

MODERATING ROLE OF BGD ON THE NEXUS OF CASH MGT AND FIRM VALUE OF SELECTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

Cash management is top notch for the survival, growth and stability of business organizations in a dwindling economy like Nigeria and thus require urgent attention to tapping into the embedded skills in women folk to achieve success and balance in board composition for improvement on the value and performance of an organization. The study examined the moderating role of board gender diversity on the nexus of cash management and firm value of selected manufacturing firms in Nigeria for the period 2014 - 2023. Correlation analysis was conducted using the OLS regression and the result showed the importance of integrating gender diversity consideration into the financial decision making processes to enhance firm value through effective cash management; hence, board gender diversity has a positive and significant effect on corporate cash management. The findings therefore, underscores the crucial interplay between cash management and board gender diversity in enhancing the value of Nigerian manufacturing firms. Consequently, we recommend among other things the prioritization of gender mix in board appointment, integrating gender diversity as a key component of the corporate governance practice and improving on the training for the underrepresented folks for effective financial and operational decisions.

1. Introduction

Generally, women are regarded as the centripetal force that hold the key to diverse success points ranging from the family, kinsmen gathering, political and non-political set ups, government and non-government organization and the society at large. Upon this premise, board gender diversity (BGD) has attracted the attention of various regulatory bodies and agencies towards the inclusion of women in the top echelon strategic cash management for the improvement of firm value. For instance, the European commission placed a thresh hold on listed companies to include up to 40% of women as board members (Niyi & Comfort, 2022; Bell, 2005). Also, Norway advocated 40.70% of women as board members (Scheppink, 2018). Furthermore, in line with OECD, 2020 move towards the support of a diverse gender board, Portugal has slightly above average included females as directors in their board (Pacheco, Lobo & Maldonado, 2020). Likewise, the corporate governance (CG) code in 2018 mandated all publicly listed companies for the inclusion of females in the board composition (Obaje, Abdullahi & Ude, 2021; Sonia & Halaolua, 2022; Niyi & Dare, 2022).

Be that as it may, African countries had not legalized the inclusion of female as part of the members of corporate boards rather had practiced freewill mode that are based on cultural implication, economic explanation, ethnic behavior or social desire (Scheppink et al 2018; Wang & Clift, 2009; Torchia, Calabro & Huse, 2011) thus transcending to incessant non-compliance without laid down punishment (Child 1975; Sana & Alia, 2021). These may have been propelled by the exerting social influence on organizational culture (Li & Chen, 2018; Hilman & Dalziel, 2005) vis a vis the position relegated to the women folk (Kim & Starks, 2016; Adam & Ferreira, 2009), growth orientation, task need and requirement (Li & Chen 2023; Post & Bryon, 2015; Child, 1975), and strategic participation move (Li et al 2023; Branco & Rotrigues, 2008).

Consequent upon these hitches and the advent of civilization, the incessant concern about the practice of a balanced gender diverse board for small, medium and corporate organizations with respect to cash management and firm value has become a topical issue over decades (Sana et al 2021; Li & Hambrick, 2005; Erhardt, Werbel & Shrader, 2003) thus leading to the apex regulator input in the deposit money banks (CBN) requesting for representation of female gender in the board (Anna et al, 2020; Grant, 1988; Darmadi, 2010; Sabatier, 2015).

The benefits and special characteristics of having a gender-diverse board are far fetching resulting to replicative values: improved cognitive contribution through creation of positive impacts by monitoring quality that can enhance cash management (Grant 1988; Liu, Wei & Xie, 2014; Ayman, Jatal, Mostafa & Irfani, 2019; Darmadi et al 2010) for optimal firm values. No wonder (Low, Robert & Whiting, 2015; Gehui, Wang & Xiang, 2021) reiterated that a gender-diverse board brings about improved intellectual contributions especially in the area of cash management which transcends to be the quickening blood vessel for growth.

The female folk has the greatest tendency to conceive, nurture and execute plans on the management of the organizations liquidity profile (Raok & Tilt, 2016; Li & Hambrich, 2005; Hilman & Dalziel, 2003; Cao & Chen, 2013) strictly avoid holding too much cash, having apt consideration for the level of long run investments to embark on, how much to borrow whether on a long term note or otherwise and the best mix of investment portfolio (Liu & Chen, 2018; Dibie, 2022), providing a sound proactive and psychological balance that may never allow the organization to be highly geared thereby exposing them to unnecessary risk (Solakoglu & Demir, 2016; Rose, 2007; Kim & Starks 2016; Li et al 2023).

Additionally, a fair representation of women folks in the board results to effective decision making

(Ayman et al, 2019), guidance with better risk management strategies (Tabitha, Njugun, Cyrus, Winnie & Kiiru, 2022; Sorin, Anca & Nucu, 2019), hence, are keen on establishing a lasting legacy for improvement of the organization's values (Grezegor, 2009; Dibie, 2022). Without argument, gender-diverse board demonstrates concerted commitment, transparency and accountability in the management of an organization's resources (Li et al, 2023; Maheshwari et al, 2017) as most women are known for not possessing traits like greed and avarice (Winnie et al, 2022).

Again, (Anna, 2020; Major, Harvest & Azali, 2022; Sorin & Elena, 2021) noted that women leave lasting legacies as they tend to consider: others first, their children inclusive of the unborn ones in their daily decisions, thus placing the organization in the forefront of improved resource and liquidity management which in turn enhances firms value. With the same thought pattern, (Scheppink et al, 2018; Li et al, 2005; Adullahi et al, 2021) quipped that organizations tend to influence their activities based on the predominant gender workforce, stressing that better representative of female gender in the board affect reputation, hence snowballing into diverse groups and organizations clamoring for female folks in different capacities especially in the area of cash management which is the life wire of an organization (Dibie, 2022; Almeida, Campello and Weisbank, 2004).

Furthermore, taking cognizance of firm's value which cannot be severed as a direct link on improving cash management, the need for gender-diverse board is unarguably important. Generally, women are unique in the application of multi perspectives to improve creativity and innovation (Jensen, 1986; Cao & Chen, 2013; Hax, 2003), gently and gradually earning reputation through trust (Cannelia & Harris, 2002; Niyi et al, 2022; Bell, 2005; Liu et al, 2014), embark on aggressive marketing to earn more profit (Aladejebi, 2021; Campbell et al 2007; Ye, Zang & Rezaee, 2010), face competitors and create a niche for their products and services (Li & Cheng, 2023; Liu et al, 2014), imbibe the best corporate governance principles and legitimacy (Sana & Alia, 2021; Janaki, 2016)

Also, the female folks improve on and retain high market share by exhibiting a sound going concern characteristics that a company is holistically run and have the capacity to attract investors (Aladejebi et al, 2021; Anna et al, 2020), strife to ensure greater employee satisfaction and clearer moral standards as women are notably agent of peace (Ghardallou, Borji & Alkahalifah, 2020; Hax, 2003; Pacheco et al, 2020), thus reducing conflict amongst the board members owing to their sensitivity (Anna et al, 2020; Li & Chen, 2018; Javad & Javad, 2019). In sum therefore, unimaginable improvement in returns on asset (ROA), returns on equity (ROE) and optimum market value would be evidenced in the various aspects of the organization's financial activities.

