Corporate Governance and Working Capital Management of Listed Manufacturing Firms in Nigeria

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ABSTRACT

This study examined the effect of corporate governance, specifically board size, board independence and board meetings, on the working capital management of listed manufacturing firms in Nigeria. The study covered the period from 2008 to 2022 and employed an ex-post facto research design, with a population consisting of 46 listed manufacturing firms on the Nigerian Exchange. A sample of 20 firms was selected using a filtering technique. Multiple linear regression analysis was used. The findings revealed that larger board sizes are associated with more efficient working capital management, as indicated by a shorter cash conversion cycle. Board independence was found to have a negative but insignificant effect on working capital management efficiency. Also, more frequent board meetings were related to less efficient working capital management, resulting in a longer cash conversion cycle. The study concluded that larger board sizes are associated with more efficient working capital management. On the other hand, excessive board meetings might only lead to inefficiencies or distractions that hinder effective working capital management. The study further concluded that the effect of board independence on working capital management is trivial as the presence of the independent directors do not significantly affect working capital management of sampled firms. The study recommended that increasing board size may enhance a firm's ability to manage its working capital effectively. Furthermore, the study recommended that firms should also strategically plan board meetings to ensure they are productive and focused on key issues.

Keywords: Working capital, corporate governance, cash conversion cycle, board size, board independence, board meeting

INTRODUCTION

Working capital management encompasses the managerial endeavor towards the efficient administration of current assets and liabilities, it plays an important role in upholding liquidity, solvency, survival, and profitability of any business (Karabay et al. 2022). According to Itan and Angelina (2022), working capital management focuses on the short-term financial handling of various elements of working capital, including inventories, receivables, payables, and cash. The working capital of a firm is so essential to its operation that if properly managed will guarantee sufficient cash flow to satisfy maturing short-term debts as and when due, ensure that the firm can sustain its operations, meet upcoming operational expenses, and gain competitive advantage (Gbalam & Uzochukwu, 2020). Over the past two decades, effective working capital management has grown increasingly important for firms to survive crises (Jamalinesari & Soheili, 2015). Although profitability may be considered as the governing factor of a business, if working capital is not effectively managed, the business may come to a stop, regardless of whether it was successful and profitable (Ibrahim et al, 2021). In other words, it is important to note that it is not enough with high profitability to be a successful company, but an effectively managed working capital is also important for success.

Corporate governance plays an important role in overseeing working capital through the development of effective policies. The Board of Directors and the CEO have the basic responsibility of formulating policies concerning accounts payable, accounts receivable, cash management, inventory procurement and maintenance, and other organizational policies (Megeid, 2015). Aligned with the principles of The Nigerian Code of Corporate Governance (2018), it is imperative for firms to adopt and implement robust corporate governance structures to

effectively achieve the strategic objectives of the company. These governance mechanisms encompass various aspects such as board size, CEO tenure, Audit committee independence, board diversity, CEO duality, Board independence, board meetings, board leadership structure, CEO remuneration, among others.

Nigeria with a population of over 200 million and obviously one of the biggest markets in Africa ought to be a strong market for its manufacturing sector (National Bureau of Statistics, 2022). However, the sector has been operating under very unfavorable environment which has resulted in the inability to compete globally and earn foreign exchange for the economy and also in the inability to provide employment opportunities in the country where the rate of unemployment is very high (Emmanuel, 2017). Firms in this sector have continually faced crucial challenges like inadequate resource linked to poor working capital management, poor liquidity levels, firms operating without credit control department and increased cases of bankruptcy making it difficult for the sector to succeed (Ochieng et al., 2020). Numerous businesses worldwide, including those seen as too large to fail, have faced crises and scandals due to poor corporate governance, which ultimately resulted in their demise. Among these corporate scandals and failures are Enron, WorldCom, Arthur Anderson, and Adelphia (Osundina et al., 2016). Also in Nigeria, there have equally been cases of scandals and failures, some of them include the case of Lever Brothers Plc (now Unilever) and Cadbury Nigeria Plc who were allegedly involved in multiple violations of corporate governance guidelines (Stephen & Benjamin, 2013). Also, some operating manufacturing companies in Nigeria are still unable to distribute dividends to their stockholders (Olaoye et al., 2019).

