<MBA Degree Thesis>

BOARD GENDER DIVERSITY AND FIRM PERFORMANCE:
An Empirical Study of Ghana and Nigeria

57180504-7   DORFE EDEM DAYON
FRONTIERS OF BUSINESS STUDIES
C.E. PROF. IRIYAMA AKIE
D.E. PROF. KAWAKAMI TOMOKO   D.E. PROF. NAGAI TAKESHI

Summary

The purpose of this thesis is to examine the relationship between board gender diversity and firm performance in listed companies found in Nigeria and Ghana. Firm characteristics are examined, aiming to understand how these boards are composed in terms of gender diversity and the impact of it on firms' performance. This paper contributes to research on corporate governance structure, mainly, gender composition of boards. Utilizing a sample of West African firms from Ghana and Nigeria, this study shows that gender diversity on the board has a positive effect on firm performance.

The thesis comprises a quantitative analysis based on financial data sourced from OSIRS, in addition to data on board characteristics, including the number of women on the board, handpicked from the annual reports, and official websites of sampled firms for the period from 2013 to 2019. This study's dependent variable is Return on Assets (ROA). Its independent variables are Blau index, and dummy variables for boards with at least three women. As control variables board size and independence, in addition to firm age, total sales, and the leverage are observed among others. For data analysis, a regression of board gender diversity as a determinant of firm performance using panel estimation techniques on balanced panel data.

The research model confirms the theoretical expectations that board gender diversity is positively related to firm performance, and that having at least one woman on the board significantly

impacts the performance of the board. However, the research model was not able to confirm the expectation that a critical mass of at least 3 women is positively related to firm performance. The study finds that a critical mass of at least three women is not conditional for the firm to experience the effect of board gender diversity. As long as the board is not homogenous (all male), and has at least one woman, there is a positive impact on the firm performance. This may be because the most beneficial impact of board gender diversity is in appointing the first woman to the board.

The findings of this study show that women are an important resource and should be given equal opportunity, based on skill and experience, consideration when filling in board positions. Giving an equal opportunity to qualified female candidates will not only increase the effect of corporate governance, but it will reduce the chance of homogeneity, and remedy groupthink. As a further step, it is recommended for the firm to consider implementing policies on board gender diversity in order to lower the chances of having a homogenous board. Board diversity could well improve a board's monitoring abilities by countering groupthink and thus ensuring that it performs its functions more effectively

This paper is purely quantitative, all firm observations with unavailable data were excluded, as such, this paper is limited to 96 firms. Future research should look at a larger data set, and account for dynamic endogeneity. Additionally, it should also consider an in-depth interview approach.

Keywords: Ghana, Nigeria, Board Gender Diversity, Agency Theory, Resource Dependency Theory, Stakeholder, Groupthink, Tokenism, Critical Mass Theory

BOARD GENDER DIVERSITY AND FIRM PERFORMANCE:
An Empirical Study of Ghana and Nigeria

57180504-7   DORFE EDEM DAYON
FRONTIERS OF BUSINESS STUDIES

C.E. PROF. IRIYAMA AKIE

D.E. PROF. KAWAKAMI TOMOKO   D.E. PROF. NAGAI TAKESHI

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION

Section 1.   BACKGROUND

Discussions on the representation of women on corporate boards have received increasing interest amongst practitioners, policymakers, and researchers in recent years. It is commonly argued that the composition of a company's board should reflect that of its market - and its customer base and that companies that rely solely on men to make strategic decisions on products, innovation, and growth are shortchanging themselves on new ideas and different views on how to address the market (Yi, 2011). According to Silverstein and Sayre (2009) in aggregate, women represent a growth market bigger than China and India combined; in fact, more than twice as big. Globally, Women performed an estimated US$31.8 Trillion in consumer spending in 2019 (Catalyst, 2020). Meanwhile, there continues to be a relatively low representation of women on boards as compared to their presence in both the general populations at large and in the corporate world in general (Conyon & He, 2017).

The case for greater female board representation commonly hinges on four criteria: improving performance, gaining access to a wider talent pool, increasing responsiveness to the market, and strengthening corporate governance (Doldor et al., 2012). To further buttress this, boards that are diverse in experience, skills, gender, age, and qualifications, have a positive effect on the quality of governance, and such boards often present a good indication of a well-run company (International Finance Corporation [IFC], 2018). Furthermore, Perault (2015) suggests that board gender diversity matters for a more fundamental reason because, through real and symbolic representations, women enhance boards' legitimacy and trustworthiness, fostering shareholders' trust in the firm and thus contributing to its market performance.

Women held 20% of board director seats worldwide in 2019, an increase from 17.9% in 2018 (Catalyst, 2020). Although it is not a widespread phenomenon, affirmative actions are under discussion or already operational in some countries to boost the number of women in top positions. In terms of affirmative action in the board room, the most well-known example is Norway where, since 2006, large firms have been required to have at least 40% female representation among the members of the

board of directors (Marinova et al., 2015). Over the last two decades, the importance of gender diversity in socioeconomic transformation has received some attention. Although, little has been done in terms of government interventions to encourage women participation in the board room. Interestingly, a recent study by Mckinsey & Company (2019) showed that Africa had the highest female representation at the board level of any region at 25% against a global average of 17% and marginally higher than the average representation on executive committees at 22%, although, since 2015, progress on increasing women's presence in middle-management roles has gone backward, on average, across Africa by around 1%.

The remainder of this paper is structured as follows. Following the introduction is Chapter 2, which presents the representation of women on the board of directors in Ghana and Nigeria respectively. Chapter 3 is an overview of the existing literature and development of the study's hypotheses, followed by Chapter 4, where the methodology is explained. Chapter 5 focuses on a description of the data and sample, while Chapter 6 presents the regression models and analysis employed in the study, as well as the results obtained, answering the questions posed in chapter 1. This is followed by Chapter 7, which discusses the results and finally, Chapter 8 concludes the main argument of the paper.

Section 2. PURPOSE OF THE STUDY

The main purpose of this study is to expand the applicable cognitive framework for corporate leaders in their decision-making process of selecting the board of directors, and on the creation of internal policies to guide the process. There have been several studies on board gender, diversity, and the relationship with the performance of the firm, using different approaches including ROA, Tobin's Q, Stock Performance. Existing literature focuses heavily on American and European firms, with some studies in Asia as well. There is little research that studies the link between board gender diversity and firm performance in Africa. This research extends the current literature by employing data from two relatively unexamined African countries: Ghana, and Nigeria.   This research goes beyond examining the presence or lack of women on the board by adding the critical mass perspective to the quantitative

research. This is to offer further insights into the research field. In sum, this study aims to gain deeper more insights about women from various dimensions in the West African context in order to expand on literature and to provide empirical evidence to policymakers, relevant decision-makers. Therefore, the issues to be studied revolve around the following objectives;

1. To understand the relationship between board gender diversity and firm performance in the West African Context

2. To assess whether the effect of board gender diversity on firm performance relates positively to the critical mass of at least 3 women on the board

There have been exploratory studies in Ghana and Nigeria on the representation of women in the board room (IFC, 2018; IFC, 2019), investigations into the relationship between gender diversity and board effectiveness (Lincoln & Adedoyin, 2012), and into the relationship between board diversity in general and firm performance (Ujunwa et al., 2012). However, little has been done in terms of empirical studies on board gender diversity and firm performance in Ghana and Nigeria. This study adds empirical evidence to the literature on the relationship between board gender diversity and firm performance, in the context of emerging economies, and more specifically in West Africa. In order to investigate the relationship between board gender diversity and firm performance, this study answers the following research questions

1. Does board gender diversity relate positively to a firm's performance?

2. Does the effect of board gender diversity on firm performance relate positively to the critical mass of at least 3 women on the board?

CHAPTER 2. WOMEN ON THE BOARD: NIGERIA AND GHANA

Section 1.   BOARD GENDER DIVERSITY IN GHANA

Over the last two decades, the importance of gender diversity in the socio-economic transformation of Ghana has received much attention.   Affirmative action has been used in Ghana since independence to address gender and regional imbalances in access to education, health, work, and politics (Dzodzi, 2009). For example, the Affirmative Action Policy of 1998 requires a 40% quota of women's representation on all government and public boards. However, these ambitious affirmative action guidelines have yet to yield results, as the quota targets have not been met (Ayentimi & Burgess, 2020). Furthermore, Ghana ranks 107 out of 153 countries in the 2020 Gender Gap Index, an 18-point drop in ranks from 2018 (World Economic Forum, 2019). Three obstacles for increasing women representation in Ghanaian society identified by Ayentimi and Burgess (2020) are all related to the labor force: women have relatively low rates of literacy; low participation in tertiary education; and low participation in professional occupations.

On this note, there is no national gender policy which specifically indicates the degree of gender diversity that corporate boards or management should attain (IFC, 2018). Therefore, it largely left to the internal policy of the corporate organization regarding gender representation on the management or board. In a sample of 162 firms across multiple sectors within the Ghanaian economy, the IFC (2019) found that only 5.7% of firms had any gender policy for their organization, however, 72.15% of boards surveyed responded that they do have female representation on their boards although representation was mostly limited to about 2 women on the board.

Section 2.   BOARD GENDER DIVERSITY IN NIGERIA

Until recently, Nigerian corporate boards were predominantly male. Actions have been in place to reduce or eliminate the glass ceiling in the workplace in the nation, of which, one of the strong actions was the Equality Law of the provision of Section 17 of the 1999 constitution (Abubakar & Şener, 2014). Nonetheless, Nigeria ranks 128 out of 153 countries in the 2020 Global Gender Gap

Index, a 5-point rise from previous rankings in 2018 (World Economic Forum, 2019). Furthermore, in spite of the Nigerian government's open commitment to gender equality, there are still gender stereotypes constraining women, and these constitute significant barriers to achieving gender balance on corporate boards (IFC, 2019).

Similar to Ghana, there are no specific legal requirements for gender diversity in Nigeria, except for regulations issued by the Central Bank of Nigeria (CBN), the Securities and Exchange Commission (SEC) Code of Corporate Governance, and the 2018 Nigerian Code of Corporate Governance (CCG). SEC Code recommends that publicly listed companies consider gender when selecting board members, and the CCG encourages the board to set diversity goals and to be mindful of them when filling board vacancies, however, the SEC and CCG codes do not prescribe gender quotas (IFC, 2019).

CBN issued a directive for a minimum of 30% female representation on the boards of Nigerian commercial banks. However, this target has not been met, as women only occupy 22% of board seats in commercial banks according to the Central Bank of Nigeria statistics (Uwazie, 2019). Based on interviews and explorative research, IFC (2019) reports that the significant factors hindering the appointment of women to corporate boards are gender and social stereotypes.

CHAPTER 3. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section first defines board gender diversity and related terms, it goes on to discuss theories related to corporate governance and to board gender diversity. Finally, it discusses findings of previous related research.

Section 1. BOARD GENDER DIVERSITY

Denis and McConnell (2003) define corporate governance as the set of mechanisms - both institutional and market-based - that induce the self-interested controllers of a firm (those that make decisions concerning how the firm will be operated) to make decisions that maximize the value of the firm to its owners (the suppliers of capital). The board of directors is the center of corporate governance with corporations being managed 'by and under the direction of' the board of directors (Macey, 2008). It is one of some internal governance mechanisms that seek to ensure that the interests of shareholders and management are closely aligned, provides information for monitoring, and ensures effective decision making (Lincoln & Adedoyin, 2012). In this paper, the term 'board' is used to refer to the combined number of all directors, i.e. management (executive) directors and supervisory (non-executive) directors. Board composition characteristics of interest comprise of the size and structure of the board: the number of directors that make up the board, the fraction of these directors that are outsiders (Denis & McConnell, 2003), as well as the gender diversity of the board.

Board diversity is defined by Cheng et al. (2007) as a variety in the composition of the Board of Directors. Cheng et al. (2007) discuss two categories of board diversity; observable diversity and nonobservable diversity. Observable diversity is readily detectable, such as race/nationality, ethnic background, gender, and age. The other is less visible diversity, which includes diversity in backgrounds such as educational, functional and occupational backgrounds, industry experience, and organizational membership. This study focuses on the observable diversity of gender within the board of firms. On this note, board gender diversity is a significant aspect of corporate governance, which is

defined as the presence of female directors on the board of directors of corporations (Carter et al, 2003). Globally, gender diversity in the boardroom is increasing, albeit slowly. The 2019 MSCI Women on Boards report showed that 2019 saw a noticeable uptick in the number of women on the board where 20.0% of directors were women, up from 17.9% in 2018 and 17.3% in 2017.

Section 2.   AGENCY THEORY

Shareholders who own equity of a firm are distinct from the executives or managers who run the organization. The agency theory is premised on the idea that this separation gave rise to agency problems since the principals (shareholders) are not in a position to directly oversee the agents (managers) in order to ensure that they are acting in the principals' best interests (Kamalnath, 2017). Hansmann and Kraakman (2004; as cited by Kamalnath 2017) suggest that the agency problem in the corporate setting arises because the agent (manager) has more information about the governance issues than the principal (shareholders). Given this information asymmetry, the principal cannot ensure that the agent's performance is exactly what is agreed upon without cost. From the agency perspective, the board of directors' primary responsibility is to exercise control over management to protect the interests of all stakeholders (Zhang, 2012). Additionally, managers are supposed to be the 'agent' of a corporation's 'owners', but managers must be monitored, and institutional arrangements must provide some checks and balances to make sure they do not abuse their power (Baysinger, 1985).

