

Directors' Diversity and the Economic Value of Equity

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Abstract

The paper examines the effect of directors' demographic and cognitive diversity on the economic value of equity based on longitudinal data from the top 15 Deposit Money Banks (DMBs) in Nigeria. The study finds steadily robust evidence that shows foreign and female directors at critical mass representation positively influence banks' net worth (a proxy of the economic value of equity). Contrary to the hypothesis, the result of cognitive diversity was rather inconclusive due to the diverse direction of causality. While the effect of directors with Bachelor of Law degrees and industry experience shows a significant negative effect, the impact of directors with business-related degrees though positively linked to the economic value of equity but remained statistically insignificant. With average sampled directors having over 23 years of industry experience, the study concluded that excessive industry knowledge is injurious to financial performance. This is because these directors are perhaps more cautious about their reputation and thus are likely to exhibit diminishing marginal utility for wealth maximization.

Keywords: board diversity, demographic, cognitive, economic value of equity

1. Background

The advent of globalization comes the evolution of the crusade for workforce equality and the growing pressure on corporations to ensure that the labour force reflects the changing business environment in terms of diversity, particularly at the highest corporate leadership (Billings et al., 2022; Latura & Weeks, 2022; Mohsni et al., 2021; Roberson & Jeong, 2007; van der Walt & Ingley, 2003). In the beginning, the issue of diversity in corporate leadership was somewhat less prominent and not at the forefront of public discourse. At least not before the cases of pervasive corporate malpractices in some of the respected elite corporations came to light (Fombrun & Foss, 2004). The spectacular collapse of notable establishments such as Enron, Tyco, Lehman Brothers, and WorldCom are well-cited examples of corporate governance (Velte, 2021; Ingley et al., 2011). Developing economies like Nigeria weren't left out of the shared scandals as some big local companies and subsidiaries of foreign entities were found culpable of systematic corporate wrongdoings (Adedeji et al., 2020; Lawal, 2016; Adewuyi & Olowookere, 2013). Aside from leading to extensive corporate regulatory changes in certain jurisdictions, these corporate scandals intensify the public scrutiny on the need to strengthen the internal governance and control mechanisms of public corporations, especially the structural composition and workings of the board of directors (Coleman & Wu, 2021). Corporate governance codes and regulatory guidelines issued in the years following the scandals delineated key recommendations including dynamics related to the structure of the board of directors (such as size, composition, leadership, and diversity) to promote board effectiveness and vigilance for enhanced executive monitoring, and control (Karavitis et al., 2021; Bhatt & Bhatt, 2017; Ogbechie, et al., 2009; Dedman, 2003).

For instance, the issue of board diversity which is the central point of this paper has received farfetched consideration from policymakers and attracted a significant volume of academic research (Ozdemir, 2020; Liu et al., 2014). Norway and other prominent countries made remarkable strides by issuing stringent social inclusion-based regulations to promote gender equilibrium in corporate leadership, especially of the board of directors. These changes include the placement of a mandatory quota on the number of female directorship representation (Bernile, et al., 2018; Børn & Staubo, 2014; Dale-Olsen et al., 2013). Using notable corporate governance theories (e.g., agency, resource dependency, stewardship, critical mass, and collective action and stakeholders, etc.), researchers, on the other hand, have intensified efforts towards offering empirical validation for the relevance and benefits associated with diversity of board membership regardless of whether they are motivated by demographic and or cognitive factors (Julizaerma et al., 2012; Shehata, et al., 2017; Hillman & Dalziel, 2003; Volonté & Gantenbein, 2016). There is also a group of research focused

on determining the extent the introduction of mandatory quota has helped in promoting board effectiveness and entrenchment of adherence to corporate best practices (Atinc et al., 2022; Mensi-Klarbach & Seierstad, 2022; de Cabo et al., 2022).

These research efforts have evolved into dual knowledge streams i.e., demographic, and cognitive, and the most prevalent diversity classifications used in successive corporate governance studies (e.g., Erhardt, et al., 2003; Forbes & Milliken, 1999). Whereas the demographic variables such as ethnic, race, and gender are mostly linked to the equality case, the business case for diversity is attributed to cognitive characteristics mainly educational qualifications and professional experience of directors (Atif, et al., 2021; Papadimitri et al., 2020; Wen et al., 2020). Advocates of board diversity have argued that these distinctive attributes have inherent benefits that enhance board task performance. For example, corporate boards with a combination of directors of different gender, race, educational and professional backgrounds are said to promote increased social capital, perspective of views, quality of board deliberation, decision outcomes, and reduced executive entrenchment and overzealousness (Arayakarnkul et al., 2022; Liu, et al., 2022; Miller & Triana, 2009). As a result, each of these diversity variables has been the subject of numerous research, with several studies linking directors' gender, race, and cognitive skills to varieties of performance measures such as *financials and market value* (Richard et al., 2007; Dezsó & Ross, 2012; Ozdemir, 2020; Julizaerma et al., 2012); *risk and internal controls* (Sila et al., 2016; 2022; Chen, et al., 2016); *stock liquidity and dividend pay-out* (Ye et al., 2019; Ahmed & Ali, 2017); cost of capital (Karavitis et al., 2021; Ali et al., 2019) with rather equivocal outcomes (see Aggarwal et al., 2019).