In addition to the corporate governance issues predominant in Nigerian manufacturing sector, so many boards are dominated by executive directors who, being part of the operations of the firm, develop conflict of interest and lack of accountability which results in poor decision making and might lead to poor working capital policies (Njoku, 2017). Because of sporadic meetings, the board has not been able to supervise management or give it guidance regarding working capital as it should have. Also, some board members who have served for a longtime in a firm tend to become management-friendly, losing their independence from the management (Adams et al., 2010). -Furthermore, Shareholders anticipate that the firm will only engage in activities that increase the value of their investments. However, such is not always the case; the board of directors' policies are not always advantageous to the firm. The value of the shareholders is significantly impacted by the company's poor cash conversion cycle policies (Gill & Bigger, 2012). These have contributed to a quest to understand the importance of pursuing a managed working capital and understanding the effect the corporate governance mechanisms may have on it.

While working capital management plays a critical role in determining the success of businesses, there has been a limited number of studies in this area. Although some researches like that of (Ahmed & Md-Rus, 2020; Akinlo, 2019; Chowdhury et al., 2018; Gorondutse et al., 2017; Leah et al., 2022; Novak et al., 2021; Olayiwola, 2018; Waheed & Nabi 2018; Wassie, 2021; Yahaya et al., 2019; Yogendrarajah & Thanabalasingam, 2011; Zhang et al., 2017) focused on the correlation between working capital management and profitability, few other studies like (Manoori & Muhammed, 2012; Mongrut et al., 2014; Nastiti et al., 2019; Onaolapo & Kajola, 2015; Parwani et al., 2021; Salawu & Alao, 2014; Tesfay & Batra, 2018; Tjandra et al., 2022) have investigated the determinants of working capital management. These studies indicated that working capital management is influenced by both firm-specific variables and macroeconomic factors. However, most of the studies in this area primarily emphasized factors like the size of the firm, its age, its leverage, and sales growth rate, and overlooked the significance of corporate governance structures, which could reasonably affect working capital management. In contrast, other studies such as (Abid et al., 2014; Ahmed et al., 2018; Chaudhry & Ahmed, 2015; Daqar, 2020; Gill & Bigger, 2013; Kengatharan & Tissera, 2019; Njoku, 2017; Sathyamoorthi et al., 2018; Wanjala et al., 2019) have focused on the impact of corporate governance on working capital management efficiency, arguing that various corporate governance factors including board meetings, board size, director independence, CEO tenure, independence of the audit committee, as well as CEO remuneration, have a considerable influence on working capital management efficiency.

In contrast, studies such as Kamau & Basweti, 2013; and Haider et al, 2019 hold a different viewpoint, concluding that corporate governance has no significant effect on working capital management efficiency, which has resulted in mixed results. Additionally, these studies were primarily conducted in developed countries where the business environment and market mechanisms differ significantly from developing countries, especially Nigeria, and focused on sectors or industries other than manufacturing firms. Moreover, the effect of corporate

governance on working capital management in Nigerian manufacturing firms remains underexplored. Although Njoku (2017) explored this matter by conducting a study on the impact of corporate governance on working capital management within Nigerian organizations, the study only covered a period of two years from 2013-2014, when the Nigerian economy and business operations were slightly different. Therefore, more recent and in-depth research is required in this area in Nigeria. Hence, this study aims to fill the gap and thus, the following null hypotheses are formulated:

H_{01}: Board size has no significant effect on working capital management of listed manufacturing firms in Nigeria.

H_{02}: Board independence has no significant effect on working capital management of listed manufacturing firms in Nigeria.

H_{03}: Board meeting has no significant effect on working capital management of listed manufacturing firms in Nigeria.

This study would be extremely significant to various stakeholders including the board of directors, shareholders, researchers, regulatory bodies among others as it will guide them in crafting policies, investment decision and cataloguing empirical evidence. The study covers a period of fifteen (15) years, from 2008 to 2022. This period was selected to broaden the scope of earlier research as well as capture the economic recession and post pandemic era. This study intends to focus on manufacturing firms listed on the Nigerian Exchange and this is because, working capital has emerged as one of the most important financial priorities for manufacturing firms in recent years.

This study is divided into five sections. Section one is the introduction, section two literature review, section three will discuss the methodology adopted for the study, section four will present the result and discussion from the data analysis and finally section five will present the conclusion and recommendation of the study.

LITERATURE REVIEW

This section focuses on conceptual, theoretical and empirical review that are discussed below.

