0.019)			0.045*** (0.015)
BoardSize	0.022*** (0.005)	0.138** (0.065)	0.162** (0.069)	0.043*** (0.015)	0.131** (0.059)	0.144*** (0.047)
BoardInd	-0.318 (0.203)	-0.255 (0.248)	-0.063 (0.039)	-0.297 (0.363)	-0.297 (0.307)	-0.378 (0.257)
AuditCom	0.263** (0.114)	0.148* (0.088)	0.175** (0.088)	0.022*** (0.005)	0.144*** (0.046)	0.182*** (0.055)
CEO gender	0.142 (0.172)	0.198 (0.135)	0.308 (0.236)	0.767** (0.321)	0.681* (0.400)	0.662* (0.398)
FirmAge	0.037 (0.024)	0.019 (0.036)	0.053 (0.087)	0.004 (0.012)	0.002 (0.005)	0.040 (0.04)
Leverage	0.363* (0.198)	0.526* (0.308)	0.175 (0.310)	-0.136** (0.059)	-0.204 (0.147)	-0.358* (0.120)
FSize	0.043 (0.052)	0.026 (0.032)	0.109 (0.076)	0.013 (0.015)	0.040 (0.155)	0.147 (0.254)
ForeignOwn	1.038*** (0.194)	1.328*** (0.468)	0.534 (0.464)	1.651*** (0.554)	1.060* (0.635)	0.827 (0.708)
Volatility	0.014*** (0.004)	0.072* (0.040)	0.041** (0.019)	-0.018** (0.009)	-0.013** (0.007)	-0.075* (0.038)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	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 tests. 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.