Gender diversity, for one, is believed to improve board monitoring since hiring directors from different backgrounds add multiple diversity facets to the oversight lens, resulting in boards that are more likely to raise questions and challenge the status quo (Yi, 2011). Hence, gender diversity on a board can be a mechanism that reduces the costs related to agency problems (Reguera-Alvarado et al., 2015). Previous studies have suggested that having female and minority board members increase the independence of the board, as they do not come from traditional backgrounds (Carter et al., 2003).

It should be noted, however, that if preferences for leadership styles are more influenced by gender than by economic considerations, a diverse board might well end up making the wrong appointment, thereby providing an untimely leadership style (or no leadership at all) (Francoeur et al.,

2008).

Section 3.   STAKEHOLDER THEORY

The stakeholder concept posits that the company should take into consideration the needs, interests, and influences of peoples and groups who either impact or may be impacted by its policies and operations (Emerson et al., 2011). In today's complex and rapidly changing business environment, when it comes to enhancing the quality of decision making, the advantages related to the knowledge, perspective, creativity, and judgment brought forward by heterogeneous groups may be superior to those related to the smoother communication and coordination associated with less diverse sets of people. (Francoeur et al., 2008)

If the function of the board is to protect the interests of the corporation's stakeholders, then it stands to reason that the board should comprise members that are representative of these stakeholders (Huse & Rindova, 2001). Larger companies receive more attention from stakeholders and watchdog organizations, which fuels concerns about reputational risk (Deloitte, 2018).

Section 4.   GROUPTHINK THEORY

Irving Janis (1971), who is credited with creating the theory on groupthink, uses the term as a quick and easy way to refer to the mode of thinking that persons engage in when concurrence seeking becomes so dominant in a cohesive group that it tends to override realistic appraisal and realistic course of actions. In terms of corporate governance and decision-making by the board, Kamalnath (2017) describes groupthink as the failure of board members to consider alternatives to the dominant view during decision-making.   Therefore, it is important to consider groupthink in a board, as the board is responsible for the corporate governance of a firm, and groupthink has been cited as a hurdle in effectively performing this role. For example, groupthink has been invoked as a contributing factor in the failures of companies such as Enron, Worldcom, and other companies during and after the 2008 financial crisis (Benabou, 2013)

In the aftermath of the 2008 financial crisis, one of the key issues of the board composition

debate has been board diversity (Kamalnath, 2017). The reasoning behind the need for independent directors is to attempt to ensure that the board critically evaluate management actions, offer diverse viewpoints, and actively discuss alternative factual inferences and plans of action. Beecher-Monas (2007) proposes that a diverse board might facilitate in providing the characteristics sought for from independent directors. Thus, board gender diversity has been considered as a remedy to groupthink as it allows for members who can offer diverse views.

Kamalnath (2017) points out that diverse boards are likely to result in enhanced decision-making on the basis that diverse people would be likely to bring diverse views about the issues being considered. Further, gender diverse boards are likely to be better monitors as diversity might help to counter the incidence of groupthink and to some extent because of women directors' current status as outsiders. Overall, Kamalnath (2017) argues that by improving board decision-making and monitoring, board diversity can help boards function more effectively.

Section 5.   RESOURCE DEPENDENCE THEORY

The resource dependency theory argues that companies are operating in an open and competitive space and that their performance relates to the access they have to the market's resources (Terjesen et al, 2009).   According to this view, a valuable contribution of a board of directors is to use their social networks to establish and enhance a firm's external legitimacy and to improve its relationships with relevant stakeholders (Zhang, 2012). In integrating both male and female directors' perspectives, an organization may be better positioned to critically weigh the risks and benefits associated with decisions to expand or shrink the business, make capital investments or adopt new processes (Ali et al., 2014). The theory recognizes the need for women participation in top hierarchical roles in corporate boardrooms as a critical resource that firms can depend on based on the enhanced benefits on firms' performance (Adeabah et al., 2019). Pfeffer and Slancik (1978: as cited in Kilic & Kuzey, 2016) expounds four primary benefits of external linkages as a provision of resources exist:

I.   information and expertise;

II.   the creation of channels of communication with important constituents of the firm;

III.   the provision of commitments for support from important organizations or groups; and

IV.   the creation of legitimacy for the firm in the external environment.

Therefore, considering the resource dependency theory, gender diversity is an important resource relevant to making strategic decision-making and the competitive advantage of the firm, which can translate to an enhanced performance of the firm. For instance, some entities appoint female directors on their boards to sustain good relations with their female clients or customers (Liu et al., 2014). Hence, the connections provided by female directors to external resources of dependency have the potential to increase critical resourcing, thus enhancing firm performance (Reguera-Alvarado et al., 2015).

Based on the theories discussed this study posits the following hypotheses;

- H0: Board gender diversity has no relation to a firm's financial performance

- **H1: Board gender diversity relates positively to a firm's financial performance**

- H0a: In Ghana, board gender diversity has no relation to a firm's financial performance

- **H1a: In Ghana, board gender diversity relates positively to a firm's financial performance**

- H0b: In Nigeria, board gender diversity has no relation to a firm's financial performance

- **H1b: In Nigeria, board gender diversity relates positively to a firm's financial performance**

Section 6.   TOKENISM THEORY

The term token refers to persons (usually women or minorities) who are hired, admitted, or appointed to a group because of their difference from other members, perhaps to serve as "proof" that the group does not discriminate against such people (Zimmer, 1988). Kanter (1977, as cited in Stichman et al., 2010) who is credited for introducing the critical-mass theory, defined a token group as a subgroup, which represents less than 15% of the overall workgroup that is perceived to be different from the rest of the group. Low et al. (2015) describe "tokens" as persons who meet the formal requirements but do not possess the auxiliary characteristics that are expected for a particular job or

position. Due to the token status and gender-role stereotypes of female directors, a lone female director may be treated as a mere "token" by both internal and external stakeholders and that her impact on corporate decisions is likely to be limited (Liu, 2014).

Section 7.   CRITICAL MASS THEORY

As an extension to the tokenism theory, the critical mass theory argues that minority gender members are not as productive as they could be when they comprise less than 35% of a team since they are reduced to symbolic representatives or tokens, of their social category (Kanter, 1977), and that women directors, in particular, are more active when a critical mass of at least three women is in attendance (Schwartz-Ziv, 2017). Similarly, Joecks et al. (2013) write that the critical mass theory postulates that until a certain threshold or "critical mass" of women in a group is reached, the focus of the group members is not on the different abilities and skills that women bring into the group, and as a consequence, groups, where a critical mass of   20-40 % women has been reached, will outperform uniform and skewed groups.

According to Konrad and Kramer (2006), solo women on boards often feel isolated and marginalized, and that when they are effective, it is not because of, but in spite of being the only woman. Adding a second woman to a board helps reduce the sense of isolation, but it does not always cause change and may create difficulties but two women may be perceived as a separate group and may find they have to be careful not to appear to be conspiring (Konrad & Kramer, 2006). They argue that a clear shift occurs when boards reach a critical mass of three or more women, where women tend to be regarded by other board members not as "female directors" but simply as directors, and they do not report being isolated or ignored. Three or more women can also change the dynamic on an average-size board (Konrad & Kramer, 2006). Kristie (2011), summarizes this notion by stating that 'one is a token, two is a presence, and three is a voice'.

In a study by Kramer et al. (2006), where interviews were held with 50 women directors, it was suggested that the critical mass of women in the boardroom is equal to three. Similarly, the results of an empirical study by Joeck et al (2013) of 151 firms on the German Stock Exchange over 5 years

(2000 – 2005) suggests that a more gender-diverse board composition will only enhance performance if diversity is sufficiently large (10+ % female representation) and that only for boards with a critical level of 30+ % females (3+ women on the board), performance will be over and above that of male boards. Kramer et al. (2006) state that the magic seems to occur when three or more women serve on a board together, finding that having such female presence on a board can create a critical mass where women are no longer seen as outsiders and are able to influence the content and process of board discussions more substantially.

Based on the tokenism and critical mass theories discussed, this study posits the second hypothesis as follows;

- H0: Effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board.

- **H2: Effect of board gender diversity on financial performance is positively relates to a critical mass of at least 3 women on the board**

- H0a: In Ghana, the effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board.

- **H2a: In Ghana, the effect of board gender diversity on financial performance is positively relates to a critical mass of at least 3 women on the board**

- H0: In Nigeria, the effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board.

- **H2b: In Nigeria, the effect of board gender diversity on financial performance is positively relates to a critical mass of at least 3 women on the board**

Section 8.   EMPIRICAL EVIDENCE ON BOARD GENDER DIVERSITY AND FIRM PERFORMANCE

As discussed in the preceding section, there have been several arguments in academia for the benefits associated with board gender diversity. However, there has been a lack of consensus in empirical evidence to support these claims. An in-depth literature review by Cabrera-Fernandez et al

(2016) comparing different studies, found tremendous disparities in the evidence provided in the studies reviewed, in the sense that some authors found a positive relationship, others negative and others found no significant relationship at all.

Specifically, Carter et al. (2003) report a positive relationship between the presence of women or minorities on company boards and firm value amongst Fortune 1000 firms, as measured by Tobin's Q. Julizaerma and Sori (2012) on a study based on Asian data, demonstrate (using ordinary least squares [OLS] regression) a positive relationship between women on the board and firm performance in Malaysian companies. Campbell and Mínguez-Vera (2008) also find that gender diversity has a positive effect on firm value based on a panel data analysis of firms listed in Spain. Catalyst (2004) examined the presumed connection between gender diversity and financial performance in a sample of 353 Fortune 500 companies from 1996 to 2000, where it concluded that firms belonging to the top quartile, in terms of diversity, achieve better financial performance than their low-quartile counterparts. Financial performance in the Catalyst (2004) study is measured by ROE and raw stock returns, while gender diversity is based solely on the participation of women as corporate officers. Morgan Stanley Capital International (MSCI) World Index (2015) reported that companies with strong female leadership generate more ROE than those without, at 10.1% per year versus 7.4%. It designated a company as having strong female leadership if the company's board has three or more women or if its percentage of women on the board is above its country average. Moreover, empirical research by Francoeur et al. (2008) shows a positive and significant corporate performance might result from an increasing female presence on corporate boards and among senior management.

On the other hand, Adams and Ferreira (2009) found that, in a sample of US firms, the average effect of gender diversity on firm performance is negative, suggesting that female presence on corporate boards may lead to over-monitoring for companies that already have strong governance in place. In a study of FTSE 100 companies, Ryan and Haslam (2005) found a marginally significant negative correlation between the percentage of women in board performance as measured by the change in share price, however, arguing that it may be due to the glass cliff – the relatively subtle barrier women face, such that their positions of leadership are associated with greater risk and an

increased possibility of failure, and can thus be seen as more precarious.

Meanwhile, in a study of Dutch and Danish firms using a market-based performance measure (Tobin's Q), the results show no relationship between the share/presence of women on boards and firm performance for these two countries and the particular year of study (Marinova et al., 2015). Although having more female directors may not have an impact on financial performance, firms with a higher proportion of women on their board are able to generate enough value to keep up with normal stock-market returns (Francoeur et al., 2008).

Despite strong theoretical support for board gender diversity, the empirical findings surveyed above reveal a growing but ambiguous collection of evidence as to the benefits (Low et al., 2015). These mixed results are not unexpected, as the link between board diversity and firm financial performance is both theoretically and empirically complicated (Carter et al., 2008). Some of the differences may be due to the data stemming from different countries (with differing board systems) and different time periods or from the use of different performance measures and estimation methods (Campbell & Minguez-Vera, 2008)

CHAPTER 4. METHODOLOGY

This chapter describes the data collection method and research design of this study whilst describing the models and explaining the relevant variables used in the study.

Section 1.   DATA COLLECTION

This study is based on a sample of firms from the Ghanaian and Nigerian Stock Exchanges respectively. The reasons behind the sampling from the stock markets of these countries are twofold. First of all, these countries represent two of the largest economies in the Economic Community of West African States (ECOWAS) region with Nigeria and Ghana having the first and second-largest GDPs in the region respectively. The two countries account for 75.44% of the regions combined GDP (CountryEconomy, 2020). Secondly, as Ntim (2016) argues, they share a number of common attributes as follows;

I.   they are all countries of Anglo–Saxon origin with similar accounting, auditing, corporate governance mechanisms, and legal systems;

II.   they have adopted the international financial reporting standards; and

III.   they have similar corporate law and ownership structures.

The initial sample was obtained from OSIRIS; a database of publicly listed companies provided by Bureau van Dijk. Data was also collected from the websites of the companies, their financial statements, as well as the company profiles on The Wall Street Journal, Bloomberg, The Market Screener and Reuters. With respect to the main explanatory variable (gender diversity), data was hand-collected data on board members' gender from firms' annual reports over seven years (2013 - 2019) on the basis of board members' first given names. The firms are geographically located in Ghana and Nigeria and are listed on the Nigeria Stock Exchange (NSE) and Ghana Stock Exchange (GSE) respectively. In total, 202 companies were listed on these two stock markets as at 2019, which includes 33 GSE listed firms and 169 NSE listed firms. Consistent with prior studies on corporate governance (Kilic & Kuzey, 2016; Liu et al., 2014; Agyemang Badu & Appiah, 2017), companies in

finance and insurance, which account for third of the companies listed, are excluded from the sample. The reason for this exclusion is that these industries are tightly regulated and secondly, they are heavily geared. This has proven to have different effects on governance mechanisms; hence it is fitting for them to be separately analyzed (Agyemang Badu & Appiah, 2017). With companies in this category excluded, there remains 136 companies in the sample size. Following this, firms with missing data, negative equity, or with recent mergers and acquisitions are also excluded from the sample set. The final sample size observed for this research was of 96 firms, with 672 observations made over a period of seven years, from 2013 to 2019. This period is selected so that the results remain current and relevant.