Conceptual Review

Working capital is defined as the excess of current assets over current liabilities. It is capital for managing short-term assets such as cash, inventories, receivables, marketable securities etc. (Lamichhane, 2019). Chowdhury et al (2018) opined that working capital is a firm's investment in current assets and is therefore an investment activity and is required to keep the current operations going. Working capital is further defined by Karabay et al, (2022) as a measure of the capability of paying liabilities back in case of liquidation. Working capital is a blend of two components that are current assets and current liabilities, which consist of accounts payable, accounts receivable, cash holdings, cash balance and inventory holdings.

Working capital is crucial to a business's operations and is closely related to its liquidity. A sufficient level of liquidity ensures that businesses can pay their short-term debts and prevents working capital from becoming blocked with excess cash. Therefore, efficient working capital management is essential to guarantee business continuity, ensure its survival, and reduce financial difficulties (Gulzar & Haque, 2023).

Working capital management has been measured by different proxies in various research. They include current ratio, quick or acid test ratio, cash conversion efficiency, cash holdings, net operating working capital (NWC), cash conversion cycle (CCC), difference between liquid assets and liquid liabilities and so on. However, for this study, working capital management will be proxied by cash conversion cycle. This is because aside from revealing the liquidity position of a firm, it specifically measures the time it would take for a company to convert its initial investment in cash into more cash which will serve as a guide for improving working capital of a firm.

Cash Conversion Cycle refers to the number of operating days that require funding. In other words, it is the average amount of time between the expenditure of money on raw materials and the receipt of money from the sale of manufactured goods (Upreti & Kulshrestha, 2022). Cash conversion cycle assesses how quickly a business can turn its cash on hand into inventories, creditors, sales, and debtors, and then back into cash (Njoku, 2017). It is calculated as: (Average Inventory Conversion Period + Average Receivable Collection Period) – Average Payable Deferral Period. The inventory conversion period represents the duration a company holds its funds in inventory or stocks. For manufacturing firms, which often have significant portions of their current assets tied up in inventory, holding excessive stock for prolonged periods can severely impact liquidity. When funds are tied up in inventory for too long, operational efficiency is compromised (Majanga, 2015).

Conversely, the receivable collection period indicates the average time it takes for a company's trade debtors to settle their accounts. To maintain optimal liquidity, it is crucial for firms to minimize the receivable collection period. Lastly, the payment deferral period reflects the number of days a business postpones payments to creditors and suppliers. Extending payment periods can temporarily enhance liquidity; however, businesses must exercise caution to avoid jeopardizing relationships with key and reliable suppliers due to delayed payments.

Corporate governance, is defined by Abid et al. (2014) as the relationship between a company's board of directors, shareholders, and other stakeholders. It encompasses the processes, procedures, customs, policies, and laws that guide and regulate the organization (Kumar & Jindal, 2019). In a similar vein, corporate governance is defined by Kajananthan and Achchuthan (2013) as the systems and procedures that guarantee that the company is managed and overseen in a manner that maximizes long-term shareholder value. It encompasses the leadership, stewardship, authority, accountability, direction and control exercised in the process of managing organizations. Corporate governance plays a significant role in the development of sound working capital management policies. It describes the framework for managing and controlling organizations and includes the interactions between a company's board of directors, top management, and shareholders. These interactions provide the framework for establishing company objectives and monitoring performance (Megeid, 2015). Various studies have used different corporate governance mechanisms which consists of board independence, board size, diversity of board members, institutional ownership, CEO tenure, board gender, board meeting, CEO compensation, CEO duality and so on. However, this study will focus on three corporate governance mechanisms: Board size, Board independence and Board meeting.