The inconclusiveness and lack of demonstrated coherent point of empirical causality between diversity and these performance measures have left many unanswered questions regarding the relevance of diversity as a vital element of board dynamics. Drawing on the combination of agency, resource dependency, and collective action theories, this paper attempt to address one of the unanswered board diversity research questions. Specifically, the paper is designed to ascertain *whether the effect of board diversity is better examined based on the degree to which directors' distinctive demographic and cognitive attributes affect their contribution to a defined corporate goal such as improvement in the economic value of equity*. The main objective of this study is to offer a modified perspective to board diversity research and contribute to the growing literature without avoidable duplication of knowledge. From a developing economic standpoint, the paper aims to narrow the growing research gap between developed and emerging economies by adding a key African corporate perspective to the board diversity debate (Liu et al., 2014; Mohsni et al., 2021).

Following a series of model estimation and robustness tests, the paper found significant empirical-based evidence that positively links demographic diversity i.e., directors' gender and racial diversity to the economic value of equity. Worthy of note is the finding that excessive industry knowledge and possession of law educational qualification reduces the economic value of equity due to diminishing marginal utility for wealth maximization with these classes of directors; more risk averse and reluctant in supporting investment initiatives that offer prospective for additional value. The remainder of this paper is organized as follows: Section two focuses on a review of related literature, research framework, and hypotheses. Section three outlines the research methodology including data source and sample, estimation model specification, and definition of variables of interest. The estimation results are presented and analyzed in section four. The conclusion, recommendations, and suggested directions for future research are captured in section five.

2. Literature Review, Research Framework, and Hypothesis Development

The board of directors assumes a summit position when it comes to firm governance. As a proxy of shareholders, the board of directors plays multiple strategic roles that guarantee corporate growth and survival (Seijts et al., 2019; Ingley & van der Walt, 2001). From monitoring to advisory and resource support, the board of directors remained the key cornerstone of corporate governance (Ntim, 2015; Kroll et al., 2008; Hillman & Dalziel, 2003). Thus, not surprising to see board structure has been a subject of intense academic investigation over the last three decades as researchers seek validation for the implemented regulatory changes and codes of corporate best practices in pursuit of board effectiveness (Campbell & Vera, 2010; Upadhyay & Triana, 2021; de Cabo et al., 2022). Different aspects of board configurations (i.e., *size, composition, power separation*) have been empirically examined to find the direction of causality between the board of directors as an instrument of internal firm governance and corporate performance (Jackling & Johl, 2009; Kiel & Nicholson, 2003). Most of the early studies were prodigiously premised on agency orientation underpinned by executive self-serving notion with the board of directors playing dual monitoring and control roles to minimize the intrinsic agency cost (Lehn et al., 2009; Hillman & Dalziel, 2003). Because of this lopsided approach, empirical evidence from past studies has been equivocal on several board dynamics and performance parameters (Pearce & Patel, 2018; Hardwick et al., 2011; Lawal, 2012). The lack of expected empirical reliability has led to an emerging paradigm shift in research from a board structural focus to the diversity of directors' attributes (mainly *demographic and cognitive*). Unlike board configuration, diversity as a dynamic of board

effectiveness focuses on understanding the how and degree to which directors' individual difference affects their behaviours, distinctive task performance, and contribution in the boardroom (Richard et al., 2007). Directors' demographic composition relies on the influence of observable differences (such as gender, race, ethnic, and age) while cognitive diversity monitors how the divergence of directors' expertise and intellectual competence impact their task performance (Selma et al., 2022; Kagzi & Guyha, 2018; Miller & Triana, 2009).

Following these diversity dimensions, and in addition to the agency perspective, past studies have deployed combinations of organisational behaviour theories including stakeholders, stewardship, social capital, resource dependency, and critical mass to investigate the impact of board diversity on corporate performance (Nuber & Velte, 2021; Padilla-Angulo, 2020; Rubino, et al., 2017; Richard, 2000). Each of these theories offers unique implications regarding the appropriate role of the board of directors for effective firm governance. To facilitate empirical examination, the paper adopted a combination of agency (monitor and control), resource dependency (resource co-optation and networking), and critical mass (unique character of few) theories (Rocca et al., 2020; Amorelli & Garc á-S áchez, 2020; Ntim, 2015; Dunn, 2012). The presumption has been that, having corporate boards comprised of directors of different races and gender and those with diverse cognitive skills, would provoke board vigilance, due diligence, and mobilization of vital resources that support the corporate common good (Nuber & Velte, 2021; Kroll et al., 2008). Interestingly, prior comparable studies with combined theoretical framework have reported fascinating evidence linking certain elements of board demographic and cognitive diversity to corporate task and financial performance (Amorelli & Garc á-S áchez, 2020; Rubino et al., 2017; Agyemang & Appiah, 2017; Kiel & Nicholson, 2003; Hillman & Dalziel, 2003).