However, despite the advantages of the BGD and the relationship between management of cash and the value of a firm, there has been research evidence on the negative effect of the moderating role of women folks as members of an organization like small and medium enterprises (SMEs) (Pacheco et al 2020). At times, unhealthy competitions, unnecessary confusion, this is not a man's world ideology, gender squabbles and challenges, conflicts are reported (Campbell et al, 2007; Liu et al, 2014; Torchia et al, 2011), as major causes of poor cash management and subsequent low firm value. Gender rivalry may lead to sub-optimality thereby affecting proper cash management and focus on improved firm values (Niyi et al, 2022; Kim & Starks et al, 2016).

Consequently, from the foregoing, the mixed ideas may be attributable to different legal framework (Pacheco et al, 2020), moderating role of the variable used: firm size, culture, business characteristics and firm age (Scheppink, 2018; Darmadi et al, 2010; Ghardallou, Borji &

Alkahlifah, 2020) on the relationship between cash management and firm value. Upon this premise, therefore, this study examined the moderating role of board gender diversity on the nexus of cash management and firm value of selected manufacturing firms in Nigeria. The rest of the paper is arranged as follows: Section 2 presents the theoretical framework, empirical review and hypotheses development while the methodology are presented in section 3. Discussion of results are showed in section 4 and section 5 presented the summary, conclusion and recommendations.

1.2 Statement of problem and Gap in Literature

The moderating role of board-gender-balance on the relationship between cash management and firm value has been drawing the attention across spheres (families, political and non-political, governmental and non- governmental, corporate and non-corporate organizations) within the past three decades knowing full well that these groups may not function well if one gender (the female) is sidelined, noting however, the innate potentials embedded in them.

But the pertinent question is whether the exclusion or inclusion of women in the groups is as a result of the achievement of social, economic goals or to provide every gender equal opportunity (Scheppink, 2018) or to subdue to an extent the general norm 'this is a man's world impression'. The level of awareness BGD moderation on cash management and firm value can't be overemphasized in the recent times. Debates had emanated from many researchers all over the world on the topic. For instance, (Campell, 2008; Scheppink, 2018; Kim & Starks, 2016; Post & Bryon, 2015) found a positive impact of BGD on cash management. Again, (Adams & Ferreira, 2009; Child, 1975; Sabatier, 2015) in their studies found a negative relationship between cash management and firm performance, while a no effect relationship were observed for the same study by (Carter 2010; Rose 2007; Ye et al, 2010). Anna et al, 2020 in their studies found a positive relationship between BGD and corporate social responsibility.

However, most literature showed the influence of BGD on firm value thus, having varied moderations (Li et al, 2018). For example, (Niyi et al, 2022) found a negative impact between BGD and firm value. Also, (Obaze et al, 2021) found a negative effect between BGD and firm performance and an insignificant negative effect between board size and return on asset (ROA). On the other hand, a significant positive relationship was found on the same study by (Li et al, 2023; Li & Cheng, 2015) but quipped that it was on the premise that the moderating variable (firm size) has a critical value.

A cursory look at the empirical evidences above showed divergent views on the results so obtained and as such has not been able to establish a steady, clearer and recurring evidences on the moderating effect of BGD on the nexus of cash management and firm value. Some scholars attributed the unsteady results to the moderating variables (firm size, age or culture), or the moderating effect of some variables on board gender diversity (work environment, growth pattern, task needs) or data from different countries (Sabatier, 2015; Li et al, 2023). This has nudged one to conclude that the task of establishing the moderating role of BGD on the nexus of cash management and firm value is yet to be rested in developed nations were a good number of literature abound and not to talk of a developing economy like Nigeria's manufacturing sector taking cognizance of the effects of culture on women gender (Scheppink, 2018; Liu et al, 2014; Bell, 2005) where they are neither allowed to be seen nor heard, let alone showcasing their innate capabilities in meaningful business activities.

In sum therefore, it has become necessary to consider this study timely in Nigeria especially now the economy needed to be driven by persons with sound knowledge and innate potentials that can move different sectors forward rather than focusing only on men folk forgetting the fact that

women are born-planners and innovators which may be harnessed for the anticipated health pills in the manufacturing sector and the economy in general.

2.1 Theoretical Framework

The two theories that are apt for the study are the human capital theory (HCT) and resource dependency theory (RDT).

2.1.1 Human Capital theory (HCT)

Human capital theory was developed by Gary Becker and Theodore Schultz between 1950s and early 1960s. HCT were based on the assumptions that investments in education is necessary to acquire skills, which in turn, will increase wealth. With these metaphysical assumptions, the employees is a part of factor of production and investment on training and development on them is paramount and determines the extent to which the other factors of production operates optimally. Consequently, in line with the studies (Campbell, 2007; Zeng & Wang, 2015; Sylvia, Emengini, Nnam and Nwekwo, 2021) that stressed the need for inclusion of female CEOs in the board as a panacea for survival and growth as women are born liquidity managers. Therefore, there is a dire need for a board gender balanced, equip everyone (without prejudice to gender) with the right training and development and ultimately harness the best for a robust managerial perspective and ultimately harness optimum firm's value.

2.1.2 Resource Dependency Theory (RDT)

RDT was developed by Pfeffer & Salancik in 1978. It explains how the organizational behaviors are affected by the external resources they possess, stressing the need for changes at different points to secure or access the resources which they do not have but are actually needed to beat competition and survival in the business environment.

RDT generally, impacts on the link between organizations by influencing their strategies for the choice of managing resources. The assumption of the theory is that there exists a de-pendency of vital resources which an organization needs from the environment. Ultimately, one advocates that the women folks should be included in a balanced quota in the management of the organizations so as to improve managerial competence and improve organizations value. (Atif & Muhammad, 2019; Sylvia, Chukwuemeka and Odo, 2024) reiterated that a balanced board composition are needed for a positive upward trajectory for establishing high firm value, hence, the need to place emphasis on fetching women as a vital change agent is prime.

2.2 Empirical Review

2.2.1 BGD and firm value

Literature exposes on the moderating role of certain firm characteristics shows that an appreciable number of studies have been done in developed economies. The few studies done in Nigeria looked at some moderating variables (size, ethnicity, culture, age of firm) and their moderating effects on variables like corporate cash holding, firm performance or firm value. A cursory look at the studies ex-rayed mixed evidences. For instance, (Scheppink, 2018) dwelt on BGD and firm performance observing culture as a moderating variable using fixed effect regression. They found a positive significant effect of BGD on firm performance as they argued that if culture should be brought low and allow women to be members of board, reputation would be affected and will transcend to improved performance.

BGD and its effects on firms' value was studied by (Niyi et al, 2022; Adam et al, 2009; Aladejebi et al, 2021; Ayman et al, 2019; Darmadi et al, 2010; Javad et al, 2019; Ghardallou et al, 2020; Torchia et al, 2011; Low et al, 2015; Li et al, 2005), using a panel data regression. They found that female board composition had a statistically negative impact on firm value which was blamed on the weak selection criteria during recruitment. Also, (Cong - Duc, Ly - Pharm & Jo - Yu, 2021) in their own study observed that the appearance of women negatively influenced firm accounting and market-based performance, after using a two-stage approach Least Square and Generalized Method of Moments (GMM) on 310 listed financial institutions from 21 Western European countries.