Furthermore, there may be other unobserved factors that affect firm performance, therefore, the use of panel data in this study facilitates a more reliable picture than that arising from purely cross-sectional studies (Campbell & Minguez-Vera, 2008). In addition, panel data can provide for instruments that are not available in cross-sectional data (Börsch-Supan & Köke, 2002). Consequently, a number of control variables are introduced in the model to reduce the omitted variable problem. The presence of endogeneity is tested using the Durbin-Wu-Hausman exogeneity test which is performed to show if the coefficient of board size is statistically significant in order to confirm if the key board variables are endogenously related to firm performance. Once confirmed, instrumental estimation techniques are adopted.

Section 2.   RESEARCH DESIGN

4.2.1.   Model for Testing Hypothesis One (H1)

To determine the influence of board gender diversity on firm performance, the model is formulated in the form:

$$Y = X\beta + \varepsilon$$

Specifically, we examine the relationship between board gender diversity on firm performance by specifying the equation (1):

$$PERFORMANCE = \alpha + \beta_1 BGD_{it} + \beta_2 BOARDSIZE_{it} + \beta_3 BOARDIND_{it} + \beta_4 AGE_{it} +$$

$\beta_5 FIRMSIZE_{it} + \beta_6 LEVERAGE_{it} + \gamma_i + \lambda_t + \delta_i + \varepsilon_{it}$

for firm i at time t.

In testing H1a and H1b, the model will be slightly adjusted by removing the country dummy, δ_i, variable as each country is studied individually. With the adjustment, model 1(a) is as follows;

$PERFORMANCE = \alpha + \beta_1 BGD_{it} + \beta_2 BOARDSIZE_{it} + \beta_3 BOARDIND_{it} + \beta_4 AGE_{it} +$

$\beta_5 FIRMSIZE_{it} + \beta_6 LEVERAGE_{it} + \gamma_i + \lambda_t + \varepsilon_{it}$

4.2.2. Model for Testing Hypothesis Two (H2)

To examine the effect of the critical mass of women on the board on financial performance by specifying equation (2)

$PERFORMANCE = \alpha + \beta_1 BGDUMMY_{it} + \beta_2 BOARDSIZE_{it} + \beta_3 BOARDIND_{it} + \beta_4 AGE_{it} +$

$\beta_5 FIRMSIZE_{it} + \beta_6 LEVERAGE_{it} + \gamma_i + \lambda_t + \delta_i + \varepsilon_{it}$

for firm i at time t.

In testing H2a and H2b, the model will be slightly adjusted by removing the country dummy, δ_i, variable as each country is studied individually. With the adjustment, model 2(a) is as follows;

$PERFORMANCE = \alpha + \beta_1 BGDUMMY_{it} + \beta_2 BOARDSIZE_{it} + \beta_3 BOARDIND_{it} + \beta_4 AGE_{it} +$

$\beta_5 FIRMSIZE_{it} + \beta_6 LEVERAGE_{it} + \gamma_i + \lambda_t + \varepsilon_{it}$

4.2.3. Regression Estimation Techniques

In order to ensure consistency, this paper makes use of the Pooled Ordinary Least Squares (OLS), Random Effects, and Two-Stage Least Squares Methods, in the analysis of the model. OLS is used in the first stage of analysis. The assumptions needed for this regression model are linearity, exogeneity, homoscedasticity, non-autocorrelation, and full rank, and that all entities are assumed to be homogenous (Das, 2019). However, it does not capture the benefit of panel data to capture heterogeneity

Thus, for the next stage, in order to capture the benefit of panel data, this study performs the

Hausman test to determine whether the Fixed-Effect (FE) or Random-Effect (RE) methods fit the model and afterward proceeds to use the recommended model to test the various hypotheses. The Fixed-Effect and Random-Effect models allow the researcher to examine variations among cross-sectional units simultaneously with variations within individual units over time (Gaur and Gaur, 2006).

Finally, this research adopts a Two-Stage Least Squares (2SLS) approach to control for potential endogeneity between board gender diversity and firm performance. When analyzing the effect of women on firm performance, endogeneity concerns also arise due to the possibility of reverse causality (Low et al., 2015). In order to address this issue, this study employs an instrumental variable (IV) in a two-stage least squares regression to address this issue. In following Wintoki et al. (2012), lagged values of the explanatory variables of board characteristics will be used as instruments of the current explanatory variable. Therefore, the variable of the one-year lagged Blau index (and lagged POF for the proxy), together with Board size of Board characteristics are considered as instruments for the endogenous variable. The model includes year effects (year dummy variables), λ_t, which is used to control economy-wide yearly fluctuations, industry dummy variables, γ_i, which is used to control for industry bias, and country dummy, δ_i, which is used to control for country-specific effects on the results. Finally, the reported standard errors are adjusted for potential heteroskedasticity, with robust standard errors.

Section 3.   DEPENDENT VARIABLE

For the dependent variable (PERFORMANCE), the accounting measure of operational performance, Return on Assets (ROA), is used as a measure of financial performance. It is the ratio of operating income to the total assets of the firm. The ROA is the ratio of the net income to the total assets of the firm. It measures the success of a firm in using its assets to generate earnings independent of the financing (debt versus equity) of those assets (Selling & Stickney, 2018). This variable is measured on a pre-tax basis to avoid complications that may come up due to the differences in the tax system of the sample countries. ROA has been widely used as a performance indicator in prior corporate governance and board gender diversity studies (Erhardt et al., 2003; Adams and Ferreira,

2009; Liu et al., 2014).

Section 4.   INDEPENDENT VARIABLE

The independent variable of interest, which is Board Gender Diversity (BGD) will represent the primary independent variables. In this regard, this and other board-related data were obtained from OSIRIS, as well as the annual reports of listed companies. The measure of board gender diversity is be operationalized using Blau (1977) index of heterogeneity. Following Blau (1977) formula, the diversity of the group is given by

$$H = 1 - \sum_{i=1}^{n} B_i^2$$

where H is the Blau index, n represents the number of categories (i.e., n = 2 in the case of gender) and B_i is the fraction of board members with characteristic i (i.e., the fraction of female or male board members). Blau index has a minimum of 0 signifying complete homogeneity (i.e., all board members are male) and a maximum of 0.5 indicating complete heterogeneity (i.e., half of all board members is female, and the other half is male).   Campbell and Mínguez-Vera (2008) argues that the percentage of female directors may not be an appropriate measure of diversity, as a higher number of female directors also shows a high degree of homogeneity in terms of gender. In addition to the Blau index, a proxy measure for Board Gender Diversity, Percentage of Females (POF) on the board, is also employed in further analysis as a check for robustness of the results.

In the model for testing hypothesis two (H2, H2a, H2b), the gender dummy variable (BGDUMMY) for critical mass of at least three or more women (CM3) is used where one (1) equals boards with 3 or more women and zero (0) equals otherwise. A proxy variable is also used in this case to check for robustness, with a dummy variable for the critical mass of at least 30% or more women (POCM3) where one (1) equals boards with at least 30% female board members and zero (0) equals otherwise

Section 5.   CONTROL VARIABLES

4.5.1. Corporate Governance Measures

As explained by Adams and Ferreira (2009), it is also believed that the relation between director independence, board size and gender diversity is largely mechanical and difficult to interpret. Therefore, this study is careful in the analysis to control for board size and independence, in order to ensure that the effects found are due to gender diversity and not those variables. The first control variable, which is the board size (BOARDSIZE), refers to the total number of directors on the firm's board.

The next is Board independence (BOARDIND), which is the share of independent directors. Directors titled as 'non-executive' and 'independent' are classified as independent directors. As first studied by Berle and Means (1932), whether independent directors bring value is an issue related to the agency problem between owners and managers. Consequently, the performance-related effect of independent board directors has been broadly investigated in corporate governance research with mixed results (Baysinger & Butler, 1985; Van Ees et al., 2003).

4.5.2. Firm Characteristics

Next, the model accounts for firm characteristics, where the author controls for the firm size (FIRMSIZE), measured by the natural log of the firm's total sales as it measures the total revenues generated by the firm as an indicator for a firm's size. Furthermore, the model considers the financial leverage (LEVERAGE) of firms, which is calculated as the book value of debt to the total assets of the firm. This information may reflect the financial stability of a firm, that is, the higher the leverage, the closer it is to breaching debt covenants and exposing the firm to the risk of bankruptcy (Abdullah, 2014). The higher the ratio, the higher the degree of leverage and, consequently, the higher the risk of investing in that company. In addition, firm age, and industry effects are included as standard control variables. Firm age (AGE) is measured as the number of years from the date of incorporation at the time of the annual report.

4.5.3. Other Variables

The firms sampled are categorized into 8 industries based on Industry Classification Benchmark (ICB) (FTSE Russell, 2019), namely: Basic materials, Industrials, Consumer goods, Consumer Services, Oil and Gas Telecommunications, Technology and Healthcare. The Industry Dummy variable (γ_i) is also employed in the regression analysis, to control for industry-related effects. Dummy variable for the country (δ_i) is also used to control for country-related effects, where Ghana equals one (1) and Nigeria equals zero (0). And finally, year dummy variables (λ_t) are included to control economy-wide yearly fluctuations.

Table 1: Definition and Computation of Variables

Variable	Definition and Computation
ROA (PERFORMANCE)	Return on Assets using P/L before tax (%)
BLAU	Blau index
FEMBOARD	Number of women on the board
POF	Percentage of women on the board
CM3	Boards with 3 or more women (1), otherwise (0).
POCM3	Boards with 30% or more women (1), otherwise (0).
BOARDSIZE	Number of directors on the board
BOARDIND	Percentage of non-executive directors
AGE	Number of years since incorporation at the time of the annual report
LEVERAGE	The ratio of the book value of debt to total assets
FIRMSIZE (LN(SALES))	Natural log of total sales
Year Dummy	Dummy Variables for year 2013-2019
Industry Dummy	Dummy variables for ICB coded industries
Country Dummy	Ghana (1) Nigeria (0)

CHAPTER 5. DATA AND DESCRIPTIVE STATISTICS

Section 1.   GENDER DIVERSITY TRENDS

This section shows the trends observed in the sample of the studied time period to give a general overview of the board gender diversity in Ghana and Nigeria through charts and figures. The first chart (Figure 1.) is based on the average proportion of female directors across industries over the 7-year period studied. Noticeably, consumer goods have the highest proportion of women at 19%. Whilst healthcare had the lowest average over the period at an average of 9% women.

Figure 1: The average proportion of female directors across industries.
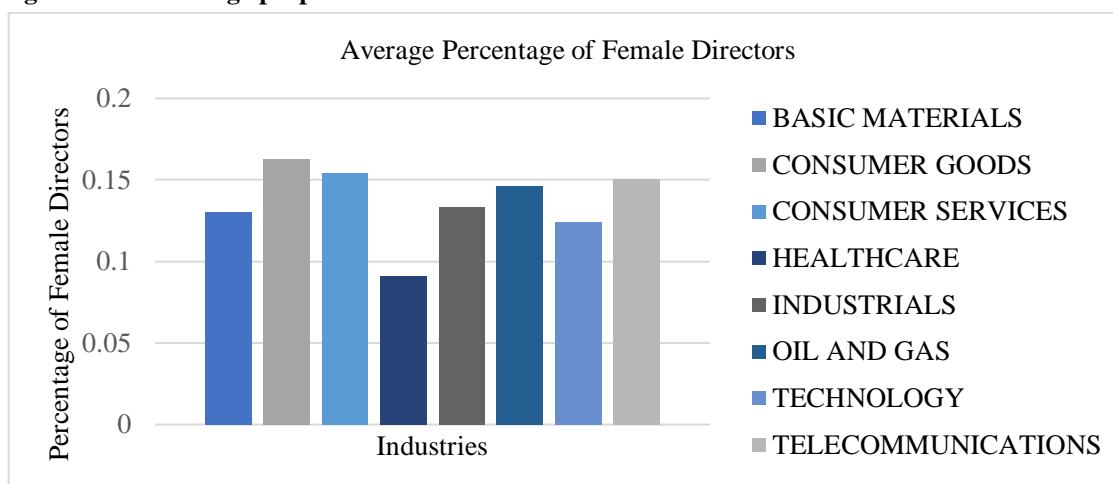
Source: Author

In the second chart (figure 2), which graphs the changes in the total proportion of female directors sampled over time, there is a steady increase from 2013 to 2019. In 2013 10.6% of board members in the firms sampled were women. There was a steady increase in the number of female board members by an estimated 1% per year from 2013 to 2017. After which there was a 2% jump from 2017 to 2018. More recently, that proportion has increased to 17.3% in 2019. This number is below the latest to the global of 20% reported by MSCI (2019).