Demographic Diversity and corporate performance

Diversity advocates have outlined several plausible benefits attributable to corporate boards with directors of different demographic compositions. Richard (2000) explores the resource dependency effect of cultural disparity and reported that a combination of directors of different racial backgrounds boosts competitive advantage. Empirical evidence from past studies equally shows that the composition of ethnic diverse directors leads to better corporate performance (see Charles et al., 2018). Ntim (2015) finds evidence that ethnic-based diversity facilitates valuable external connection and resource mobilization which enhances firm market value. Regarding gender, Dezso & Ross (2012) argue that female directors reduce information asymmetry and increase shared perspective, social capital, and competitiveness. The diverse perspectives shared in boards with diversified membership facilitate corporate innovation (Cumming & Leung, 2021). Khemakhem et al., (2022) contend that the composition of female directors promotes voluntary corporate disclosure related to environmental sustainability, social responsibility, and governance and accountability. Given their painstaking nature, female directors are presumed to be far better monitors than their male counterparts who are susceptible to reckless corporate overrides (Rocca et al., 2020; Liu et al., 2014; Ahmed & Ali, 2012).

Several other studies have investigated the empirical validity of these benefits in relation to corporate value and financial improvements focusing mostly on the effect of gender diversity (e.g., Aroara, 2022; Abdullahi & Abdalla, 2020; Oba & Fodio, 2013; Lückenath-Rovers, 2013; Elstad & Ladegard, 2012; Dunn, 2012; Campbell & Vera, 2010). Aroara (2022) examines 500 firms listed on the Bombay Stock Exchange and found empirical support for the positive impact of female directors on firm performance. Lückenath-Rovers (2013) in a comparative investigation of Dutch firms using a series of financial indicators, reported that firms with gender-diverse boards outperform those with no women representation. They further argue that female directors enhance corporate reputation because they are better at stakeholder management. Aside from financial-related inducement, demographic diversity is instrumental in promoting board independence. Contrary to popular conception, Abdullah (2014), in a study comprising of Malaysian large firms, fails to locate a constructive association between gender diversity but found statistically significant evidence that female directors' composition is not only moderated by board size but positively linked to board independence.

Despite these optimistic views, there are diversity skeptics with contingency-based ideology that the impact of directors' demographics on corporate performance are comprehensive and conditional (Richard et al., 2003; Cumming & Leung, 2021). Low et al., (2015) opine that the influence of female directors is contingent as they found a significantly reduced effect of gender diversity on corporate performance in countries that have achieved substantial women empowerment and those with innate culturally based resistance. In support of the contingent narrative, Roberson & Jeong (2007) offer critical mass evidence that showed an inverse relationship between board racial diversity and firm performance with the direction of causality turning positive only at the attainment of the ideal threshold of racial representation. This finding speaks to the importance of the numeric strength of directors belonging to specific demography of interest. Critical mass theory hypothesized that it takes a minimum number of directors of same demographic configuration for their contribution to impact outcome of board decisions. Using data sample drawn from top 500 Australian companies, Wang & Clift (2009), report lack of significant relationship between gender and racial diversity and firm performance. They attributed the lack of conspicuous evidence to absence of critical directors' representation across gender and racial

demographics. In a US-based study, Vairavan & Zhang (2020) rely on S&P 1500 firms and found neither direct nor indirect connection between racial diversity and performance as well as productivity. Therefore, unlocking the usefulness that differences in board member demography brings to boardroom largely depends on the level of their critical mass representation which is the boundary that separates tokenism from pragmatic board diversity (Richard et al., 2003; Abdullah, 2014). In respect of gender, for example, while some researchers have argued that a minimum of one female director is sufficient to draw participation (e.g., Aroara, 2022; Lücknerath-Rovers, 2013), most studies are of the view that at least three female directors may be required to achieve representation threshold (see; Kinatader et al., 2021; Brahma, et al., 202). Consistent with the above line of thought, the study adopts the following hypothesis.

H1. Critical mass of directors' gender representation and board racial diversity are positively linked to economic value of equity.

Cognitive Diversity and corporate performance

Beyond demographic configuration, the degree of directors' task performance and contribution also depends on their individual cerebral abilities and experience (Gray & Nowland, 2013; Meyerinck et al., 2016; Roberson & Jeong, 2007). Unlike the demographic characteristics, cognitive components offered a business case for board diversity with emphasis on directors' talents and knowledge. Here, the effectiveness of board presumably hinges on the composition of highly cognitive directors with a variety of skills sets and experience which, according to Gary & Nowland (2017), enhance monitoring and advisory function. Padilla-Angulo, 2020 opines that having a diversified board membership along cognitive dimension improves quality of board deliberations and strategic choices. Boards with experience directors facilitate sharing of skills and provide learning avenue for rookies and less versatile directors. Prior studies have attributed experience of directors to corporate best practices. Wen et al., (2020) examine the effect of directors' experience on corporate tax behaviours and found that the presence of directors with foreign experience limits corporate tax avoidance. In their study of Chinese A-share listed firms, Selma et al., (2022) find evidence connecting directors with business knowledge and foreign experience to increased corporate philanthropic generosity. They argued that the multiplicity of knowledge and skills from cognitive diversified board facilitate corporate response to stakeholders needs and corporate social responsibility. From market value perspective, Gray & Nowland (2013) report that the stock market attach premium to firms with board comprising educated and professionally experienced directors. Using historical data on 3,157 director appointments drawn from firms listed on the Australian Stock Exchange, they found positive market reaction to appointment of board members with depth and breadth of experience. The optimistic market reaction to such appointments in the words of Meyerinck et al., (2016) is premised on the assumption that experience (industry) directors provide greater "*knowledge of products, markets, competitors, industry regulations and standards*".