Board size is defined by Lawal (2012) as the total number of directors who sit on a board of directors. The size of the board highly determines the ideal level of short-term capital that an organization requires (Gill & Shah, 2012). The phrase "board size" describes the total number of directors on a board of directors. As a variable that is frequently used in the literature on corporate governance, it is computed by counting the number of directors on a company's board of directors for each accounting year, including the CEO and Chairman, executive directors, non-executive directors, and outside directors (Kudal & Dawar, 2020). Board independence according to Umar et al. (2022) refers to when majority of the board of directors are non-executive directors. These independent directors have a substantial influence on decision-making and contribute a variety of skills and knowledge to the organization's effective and efficient operation (Gulzar & Haque, 2023). According to Chaudhry and Ahmed (2015) board independence increases working capital management effectiveness because having outside directors on the board ensures that the management develops the best working capital management policies. Kyereboah-Coleman (2008) asserted that for efficient control, the board of directors should consist of more non-executive directors (NEDs) as this lessens conflicts of interest and ensures a board's independence in overseeing and making fair and unbiased judgments about management. Board meeting is a crucial board characteristic that assesses how frequently meetings are held to evaluate the efficacy of the board. The board's meeting count is the total number of board of directors' meetings held annually (Akpan & Amran, 2014). In a study by Kudal and Dawar (2020), a board meeting was described as a formal gathering of the board of directors of an organization and any invited guests, held at regular intervals and as necessary to discuss important issues, evaluate performance, and conduct the board's legal business.

Theoretical Review

The agency theory, introduced by Jensen and Meckling in 1976, serves as the grand theory of corporate governance. The theory identifies agency problems that arise due to information asymmetry and unethical

behavior of management, leading to the formulation of mechanisms such as audit committees, board independence, external audits, relevant policies, laws, and regulations that ensure managers act in the best interests of the business's owners. In particular, several studies such as Njoku (2017), Sathyamoorthi et al. (2018), and Kengatharan and Tissera (2019) have highlighted the applications of the agency theory in defining the relationship between corporate governance mechanisms and the efficiency of working capital management.

Numerous disciplines have utilized this theory to investigate relationships between principals and agents. Researchers such as Njoku (2017), Sathyamoorthi et al. (2018), and Kengatharan and Tissera (2019) have highlighted the applications of agency theory in defining the relationship between corporate governance mechanisms and working capital management efficiency. The theory is significant as it underpins the development of policies governing organizational governance. Mechanisms such as audit committees, board independence, external audits, and relevant laws and regulations are implemented primarily to control agency problems and ensure that managers act in the best interests of the business's owners (Homayoun & Homayoun, 2015).

Empirical Review

Gulzar and Haque (2023) conduct research on the working capital efficiency of manufacturing firms from emerging markets and the implications of corporate governance on it. Their study covers the period from 2014 to 2019 and included the top firms listed on the Bombay Stock Exchange (BSE). To examine the relationship between working capital efficiency and corporate governance, panel econometric methodology based on Generalized Least Squares (GLS) was utilized. The findings of the study showed that board independence has a positive and significant impact on working capital management. This implies that independent directors pay proper attention to creditors in paying off short-term debts to maintain credibility in the market.

Khan et al. (2021) conducted a panel study to investigate the mediating role of working capital management in the relationship between corporate governance measures and firm performance. The study population covered all listed non-financial corporations in the Pakistan Stock Exchange (PSE), which encompassed 140 companies obtained using a non-probabilistic sampling technique explicitly purposive sampling. The authors analyzed data collected from annual reports of these companies over eight years (2008 to 2015) using structural equation modeling. The study used a balanced data panel matrix that consisted of a time series in the dataset for each cross-sectional member. Ultimately, the results revealed no significant relationships between the independence of the board and working capital management.

Kengatharan and Tissera (2019) also examined the impact of corporate governance practices on the effectiveness of working capital management in Sri Lanka's manufacturing sector. They gathered data from the annual reports of 30 publicly listed manufacturing firms from the period of 2013 to 2017. Pearson correlation was used to evaluate the relationship between working capital management effectiveness and corporate governance practices. OLS regression analysis was employed to assess the explanatory power of these governance practices on working capital management effectiveness. The study revealed that board size has no significant impact on working capital management, while board meetings were found to significantly enhance the cash conversion cycle. Additionally, Kumar and Jindal (2019) found that non-executive directors have a negative and significant association with working capital in their study on the impact of corporate governance on the profitability and working capital management of the Indian manufacturing sector.

In a separate study, Sathyamoorthi et al. (2018) analyzed the impact of corporate governance on the efficiency of working capital management in Botswana's consumer services sector. They used a sample of six companies, resulting in 36 observations taken from annual reports available on the companies' websites over the 2012 to 2017 period. OLS regression analysis was used to determine the degree to which corporate governance components influenced working capital. The results revealed that board size had a considerably negative effect on the cash conversion cycle, indicating that a larger board could improve the liquidity of the organization.