In another study (Kilic, Kilic, Kuzzey & Kuzzey, 2016) used instrumental variable regression analysis for 2008 - 2012 and found that the board of the sampled companies are mainly dominated by men but the inclusion of females positively related to the financial performance of the organization. Again, (Murray, 1989), x- rayed the top management group heterogeneity and firm performance using a sample of 84 out of 500 companies for the period 1967 - 1981 and found that homogenous groups interact more efficiently and are more preferred under conditions of environmental changes. (Nguyen, Locke & Reddy, 2015) analyzed whether BGD matters and found that there existed a positive effect of gender-balance on firm performance. However, a marginal positive effect on performance subsists as the percentage of women increased to about 20%, suggesting that there is a potential trade-off between the cost and benefit of board gender diversification.

(Pacheco et al, 2020) ventured into the impact of gender on financial performance. They used Tobit regression and random effect model on 141 firms as sample. The result showed evidence of fewer possibility for women to be board members especially in a large and aged organizational structures. In the same vein, a study by (Hurley & Chouhary, 2020) after using panel data of 58 selected companies for a period 2012 - 2016 consented that female led CEOs are smaller in size with low income and net revenue and that the panel data result shows that impact of female CEOs is mixed depending on the risk measure used, whereas increasing female board members reduces that risk.

Another study (Janakoplos & Bernasek, 1998) confirmed in their findings that women are generally more risk averse in approach to strategic matters and thus, found no significant correlation between gender diversity and corporate cash holding. In addition, (Elstad & Ladergard, 2012) ventured into the study to find if women are key influencers in corporate boards using 458 samples of Norwegian women on the board and found that women possess a low level of sensor ship, high level of information sharing and key influencers in strategic matters.

Again, (Obaze et al, 2021; Li et al, 2023) studied the moderating effects of firm size on the relationship between board structure and firm financial performance using random effect regression with correlation matrix as a robust check and found that a significant negative effect existed for both board size and board independence moderated by firm size and return on asset (ROA). However, (Li et al, 2023) asserted that firm size may undermine the positive impact of BGD on firm performance and that firm size is less than some critical value. In the same vein, (Sana et al, 2021; Liu et al, 2014) studied the moderating role of firm size on BGD and firm performance and found that BGD is positively related to performance but firm size negatively moderates such relationships as smaller firms benefited most from a gender-diverse board, thus concluding that a gender diverse board positively affected consumer, utilities and small and medium scale related businesses but not larger industries.

BGD and corporate cash holding

Additionally, (Gehui et al, 2021; Vafaei, Ahmed & Mather, 2015) were nudged to conclude that there was a significant positive effect of BGD and corporate cash holding of Chinese firms as they studied the relationship between corporate cash holding and Board gender diversity. (Vafaei et al, 2015) confirmed a positive relationship between gender diversity and corporate cash holding though with control on firm specific such as ownership and governance characteristics. However, a study by (Muhammad, Benjamin & Allen, 2019) found a negative relationship between BGD and corporate cash holdings on the sampled companies.

Furthermore, in the study by (Sonia et al, 2022; Branco & Rotrigues, 2008; Anna et al, 2020) on the moderating role of BGD on corporate social responsibility (CSR) and earnings management of French listed companies. They found a significant positive relationship between CSR and earnings management, reiterating that a positive relation are observed for firms that have BG balance mainly because female directors exhibit appreciable social responsible behavior but are negatively associated with earnings management. Again, (Ghaleb, Almashaqbeh & Qasem, 2021; Issa & Fang, 2019) studied CSR, BGD and real earnings management using content analysis and (OLS) ordinary least square. They found that CSR reporting is significantly and negatively associated with real earnings management in Jordanian market, and that BGD is negatively and significantly related to real earnings management but BGD moderates CSR and income nexus. Again, (Al - Shaer & Zamam, 2016) dwelt on BGD and sustainability reporting quality and found that BGD is positively associated with sustainability reporting after using corporate governance, firm reporting incentives, reporting behavior and environment as controls.

2.3 Hypotheses Development

2.3.1 Board gender diversity and cash management

The moderating effect of BGD on cash management and firm value has been unfolding from previous literature exposes. This is as a result of the importance of the inclusion of female gender that has been neglected and relegated to the background without taking cognizance of their capabilities (Obaze, 2021), forgetting the fact that women have near to a genius characteristic in decision making and problem-solving articulation.

(Gehui et al, 2021; Vafaei, 2015) observed that a positive correlation existed between BGD and cash management adding that females impact positively on the cash retention after dividend payout out and are risk averse in accepting very high risk investment portfolios. (Campbell et al, 2007; Sonia & Samek, 2022) in their studies found a significant positive link between a gender diverse board and corporate cash holding and described women as having high innovative intensity. Accordingly, (Zeng & Wang, 2015) confirmed the same stance adding that female CEOs are precautionous in handling issues of cash retention and management than their male counterparts.

However, (Loukil, Yousfi & Raissa, 2019) reiterated that no significant link existd between the managerial and strategic decision making and female representation on the board. This was supported by (Janakoplos, 1998) stressing that women are conservative especially in consideration of investments in risky portfolios. These evidences may be pointing at a conclusion that BGD has no effect or correlation on cash management style. While (Muhammad, 2019) found a strong negative relationship between female board members representation and cash holding attributing such nexus to the style of corporate governance structure in China and US. Therefore, based on the mixed evidences, we hereby propose the hypothesis:

H₁: There is no effect of a gender-diverse board on corporate cash management.

2.3.2 Board gender diversity and firm performance

Several studies ventured into the moderating role of gender diversity on firm performance. For instance, (Darmadi, 2010) quipped that there is a positive nexus between women in top management and firm performance in Indonesia. In the same vein, (Nguyen, Locke & Reddy, 2015; Kilic et al, 2016) supported the argument highlighting that women have reputation (Scheppink, 2018) and this may affect the usage of resources for the enhancement of firm performance. Thus, pointing at the fact that women hardly divert public or business funds for personal use.

However, (Niyi et al, 2022; Adam et al, 2009; Aladejebi et al, 2021; Javad et al, 2019; Ghardallou et al, 2020; Torchia et al, 2011; Low et al, 2015; Li et al, 2005) confirmed a negative and significant correlation between a gender-diverse board and firm performance. Also, (Cong - Duc, Ly-Pharm & Jo-Yu, 2021) in their own study observed that the appearance of women negatively influenced firm accounting and market-based performance. Consequent upon these premises, we propose another hypothesis:

H₂: There is no effect of a gender-diverse board on firm performance.

3.0 Methodology

The study adopted an ex-post facto research design from secondary data obtained from the Nigerian Stock Exchange (NSE) for the period 2014 to 2023. The population were all the listed companies for the period under review while the sampling technique was purposive sampling. This was used to select all the manufacturing companies for the period.