Figure 2: Changes in the proportion of female directors from 2013-2019.

Percentage of female Directors
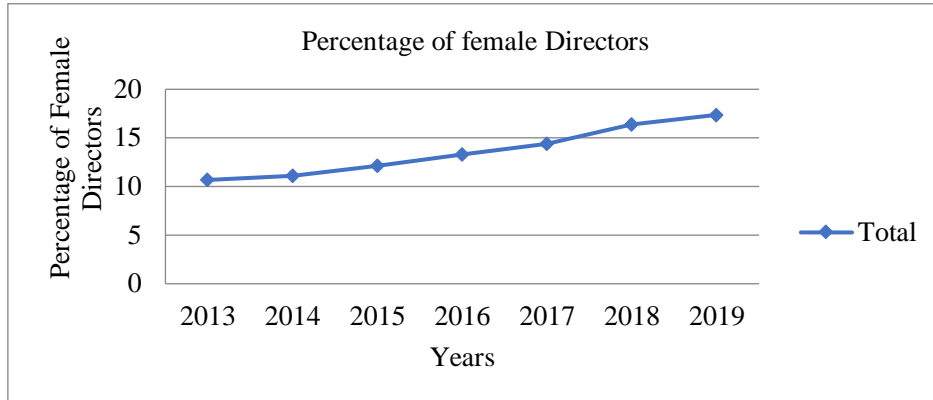
A closer look at the composition (Figure 3) shows that in the early 2010s (specifically, 2013 and 2014), almost half of the companies sampled (45%) were homogeneously male, with no women on the board. However, the latest statistics show that this number has fallen drastically to only about a quarter (25%) of the companies sampled. In addition, the board composition of one woman saw a sharp increase from 2014 to 2015 followed by a steady decline Meanwhile, the dominant composition is of boards with two women, which represents 35% of the sample. At the same time, the board composition with three women has had the lowest numbers of the last 7 years, in spite of a noticeable steady increase over the period observed. The steady increase in the composition of boards with women could explain the steady decrease in the composition of boards with no women.

Figure 3: Changes in board compositions from 2013 to 2019

Board composition
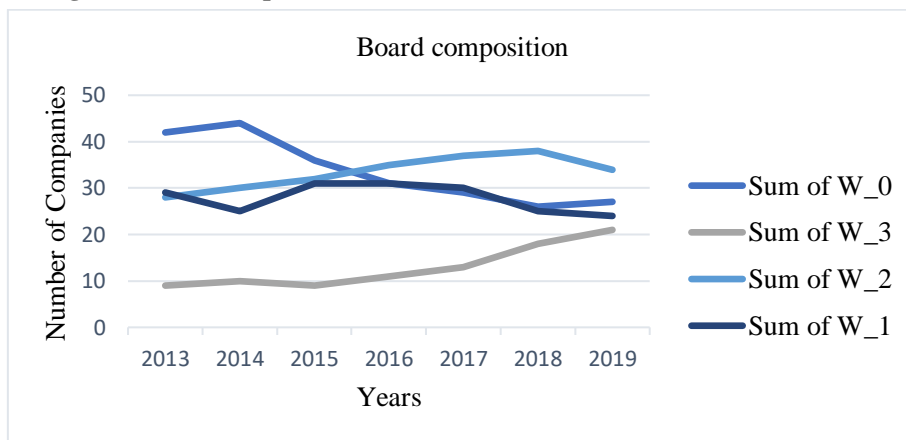
W_0: All male Boards; W_3: At least 3 women on the board; W_2: 2 women on the board; W_1: 1

woman on the board

Section 2.　　　　　MEANS, STANDARD DEVIATION AND CORRELATIONS FOR VARIABLES

Table 2 presents the descriptive statistics for relevant variables used in the primary tests of this study. For FEMBOARD, the mean number of women on the board 1.198 (with a low standard deviation of 1.17) shows that on average, number of women on the board does not reach the critical mass of at least 3 woman as proposed by several scholars (Kramer et al., 2006; Kristie, 2011; Liu et al., 2014) for an optimal effect on efficiency. In addition, the average percentage of women on a board is 14.2% which represents an average Blau index of diversity at 0.205. These results reveal that the female directors represent a minority on the board of Ghanaian and Nigerian listed companies. On average, the board size of firms included in the sample consists of approximately 9 (8.5) directors. The case of these countries provides an interesting context to examine this relationship. In Nigeria, the Code of Corporate Governance Best Practice in 2011 recommend that the size of the board should be at least five members, however, gave no ceiling. Similarly, in Ghana, the Companies' Code recommends at least two members as board members without giving a ceiling. This could explain why the largest board size sampled is composed of 23 directors.

Table 2: Descriptive statistics for variables (N=672)

Variable	Mean	Standard Deviation	Minimum	Maximum
ROA	3.564	13.813	-58.24	79.27
BLAU	.205	.175	0	.5
POF	.142	.14	0	.67
FEMBOARD	1.198	1.17	0	6
BOARDSIZE	8.461	2.49	3	23
BOARDIND	.608	.17	0	1
AGE	43.792	19.559	4	96
LN (SALES)	10.412	2.332	0	15.282
LEVERAGE	9.228	4.368	.05	15.57

Table 3 presents the correlation matrix amongst the explanatory, control, and financial performance variables. About half of the correlations are significantly correlated and in the expected direction. Of interest is the significant positive relationship between gender diversity and firm performance (ROA). Blau index and the is positively correlated at a 5% significance level. Meanwhile,

the percentage of female directors and the number of female directors, are positively correlated at a 10% significance level. On the other hand, there is little significant correlation between the firm and board characteristics and measures for board gender diversity. The notable exception is the board size, which is positively and significantly correlated with the number of female directors at a 1% significance level. This may suggest that the more women there are on the board, the larger the board size. In addition, firm age is positively and significantly correlated with the number of women on the board at a 10% significance level, which means that for every year older a company is, there is an 8% positive increase in the number of women on the board.

Table 3: Correlation Matrix for explanatory, control and financial performance variables.

	1	2	3	4	5	6	7	8	9
1. ROA	1								
2. BLAU	0.113 **	1							
3. FEMBOARD	0.0812 *	0.912 ***	1						
4. POF	0.0949 *	0.967 ***	0.913 ***	1					
5. BOARDSIZE	0.039	0.056	0.299 ***	-0.014	1				
6. BOARDIND	0.017	-0.033	-0.011	0.004	0.125 **	1			
7. AGE	0.014	0.044	0.079 *	0.046	0.0002	-0.008	1		
8. LN (SALES)	0.339 ***	0.032	0.113 **	-0.035	0.437 ***	0.069	0.164 ***	1	
9. LEVERAGE	0.053	-0.00	0.069	-0.047	0.343 ***	0.237 ***	-0.056	0.433 ***	1

Note Asterisks indicate significance at 0.01(***), 0.05(**), and 0.10(*) levels respectively

As shown in Table 4, there is some significant difference that exists between firms that have at least one female director and those that do not. Most notably, firms with at least one female director, on average outperform firms without any female director by an average of 4.16% in ROA. This is consistent with studies by Low et al., (2015) in Asia, which found firms with at least one female director on average significantly outperform completely homogenous firms. We should however note, that this may not imply causation. Adams and Ferreira (2009) in their study noted that firm performance is likely to affect the incentives of women to join firms and the incentives of firms to hire

female directors.

Larger corporations tend to have larger boards and are more proactive in efforts to improve corporate governance (Low et al., 2015). In addition, we find that firms with at least one female director, on average, belong to boards with larger board sizes. This is consistent with studies that suggest that there is a positive relationship between organization size and both the number of women and the likelihood of having at least one woman on the board (Hyland & Marcellino, 2002). On the other hand, there is no significant correlation between the Blau index and Percentage of Females on the board and the board size as seen in Table 3. This means that although a larger board may have a higher chance of having at least one female on the board, it does not necessarily translate to higher gender diversity.

In looking at table 4 we find that there is no significant difference in the average leverage when comparing between boards with at least one woman and those without women. Interestingly, this is inconsistent with previous research that show otherwise. For example, Low et al., (2015) reported from their analysis that firms that have a greater proportion of female directors appear to be less leveraged explaining that it may be as a result of higher risk aversion amongst women as shown in other studies (Eckel & Grossman, 2002).

In comparing Ghana, and Nigeria, we find that the mean ROA for firms with at least one female director in Nigeria is significantly higher, compared to firms with no female director. Meanwhile in Ghana, although firms with at least one female director have higher mean ROA compared to firms with no female directors, the difference is not significant. Furthermore, we find that for both countries, firms with at least one female director also have higher leverage compared to firms without female directors, which Ghana having a significant difference, whilst Nigeria does not. Finally, we see that for both countries, the average board size of firms with at least one woman is significantly higher than firms with homogenous boards.

Table 4: A comparison between firms that have no female directors and firms that have at least one female director.

	Num. of female directors = 0	Num. of female directors > 0			
	Mean	Mean	Difference	Standard Error	t-value
Panel A: Full Sample (n=672)					
	n= 235	n= 437			
ROA	0.86	5.02	-4.16***	1.11	-3.75
BOARDSIZE	7.65	8.9	-1.25***	0.2	-6.4
BOARDIND	0.62	0.6	0.02	0.01	1.5
AGE	43.23	44.1	-0.87	1.58	-0.55
LN (SALES)	9.79	10.75	-0.96***	0.18	-5.15
LEVERAGE	8.86	9.43	-0.56	0.35	-1.6
Panel B (n = 553 (NG), 119 (GH))					
Ghana	n = 37	n = 82			
ROA	1.01	5.68	-4.66	2.88	-1.6
BOARDSIZE	6.95	7.77	-0.82***	0.37	-2.2
BOARDIND	0.57	0.49	0.08**	0.04	1.8
AGE	46.65	46.56	0.09	3.27	0.05
LN (SALES)	9.31	9.94	-0.62	0.51	-1.2
LEVERAGE	0.46	0.66	-0.21***	0.05	-3.95
Nigeria	n = 198	n = 355			
ROA	0.83	4.87	-4.04***	1.2	-3.35
BOARDSIZE	7.78	9.16	-1.38***	0.22	-6.3
BOARDIND	0.63	0.63	0	0.01	0.25
AGE	42.59	43.53	-0.94	1.79	-0.55
LN (SALES)	9.88	10.93	-1.05***	0.19	-5.4
LEVERAGE	0.63	0.6	0.04	0.03	1.4

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

CHAPTER 6. REGRESSION ANALYSIS AND RESULTS

Section 1.   REGRESSION RESULTS AND ANALYSIS OF HYPOTHESIS ONE (1)

6.1.1. Compound Regression Analysis of Ghana and Nigeria

Results for the regression analysis of hypothesis one (H1) is shown in Table 5 below. In order to understand the relationship between board gender diversity and firm performance, Pooled OLS regression on model (1) fitted using robust standard errors is performed. The results show a positive and significant relationship at 1% confidence level between ROA and Blau as seen in column (1).

A Hausman test is performed to determine the right method (RE or FE) to be used for this panel data analysis where the null hypothesis is that RE method is appropriate, and the alternative hypothesis is that the FE method is appropriate. The results of the Hausman test is not significant at p- value of 0.144 as seen in Appendix 1, and therefore fails to reject the null hypothesis that Random Effects model is more appropriate. Therefore, the study proceeds with the use of the random effect method for analysis. A positive and significant relationship between ROA and Blau index of diversity is found at a 5% significance level in column (2).

Finally, for the two-stage least squares methods in column (4), an instrumental variable (IV) is used. A concern raised by Adams and Ferreira (2009) in using such techniques is the difficulty that arises in defining valid instruments. Larcker and Rusticus (2010) also points out that instruments often lack theoretical support and are not fully tested for validity and relevance, which may lead to estimates that may be more biased than those from OLS.   Literature on board gender diversity and firm performance reveals interesting choices of instruments, such as Liu et al (2014) who uses the percentage of women directors in the industry on the basis that the percentage of women in the industry may affect the percentage of women in the firm. In addition, Adams and Ferreira (2009) uses the fraction of male directors with board connections to female directors as an instrument considering that access to informal social networks amongst male directors helps women to secure a position on company boards. As pointed out by Low et al., (2015) many other studies on gender diversity that adopt the IV approach do not provide sufficient justification as to their choice of instruments and rarely

report any results relating to their IV estimates.

Following Liu et al. (2012), the Blau index and the percentage of female directors in the firm's industry (2-digit IC code) was considered as the as an instrumental variable. The first stage regression model showed that there is no relationship between the proposed IV and the endogenous regressor. Furthermore, results show a small F-statistic less than 10 (Appendix 4) which means it is a weak instrument. Hence, this instrument dropped as weak IVs may cause estimators to perform poorly (Liu et al, 2012).