In addition to cognitive experience, director's educational qualification is another aspect of cognitive diversity that has been linked to board effectiveness. Although literatures regarding the effect of directors' level of education remain scanty compared to other diversity components, the available evidence suggests that academic qualification of board members and leadership does influence corporate performance (see Rokiah et al., 2015; Darmadi, 2013). Earlier, Jalbert et al., (2002) examine Fobes 800 large US firms and found that director's (CEO) education, as well as the rating of schools where such degrees were obtained does impact market value and financial performance. Ujunwa (2012) investigates 122 listed firms on the Nigeria Stock Exchange and found consistent evidence that directors with higher educational qualification (i.e., PhD) impact performance. This finding was further corroborated in another longitudinal study, where Lawal (2016) reports statistically significant relationship between directors with graduate business degree i.e., MBA and increased market value. Even though there are isolated evidence of negative effect (e.g., Kagzi & Guyha, 2018), the majority of available studies supports the conception that director's intellectual resourcefulness does positively affect board task performance (Rokiah et al., 2015; Darmadi, 2013; Jalbert et al., 2002). Consistent with the above, the study adopts the following hypothesis.

H2. Directors' cognitive diversity is positively linked to economic value of equity.

3. Methodology and Model Specification

3.1 Data Source and Sample

This study is anchored on panel data drawn from 37 deposit money banks listed on the Nigeria Stock Exchange for the period 2012 to 2018. Data on key structural characteristics of corporate boards such as size, independent director compositions, demographic diversity (mainly gender and racial diversity) and cognitive diversity (i.e., educational qualifications and professional experience) and those used in the estimation of the economic value of equity were drawn from the respective annual financial statement reports. The paper adopted a pragmatic data filtering methodology that picks samples based on the availability of complete audited financials, international and national banking authorizations. Non-interest banks and those with regional banking authorisations were thus eliminated from the sample. As result, the final data sample was reduced to 15 top listed banks, covering the 7-year period which brought the total number of

observation sample to 105 used in model estimation and analyses. Interestingly, the sampling technique adopted here is consistent with those espoused in most prior studies (e.g., Bernile, et al., 2018; Ozdemir, 2020).

3.2 Model Specification

The paper empirically examines the causality of gender diversity and economic value of equity as a measure of wealth maximisation performance of deposit money banks using an expanded ordinary least squares (OLS) model.

Baseline Model

$$\text{Critical Mass Test Model: } 1nEVE = \alpha + \beta_0 + \beta_1FDCRTM + \beta_2RDiv + \beta_3DEduQ_1 + \beta_4DEduQ_2 + \beta_5DCogExp + \beta_6CINED + \beta_71nBS + \beta_81nBnkSize + \varepsilon \dots \dots \dots (i)$$

Robustness Model

$$\text{RDiv_Sensitivity Model: } 1nEVE = \alpha + \beta_0 + \beta_1 FDCRTM + \beta_2DEduQ_1 + \beta_3DEduQ_2 + \beta_4DCogExp + \beta_5CINED + \beta_61nBS + \beta_71nBnkSize + \varepsilon \dots \dots \dots (ii)$$

3.3 Definition of Variables

The economic value of equity (EVE) is defined and calculated as the difference between assets and liabilities at current market value. The paper introduced six (6) explanatory variables across board structure features and demographic and cognitive diversity elements. The composition of independent non-executive director (CINED) is a variable defined and measured as the number of independent non-executive directors divided by board size (Karavitis et al., 2021; Sila et al., 2016). Critical Mass of female directors (FDCRTM) represents the first gender demographic of directors defined as having a minimum of three (3) female director representation on board and calculated as dummy that equals one (1) when board has greater than or equal to 3 female directors and zero (0) value if otherwise (Kinateder et al., 2021; Gordini & Rancati, 2017; Chen, et al., 2016; Gulamhussen & Santa, 2015; Liu et al., 2014; Dezso & Ross, 2012). Racial diversity (RDiv) is the second gender demographic defined in terms of non-Nigerian directors’ representation and calculated as the number of foreign directors divided by total board size (Erhardt, et al., 2003). Cognitive diversity is measured across three spectrums. First, directors’ banking and finance related educational qualification ($DEduQ_1$) is defined and measured as the proportion of directors with business, accounting, finance, and economic related degrees to board size (Selma et al., 2022; Cumming & Leung, 2021). The second cognitive variable relates to directors’ legal competence which is defined and measured as the proportion of directors with law degree ($DEduQ_2$) to board size (Chidambaran et al., 2022). The third cognitive variable focuses on banking and finance industry experience. Directors’ cognitive experience (DCogExp) is defined as the total number of years of professional experience in banking and finance by the directors and calculated as natural logarithm of absolute years of experience (Gray & Nowland, 2013). The paper controls for the effect of board size because of inherent groupthink disorder often associated with large board size and bank size to neutralise the outlier effect of bigger banks on the sample (see Sila et al., 2016). Board size ($1nBS$) is defined as the total number of directors on boards and measured as the natural logarithm of absolute total number of directors (Liu et al., 2022; Gordini & Rancati, 2017). Bank size ($1nBNKSize$) is defined as the total asset of the bank and measured as the natural logarithm of bank’s total assets (Gilani et al., 2021; Richard et al., 2007; Bernile, et al., 2018).