Also, Narwal and Jindal (2018) conducted research on the impact of corporate governance and working capital management on the corporate profitability of Indian manufacturing companies. Their study consisted of a sample of 50 manufacturing companies examined from 2010 to 2015. The research aimed to establish a connection

between working capital, profitability, and corporate governance, and it developed two regression equations. The results revealed that board meetings positively and significantly impacted working capital management.

In a quantitative study, Njoku (2017) investigated the impact of corporate governance on working capital management in Nigerian organizations. They randomly selected a sample of 89 Nigerian companies and collected publicly available ethical ratings and financial data between 2013 and 2014. The findings indicated a considerable relationship between board size and working capital management. The study was for a two-year period however, there is need to broaden the scope of this research to make definitive statistical conclusions about the population.

According to Fiador (2016), their study aimed to investigate how the internal governance characteristics of board size, board independence, and CEO duality could impact the efficiency of working capital management, including the cash conversion cycle, inventory, receivables, and payables. The study used data from a sample of thirteen non-financial companies listed on the Ghana Stock Exchange, covering nine years from 2001 to 2012. The results suggested that the proportion of non-executive board members has a negative and significant effect on the cash conversion cycle, receivables period, and payable period, but not on the inventory period.

In another study by Chaudhry and Ahmed (2015) on manufacturing firms listed on the Karachi Stock Exchange, using secondary data from the annual financial reports of 168 companies for the period 2010 to 2013, it was revealed that board independence has a significant negative impact on working capital management efficiency. Similarly, Jamalinesari and Soheili (2015) analyzed the relationship between the efficiency of working capital management in companies and corporate rule in the Tehran stock exchange from 2008-2013, with a sample of 115 companies selected through elimination sampling. The study revealed that the independence of the board of directors has a positive relationship with working capital management.

In Egypt, Megeid (2015) researched the impact of corporate governance on working capital management and financial performance, based on a sample of 57 listed manufacturing firms on the Egyptian Stock Exchange from 2006 to 2010. To analyze the results, multiple regressions and Pearson correlation methods were used, and the findings indicated that board independence has a statistically significant effect on working capital management.

Wasiuzzaman and Arumugam (2013) explored the determinants of working capital investment in Malaysian public listed firms by analyzing data from 192 companies over eight years from 2000 to 2017 using the OLS regression technique. The result showed that the independence of the board had no significant influence on the investment in operating working capital by firms. Hence, working capital management issues might not be crucial to the board of directors, meaning that the decisions made by the board of directors do not influence the working capital investment of their firms.

Gill and Bigger (2013) conducted a study to investigate the impact of corporate governance on the efficiency of working capital management in American manufacturing firms. They utilized a sample of 180 manufacturing firms listed on the New York Stock Exchange (NYSE) over three years (2009-2011) using a correlational and non-experimental research design. According to their findings, corporate governance contributes to improving the efficiency of working capital management. Although they found that board size does not affect the efficiency of working capital management, indicating that large board size may have no benefits for American manufacturing firms in this regard.

Kamau and Basweti (2013), in their examination of the relationship between corporate governance and working capital efficiency in Nairobi, opined that an increase in the number of board meetings could lead to inefficiencies, thereby resulting in working capital management inefficiency. This finding was consistent with that of Ali and Shah (2017), who investigated the impact of corporate governance practices on working capital management efficiency for the period 2014 - 2016. They found that board meetings had no impact on the working capital management efficiency of firms, indicating that they did not improve the utilization of working capital.

METHODOLOGY

This study employed an ex-post facto research design. Data for the study was collected from the audited annual reports of listed manufacturing firms on the Nigerian Exchange (NGX) for 15years covering the period 2008-

2022. The population of the study consist of 46 listed manufacturing firms taken from four sectors; conglomerate firms, industrial goods firms, consumer goods firms and health care that are operational in Nigeria from 1 January 2008 to 31 December 2022. However, only 20 listed manufacturing firms was selected as the study's sample size using purposive sampling technique. This technique was adopted due to its appropriateness in applying certain criteria in sorting the manufacturing firm and these criteria are; sampled manufacturing firms must have been listed on the Nigerian Exchange group prior to the period 2008 and remained listed up till 2022 and must have complete fifteen years published annual reports and accounts covering the period 2008-2022 providing sufficient data to carry out the research Also, they must be primarily engaged in the transformation of raw materials into finished products.