As per Wintoki et al., (2012) past values of governance and performance can be used as instruments for current realizations of governance and eliminates the need for external instruments. On this basis, this study proceeds to use one-year lagged board characteristics as the IV. Again, tests for endogeneity and strength of instruments are performed and lagged board characteristics. Independent directors and board size are dropped after failing to show significance to the endogenous regressor and to be weak with the F-statistic less than 10 (Appendix 2). This leaves one strong and exogenous variable of lagged board gender diversity – Blau index (and its proxy POF) to be used as the instrumental variable. First, the Hausman test of overidentifying restriction is used to assess the validity of the instrument, for both the full sample, and the female director firm sample, the test fails to reject exogeneity at the 10% level (Appendix 2 and 3 respectively). In column (3) a one-year lag of the Blau index in the first stage regression, with the Blau index is found to be significantly related to the endogenous regressor with F-statistic being greater than 10. In the second stage regression, we find a positive and significant relationship Blau index and ROA at a 10% significance between in column (4).

All of the results point to a positive and significant relationship between the firm performance measured by ROA, and Gender diversity measured by the Blau index. This supports H1 that Board Gender Diversity relates positively to a firm's financial performance. These findings are consistent with previous studies (Catalyst, 2004; Campbell & Minguez-Vera, 2008; Julizaerma, 2012; Liu et al.,2014; Low et al., 2015)

Table 5: Effect of the board gender diversity on firm performance.

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	-18.251***	-7.436	0.036	1.641
	(5.525)	(8.297)	(0.031)	(7.946)
BLAU	12.696***	11.306**	-	11.835*
	(3.289)	(4.630)	-	(6.890)
BOARDSIZE	-0.660***	-0.698**	0.002	-0.544*
	(0.209)	(0.301)	(0.002)	(0.296)
BOARDIND	-2.324	-5.038	-0.001	-7.233
	(2.910)	(4.323)	(0.021)	(4.574)
AGE	-0.084***	-0.108**	0	-0.104**
	(0.027)	(0.052)	(0.000)	(0.051)
LN (SALES)	3.470***	4.611***	-0.007**	4.340***
	(0.461)	(1.152)	(0.003)	(1.094)
LEVERAGE	-1.391***	-1.874*	0.004	-2.018*
	(0.518)	(1.117)	(0.004)	(1.046)
$BLAU_{T-1}$	-	-	0.852***	-
	-	-	(0.022)	-
F-statistic	-	-	141.46	-
Country Dummy	-12.384***	-16.282	0.0408	-18.046*
	(5.364)	(10.663)	(0.044)	(10.101)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	672.000	672.000	576.000	576.000
R-squared	0.232	-	0.773	-
Number of IDs	-	96	-	96
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

With regard to other board characteristics, we find that board size is negatively and significantly related to firm performance at 1%, 5% and 10% for OLS, RE and 2SLS estimation techniques respectively. Which shows that a large board size has negative impact on firm performance. This is consistent with the negative relationship between board size and firm performance documented by a number of researchers (Eisenberg et al., 1998; Garg, 2007; Guest, 2009). On the other hand, there is no significance between board independence and firm performance. From the first stage regression in Table 6 column (3), by analyzing the country dummy (Ghana=1 and Nigeria=0) we find that there

is no significance in the Blau index, and hence board gender diversity, of Ghanaian firms, compared to Nigerian firms. We also see from the country dummy in columns (1), (2) and (4) that ROA for firms in Ghana is negatively and significant compared to that of firms in Nigeria.

As a test of robustness, the estimation process was repeated using the proxy measure for board gender diversity, POF, also used in previous studies (Liu et al., 2014; Low et al., 2015) is employed in Appendix 5. The POF results are found to be consistent in terms of direction and significance of the variables of interest. We can therefore reject the null hypotheses in favor of the alternative hypothesis one that the board gender diversity relates positively to firm performance.

Board compositions with at least one woman make up 65% of the observations of firms in the specified period (2013-2019). This research also goes a step further to analyze model one (1) on a sample of boards with at least one woman, as seen in Table 6. For both the main measure of board gender diversity, Blau index in Table 6, and its proxy POF (Appendix 6), the results show no significance between firm performance and board gender diversity. This shows that, when analyzing firms which already have women on their boards, the positive relationship between firm performance and board gender diversity is no longer significant. From the first stage regression in Table 6 column (3), by analyzing the country dummy (Ghana=1 and Nigeria=0) we find that there is no significance in the Blau index (board gender diversity) of Ghanaian firms, compared to Nigerian firms. In addition, from analyzing the country dummy in Table 6, we find that there is no significance in the in ROA of Ghanaian firms compared to Nigerian, when studying firms with at least one woman on the board.

Table 6: Regression results for firms with at least one female director.

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	5.807	-0.601	0.194***	-3.576
	(6.411)	(12.806)	(0.037)	(15.696)
BLAU	2.301	6.824	-	21.937
	(5.683)	(8.722)	-	(15.349)
BOARDSIZE	-0.812***	-0.562*	-0.005**	-0.382
	(0.248)	(0.307)	(0.002)	(0.325)
BOARDIND	-3.48	-3.093	-0.002	-3.16
	(3.537)	(5.495)	(0.018)	(5.320

AGE	-0.064*	-0.06	0	-0.045
	(0.033)	(0.058)	0.000	(0.066)
LN (SALES)	2.994***	3.417***	-0.004	3.127**
	(0.533)	(1.226)	(0.002)	(1.357)
LEVERAGE	-1.076*	-1.513	0.001	-0.992
	(0.611)	(1.284)	(0.003)	(1.487)
$BLAU_{T-1}$	-	-	0.634***	-
	-	-	(0.046)	-
F-Statistic	-	-	43.570	-
Ghana Dummy	-9.968	-13.785	0.01	-8.19
	(6.262)	(12.368)	(0.036)	(14.659)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	437	437	368	368
R-squared	0.216	-	0.66	-
Number of IDs	-	76	-	75
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

6.1.2. Comparative Regression Analysis of Ghana and Nigeria

As a further step, the same analysis conducted for section 6.1.1. is conducted on firms from Ghana and Nigeria separately, to analyze any similarities or differences that might exist between the two countries, and by so doing tests hypotheses H1a and H1b.

For Ghana, we find in Table 6, testing for H1a, below that we find that Blau index is positively and significantly related to firm performance at 1%, 1% and 10% for OLS, RE and 2SLS estimation techniques respectively. Hence, rejecting the null hypothesis in favor of the alternative hypothesis H1a that in Ghana, board gender diversity relates positively to a firm's financial performance.

Table 7: Effect of the board gender diversity on firm performance in Ghana

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	-31.432***	-45.704***	0.077	-48.038***
	(10.536)	(13.856)	(0.121)	(11.311)
BLAU	24.816***	27.273***	-	27.343*
	(9.117)	(8.971)	-	(14.019)
BOARDSIZE	0.502	0.327	0.018*	1.004

	(1.230)	(1.513)	(0.009)	(1.183)
BOARDIND	1.239	7.421	-0.014	5.187
	(5.396)	(7.273)	(0.075)	(6.751)
AGE	-0.008	-0.138	0.001	-0.126
	(0.138)	(0.200)	(0.001)	(0.186)
LN (SALES)	3.394***	5.165***	-0.020*	4.836**
	(1.023)	(1.751)	(0.011)	(1.926)
LEVERAGE	-30.634***	-32.688***	-0.029	-31.594***
	(5.398)	(7.892)	(0.047)	(8.111)
$BLAU_{T-1}$	-	-	0.815***	-
	-	-	(0.071)	-
F-Statistic	-	-	166.35	-
Year Dummy	Yes	Yes	-	Yes
Industry Dummy	Yes	Yes	-	Yes
Observations	119	119	-	102
R-squared	0.539	-	-	-
Number of IDs	-	17	-	17
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

In analyzing subset of sample of firms from Nigeria, as in Table 8 below, in testing for H1b, we find that find that Blau index is positively and significantly correlated with firm performance at 1%, 5% for OLS, RE respectively. However, in the 2SLS estimation technique we find a positive but insignificant relationship between Blau index and the performance ROA. Meaning that when endogeneity is considered, we are unable to reject the null hypothesis that, in Nigeria, board gender diversity has no relation to a firm's financial performance. This shows that in the case of Nigeria, the positive significance of board gender diversity on the board decreases.

Table 8: Regression results on the effect of the board gender diversity on firm performance in Nigeria

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	-4.091	-5.455	0.041	4.905
	(4.241)	(9.200)	(0.034)	(8.616)
BLAU	11.917***	8.264*	-	12.048
	(3.573)	(4.739)	-	(8.050)

BOARDSIZE	-0.440**	-0.647**	0.002	-0.532*
	(0.206)	(0.301)	(0.002)	(0.297)
BOARDIND	-3.364	-9.473**	-0.023	-11.325**
	(3.054)	(4.654)	(0.023)	(5.253)
AGE	-0.100***	-0.107**	0	-0.105**
	(0.028)	(0.053)	0.000	(0.051)
LN (SALES)	3.736***	4.273***	-0.004	4.103***
	(0.677)	(1.448)	(0.004)	(1.560)
LEVERAGE	-1.571**	-1.134	0.001	-1.553
	(0.704)	(1.416)	(0.005)	(1.503)
$BLAU_{T-1}$	-	-	0.852***	-
	-	-	(0.024)	-
F-statistic	-	-	126.41	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	553	553	-	474
R-squared	0.237	-	-	-
Number of IDs	-	79	-	79
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

As a test for robustness, the same analysis is performed on the sample subset of Ghana and Nigeria with percentage of females (POF) as the proxy variable in the Appendices. For, Ghana, in Appendix 8, similar to results in the main regression, there is a positive and significant relationship between Blau and ROA at 1%, 1% and 5% for OLS, RE and 2SLS respectively. For Nigeria, in Appendix 9, Blau is positive and significant at 1% with pooled OLS technique, which does not account for nuances in panel estimation. Similar to results in Table 8, in the RE and 2SLS estimations which accounts for panel estimations, significance decreases, and completely eliminated. We see that compared with Nigerian firms, board gender diversity has a stronger effect on firm performance in Ghanaian firms, compared to Nigerian firms.

Similarly, model for testing hypotheses H1a and H1b is used in analyzing a sample subset of boards with at least one woman for Ghana and Nigeria. Board compositions with at least one woman make up 69% of the observations of firms from Ghana for the specified period (2013-2019). In Table 9, analyzing a sample of firms in Ghana, using OLS and RE in columns (1) and (2), there is seen to be

no significant relationship between Blau and ROA. However, in column (4) where 2SLS estimation technique is used, there is seen to be a positive and significant relationship at a 5% significance level.

Table 9: Regression results for firms in Ghana with at least one female director

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	-27.488*	-27.488*	-0.03	-40.308***
	(14.771)	(16.367)	(0.113)	(13.348)
BLAU	4.308	4.308	-	42.831**
	(19.063)	(14.062)	-	(20.361)
BOARDSIZE	-0.65	-0.65	0.006	0.755
	(1.975)	(1.794)	(0.009)	(1.471)
BOARDIND	3.51	3.51	0.179**	-5.853
	(8.773)	(13.077)	(0.080)	(15.473)
AGE	-0.045	-0.045	0.001	-0.118
	(0.176)	(0.163)	(0.001)	(0.152)
LN (SALES)	4.189***	4.189*	-0.01	4.794**
	(1.495)	(2.168)	(0.006)	(1.946)
LEVERAGE	-27.824***	-27.824***	-0.01	-30.132***
	(5.846)	(7.131)	(0.034)	(7.972)
$BLAU_{T-1}$	-	-	0.668***	-
	-	-	(0.096)	-
F-Statistic	-	-	38.170	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	82	82	70	70
R-squared	0.537	-	0.836	-
Number of IDs	-	14	-	14
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Board compositions with at least one woman make up 64% of the observations of firms from Nigeria for the specified period (2013-2019). In all estimation techniques (OLS, RE, and 2SLS) there is seen to be no significant link between Blau index, and ROA (Table 10). In analyzing among firms with at least one female director, any significance noticeable from the analysis of the full sample of Nigerian firms in Table 8 is eliminated.

Table 10: Regression results for firms in Nigeria with at least one female director

VARIABLES	ROA	ROA	BLAU	ROA
	(1)	(2)	(3)	(4)
Intercept	11.364	4.522	0.224***	2.104
	(7.572)	(14.874)	(0.052)	(18.919)
BLAU	-2.714	1.418	-	16.287
	(6.203)	(9.120)	-	(18.396)
BOARDSIZE	-0.519**	-0.497	-0.005**	-0.417
	(0.243)	(0.350)	(0.002)	(0.355)
BOARDIND	-4.662	-5.628	-0.052**	-3.01
	(4.335)	(5.674)	(0.026)	(5.954)
AGE	-0.085**	-0.067	0	-0.053
	(0.034)	(0.059)	0.000	(0.068)
LN (SALES)	3.405***	2.846**	0.002	2.657
	(0.983)	(1.381)	(0.004)	(1.895)
LEVERAGE	-1.592	-0.679	-0.005	-0.386
	(1.015)	(1.474)	(0.005)	(1.993)
$BLAU_{T-1}$	-	-	0.622***	-
	-	-	(0.052)	-
F-Statistic	-	-	33.900	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	355	355	298	298
R-squared	0.216	-	0.633	-
Number of IDs	-	62	-	61
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Section 2.   REGRESSION RESULTS AND ANALYSIS OF HYPOTHESIS TWO (2)

6.2.1. Compound Regression of Ghana and Nigeria

Results for the regression analysis of hypothesis two are shown in Table 6 below. Pooled OLS regression using robust standard errors, and Random Effects (RE) regression are used in the analysis of model (2). We test for the critical mass of the magic number of at least 3 women, and as a proxy measure of critical mass, boards with at least 30% women.