Table 1. Summary of Variable Definitions

| Variable | Definitions |
|--|--|
| Economic Value of Equity (1nEVE) | A natural logarithm of annualised economic value of equity. |
| Composition of Independent Non-Executive Directors (CINED) | Proportion of independent non-executive directors to board size. |
| Racial Diversity (RDiv) | Ratio of foreign directors to board size. |
| Critical Mass of Female Directors (FDCRTM) | Dummy variable equal 1 when boards with greater-than/or equal 3 female directors, 0 otherwise. |
| Directors Educational Qualifications (DEduQ ₁) | Proportion of directors with Business, Accounting, Finance and Economic Degrees |
| Directors Educational Qualifications (DEduQ ₂) | Proportion of directors with Law Degree |
| Directors Cognitive Experience (DCogExp) | Natural logarithm of directors' total years of professional experience. |
| Board Size (1nBS) | Natural logarithm of total number of directors on the boards. |
| Bank Size (1nBNKSize) | Natural logarithm of total asset. |

4. Empirical Result and Analysis

Descriptive Statistics

The summary descriptive statistics for both the dependent and independent variables are presented in Table 2. The economic value of equity average ₦29,153Million with a maximum of ₦82,503Million. The corporate boards of the sampled banks have an average of approximately 14 directors in total with the maximum been 21 which signifies large board size. Of these board sizes, an average of 6 directors are independent non-executives. There is an average of

almost three (3) female directors per board representing 21 per cent of average board size of the sampled banks. The Nigeria Deposit Money Banks (DMBs) are significantly indigenous in nature with limited racial diversity in terms of foreign directorships. The descriptive statistics shows an average of less than one foreign director with as maximum of 6 foreign directors mainly in banks with significant foreign affiliation. An average of 8 directors in each board of the sampled banks tends to have degree either in business, accounting, finance and or economics.

Table 2. Descriptive Statistics

| Variable | No. of Observations | Minimum | Maximum | Mean | Median | Std. Dev. | Q1 | Q2 | Q3 |
|--|---------------------|---------|---------|--------|--------|-----------|--------|--------|--------|
| Economic Value of Equity ("Mln") | 105 | 2471 | 82503 | 29153 | 21379 | 20750 | 12632 | 21379 | 42519 |
| Independent Non-Executive Directors (INED) | 105 | 2.000 | 9.000 | 5.704 | 5.000 | 1.634 | 5.000 | 5.000 | 7.000 |
| Female Directors (FDir) | 105 | 0.000 | 6.000 | 2.895 | 3.000 | 1.544 | 2.000 | 3.000 | 4.000 |
| Racial Diversity (RDiv) | 105 | 0.000 | 6.000 | 0.904 | 0.000 | 1.472 | 0.000 | 0.000 | 1.500 |
| Directors Educational Qualifications (DEduQ ₁) | 105 | 0.000 | 15.000 | 7.162 | 8.000 | 4.084 | 3.000 | 8.000 | 10.000 |
| Directors Educational Qualifications (DEduQ ₂) | 105 | 0.000 | 5.000 | 1.638 | 1.000 | 1.177 | 1.000 | 1.000 | 2.000 |
| Directors Cognitive Experience (InDCogExp) | 105 | 16.500 | 32.000 | 23.950 | 24.000 | 3.969 | 21.000 | 24.000 | 25.950 |
| Board Size | 105 | 6.000 | 21.000 | 13.800 | 14.000 | 3.396 | 12.000 | 14.000 | 16.000 |
| Bank Size (lnBNKSize) | 105 | 5.670 | 9.840 | 7.614 | 6.770 | 1.431 | 6.155 | 6.770 | 9.045 |

The second cognitive diversity parameter shows that an average of one director per board has law degree. A significant number of directors has an average of 23 years of finance and banking experience. From the correlation matrix presented in table 3 below, a significant number of explanatory variables exhibited weak correlation in terms of the degree of relationship which indicates non-multicollinearity. Therefore, there are no noticeable correlation between explanatory variables in the model that are likely to impair reliability of our statistical inference.

Table 3. Correlation Matrix

| Variables | InEVE | FDCRTM | RDiv | DEduQ ₁ | DEduQ ₂ | DCogExp | CINED | InBS | lnBNKSize |
|--------------------|--------|--------|--------|--------------------|--------------------|---------|--------|-------|-----------|
| InEVE | 1.000 | | | | | | | | |
| FDCRTM | 0.103 | 1.000 | | | | | | | |
| RDiv | -0.023 | -0.034 | 1.000 | | | | | | |
| DEduQ ₁ | 0.080 | 0.279 | 0.072 | 1.000 | | | | | |
| DEduQ ₂ | -0.099 | 0.287 | -0.019 | 0.546 | 1.000 | | | | |
| DCogExp | -0.269 | 0.001 | -0.075 | 0.024 | -0.112 | 1.000 | | | |
| CINED | -0.024 | 0.430 | -0.027 | 0.055 | -0.167 | 0.153 | 1.000 | | |
| InBS | 0.841 | 0.003 | -0.195 | 0.109 | 0.006 | -0.209 | -0.047 | 1.000 | |
| lnBNKSize | 0.077 | 0.497 | -0.056 | 0.069 | -0.086 | 0.203 | 0.707 | 0.094 | 1.000 |