3.1 Method of data analysis

The study conducted descriptive statistics to provide an understanding of the data in terms of the mean, standard deviation, maximum, and minimum. Correlation analysis was also conducted to express the relationship between the independent and dependent variables employed in the study. However, to achieve the objective of the study, the ordinary least square (OLS) regression was employed.

3.1.1 Model Specification

Based on the theoretical literature and earlier empirical studies, the present study adapted the Gholami, Sands, and Rahman (2022) model to express the econometric form of the model as below:

$$MP_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CPP_{it} + \beta_3 BGD * (CCC)_{it} + \beta_4 BGD * (CPP)_{it} + \beta_5 LEV_{it} + \beta_6 FSize_{it} + \mu_{it} \dots [1]$$

$$EPS_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CPP_{it} + \beta_3 BGD * (CCC)_{it} + \beta_4 BGD * (CPP)_{it} + \beta_5 LEV_{it} + \beta_6 FSize_{it} + \mu_{it} \dots [2]$$

The apriori expectation based on the literature reviewed and related theories is stated as follows; $\beta_1 X_{1it} < 0$, $\beta_2 X_{2it} < 0$, $\beta_3 X_{3it} > 0$, $\beta_4 X_{4it} < 0$, $\beta_5 X_{5it} > 0$, $\beta_6 X_{6it} < 0$. The basis for this expectation flows from the outcome of the literature review and empirical findings.

Where:

β_0	=	Constant
$\beta_1- \beta_6$	=	Slope coefficient
μ	=	Stochastic disturbance
i	=	i^{th} company
t	=	period

3.1.2 Variable measurement:

- **Independent variable:** The independent variable is the cash management. It was measured by cash conversion cycle (CCC) and cash payment period (CPP).
- **Dependent variable:** The dependent variable is firm value and can be measured by market price (MP) and earning per share (EPS)
- **Control variable:** the control variables are firm size and leverage. Firm size was measured by taking the log transformed value of total assets while leverage was measured using total debt to equity ratio.
- **Moderating variable:** the moderating variable was the board gender diversity (BGD) which was measured by the composition of female independent directors on the board for the manufacturing companies under study.

4.0 Discussion of result

The table in appendix II provides descriptive statistics for seven key variables—Earnings per Share (EPS), Market Price (MP), Cash Conversion Cycle (CCC), Cash Payment Period (CPP), Gender-Diverse Board (GDB), Leverage (LEV), and Firm Size (FSIZE). These variables were analyzed using mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera, probability, and other summary measures based on 230 observations.

The mean values offer insights into the central tendency of each variable. For instance, the average EPS was 3.95, indicating moderate profitability among the firms. The mean MP was 3.47, suggesting relatively low stock prices for these companies. CCC and CPP have mean values of 14.13 and 20.56, respectively, highlighting the firms' operational efficiency in managing cash flows and payments. FSIZE, with a mean of 68,669.93, reflects significant variability in the scale of the sampled firms.

The standard deviations of the variables indicate the degree of variation. EPS (5.17) and MP (4.33) exhibit moderate spread, whereas CCC (14.92) and CPP (40.05) have relatively higher deviations,

pointing to wide disparities in cash management practices. FSIZE had an extraordinarily high standard deviation (290,425), showing substantial variability in firm sizes.

The maximum and minimum values reveal the range of the data. EPS ranges from -3.84 to 23.37, demonstrating the disparity between under performing and highly profitable firms. Similarly, MP ranges from -4.98 to 53.86, indicating wide variability in stock valuations. Notably, CCC and CPP have extreme negative minimum values (-8.94 and -210.48, respectively), suggesting anomalies or unique operational challenges in some firms.

Skewness values indicate asymmetry in the distribution of the variables. Most variables were highly positively skewed (e.g., MP, CCC, GDB, and FSIZE), implying the presence of outliers or extremely large values pulling the distribution to the right. However, CPP is negatively skewed (-2.47), suggesting that the majority of firms have shorter payment periods, with few outliers having significantly longer periods.

Kurtosis values reveal the peakedness of the data distribution. All variables exhibit high kurtosis, far exceeding the normal distribution benchmark of 3, indicating leptokurtic distributions. This suggests the presence of extreme outliers or heavy tails in the dataset, particularly for FSIZE (159.78) and GDB (88.52).

The Jarque-Bera test and its associated probabilities confirm non-normal distributions for all variables (p-values = 0.000). This implies that the data are not symmetrically distributed and contain significant outliers, as observed in the skewness and kurtosis measures.

The sum and sum of squared deviations provide additional insights. The total EPS of 909.02 reflected the cumulative profitability across 230 firms, while the aggregate FSIZE of 15,794,083 highlights the combined scale of these entities. The large sum of squared deviations for FSIZE (1.93E+13) emphasizes the high dispersion in firm sizes.

The observed statistics underline the dynamic and heterogeneous nature of the sampled firms in terms of cash management, profitability, and governance. Variables like GDB (mean = 25.19) and LEV (mean = 1.39) suggest a moderate emphasis on diversity and leverage. These findings provide a foundation for assessing the moderating role of gender-diverse boards on the nexus between cash

management practices (CCC and CPP) and firm value (EPS and MP), shedding light on the varying operational and governance characteristics across the manufacturing sector in Nigeria.

Hypothesis I

Restatement of Hypothesis: H_1 : There is no effect of a gender-diverse board on corporate cash management.

The findings of appendix III suggest that corporate cash management, as measured by cash conversion cycle (CCC) and cash payment period (CPP), significantly influences the presence of a gender-diverse board (BGD) in Nigerian manufacturing firms. Specifically, the CCC has a substantial and positive effect, with a coefficient of 1.734955 and a t-statistic of 38.02533, which is statistically significant at the 1% level ($p = 0.0000$). This implies that efficient cash management practices strongly correlate with the likelihood of having gender-diverse boards, highlighting the importance of CCC in influencing board diversity.

The cash payment period (CPP) also exhibits a positive effect on BGD, with a coefficient of 0.051022 and a t-statistic of 2.449096, which is statistically significant at the 5% level ($p = 0.0151$). This suggests that firms with optimized cash payment cycles are more likely to have gender-diverse boards. Although the effect size is smaller compared to CCC, the significance indicates that CPP still plays a role in shaping the nexus between cash management and board diversity.

The model's R-squared value of 0.797014 indicates that approximately 79.7% of the variations in board gender diversity (BGD) are explained by the cash conversion cycle (CCC) and cash payment period (CPP). This high explanatory power suggests that the independent variables effectively capture the dynamics affecting board diversity in the context of Nigerian manufacturing firms.

The adjusted R-squared of 0.796124 confirms the robustness of the model, accounting for the degrees of freedom and showing that the explanatory variables remain strong predictors of BGD. This alignment between R-squared and adjusted R-squared values further supports the model's reliability.

The Durbin-Watson statistic of 1.702261 suggests the absence of severe autocorrelation in the residuals, indicating that the panel data estimation results are reliable. Furthermore, the low standard error of the regression (13.35208) reinforces the accuracy of the predicted values in

capturing actual board diversity outcomes.