Generally, there is no significant relationship in the relationship between having at least 3

women on the board or at least 30% women on the board, and board performance. In using the proxy variable of at least 30% of women on the board (column 3), the OLS regression result shows a positive and significant relationship. However, this result should be viewed with care, as it does not take into account the panel related effects in the regression. This means that in the sample studied, there is no lower limit in the number or proportion of women that need to be met in order to the firm to experience the impact of board gender diversity. Therefore, we cannot reject the null hypothesis that the effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board. This is inconsistent with other studies on the critical mass theory (Liu et al., 2014; Kristie, 2011; Kramer et al., 2006)

Table 11: Regression results of the critical mass of women on the board on firm performance

VARIABLES	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)
Intercept	-4.069	-6.128	-4.794	-6.242
	(4.138)	(8.853)	(4.027)	(8.550)
CM3	1.263	-0.142	-	-
	(1.401)	(1.582)	-	-
POCM3	-	-	3.745**	1.276
	-	-	(1.884)	(2.419)
BOARDSIZE	-0.685***	-0.606**	-0.595***	-0.600**
	(0.218)	(0.303)	(0.211)	(0.294)
BOARDIND	-2.374	-5.26	-3.355	-5.275
	(2.984)	(4.415)	(3.089)	(4.384)
AGE	-0.080***	-0.105**	-0.082***	-0.106**
	(0.027)	(0.052)	(0.027)	(0.051)
LN (SALES)	3.289***	4.613***	3.390***	4.626***
	(0.454)	(1.205)	(0.467)	(1.184)
LEVERAGE	-1.152**	-1.831	-1.258**	-1.875*
	(0.522)	(1.165)	(0.523)	(1.135)
Country Dummy	-9.960*	-15.574	-11.188**	-16.104
	(5.428)	(11.147)	(5.467)	(10.908)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	672	672	672	672
R-squared	0.21	-	0.217	-
Number of IDs	-	96	-	96

Regression Type	OLS	RE	OLS	RE

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

The results obtained show that there is no significance at the critical mass of women on the board, and therefore we cannot reject the null hypothesis that the effect of board gender diversity on firm performance has no relationship with a critical mass of at least 3 women. This means that in the sample of firms studied, a critical mass of 3+ women or 30%+ women on a board (Kramer et al., 2006; Kristie, 2011) may not be essential for the board for a positive effect to be felt on the firm's financial performance.

A model 2 regressions is repeated with dummy variable for firms that have completely homogenous board at a Blau index of 0, or of 0% of women on the board (Appendix 7). The results OLS and RE regression show that there is a significantly negative relationship between having a homogenous board and firm performance at 1% and 5% respectively. Showing that having a homogenous board is has a negative impact on the firm's financial performance.

The country dummy shows that ROA for firms in Ghana is negatively related to that of firms in Nigeria significantly in the case of OLS regression, but insignificantly, in the case of RE panel data estimation.

6.2.2. Comparative Regression Analysis of Ghana and Nigeria

As a further step, the same analysis conducted for section 6.2.1. is conducted on firms from Ghana and Nigeria separately, to analyze any similarities of differences that might exist between the two countries.

In table 12, the regression results for the critical mass of at least 3 women in Ghanaian firms, testing for H2a, show that there is no significant relationship with the critical mass of women on the firm performance. Furthermore, analysis of proxy variable, POCM3 of 30%+ women on the board also show no significance in relation to the ROA. Therefore, we cannot reject the null hypothesis that in Ghana, the effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board.

Table 12: Regression results of the critical mass of women on the board on firm performance in Ghana

VARIABLES	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)
Intercept	-27.039***	-41.190**	-27.567***	-44.450***
	(10.041)	(16.587)	(10.300)	(13.353)
CM3	0.78	1.834	-	-
	(7.137)	(4.284)	-	-
POCM3	-	-	2.415	3.463
	-	-	(4.644)	(8.785)
BOARDSIZE	0.693	0.451	0.771	0.738
	(1.180)	(1.773)	(1.286)	(1.572)
BOARDIND	3.833	9.375	3.152	9.098
	(4.877)	(8.326)	(4.853)	(7.116)
AGE	0.108	-0.073	0.097	-0.085
	(0.152)	(0.226)	(0.132)	(0.188)
LN (SALES)	2.050**	4.419**	2.175**	4.604***
	(0.995)	(1.775)	(0.929)	(1.646)
LEVERAGE	-27.894***	-33.539***	-28.685***	-34.550***
	(5.590)	(9.330)	(6.020)	(9.851)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	119.000	119.000	119.000	119.000
R-squared	0.493	-	0.495	-
Number of IDs	-	17	-	17
Regression Type	OLS	RE	OLS	RE

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

In Table 13, where effect of critical mass of women on firm performance on Nigerian firms is analyzed, testing for H2b, there is seen to be no significant retaliation with the dummy variable CM3 of 3 or more women on the board. The proxy variable of at POCM3 (30%+) women on the board, significance is found in the pooled OLS analysis at 5% level. However, this should be viewed with care, as it does not take into account the panel related effects in the regression. Similarly, we cannot reject the null hypothesis that in Nigeria, the effect of board gender diversity on financial performance has no relation to a critical mass of at least 3 women on the board.

Table 13: Regression results of the critical mass of women on the board on firm performance in Ghana

VARIABLES	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)
Intercept	-2.146	-4.706	-2.988	-4.703
	(4.470)	(9.708)	(4.336)	(9.257)
CM3	1.057	-0.493	-	-
	(1.525)	(1.688)	-	-
POCM3	-	-	4.363**	1.385
	-	-	(2.101)	(2.312)
BOARDSIZE	-0.448**	-0.552*	-0.349*	-0.564*
	(0.216)	(0.297)	(0.204)	(0.290)
BOARDIND	-3.664	-10.039**	-4.692	-9.855**
	(3.139)	(4.739)	(3.247)	(4.631)
AGE	-0.098***	-0.104**	-0.100***	-0.106**
	(0.028)	(0.052)	(0.028)	(0.052)
LN (SALES)	3.744***	4.356***	3.846***	4.369***
	(0.702)	(1.541)	(0.692)	(1.495)
LEVERAGE	-1.501**	-1.124	-1.636**	-1.195
	(0.727)	(1.499)	(0.706)	(1.447)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	553.000	553.000	553.000	553.000
R-squared	0.217	-	0.228	-
Number of IDs	-	79	-	79
Regression Type	OLS	RE	OLS	RE

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

In this sense, we can see that, both in Ghana and Nigeria share similarities, in that, in both countries, the effect of board gender diversity on financial performance has little or no relation to a critical mass of at least 3 women on the board. Meanwhile, analysis of homogenous boards in Ghana and Nigeria are separately analyzed with dummy variable w_0 where boards with 0 female directors equals one (1), and zero (0) otherwise. Results in Appendix 10 show consistently negative and significant relationship with firm performance (ROA). For Nigeria at 1% and 10% significance levels for OLS and RE respectively, and for Ghana at 1% significance levels for both OLS and RE.

CHAPTER 7. DISCUSSION

There is growing interest in the need for diversity, as there are growing calls for the need for equal opportunity and representation for previously underrepresented groups of people, including women. This has led to several studies on the effect of gender representation at the corporate governance level as well as in other levels of the firm. Several corporate governance related theories, including agency theory, stakeholder theory and resource dependency support the need for women representation, by tapping into resources of the community, of which women are a part. In addition, several authors argue for the need for the board to reflect the characteristics of the market in which they operate. Furthermore, diversity proponents argue that diversity prevents groupthink and contributes different perspectives to the discussions and decision-making.

The objective of this study was to add to the literature by providing deeper insights into the relationship between board gender diversity and firm performance in the West African Region, using a study of Ghana and Nigeria. This thesis examines the effect of board gender diversity on firm performance by testing a set of three related hypotheses. The evidence is obtained using a range of regression methods including pooled Ordinary Least Square (OLS), Random Effects (RE) and Two-Stage Least Squares (2SLS) with robust standard errors. Return on Assets (ROA) using profit and loss before tax is the dependent variable, and Blau index (together with proxy measures of board gender diversity) is the main independent variable with the support of seven control variables. Sample data contained a total of 96 firms from the Nigerian and Ghanaian stock exchanges from 2013 to 2017, with 672 observations.

First of all, in analyzing the results for H1 that board gender diversity is positively related to firm performance, we find that here is a positive and significant relationship between board gender diversity and ROA as a measure of firm performance and hence reject the null hypothesis. The results support previous studies of Low et al. (2015) Liu et al. (2012) who found positive and significant relationships between board gender diversity and firm performance. From the further analysis in table 6, it is observed that that the significant relationship between firm performance of female directors on

the board is eliminated in a sample subset of firms with at least on woman on the board. This means that, similar to studies by Low et al. (2015) in Asia , we find that adding the first female director to the board has the most beneficial impact on firm financial performance of the firm and that she is not a "token" woman who lacks influence on board practices and decisions.

In comparing the results of Ghana and Nigeria on hypotheses H1a and H1b, we find that in Ghana board gender diversity has a strong effect on firm performance, whilst board gender diversity has lower significant effect in Nigeria. The weak results of Nigeria could be influenced by the trend in Nigeria of board appointments based on linkages to strong family ties more than experience and qualifications, as explained by Ujunwa et al. (2012) in a study of board diversity in Nigeria.

An interesting observation is made in studying the relationship between board gender diversity, board size, and firm performance. First of all, from the correlation matrix (Table 3) we see a significant positive correlation between board size the number of females on the board. And in and from the comparison of means (Table 4) we find that firms with at least one female have on average larger board size compared to firms without females. The results of the regression analysis show that that although there is a negative relationship between board size and firm performance, and board gender diversity tends to increase with board size board gender diversity still has a significantly positive impact on the firm performance.

However, in the analysis of H2 that the effect of board gender diversity on financial performance positively relates to a critical mass of at least 3 women on the board, the results fail to reject the null hypothesis that the effect of board gender diversity on firm performance has no relation to a critical mass of women on the board. Furthermore, in the comparison of Ghana and Nigeria on Hypothesis H2a and H2b, we find that both cases are similar, in that the effect of board gender diversity on firm performance has little or no relation to the critical mass of 3 or more women directors on the board. In addition, it is noteworthy that the results of further tests performed show that homogenous board compositions with only men have a significantly negative relationship with a firm performance. This highlights the beneficial impact of board gender diversity for the firm.

From the results, we see that there is strong evidence in favor of board gender diversity. This

supports the resource dependency theory that it is beneficial for the firm to employ the use of the resources in its community, of which women are a part. Secondly, gender diversity on a board is an effective mechanism that reduces the costs related to agency problems (Reguera-Alvarado et al., 2015). And finally, appointing the first woman to the board is the most beneficial, and the evidence shows that the women appointed to the board are not only 'token' women as their presence contributes to significant positive effects on the financial performance. Women on the board has the potential to remedy groupthink, as the woman can contribute a different point of view to remedy the existing groupthink and thus support in effective corporate governance of the firm.

CHAPTER 8. CONCLUSION

Section 1.   IMPLICATIONS OF THE STUDY

This study sought to add to the existing literature by finding out if there is a positive relationship with board gender diversity in West Africa, as well as to find out whether the effect of board gender diversity is positively related to a critical mass of at least 3 women. Using empirical methods, this paper has been able to answer these questions.

The results of this research support the call for more women to be invited to the board, with findings in favor of board diversity. Interestingly, we find that after the first woman is appointed, there is no lower limit to the number of women required on the firm to impact the performance of the firm. We consistently find negative significant relationship between board size and financial performance of the firm. Therefore, it is recommended that firms should not increase its board size in order to appoint women on their board. Instead, they should allow equal opportunity to female candidates based on skill and experience in appointing new members to the board in order to fully reap the benefits of having women on the board of directors. Otherwise, there is the risk of appointing 'token' women where the firm might see no benefit or, even worse, a negative effect of having women on the board. Giving equal opportunity to qualified female candidates will not only increase the effect of corporate governance, but it will reduce the chance of homogeneity, which will eliminate group think. Board diversity could well improve a board's monitoring abilities by countering groupthink and thus ensuring that it performs its functions more effectively (Kamalnath, 2017). Furthermore, it is also recommended that, as a more intentional approach, firms could develop internal policies on gender diversity, in order to reduce the chances of appointing homogenous boards.

In Chapter 2, low participation in professional occupations is identified as one of the obstacles to women representation (Ayentimi & Burgess 2020). Therefore, there is a need to overcome this in order to have an adequate pool of qualified women for board appointment considerations. To do so, women should be given equal opportunity for career advancement based on their performance in order to gain the necessary skill and experience to be considered candidates for appointment to the board,

as they are an important part of the resource of the company. Where there are few qualified women a homogenous board seeking to improve their diversity situation may end up appointing token women who may not be qualified for the positions, and consequently would be unable to contribute to board decision making.

In summary, it is recommended that the firm considers qualified women in board appointments, and to be intentional about board gender diversity by implementing internal policies.