Estimation and Analysis

Assessment results from baseline model show that involvement of at least three (3) or more female directors (FDCRTM) is positively associated with enhanced economic value of equity and statistically significant at less than 1 percent degree of confidence (i.e., coefficient: 0.7623; p-value <0.01). This finding implies that the effectiveness of female directors on board are more noticeable with achievement of reasonable women directors' representation threshold. Aside from offering support to hypothesis1 and the fundamental premise of critical mass theory, the finding is consistent with similar past studies (e.g., Kinateder et al., 2021; Ahmed & Ali, 2017; Garcia-Meca et al., 2015; Nguyen et al., 2015; Liu et al., 2014; Dezsó & Ross, 2012; Julizaerma et al., 2012). The presence of foreign directors which is often used to gauge the degree of racial diversity (RDiv) shows statistically significant positive relationship with improved bank net worth at 5 percent level (i.e., coefficient: 2.2196; p-value <0.05). In addition to validating the presumption of hypothesis 1, the reported direction of causality is consistent to those documented in prior studies that had investigated the effect and relevance of racial diversity and financial performance (e.g., Estayia & Nasir, 2016; Miller & Triana, 2009; Richard et al., 2007; Erhardt, et al., 2003). Estimation result on cognitive diversity is rather equivocal. Whereas the relationship between directors with business, accounting, finance, and or economics degrees (DEduQ₁) and economic value of equity is positive similar to Selma et al., (2022), though not statistically significant (i.e., coefficient: 0.2989; p-value >0.05), the presence of directors with degree in law (DEduQ₂) is negatively related to economic net worth and statistically significant at 1 percent (i.e., coefficient: -4.6937; p-value<0.01) consistent with findings from related studies (e.g., Liu & Sun, 2021; Fernández-Temprano & Tejerina-Gaite, 2020). The third cognitive variable measured in terms of directors' cognitive banking industry experience (DCogExp) also returned a negative correlation and statistically significant at 10 percent (coefficient: -1.5461) consistent with prior comparable studies (e.g., Harjoto et al., 2018; Le et al., 2013).

Table 4. Assessment of Firm-level Effect of Demographic and Cognitive Diversity on Economic Value of Equity

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------------|-------------|-------------------------|-------------|--------|
| <i>Constant</i> | 3.7220 | 2.5184 | 1.4779 | 0.1427 |
| FDCRTM | 0.7623*** | 0.2293 | 3.3249 | 0.0013 |
| RDiv | 2.2196** | 0.8547 | 2.5968 | 0.0109 |
| DEduQ ₁ | 0.2989 | 0.4129 | 0.7238 | 0.4710 |
| DEduQ ₂ | -4.6937*** | 1.4275 | -3.2880 | 0.0014 |
| DCogExp | -1.5461* | 0.9405 | -1.6439 | 0.1035 |
| CINED | -0.0464 | 0.0789 | -0.5882 | 0.5578 |
| lnBNKSize | 1.0637*** | 0.0662 | 16.0602 | 0.0000 |
| lnBS | -1.0375 | 1.0811 | -0.9597 | 0.3396 |
| R ² | 0.7757 | Mean dependent variable | | 6.6814 |
| Adjusted R ₂ | 0.7571 | S.D. dependent variable | | 1.7915 |
| S.E. of regression | 0.8830 | Akaike info criterion | | 2.6709 |
| Sum squared residual | 74.8549 | Schwarz criterion | | 2.8984 |
| Log likelihood | -131.2221 | Hannan-Quinn criterion | | 2.7631 |
| F-statistic | 41.5107 | Durbin-Watson statistic | | 2.1149 |
| Prob(F-statistic) | 0.0000 | | | |

Note: ***, **, * are statistically significant respectively at 1%, 5%, and 10% levels. Critical Mass of Female Directors (FDCRTM): Dummy variable equal 1 when boards with greater-than/or equal 3 female directors, 0 otherwise. Racial Diversity (RDiv): Ratio of foreign directors to board size. Directors Educational Qualifications (DEduQ₁): Proportion of directors with Business, Accounting, Finance and Economic Degrees. Directors Educational Qualifications (DEduQ₂): Proportion of directors with Law Degree. Directors Cognitive Experience (DCogExp): Natural logarithm of directors' total years of professional experience. Composition of Independent Non-Executive Directors (CINED): Proportion of independent non-executive directors to board size. Board Size (lnBS): Natural logarithm of total number of directors on the boards. Bank Size (lnBNKSize): Natural logarithm of total asset.