Based on the results, the null hypothesis (H1: There is no effect of a gender-diverse board on corporate cash management) is rejected. The significant coefficients of both CCC and CPP demonstrate that cash management has a meaningful impact on board gender diversity in Nigerian manufacturing firms. This highlights the importance of integrating gender diversity considerations into financial decision-making processes to enhance firm value through effective cash management.

Hypothesis II

Restatement of Hypothesis: H₂: There is no effect of a gender-diverse board on firm performance. This study explores the moderating role of a gender-diverse board (BGD) in the relationship between cash management and firm value, with a focus on selected manufacturing firms in Nigeria. The hypothesis posited that a gender-diverse board has no significant effect on firm performance. Utilizing a Panel Least Squares method, data spanning 2014 to 2023 for 23 firms were analyzed, resulting in 230 balanced panel observations. The dependent variable, BGD, is evaluated alongside the independent variables, market price (MP) and earnings per share (EPS).

From the results in appendix III, market price (MP) has a strong and statistically significant positive relationship with firm value. With a coefficient of 6.891803 and a t-statistic of 84.29070, the associated p-value of 0.0000 indicates high significance at conventional levels. This suggests that market price is a critical determinant of firm performance, corroborating its role in signaling financial health and market expectations.

In contrast, earnings per share (EPS) has an insignificant effect on firm performance. Its coefficient (0.040870) and a t-statistic of 0.586403 yield a p-value of 0.5582, exceeding the conventional significance threshold of 0.05. This indicates that EPS alone does not significantly drive variations in firm value within the selected firms during the study period.

The results suggest that gender diversity on boards (BGD), as a moderating factor, does not play a significant direct role in influencing firm value, as evidenced by the insignificance of EPS. However, the significant relationship between market price and firm performance may imply an

indirect benefit of gender diversity in enhancing board decisions that positively influence stock market perceptions.

The model exhibits a high degree of explanatory power, with an R-squared value of 0.957922, indicating that approximately 95.79% of the variability in the dependent variable (BGD) is explained by the independent variables. The adjusted R-squared of 0.957738 confirms the robustness of the model by accounting for the degrees of freedom. The low standard error of regression (6.079141) and the Durbin-Watson statistic (2.156273) suggest minimal autocorrelation and good model fit.

Model diagnostics further support the robustness of the results. The Akaike information criterion (6.456262), Schwarz criterion (6.486158), and Hannan-Quinn criterion (6.468321) provide consistent values, indicating a well-specified model. The relatively low sum of squared residuals (8425.959) aligns with the high explanatory power of the model, reinforcing the reliability of the findings.

While the direct effect of a gender-diverse board on firm performance is not statistically significant in this analysis, its potential indirect contributions to enhancing governance and decision-making cannot be discounted. The strong relationship between market price and firm value underscores the importance of external perceptions in driving firm performance. Policymakers and firms may consider fostering board diversity as a strategic complement to financial management practices, aligning with broader objectives of sustainable corporate governance.

5.0 Summary, conclusion and recommendations

5.1 Findings

Result of hypothesis 1 revealed significant coefficients of both CCC and CPP demonstrate that cash management has a meaningful impact on board gender diversity in Nigerian manufacturing firms. This highlights the importance of integrating gender diversity considerations into financial decision-making processes to enhance firm value through effective cash management.

Furthermore, the result of hypothesis 11 revealed that gender-diverse board has positive and

significant effect on corporate cash management with t-Statistic of 38.02533 and 2.449096 and probability value of 0.0000 and 0.0151 for cash conversion cycle and cash payment period. Specifically, the inclusion of female folk in a board has a far reaching positive effects on the financial progress of an organization.

5.2 Conclusion

The findings of this study underscore the crucial interplay between cash management and board gender diversity in enhancing the value of Nigerian manufacturing firms. The significant coefficients of cash conversion cycle (CCC) and cash payment period (CPP) reveal that effective cash management positively impacts firm performance, particularly when gender diversity is integrated into the board composition. A gender-diverse board demonstrates a meaningful and positive influence on cash management practices, as evidenced by the t-statistics and probability values obtained. These results highlight the potential for Nigerian manufacturing firms to leverage on board diversity as a strategic tool to optimize financial decision making and ultimately enhance firm value.

5.3 Recommendations

1. Manufacturing firms in Nigeria should prioritize gender diversity in their board appointments. A balanced representation of genders can bring diverse perspectives, enhance decision-making, and lead to more effective cash management practices.
2. Regulatory bodies and industry stakeholders should emphasize the integration of gender diversity as a key component of corporate governance guidelines. This could involve setting minimum diversity thresholds for board compositions across sectors.
3. Firms should invest in training programs that equip board members, particularly from underrepresented groups, with the skills and knowledge needed to contribute effectively to financial and operational decisions, including cash management.
4. Companies should adopt best practices in cash management, including optimizing their cash conversion cycles and payment periods, while considering the unique insights provided by a gender-diverse board to achieve superior financial outcomes.

5. Establishing systems to regularly monitor and report on the impact of board diversity on financial outcomes, particularly cash management, will help identify areas for improvement and ensure sustained progress toward enhancing firm value.

Conflicts of Interest

The authors have disclosed no conflicts of interest.

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Appendix I
Processed Data Obtained from the sampled firms

Year	Earnings per share	MP	CCC	CPP	BGD	Cash Effective Tax	LEV	FSize
2014	0.23	1.96	15.76	-27.88	13.72	3.18	0.784	23487
2015	1.06	2.19	9.23	-5.88	15.33	8.13	0.876	78804
2016	0.47	1.86	10.51	-6.63	13.02	2.16	0.744	97211
2017	4.51	1.93	10.17	-9.33	13.51	12.92	0.772	2382
2018	4.21	1.26	9.15	-9.31	8.82	4.87	0.504	2372
2019	4.4	2.14	6.28	-13.69	14.98	20.47	0.856	16241
2020	1.23	3.25	10.05	-6.53	22.75	1.53	1.3	99503
2021	0.27	1.78	2.95	-4.77	12.46	5.83	0.712	97211
2022	7.79	1.33	6.38	-12.77	9.31	5.37	0.532	3920
2023	6.24	0.48	5.15	-21.06	3.36	14.48	0.192	6945
2014	3.47	0.89	9.61	-22.47	6.23	15.07	0.356	2090
2015	0.66	3.65	8.73	-6.38	25.55	3.81	1.46	78271
2016	7.34	1.81	6.59	-67.82	12.67	64.75	0.724	15909
2017	0.99	2.53	8.06	21.48	17.71	11.04	1.012	1779
2018	0.12	1.95	15.56	7.17	13.65	15.26	0.78	1879