Section 2.   LIMITATIONS OF THE STUDY

Although this thesis has provided valuable insights in the field of corporate governance and board diversity, the results should be interpreted in light of several limitations. First of all, although the models developed for this research are built upon previous reliable studies in this field, some variables that also affect board gender diversity and firm performance may not have been accounted for in the models, other factors such as the number of women managers, diversity of the by firm, experience and/or education of women directors, are potential influencers of the number of women on the board as well as the performance of the women on the board. If time and resources allow, including all possible factors can not only improve the predictability of the overall model but also influence the multiple regression results of the variables included in this study.

Secondly, due to limited data availability, the measure of performance in this study was limited to Return on Assets (ROA) before Profit and loss. Previous research has shown different interactions between board gender diversity and different performance indicators such as Tobin's Q, Return on Equity (ROE), Return on Sales (ROS), Efficiency Ratios, which is limited in this study. The sample of publicly listed companies may result in some limitations in terms of the ability to generalize the results. Similarly, the sample size of 96 companies is considered relatively small. The size of the sample is due to the developing nature of the Nigerian and Ghanaian Stock Exchanges which have a small and growing number of companies listed on the respective exchanges.

In addition, the empirical sample data is studied over a period of 7 years which is a short time period. Future research could consider longitudinal panel data spread over a longer period of time,

potentially beyond 2013 to observe the changes over time. Although our robustness test using TSLS shows that endogeneity (reverse causality and simultaneity) is less of a concern in this study paper, we recognize that dynamic endogeneity is generally a concern in corporate governance literature and thus may limit the scope of conclusions. Future research should look at a larger data set and adopt econometric methods that account for dynamic endogeneity.

Lastly, this research was purely quantitative and based on primary and secondary data collection. The link with board gender diversity and performance is considered two nations context, with similarities in corporate governance. As Grosvold et al. (2007) point out, the institutional and cultural context might be of importance when analyzing board diversity and its effects. Hence it is limited in insights on nuances that may not be explained purely quantitative analysis. Board composition may or may not represent how board gender diversity, in addition to other corporate governance measures operates in practice. Therefore, future research should consider a mix of qualitative and quantitative studies to form deeper insights into the role of gender diversity in corporate governance and firm performance in addition to the impact of the cultural, and social context. Methodologically, more insights may be obtained by future studies by conducting in-depth interviews with boards, managers, and shareholders.

REFERENCES

[1] Inoue, T. (2001). "Symbolic Computation for Asymptotic Expansions of Multivariate Statistics", in Japanese (to appear).

[2] Inoue T., Asahi Y., Yamaguchi K. (2001). "An Advanced Statistical Information Disclosure over the Internet", Proceedings of the IAOS Satellite Meeting on Statistics for the Information Society, 208-217.

[3] Abdullah, S. (2014). The causes of gender diversity in Malaysian large firms. *Journal of Management and Governance, 18* (4), 1137-1159.

[4] Abubakar, K., & Şener, İ. (2014). Board Composition and Gender Diversity: Comparison of Turkish and Nigerian Listed Companies. *Procedia - Social and Behavioral Sciences, 150*, 1002-1011.

[5] Adams , R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*, 291–309.

[6] Adeabah, D., Gyeke-Dako, A., & Andoh, C. (2019). Board gender diversity, corporate governance and bank efficiency in Ghana: a two stage data envelope analysis (DEA) approach. *Corporate Governance, 19*, 299-320.

[7] Agyemang Badu, E., & Appiah, k. o. (2017). The Impact of Corporate Board Size on Firm Performance: Evidence from Ghana and Nigeria. *Research in Business and Management, 4*, 1-12.

[8] Ali, M., Ng, Y. L., & Kulik, C. T. (2014). Board Age and Gender Diversity: A Test of Competing Linear and Curvilinear Predictions. *Journal of Business Ethics, 125*, 497–512.

[9] Ayentimi, D. T., & Burgess, J. (2020, March 6). *Women in Ghana: progress, but important challenges remain.* Retrieved May, 2020 from The Conversation: https://theconversation.com/women-in-ghana-progress-but-important-challenges-remain-130065

[10] Baysinger, B. &. (1985). Corporate Governance and the Board of Directors: Performance Effects of Changes in Board Composition. *Journal of Law, Economics, & Organization, 1*(1), 101-124.

[11] Beecher-Monas, E. (2007). Marrying Diversity and Independence in the Boardroom: Just How Far Have You Come, Baby? *Oregon Law Review , 86*(2), 373.

[12] Benabou, R. (2013). Groupthink: Collective Delusions in Organizations and Markets. *80*, 429-462.

[13] Berle, A. A., & Means, G. C. (1932). *The Modern Corporation and Private Property.* New York: MacMillan.

[14] Börsch-Supan , A., & Köke, J. (2002). An Applied Econometricians' View of Empirical Corporate Governance Studies. *German Economic Review, 3*(3), 295-326.

[15] Cabrera-Fernández , A. I., Martínez-Jimé, R., & Hernández-Ortiz, M. J. (2016, March). Women's participation on boards of directors: a review of the literature. *International journal of gender and entrepreneurship, 8*(1), 69-89.

[16] Campbell, K., & Minguez-Vera, A. (2008). Gender Diversity in the Boardroom and Firm Financial Performance. *Journal of Business Ethics, 83*, 435–451 .

[17] Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate Governance, Board Diversity,and Firm Value. *The Financial Review, 38*, 33-53.

[18] Catalyst. (2004, January 15). *Report: The Bottom Line: Connecting Corporate Performance and Gender Diversity.* From Catalyst: https://www.catalyst.org/research/the-bottom-line-connecting-corporate-performance-and-gender-diversity/

[19] Catalyst. (2020, April 4). *Buying power: Quick take.* From Catalyst: https://www.catalyst.org/research/buying-power/

[20] Catalyst. (2020, January 30). *Women in the Workforce – Global: Quick Take.* From Catalyst: https://www.catalyst.org/research/women-in-the-workforce-global/

[21] Cheng, M., Gray, S. J., & Kang, H. (2007, March). Corporate Governance and Board Composition: diversity and independence of Australian boards. *Corporate Governance, 15*(2), 194-207.

[22] Conyon, M. J., & He, L. (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research, 79*, 198-221.

[23] CountryEconomy. (2019). ECOWAS - Economic community of west African states 2020. Retrieved from https://countryeconomy.com/countries/groups/economic-community-west-african-states

[24] Das, P. (2019). Econometrics in theory and practice: Analysis of cross section, time series, and panel data with stata 15.1. Singapore: Springer Nature Singapore.

[25] Deloitte. (2018). *Women in the boardroom.* Retrieved May, 2020 from Deloitte: https://www2.deloitte.com/global/en/pages/risk/articles/women-in-the-boardroom-global-perspective.html

[26] Denis , D. K., & McConnell, J. J. (2003). International Corporate Governance. *The Journal of Financial and Quantitative Analysis, 38*(1), 1-36.

[27] Doldor , E., Vinnicombe, S., Gaughan , M., & Sealy, R. (2012). *Gender Diversity on Boards: The Appointment Process and the Role of Executive Search Firms.* Equality and Human Rights Commission Research report 85.

[28] Dzodzi, T. (2009). Affirmative Action and the Prospects for Gender Equality in Ghanaian Politics. Retrieved May, 2020

[29] Eckel, C. C., & Grossman, P. J. (2002). Sex differences and statistical stereotyping in attitudes toward financial risk. *Evolution and Human Behaviour, 23*(4), 281-295.

[30] Eisenberg, T., Sundgren, S., & Wells, M. T. (1998). Larger board size and decreasing firm value in small firms. *Journal of Financial Economics, 48*(1), 35-54.

[31] Emerson , W. M., Alves, H., & Raposo, M. (2011). Stakeholder theory: Issues to resolve. *Management Decision, 49*(2), 226-252.

[32] Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of Director Diversity and Firm Financial Performance. *Corporate Governance: An International Review, 11*(2), 102-111.

[33] Francoeur, C., Labelle, R., & Sinclair-Desgagné, B. (2008). Gender Diversity in Corporate Governance and Top Management. J Bus Ethics 81, 83–95 (2008). *Journal of Business Ethics 81*, 83–95. From https://doi.org/10.1007/s10551-007-9482-5

[34] Garg, A. K. (2007). Influence of Board Size and Independence on Firm Performance: A Study of Indian Companies. *The Journal for Decision Makers, 32*(3), 39-60.

[35] Grosvold, J., Brammer , S., & Rayton, B. (2007). Board diversity in the United Kingdom and Norway: an exploratory analysis. *16*(4), 344-357.

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

[37] Huse, M., & Rindova, V. (2001). Stakeholders' Expectations of Board Roles: The Case of Subsidiary Boards. *Journal of Management and Governance, 5*(2), 153-178.

[38] Hyland, M. M., & Marcellino, P. A. (2002). Examining gender on corporate boards: a regional study. *Corporate Governance, 2*(4), 24-31.

[39] International Finance Corporation. (2019). *Women on boards in Nigeria.* Retrieved May, 2020 from The World Bank: http://documents.worldbank.org/curated/en/775651567754681552/Women-on-Boards-in-Nigeria

[40] International Financial Corporation. (2018, May 1). *Gender Diversity in Ghanaian Boardrooms.* From The World Bank: http://documents.worldbank.org/curated/en/444401532716221776/Gender-diversity-in-Ghanaian-boardrooms-An-abridged-report-on-women-on-boards-of-corporate-and-public-institutions-in-Ghana

[41] Joecks, J., Pull, K., & Vetter, K. (2013). Gender Diversity in the Boardroom and Firm Performance: What Exactly Constitutes a "Critical Mass?". *Journal of Business Ethics, 118*(1), 61-72.

[42] Julizaerma, M. S. (2012.). Gender diversity in the boardroom and !rm performance of Malaysian public listed companies. *Procedia- Soc. Behav. Sci., 65*, 1077–1085.

[43] Kamalnath, A. (2017). Gender Diversity as the Antidote to 'Groupthink' on Corporate Boards. *Deakin Law Review, 22*, 85-106.

[44] Kanter, R. M. (1977). Some Effects of Proportions on Group Life: Skewed Sex Ratios and Responses to Token Women. *American Journal of Sociology, 82*(5), 965-990.

[45] Kilic, M., & Kuzey, C. (2016). The effect of board gender diversity on firm performance: evidence from Turkey. *Gender in management, 31*(7), 434-455.

[46] Konrad, A. M., & Kramer, V. W. (2006, Decemeber). *How Many Women Do Boards Need?* Retrieved June, 2020 from Harvard Business Review: https://hbr.org/2006/12/how-many-women-do-boards-need

[47] Kramer, V. W., Konrad, A. M., Erkut, S., & Hooper, M. J. (2006). Critical Mass on Corporate Boards: Why Three or More Women Enhance Governance. *31*(2), 19-22.

[48] Kristie, J. (2011). The power of three. *35*(5), 22-32.

[49] Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of Accounting and Economics, 49*(3), 186-205 .

[50] Lincoln, A., & Adedoyin, O. (2012). Corporate Governance and Gender Diversity in Nigerian Boardrooms. *World Academy of Science, Engineering and Technology* , 1853-1859.

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

[52] Low, D. C., Roberts , H., & Whitin, R. H. (2015). Board gender diversity and !rm performance: Empirical evidence from Hong Kong, South Korea, Malaysia and Singapore. *Pacific-Basin Finance Journal*, 381-401.

[53] Macey, J. R. (2008). Corporate Governance: Promises Kept, Promises Broken. Princeton University Press.

[54] Marinova, J., Plantenga, J., & Remery, C. (2015). Gender diversity and firm performance: evidence from Dutch and Danish board rooms. *The International Journal of Human Resource Management*, 1777-1790.

[55] Mckinsey & Company. (2019, 24 November). *The power of parity: Advancing women's equality in Africa*. From Mckinsey & Company: https://www.mckinsey.com/featured-insights/gender-equality/the-power-of-parity-advancing-womens-equality-in-africa

[56] Morgan Stanley Capital International. (2015, November 30). *https://www.msci.com/www/blog-posts/women-on-boards-global-trends/0263383649*. Retrieved May, 2020 from MSCI: https://www.msci.com/www/blog-posts/women-on-boards-global-trends/0263383649

[57] Ntim, C. G. (2016). Corporate governance, corporate health accounting, and firm value: The case of HIV/AIDS disclosures in Sub-Saharan Africa. *The International Journal of Accounting, 51*(2), 155-216.

[58] Perault, E. (2015). Why Does Board Gender Diversity Matter and How Do We Get There? The Role of Shareholder Activism in Deinstitutionalizing Old Boys' Networks. *Journal of Business Ethics, 128*, 149-165.

[59] Reguera-Alvarado , N., Fuentes, P., & Laffarga, J. (2015). gender diversity on the board can be a mechanism to reduce the costs associated with agency problems. *Journal of Business Ethics, 141*, 337-350.

[60] Ryan, M. K., & Haslam, S. A. (2005). The Glass Cliff: Evidence that Women are Over-Represented in Precarious Leadership Positions. *British Journal of Management, 16*, 85-90.

[61] Schwartz-Ziv, M. (2017). Gender and Board Activeness: The Role of a Critical Mass. *Journal of Financial and Quantitative Analysis, 52*(2), 751-780.