Therefore, the paper found no conclusive evidence to support hypothesis 2. An ambiguous empirical finding of this nature is not limited to this study but rather widespread in corporate governance research and acknowledged in most past studies (Aggarwal et al., 2019; Lawal, 2012). Though not statistically significant, in contrast to the common belief that the composition of independent non-executive directors (CINED) enhances firm financial performance due to increased board monitoring and control, the estimation result shows inverse causality which indicates the likelihood that certain independent non-executive director composition may weaken economic value of equity (i.e., coefficient: -0.0463; p-value>0.05). This finding is not an isolated empirical outcome but rather consistent with prior discoveries (see Ali et al., 2019; Charles et al., 2018; Jackling & Johl, 2009; Kim, 2007). Most importantly, the finding further provides a sort of validation to the argument put forth by Sila et al., (2016) where they control for the effect of board independence on the premise that independent non-executive directors create shareholder-centric board which could result in complex corporate risk-taking.

Robustness Test

We further conducted a robustness test to ascertain the stability of the estimation results obtained in the baseline mode under different condition (see table 5). Racial diversity variable was removed from the estimation model to determine whether the remaining key variables left in the model will return similar outcomes as obtained in the preceding base line model. This robustness methodology is consistent with the approach deployed in prior studies (see Liu et al., 2022). Interestingly, the critical mass of female directors (FDCRTM) remained positively linked to improved economic value of equity ratio at 1 per cent statistical level of significance (i.e., coefficient: 0.7432; p-value <0.05). This outcome not only affirmed the baseline model results but also points to the fact that the obtained results is robust when subjected to sensitivity assessment. The result also offered collaborative support to prior studies that had reported similar findings (e.g., Brahma, et al., 2021; Ye at al., 2019; Low et al., 2015; Nguyen et al., 2015; Dezsó & Ross, 2012). On cognitive diversity, the paper found that the educational qualification of directors with business, accounting, finance, and or economics degrees (DEduQ₁) remained positively linked to increased banks' economic net worth but statistically insignificant (i.e., coefficient: 0.4641; p-value>0.05). The finding of positive effect of DEduQ₁ is consistent with empirical outcome of Amore et al., 2019 and Darmadi, 2013. In accordance with the findings from baseline assessment, robustness test result also showed that the presence of directors with bachelor's degree in law (DEduQ₂) is negatively related to economic value of equity and statistically significant at 5 percent (i.e., coefficient: -5.0745; p-value<0.05) (see Liu and Sun, 2021).

Table 5. Robustness test of the Effect of INED and Diversity Variables on Economic Value of Equity

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------|-------------|-------------------------|-------------|--------|
| <i>Constant</i> | 4.9884 | 2.5428 | 1.9617 | 0.0527 |
| FDCRTM | 0.7432*** | 0.2358 | 3.1514 | 0.0022 |
| DEduQ ₁ | 0.4641 | 0.4199 | 1.1053 | 0.2718 |
| DEduQ ₂ | -5.0745*** | 1.4614 | -3.4723 | 0.0008 |
| DCogExp | -1.8846** | 0.9586 | -1.9659 | 0.0522 |
| CINED | -0.0540 | 0.0811 | -0.6658 | 0.5071 |
| lnBNKSize | 1.0229*** | 0.0662 | 15.4471 | 0.0000 |
| lnBS | -0.9800 | 1.1124 | -0.8810 | 0.3805 |
| R-squared | 0.7600 | Mean dependent variable | | 6.6814 |
| Adjusted R-squared | 0.7427 | S.D. dependent variable | | 1.7915 |
| S.E. of regression | 0.9088 | Akaike info criterion | | 2.7197 |
| Sum squared residual | 80.1130 | Schwarz criterion | | 2.9219 |
| Log likelihood | -134.7861 | Hannan-Quinn criterion | | 2.8017 |
| F-statistic | 43.8794 | Durbin-Watson statistic | | 2.1304 |
| Prob(F-statistic) | 0.0000 | | | |

Note: ***, **, * are statistically significant respectively at 1%, 5%, and 10% levels. *Critical Mass of Female Directors (FDCRTM)*: Dummy variable equal 1 when boards with greater-than/or equal 3 female directors, 0 otherwise. *Directors Educational Qualifications (DEduQ₁)*: Proportion of directors with Business, Accounting, Finance and Economic Degrees. *Directors Educational Qualifications (DEduQ₂)*: Proportion of directors with Law Degree. *Directors Cognitive Experience (DCogExp)*: Natural logarithm of directors' total years of professional experience. *Composition of Independent Non-Executive Directors (CINED)*: Proportion of independent non-executive directors to board size. *Board Size (lnBS)*: Natural logarithm of total number of directors on the boards. *Bank Size (lnBNKSize)*: Natural logarithm of total asset.

The robustness assessment also reveals the presence of negative association between cognitive experience (DCogExp) and economic value of equity as the proportion of directors with banking and finance expertise is significantly linked to impaired bank economic net worth (i.e., coefficient: -1.885; p-value<0.05) consistent with Agyemang & Appiah (2017). Finally, and contrary to the blanket notion that the composition of independent outside directors enhances firm financial performance, the robustness test re-affirmed the accuracy of baseline assessment which indicates, to a large extent, that the appointment and inclusion of non-executive directors are cognitive based, and that the presence of independent non-executives (CINED) may be a tokenism and potentially, though not significant, jeopardizes increased economic value of equity (i.e., coefficient: -0.0540; p-value>0.05). This paper offered equivocal support to previous studies that had reported inverse relationship between the effect of CINED and firm financial performance (e.g., Pearce & Patel, 2018; Terjesen, et al., 2016; Garba & Abubakar, 2014). Overall, the robustness test offered strong support to the baseline result as the direction of causality between independent and dependent variables remained stable and significantly consistent.