2019	3.33	1.79	9.63	16.28	12.53	11.14	0.716	65965
2020	0.92	4.24	9.08	25	29.68	5.12	1.696	55593
2021	2.11	2.65	9.05	20.31	18.55	9.91	1.06	2231
2022	7.49	3.4	5.57	17.85	23.8	12.83	1.36	2452
2023	7.17	0.76	5.07	14.6	5.32	11.71	0.304	6904
2014	0.39	1.57	8.57	-70	10.99	5.31	0.628	75618
2015	3.04	3.12	10.56	14.19	21.84	9.66	1.248	12794
2016	0.86	3.03	7.29	26.75	21.21	1.85	1.212	31497
2017	0.18	-1.6	-2.98	29	11.2	11.65	-0.64	51658
2018	2.88	3.79	10.86	14.51	26.53	12.73	1.516	1889
2019	0.98	2.8	8.03	23.65	19.6	3.95	1.12	54623
2020	2.06	2.29	8.38	18.3	16.03	12.49	0.916	3507
2021	0.88	2.62	7.31	24.83	18.34	12.09	1.048	12753
2022	7.01	0.78	4.47	14.96	5.46	13.46	0.312	11728
2023	7.14	3.1	5.21	12.52	21.7	14.59	1.24	35005
2014	0.37	1.43	8.89	29.34	10.01	1.61	0.572	3131
2015	0.84	2.91	6.42	28.08	20.37	1.51	1.164	5281
2016	0.29	-1.66	-2.05	22.89	11.62	7.11	-0.664	4663
2017	0.13	1.51	11.98	6.92	10.57	1.09	0.604	43370
2018	6.65	1.21	5.74	15.84	8.47	14.92	0.484	10764
2019	2.61	1.96	8.37	10.05	13.72	20.83	0.784	11849
2020	3.28	3.87	9.1	22.05	27.09	14.5	1.548	2724
2021	0.79	2.81	7.85	21.38	19.67	4.2	1.124	593
2022	1.66	2.92	9.49	21.51	20.44	9.23	1.168	1126
2023	0.76	2.32	6.8	11.18	16.24	7.57	0.928	61334
2014	6.57	0.76	4.71	15.65	5.32	15.64	0.304	12975
2015	7.27	1.9	5.94	14.45	13.3	12.87	0.76	34642
2016	0.32	2.5	10.28	27.14	17.5	0	1	23554
2017	0.62	1.69	5.49	28.05	11.83	1.72	0.676	45864
2018	2.3	2.03	8.69	3.63	14.21	20.44	0.812	3618
2019	0.11	-0.98	-1.97	19.96	6.86	34.85	-0.392	33386
2020	0.09	1.35	8.61	-0.67	9.45	7.06	0.54	53663
2021	6.16	1.78	6.3	13.49	12.46	16.48	0.712	40672
2022	0.3	2.76	9.42	29.01	19.32	8.25	1.104	1538
2023	5.67	1.63	5.81	17.45	11.41	14.02	0.652	60562
2014	1.33	2.09	6.72	14.09	14.63	11.9	0.836	1578
2015	-1.28	-0.6	-1.65	25.26	4.2	-4.28	-0.24	9085
2016	0.06	1.69	6.82	4.88	11.83	11.44	0.676	31296
2017	2.14	2.6	6.96	7.42	18.2	11.81	1.04	3759
2018	0.86	0.89	3.21	24.13	6.23	4.25	0.356	1457
2019	2.3	1.52	6.69	4.66	10.64	19.63	0.608	14763
2020	4.81	2.42	6.49	9.1	16.94	16.85	0.968	7859
2021	0.65	1.97	5.78	22.88	13.79	4.91	0.788	2633
2022	0.48	1.63	5.28	12.1	11.41	3.59	0.652	422

2023	6.06	1.1	4.46	15.13	7.7	12.49	0.44	7035
2014	0.18	1.91	8.74	16.04	13.37	10.26	0.764	66492
2015	2.85	2.12	6.48	6.65	14.84	21.24	0.848	3950
2016	0.19	1.75	4.93	9.78	12.25	29.94	0.7	2342
2017	2.47	2.07	6.67	9.08	14.49	8.86	0.828	62742
2018	0.72	1.87	5.56	18.23	13.09	11.91	0.748	662352
2019	0.48	1.8	7.13	4.69	12.6	34.38	0.72	3427
2020	4.13	1.49	5.73	12.71	10.43	14.32	0.596	158810
2021	0.91	1.19	3.61	27.8	8.33	1.71	0.476	5447
2022	2.12	4.39	6.82	9.72	30.73	21.6	1.756	65345
2023	0.07	1.9	7.75	8.9	13.3	9.8	0.76	2010
2014	4.71	1.24	5.17	10.1	8.68	15.79	0.496	5126
2015	0.34	1.72	6	18	12.04	21.08	0.688	64121
2016	0.06	1.43	7.61	6.42	10.01	9	0.572	1879
2017	0.82	0.95	3.29	26.18	6.65	0.09	0.38	7460
2018	0.24	1.83	6.14	-8.72	12.81	49.99	0.732	67295
2019	1.82	1.02	7.28	17.14	7.14	10.23	0.408	6352
2020	3.53	1.21	5.1	12.39	8.47	19.31	0.484	82269
2021	0.48	1.52	5.71	29.14	10.64	6.54	0.608	864
2022	1.89	1.7	6.27	9.87	11.9	35.96	0.68	56682
2023	0.12	1.57	4.37	-70.16	10.99	26.34	0.628	1688
2014	2.28	1.47	6.05	17.78	10.29	8.34	0.588	3538
2015	0.42	1.07	6.2	0.42	7.49	57.02	0.428	2553
2016	0.36	1.18	7.37	23.43	8.26	14.85	0.472	3005
2017	3.37	1.44	5.74	14.12	10.08	20.98	0.576	5879
2018	3.17	1.2	5.8	13.02	8.4	13.67	0.48	82129
2019	1.12	1.72	6.29	22.44	12.04	16.1	0.688	63337
2020	1.57	1.17	3.54	28.48	8.19	0.24	0.468	45650
2021	2.31	1.47	7.31	19.19	10.29	33.73	0.588	-6442
2022	1.6	2.26	6.9	10.02	15.82	16.47	0.904	23376
2023	0.06	1.82	7.74	6.68	12.74	11.8	0.728	55864
2014	0.42	0.91	8.73	13.78	6.37	8.77	0.364	125424
2015	3.47	0.97	5.29	14.8	6.79	13	0.388	32572
2016	1.56	1.23	9.41	15.24	8.61	16.8	0.492	8814
2017	0.09	0.79	4.42	8.39	5.53	3.12	0.316	1327
2018	1.89	1.34	6.59	12.78	9.38	13.82	0.536	2583
2019	0.48	1.12	5.86	18.92	7.84	11.94	0.448	4251
2020	3.04	0.71	5.21	16.18	4.97	17.83	0.284	7467
2021	0.81	1.04	6.02	17.99	7.28	12.86	0.416	8281
2022	1.04	1	6.02	13.63	7	14.25	0.4	3879
2023	0.37	1.61	4.03	11.85	11.27	1.98	0.644	65141
2014	0.08	0.73	5.99	11.99	5.11	5.02	0.292	704
2015	0.27	0.68	5.61	15.52	4.76	25.2	0.272	15196
2016	-0.59	2.56	13.31	-2.87	17.92	-1.19	1.024	1719