[62] Selling, T. I., & Stickney, C. P. (2018). The Effects of Business Environment and Strategy on a Firm's Rate of Return on Assets. *Financial Analysis Journal*, 43-52.

[63] Silverstein , M. J., & Sayre, K. (2009, September). *The Female Economy* . From Harvard Business Review: https://hbr.org/2009/09/the-female-economy

[64] Stichman, A. j., Hassell, K. D., & Archbold, C. A. (2010). Strength in numbers? A test of Kanter's theory of tokenism. *Journal of Criminal Justice, 38*, 633-639.

[65] Terjesen , S., Sealy, R., & Singh, V. (n.d.). Women directors on corporate boards: a review and research agenda. *Corporate Governance: An International Review, 17*(3), 320-337.

[66] The World Bank. (2019). *GDP (current US$) - Ghana, Nigeria*. Retrieved June, 2020 from The World Bank: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=GH-NG

[67] Ujunwa, A., Okoyeuzu, C., & Nwakoby, I. (2012). Corporate board diversity and firm performance: Evidence from Nigeria. *Revista de Management Comparat International*, *13*(4), 605.

[68] Uwazie, C. (2019, July 9). *Women's Representation on African Corporate Boards: an Overview*. Retrieved May, 2020 from Policy Center for The New South: https://www.policycenter.ma/opinion/women%E2%80%99s-representation-african-corporate-boards-overview#.XsuFohMzbBI

[69] Van Ees, H., Postma, T. J., & Sterken, E. (2003). Board Characteristics and Corporate Performance in the Netherlands. *Eastern Economic Journal, 29*(1), 41-58.

[70] Wintoki, M. B., Link, J. S., & Netter, J. M. (2011). Endogeneity and the Dynamics of Internal Corporate Governance. *Journal of Financial Economics, 105*(3), 581-606.

[71] World Economic Forum. (2019). *Global Gender Gap Report 2020*. Retrieved May, 2020 from The Global Gender Gap Report 2020: http://reports.weforum.org/global-gender-gap-report-2020/

[72] Yi, A. (2011). Mind the Gap: Half of Asia's Boards Have no Women, A Risky Position for Governance and Growth. The Korn/Ferry Institute. .

[73] Zhang, L. (2012). Board demographic diversity, independence, and corporate social performance. *Corporate Governance, 12*(5), 686-700.

[74] Zimmer, L. (1988, Feb https://www.jstor.org/stable/800667). *Tokenism and Women in the Workplace: The Limits of Gender-Neutral Theory.* Retrieved 2 28, 2020 from JSTOR.

[75] Zimmer, L. (1988). Tokenism and Women in the Workplace: The Limits of Gender-Neutral Theory. *Social Problems, 35*(1), 64-77.

APPENDICES

Appendix 1: Hausman FE RE test

```
. hausman fe re
```

| | ——— Coefficients ——— | | | |
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
	fe	re	Difference	S.E.
b	8.631864	11.30628	-2.674419	2.459172
board_size	-.7214236	-.6975242	-.0238993	.1951322
perc_ind	-6.496581	-5.03835	-1.458231	2.772911
firm_age	-.5459153	-.1077433	-.4381721	.2465636
lsales	6.644458	4.611458	2.033	.6152004
leverage	-.0185887	-1.873963	1.855375	1.271983
yr_2	-.1323966	.3763944	-.508791	.
yr_3	.5478529	1.598209	-1.050356	.
yr_4	-.5534053	1.223964	-1.777369	.
yr_5	-.9744819	2.332361	-3.306843	.
yr_6	-1.321354	2.932024	-4.253378	.

```
                    b = consistent under Ho and Ha; obtained from xtreg
        B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(11) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =        15.92
                Prob>chi2 =      0.1441
                (V_b-V_B is not positive definite)
```

Appendix 2: Hausman test for full sample

```
. estat endog

  Tests of endogeneity
  Ho: variables are exogenous

  Robust score chi2(1)          =  .046991  (p = 0.8284)
  Robust regression F(1,555)    =   .04552  (p = 0.8311)
```

Appendix 3: Hausman test for sample of boards with female directors

```
. estat endog

  Tests of endogeneity
  Ho: variables are exogenous

  Robust score chi2(1)          =  .942889  (p = 0.3315)
  Robust regression F(1,347)    =  .965679  (p = 0.3264)
```

Appendix 4: Relationship between instrumental variables considered

VARIABLES	Blau	Blau	Blau	POF	POF	POF
Constant	0.331***	0.380***	0.380***	0.212***	0.273***	0.271***
	(0.097)	(0.083)	(0.082)	(0.074)	(0.066)	(0.066)
IC_bindustry	-0.168	-	-	-	-	-
	(0.173)	-	-	-	-	-
POF Industry	-	-	-	-0.121	-	-
	-	-	-	(0.179)	-	-
$\overline{BOARDSIZE}_{T-1}$	-	-0.007	-	-	-0.005	-
	-	(0.005)	-	-	(0.004)	-
$\overline{BOARDIND}_{T-1}$	-	-	0.001	-	-	0.031
	-	-	(0.093)	-	-	(0.070)
AGE	0	0	0	0	0	0
	0.000	0.000	0.000	0.000	0.000	0.000
BOARDSIZE	0.003	0.009*	0.003	0	0.005	0.001
	(0.003)	(0.005)	(0.003)	(0.003)	(0.004)	(0.002)
BOARDIND	0.001	0.012	0.011	0.036	0.043	0.016
	(0.041)	(0.046)	(0.094)	(0.032)	(0.035)	(0.070)
LN (SALES)	-0.007	-0.008	-0.009	-0.006	-0.008*	-0.009*
	(0.006)	(0.006)	(0.006)	(0.004)	(0.005)	(0.005)
LEVERAGE	-0.006	-0.007	-0.008	-0.007*	-0.008*	-0.009**
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
F-statistic	3.28	2.86	2.68	2.34	2.03	1.9
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	672	576	576	672	576	576
R-squared	0.081	0.079	0.077	0.063	0.063	0.061

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 5: Effect of the percent of women directors on firm performance: robustness test.

VARIABLES	ROA	ROA	POF	ROA
	(1)	(2)	(3)	(4)
Intercept	-18.170***	-7.257	0.086*	1.364
	(5.539)	(8.435)	(0.048)	(8.051)
POF	14.828***	10.340**	-	15.287*
	(4.130)	(5.139)	-	(8.266)
BOARDSIZE	-0.620***	-0.646**	0.003**	-0.505*
	(0.208)	(0.296)	(0.001)	(0.286)
BOARDIND	-2.847	-5.177	0.002	-7.239
	(2.939)	(4.337)	(0.016)	(4.566)
AGE	-0.083***	-0.107**	0	-0.103**
	(0.027)	(0.052)	0.000	(0.051)
LN (SALES)	3.466***	4.613***	-0.005*	4.353***
	(0.462)	(1.160)	(0.003)	(1.096)
LEVERAGE	-1.354***	-1.866*	-0.005**	-2.019*
	(0.517)	(1.118)	(0.002)	(1.043)
POF_{T-1}	-	-	0.798***	-
	-	-	(0.038)	-
F-Statistic	-	-	57.99	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
Observations	672.000	672.000	576.000	576.000
R-squared	0.23	-	-	-
Observations	-	96	-	96
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 6: Regression results on POF for firms with at least one female director.

VARIABLES	ROA	ROA	POF	ROA
INTERCEPT	5.866	2.025	0.120***	0.655
	(6.344)	(13.243)	(0.036)	(16.663)
POF	2.689	1.918	-	15.861
	(5.840)	(7.459)	-	(16.936)
BOARDSIZE	-0.810***	-0.594*	-0.003*	-0.401
	(0.252)	(0.312)	(0.002)	(0.334)
BOARDIND	-3.587	-3.349	0.014	-3.579
	(3.581)	(5.587)	(0.018)	(5.564)
AGE	-0.064*	-0.058	0	-0.042
	(0.033)	(0.058)	0.000	(0.065)
LN (SALES)	2.997***	3.374***	-0.005*	3.080**
	(0.533)	(1.215)	(0.003)	(1.352)
LEVERAGE	-1.074*	-1.5	0.001	-0.969
	(0.613)	(1.274)	(0.003)	(1.481)
$\overline{POF_{T-1}}$	-	-	0.650***	-
	-	-	(0.053)	-
F-Statistic	-	-	34.390	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
Observations	437	437	368	368
R-squared	0.216	-	0.631	-
Observations	-	76	-	75
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 7: Regression results on sample of firms with no female directors.

VARIABLES	ROA	ROA
Intercept	0.145	-2.551
	(4.356)	(8.565)
w_0	-4.909***	-3.799**
	(1.222)	(1.693)
BOARDSIZE	-0.808***	-0.769**
	(0.225)	(0.314)
BOARDIND	-1.849	-5.215
	(2.922)	(4.345)
AGE	-0.081***	-0.105**
	(0.027)	(0.052)
LN (SALES)	3.394***	4.524***
	(0.460)	(1.144)
LEVERAGE	-1.361***	-1.811
	(0.524)	(1.110)
Year Dummy	Yes	Yes
Industry Dummy	Yes	Yes
Country Dummy	Yes	Yes
Observations	672.000	672.000
R-squared	0.233	-
Observations	-	96
	OLS	RE

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 8: Effect of the percent of women directors on firm performance on firms from Ghana: robustness test.

VARIABLES	ROA	ROA	POF	ROA
	(1)	(2)	(3)	(4)
Intercept	-29.650***	-46.170***	0.062	-51.340***
	(10.360)	(13.603)	(0.100)	(11.583)
POF	24.661*	29.819*	-	49.858**
	(13.354)	(15.623)	-	(20.554)
BOARDSIZE	0.562	0.523	0.014*	1.186
	(1.238)	(1.578)	(0.008)	(1.062)
BOARDIND	1.195	7.662	-0.002	4.443
	(5.033)	(7.225)	(0.053)	(6.510)
AGE	0.015	-0.134	0.001	-0.152
	(0.129)	(0.206)	(0.001)	(0.201)
LN (SALES)	3.084***	5.094***	-0.017**	5.202***
	(0.960)	(1.661)	(0.008)	(2.007)
LEVERAGE	-30.068***	-33.385***	-0.018	-32.792***
	(5.625)	(8.334)	(0.034)	(8.462)
POF_{T-1}		-	0.788***	-
	-	-	-	-
F-Statistic	-	-	-	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	119.000	119.000	102.000	102.000
R-squared	0.523	-	0.830	-
Number of IDs	-	17	-	17
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 9: Effect of the percent of women directors on firm performance on firms from Nigeria: robustness test.

VARIABLES	ROA	ROA	POF	ROA
	(1)	(2)	(3)	(4)
Intercept	-4.343	-5.222	0.024	4.694
	(4.262)	(9.343)	(0.026)	(8.768)
POF	14.515***	6.759	-	13.779
	(4.535)	(4.964)	-	(9.744)
BOARDSIZE	-0.406**	-0.603**	0.002	-0.490*
	(0.204)	(0.294)	(0.001)	(0.285)
BOARDIND	-3.769	-9.644**	-0.018	-11.308**
	(3.082)	(4.654)	(0.019)	(5.223)
AGE	-0.100***	-0.106**	0	-0.104**
	(0.028)	(0.052)	0.000	(0.051)
LN (SALES)	3.738***	4.306***	-0.003	4.109***
	(0.678)	(1.474)	(0.004)	(1.585)
LEVERAGE	-1.543**	-1.149	0.001	-1.54
	(0.703)	(1.432)	(0.004)	(1.515)
POF_{T-1}	-	-	0.776***	-
	-	-	(0.045)	-
F-Statistic	-	-	43.82	-
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	553	553	474	474
R-squared	0.236	-	0.696	-
Number of IDs	-	79	-	79
Regression Type	Pooled OLS	Random Effects	2SLS – First Stage IV	2SLS – Second Stage IV

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)

Appendix 10: Regression results on sample of firms with no female directors in Nigeria and Ghana

VARIABLES	NIGERIA		GHANA	
	ROA	ROA	ROA	ROA
	(1)	(2)	(3)	(4)
Intercept	2.237	-1.139	-20.388*	-30.000**
	(4.669)	(9.283)	(11.183)	(13.974)
w_0	-5.066***	-3.469*	-9.884***	-8.557***
	(1.332)	(1.88)	(2.995)	(2.957)
BOARDSIZE	-0.580***	-0.714**	0.08	-0.153
	(0.22)	(0.317)	(1.238)	(1.426)
BOARDIND	-3.301	-9.806**	4.866	8.575
	(3.059)	(4.709)	(5.739)	(7.863)
AGE	-0.098***	-0.105**	0.016	-0.08
	(0.028)	(0.052)	(0.15)	(0.154)
LN (SALES)	3.730***	4.203***	3.228***	4.525***
	(0.685)	(1.434)	(1.054)	(1.592)
LEVERAGE	-1.619**	-1.099	-31.738***	-33.165***
	(0.716)	(1.406)	(5.174)	(7.506)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Observations	553	553	119	119
R-squared	0.242	-	0.545	-
Number of IDs	-	79	-	17
Regression Type	OLS	RE	OLS	RE

Standard errors in parenthesis. Asterisks show significance at 1% (***), 5% (**), and 10% (*)