5. Conclusion and Recommendations

Using a combination of agency, resource dependency and collective action theories anchored on executive monitoring and resource co-optation roles of board of directors at a given diversity threshold, this paper investigated the financial impact of demographic and cognitive diversity, as well as the presence of independent non-executive directors on economic value of equity with particular emphasis on Deposit Money Banks (DMDBs) in Nigeria. As expected, the assessment generated several interesting outcomes with potential implications for future research and public policy decisions, especially, with regards to the ideal board configuration approach that would enhance board effectiveness and engender superior firm performance. In accordance with the underlying objectives of the study, the paper postulated two sets of hypotheses to guide model specification and direction of empirical valuation. Hypothesis 1 relied on the presumption that, having a mixture of directors of different gender and racial backgrounds would create vigilant and resourceful board with external networks and social capital that support executive management in the delivery of corporate performance that would positively affect the economic value of equity.

Consistent with the above notion, the paper found irresistible support for hypothesis 1 linking composition of female and foreign directors to increased financial net worth at baseline estimation. The statistical level of significance of female directors' usefulness remained high and stable even when subjected to robustness assessment under different sensitivity condition. Apart from this empirical finding being in alignment with erstwhile related studies (e.g., Karavitis et al., 2021; Garcia-Meca et al., 2015; Gulamhussen & Santa, 2015; Richard et al., 2007), the result of hypothesis 1 has fundamental implications. First, the gender diversity variable was tested in line with critical mass theory which is premised on the assumption that female directors' representation mostly reached an ideal threshold before their impact on board would be noticeable especially in modern corporations where male gender maintained an unequivocal

dominance. Numerous studies have offered recommendations on what that numeric threshold should be. While some argued that having at least one female director should be sufficient, most studies favoured a minimum of three female directors in each board at a time (see Kinateder et al., 2021; Brahma, et al., 2021; Wang & Clift, 2009). Intriguingly, the female director variable used in this study was measured in line with popular suggestion of having at least three (3) female directors and the result obtained unambiguously validated the assumption that female representation threshold is a vital criteria to be considered when measuring the effect of gender diversity on corporate governance at firm level. Secondly, the finding also has implication for corporate policy decisions and regulations. This study points to the inherent value of adopting gender quota regulations in promoting gender diversity as implemented in certain jurisdictions, notably Norway and Spain amongst others and offered a case for the emerging and developing economies including those with innate culturally based resistance for women participation in corporate governance to emulate (Mohsni et al., 2021; Børren & Staubo, 2014).

Regarding Hypothesis 2, the empirical outcome was equivocal at both baseline and robustness test levels. Contrary to the underlying theory, the paper found statistically significant negative relationship between two cognitive diversity measures (i.e., the effect of directors with Bachelor of Law degrees and those that possessed industry experience) and economic value of equity. The third cognitive variable relating to directors with business, accounting, finance, and or economics degrees while maintaining a positive connection with the economic value of equity as proposed, the degree of causality was grossly insignificant to draw a reliable statistical inference. Again, there are few reasonable deductions that can easily be made from these estimation outcomes starting from the later. The partial evidence linking business related degrees to improved economic value of equity should not be completely ignore merely based on limited statistical level of significance but rather, this calls for more elaborate investigation through increased sample size and extension of the observation periods. Perhaps, there is a high likelihood that future research would benefit from this suggestion because there are prior documented big data studies with robust empirical evidence regarding the impact of directors with business degrees such as MBA on firm performance (Sun et al., 2021; Amore et al., 2019).

The finding of negative effect of directors with law qualification and industry experience on banks' economic net worth is a testament to the adverse moderating consequence that excessive knowledge of specific business and regulatory environment may potentially have on board deliberations and corporate strategic decisions. Directors with vast industry knowledge and legal backgrounds are perhaps more risk averse and cautious about their reputation and thus likely to exhibit diminishing marginal utility for wealth maximization (Gilani et al., 2021; Harjoto et al., 2018). As a result, such directors may be more reluctant in supporting ambitious business proposals aimed at growing economic value of equity due to their intrinsic dislike for risk. Because of their risk averse temperament, the satisfaction that such directors would hypothetically derive from achievement of any given increase in economic value of equity may be extremely lower than the disutility of a loss of same amount in economic value of equity (Gilani et al., 2021). Hence, the observed inverse relationship between these sets of directors and the banks' financial net worth. In summary, the results of empirical assessments from this study were robust, given the data set used especially with regards to the relevance of board demographic diversity which offered stout backing for gender equality advocators calling for increased participation of women at uppermost corporate echelon. Nevertheless, big data studies are needed to enable further empirical validation and reliable generalisation of the reported evidence. Researchers are therefore encouraged to explore deeper the double-edged sword narrative that excessive industry knowledge potentially offers in terms of improved firm governance through quality advisory on one hand, and the effect of directors' overly conservative attitude towards viable investment opportunities due to reduced marginal utility for wealth (see Arora, 2022).

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