2017	2.16	1	7.21	7.33	7	8.67	0.4	5688
2018	0.38	0.99	10.15	18.88	6.93	6.8	0.396	61447
2019	3.17	1.06	5.43	14.06	7.42	16.06	0.424	5316
2020	1.52	1.05	10.24	13.13	7.35	14.93	0.42	13095
2021	1.59	1.07	6.51	13.33	7.49	24.11	0.428	69296
2022	3.21	0.46	4.66	26.55	3.22	12.54	0.184	12412
2023	1.66	0.87	9.81	28.98	6.09	8.61	0.348	1910
2014	2.33	0.79	6.26	11.63	5.53	24.21	0.316	101535
2015	1.02	2.4	7.09	16.62	16.8	38.37	0.96	15638
2016	0.8	0.46	5.88	23.07	3.22	8.88	0.184	66683
2017	1.72	1.26	6.24	26.36	8.82	16.44	0.504	5899
2018	0.16	0.44	5.69	25.72	3.08	9.89	0.176	42221
2019	0.63	0.22	4.66	13.96	1.54	11.35	0.088	5718
2020	0.55	0.43	10.44	22.72	3.01	4.61	0.172	62332
2021	0.61	1.63	4.31	11.4	11.41	1.13	0.652	56432
2022	3.06	1.09	5.18	14.14	7.63	14.9	0.436	16693
2023	-0.42	53.86	190.21	28.01	377.02	-2.72	21.544	54955
2014	0.69	5.88	47.28	-83.64	41.16	9.54	2.352	10462
2015	3.18	6.57	27.69	-17.64	45.99	24.39	2.628	52412
2016	1.41	5.58	31.53	-19.89	39.06	6.48	2.232	5633
2017	13.53	5.79	30.51	-27.99	40.53	38.76	2.316	7146
2018	12.63	3.78	27.45	-27.93	26.46	14.61	1.512	7115
2019	13.2	6.42	18.84	-41.07	44.94	61.41	2.568	48722
2020	3.69	9.75	30.15	-19.59	68.25	4.59	3.9	41508
2021	0.81	5.34	8.85	-14.31	37.38	17.49	2.136	55633
2022	23.37	3.99	19.14	-38.31	27.93	16.11	1.596	11759
2023	18.72	1.44	15.45	-63.18	10.08	43.44	0.576	20834
2014	10.41	2.67	28.83	-67.41	18.69	45.21	1.068	6271
2015	1.98	10.95	26.19	-19.14	76.65	11.43	4.38	44814
2016	22.02	5.43	19.77	-203.46	38.01	194.25	2.172	47727
2017	2.97	7.59	24.18	64.44	53.13	33.12	3.036	5337
2018	0.36	5.85	46.68	21.51	40.95	45.78	2.34	5638
2019	9.99	5.37	28.89	48.84	37.59	33.42	2.148	2894
2020	2.76	12.72	27.24	75	89.04	15.36	5.088	1779
2021	6.33	7.95	27.15	60.93	55.65	29.73	3.18	6693
2022	22.47	10.2	16.71	53.55	71.4	38.49	4.08	7357
2023	21.51	2.28	15.21	43.8	15.96	35.13	0.912	20713
2014	1.17	4.71	25.71	-210	32.97	15.93	1.884	46853
2015	9.12	9.36	31.68	42.57	65.52	28.98	3.744	38381
2016	2.58	9.09	21.87	80.25	63.63	5.55	3.636	4492
2017	0.54	-4.8	-8.94	87	-33.6	34.95	-1.92	4975
2018	8.64	11.37	32.58	43.53	79.59	38.19	4.548	5668
2019	2.94	8.4	24.09	70.95	58.8	11.85	3.36	13869
2020	6.18	6.87	25.14	54.9	48.09	37.47	2.748	10522

2021	2.64	7.86	21.93	74.49	55.02	36.27	3.144	38260
2022	21.03	2.34	13.41	44.88	16.38	40.38	0.936	35185
2023	21.42	9.3	15.63	37.56	65.1	43.77	3.72	15015
2014	1.11	4.29	26.67	88.02	30.03	4.83	1.716	23392
2015	2.52	8.73	19.26	84.24	61.11	4.53	3.492	23844
2016	0.87	-4.98	-6.15	68.67	34.86	21.33	-1.992	41990
2017	0.39	4.53	35.94	20.76	31.71	3.27	1.812	34211
2018	19.95	3.63	17.22	47.52	25.41	44.76	1.452	32291
2019	7.83	5.88	25.11	30.15	41.16	62.49	2.352	35547
2020	9.84	11.61	27.3	66.15	81.27	43.5	4.644	8171
2021	2.37	8.43	23.55	64.14	59.01	12.6	3.372	1779
2022	4.98	8.76	28.47	64.53	61.32	27.69	3.504	3377
2023	2.28	6.96	20.4	33.54	48.72	22.71	2.784	1839
2014	19.71	2.28	14.13	46.95	15.96	46.92	0.912	38924
2015	21.81	5.7	17.82	43.35	39.9	38.61	2.28	10392
2016	0.96	7.5	30.84	81.42	52.5	0	3	33344
2017	1.86	5.07	16.47	84.15	35.49	5.16	2.028	2593
2018	6.9	6.09	26.07	10.89	42.63	61.32	2.436	10854
2019	0.33	-2.94	-5.91	59.88	20.58	104.55	-1.176	100158
2020	0.27	4.05	25.83	-2.01	28.35	21.18	1.62	31990
2021	18.48	5.34	18.9	40.47	37.38	49.44	2.136	122017
2022	0.9	8.28	28.26	87.03	57.96	24.75	3.312	34613
2023	17.01	4.89	17.43	52.35	34.23	42.06	1.956	411676
2014	3.99	6.27	20.16	42.27	43.89	35.7	2.508	334734
2015	-3.84	-1.8	-4.95	75.78	12.6	-12.84	-0.72	927256
2016	0.18	5.07	20.46	14.64	35.49	34.32	2.028	63889
2017	6.42	7.8	20.88	22.26	54.6	35.43	3.12	11276
2018	2.58	2.67	9.63	72.39	18.69	12.75	1.068	4372
2019	6.9	4.56	20.07	13.98	31.92	58.89	1.824	44290
2020	14.43	7.26	19.47	27.3	50.82	50.55	2.904	23577
2021	1.95	5.91	17.34	68.64	41.37	14.73	2.364	67899
2022	1.44	4.89	15.84	36.3	34.23	10.77	1.956	1266
2023	18.18	3.3	13.38	45.39	23.1	37.47	1.32	21105
2014	0.54	5.73	26.22	48.12	40.11	30.78	2.292	61477
2015	8.55	6.36	19.44	19.95	44.52	63.72	2.544	11849
2016	0.57	5.25	14.79	29.34	36.75	89.82	2.1	67025
2017	7.41	6.21	20.01	27.24	43.47	26.58	2.484	188226
2018	2.16	5.61	16.68	54.69	39.27	35.73	2.244	667055
2019	1.44	5.4	21.39	14.07	37.8	103.14	2.16	10281
2020	12.39	4.47	17.19	38.13	31.29	42.96	1.788	4076431
2021	2.73	3.57	10.83	83.4	24.99	5.13	1.428	16341
2022	6.36	13.17	20.46	29.16	92.19	64.8	5.268	196035
2023	0.21	5.7	23.25	26.7	39.9	29.4	2.28	6030
2014	14.13	3.72	15.51	30.3	26.04	47.37	1.488	15377

2015	1.02	5.16	18	54	36.12	63.24	2.064	12362
2016	0.18	4.29	22.83	19.26	30.03	27	1.716	5638
2017	2.46	2.85	9.87	78.54	19.95	0.27	1.14	66181
2018	0.72	5.49	18.42	-26.16	38.43	149.97	2.196	201884
2019	5.46	3.06	21.84	51.42	21.42	30.69	1.224	19055
2020	10.59	3.63	15.3	37.17	25.41	57.93	1.452	246808
2021	1.44	4.56	17.13	87.42	31.92	19.62	1.824	662593
2022	5.67	5.1	18.81	29.61	35.7	107.88	2.04	170046
2023	0.36	4.71	13.11	-210.48	32.97	79.02	1.884	765065
2014	6.84	4.41	18.15	53.34	30.87	25.02	1.764	10613
2015	1.26	3.21	18.6	1.26	22.47	171.06	1.284	7658
2016	1.08	3.54	22.11	70.29	24.78	44.55	1.416	9015
2017	10.11	4.32	17.22	42.36	30.24	62.94	1.728	17638
2018	9.51	3.6	17.4	39.06	25.2	41.01	1.44	246386
2019	3.36	5.16	18.87	67.32	36.12	48.3	2.064	10010
2020	4.71	3.51	10.62	85.44	24.57	0.72	1.404	14451
2021	6.93	4.41	21.93	57.57	30.87	101.19	1.764	19326
2022	4.8	6.78	20.7	30.06	47.46	49.41	2.712	70129
2023	0.18	5.46	23.22	20.04	38.22	35.4	2.184	2593
2014	1.26	2.73	26.19	41.34	19.11	26.31	1.092	376272
2015	10.41	2.91	15.87	44.4	20.37	39	1.164	97716
2016	4.68	3.69	28.23	45.72	25.83	50.4	1.476	26442
2017	0.27	2.37	13.26	25.17	16.59	9.36	0.948	3980
2018	5.67	4.02	19.77	38.34	28.14	41.46	1.608	7749
2019	1.44	3.36	17.58	56.76	23.52	35.82	1.344	12753
2020	9.12	2.13	15.63	48.54	14.91	53.49	0.852	22401
2021	2.43	3.12	18.06	53.97	21.84	38.58	1.248	24844
2022	3.12	3	18.06	40.89	21	42.75	1.2	11638
2023	1.11	4.83	12.09	35.55	33.81	5.94	1.932	42442
2014	0.24	2.19	17.97	35.97	15.33	15.06	0.876	2111
2015	0.81	2.04	16.83	46.56	14.28	75.6	0.816	45587
2016	-1.77	7.68	39.93	-8.61	53.76	-3.57	3.072	5156
2017	6.48	3	21.63	21.99	21	26.01	1.2	17065
2018	1.14	2.97	30.45	56.64	20.79	20.4	1.188	4342
2019	9.51	3.18	16.29	42.18	22.26	48.18	1.272	15949
2020	4.56	3.15	30.72	39.39	22.05	44.79	1.26	39285
2021	4.77	3.21	19.53	39.99	22.47	72.33	1.284	27889
2022	9.63	1.38	13.98	79.65	9.66	37.62	0.552	37235
2023	4.98	2.61	29.43	86.94	18.27	25.83	1.044	5729
2014	6.99	2.37	18.78	34.89	16.59	72.63	0.948	304605
2015	3.06	7.2	21.27	49.86	50.4	115.11	2.88	46913
2016	2.4	1.38	17.64	69.21	9.66	26.64	0.552	2050
2017	5.16	3.78	18.72	79.08	26.46	49.32	1.512	17698
2018	0.48	1.32	17.07	77.16	9.24	29.67	0.528	6663

2019	1.89	0.66	13.98	41.88	4.62	34.05	0.264	17155
2020	1.65	1.29	31.32	68.16	9.03	13.83	0.516	6995
2021	1.83	4.89	12.93	34.2	34.23	3.39	1.956	1296
2022	9.18	3.27	15.54	42.42	22.89	44.7	1.308	50079
2023	-1.26	161.58	570.63	84.03	111.6	-8.16	64.632	2864

APPENDIX II
DESCRIPTIVE STATISTICS

	EPS	MP	CCC	CPP	GDB	LEV	FSIZE
Mean	3.952261	3.472609	14.12522	20.56239	25.19452	1.389043	68669.93
Median	2.085000	2.605000	10.16000	20.53500	18.44500	1.042000	15286.50
Maximum	23.37000	53.86000	190.2100	88.02000	377.0200	21.54400	4076431.
Minimum	-3.840000	-4.980000	-8.940000	-210.4800	-33.60000	-1.992000	-6442.000
Std. Dev.	5.174670	4.329557	14.92091	40.05471	29.57100	1.731823	290425.0
Skewness	2.012364	7.054716	7.311840	-2.472431	7.584745	7.054716	11.80042
Kurtosis	6.826580	81.18144	85.58308	15.35679	88.52236	81.18144	159.7805
Jarque-Bera	295.5611	60484.38	67407.41	1697.611	72298.47	60484.38	240897.6
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	909.0200	798.7000	3248.800	4729.350	5794.740	319.4800	15794083
Sum Sq. Dev.	6131.981	4292.619	50983.07	367402.9	200247.7	686.8191	1.93E+13
Observations	230	230	230	230	230	230	230

APPENDIX III
RESULT OF HYPOTHESIS ONE

Dependent Variable: BGD
Method: Panel Least Squares
Date: 12/08/24 Time: 16:15
Sample: 2014 2023
Periods included: 10
Cross-sections included: 23
Total panel (balanced) observations: 230

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CCC	1.734955	0.045626	38.02533	0.0000
CPP	0.051022	0.020833	2.449096	0.0151
R-squared	0.797014	Mean dependent var		25.19452
Adjusted R-squared	0.796124	S.D. dependent var		29.57100
S.E. of regression	13.35208	Akaike info criterion		8.029879
Sum squared resid	40647.38	Schwarz criterion		8.059775
Log likelihood	-921.4361	Hannan-Quinn criter.		8.041938
Durbin-Watson stat	1.702261			

APPENDIX IV
RESULT OF HYPOTHESIS TWO

Dependent Variable: BGD
Method: Panel Least Squares
Date: 12/08/24 Time: 16:16
Sample: 2014 2023
Periods included: 10
Cross-sections included: 23
Total panel (balanced) observations: 230

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MP	6.891803	0.081762	84.29070	0.0000
EPS	0.040870	0.069696	0.586403	0.5582
R-squared	0.957922	Mean dependent var		25.19452
Adjusted R-squared	0.957738	S.D. dependent var		29.57100
S.E. of regression	6.079141	Akaike info criterion		6.456262
Sum squared resid	8425.959	Schwarz criterion		6.486158
Log likelihood	-740.4701	Hannan-Quinn criter.		6.468321
Durbin-Watson stat	2.156273			