Furthermore, this study adapts the multiple regression model used by Kengatharan & Tissera (2019) stated below.

$$CCC= \beta_0+\beta_1BM+\beta_2BS+\beta_3CET+\beta_4ACS+\beta_5SG+\beta_6FS+\varepsilon$$

Where CCC = Cash conversion cycle, BM = Board meetings, BS = Board size, CET = CEO tenure, ACS = Audit committee size, SG = Sales growth, FS = Firm size

This study modifies the above model by using board independence as a corporate governance mechanism in place of audit committee size used by Kengatharan & Tissera (2019). This is because this study believes that the variable audit committees represent an internal governance mechanism whose impact is to improve the quality of financial management and performance of a company as opposed to board independence which is felt more on the day-to-day operations of the firm. It is in view of this that this study uses board independence as a proxy for board characteristics. Therefore, the functional relationship between the variables is given in the following regression equation:

$$CCC= f(BS, BI, BM, FS) \quad \text{i}$$

$$CCC_{it}= \beta_0 + \beta_1BS_{it} + \beta_2BI_{it} + \beta_3BM_{it} +\beta_4FS_{i\,t}+ \varepsilon_{it} \quad \text{ii}$$

Where:

CCC_{it} - Cash Conversion Cycle

BS_{it} - Board Size

BI_{it} – Board Independence

BM_{it} – Board Meeting

FS_{it} - Firm Size

ε_{it} - Error term

β_0, β_1, β_2, β_3, β_4, β_5 - Model coefficients

Table 1Variables, Definitions and Measurement

Variable	Definition	Measurement	Sources
Cash Conversion Cycle (CCC)	Number of days that a company needs to convert its stocks and other resources into cash flow.	(Average Inventory Conversion Period + Average Receivable Collection Period) – Average Payable Deferral Period	(Sisay& Nongmaithem, 2019; Kengatharan & Tissera, 2019)

Average Inventory Conversion Period	No of days a company has sold and replaced stocks during a certain period	Average Inventory ÷ Cost of goods sold) × 365 days.	Majanga, 2015
Average Receivable Collection Period	Number of days to be waited to receive cash from customers	Average Account Receivables ÷ Net sales) × 365 days	(Sisay& Nongmaithem, 2019)
Average Payable Deferral Period	Number of days it takes to pay accounts payables	Average Account Payable ÷ Cost of goods sold) × 365 days.	(Sathyamoorthi et al.,2018)
Board Size (BS)	Number of directors serving on the board	Number of directors serving on the board.	(Gill & Bigger, 2013)
Board Independence (BI)	Independent directors on the board.	Number of non-executive independent directors on the board divided by total board size.	(Arora & Sharma, 2016; Megeid, 2015)
Board Meeting (BM)	Number of times the board members meet in a year	Number of board meetings held in a year.	(Ali & Shah, 2017;Kengatharan & Tissera, 2019)
Firm size (FS)	Size of the firm	Natural logarithm of total assets	(Kengatharan & Tissera, 2019; Gill &Shah, 2012)

Source: Author's compilation (2024).

RESULT AND DISCUSSION

Table 2 presents the descriptive statistics for the variables used in this study. The variables considered in the study include board size, board independence, board meetings, and working capital management.

Table 2 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
CCC	300	40.021	17.297	10.555	88.072
BS	300	10	2.363	5	18
BI	300	0.525	0.286	0.212	0.9
BM	300	4.86	1.13	3	10
FS	300	7.348	0.943	3.967	8.79

Source: Stata 13

Table 2 shows that the number of observations is 300 which was arrived by considering the 15 years covered by the study and the 20 firms taken as sample. Table 2 further shows that the average cash conversion cycle among the sampled firms is 40 days while all other values fall between a maximum of 88 days and minimum of 10 days. This means that the slowest company among the sampled firms takes 88 days to convert raw materials into cash while the fastest among the sampled firms convert raw materials into cash within just 10 days. The variability

between the maximum and the minimum is so huge that it led to rise of the standard deviation to 17 days. The average board size for the sampled firms was 10, with a minimum board size of 5 and a maximum board size of 18. This suggests that companies have a larger pool of talent and expertise to draw from in making decisions and overseeing operations. Moreover, the standard deviation for the board size was 2.363 which indicate that there is less variability in the distribution of directors across the boards. On the other hand, board independence reveal an average of 0.525, with a standard deviation (of 0.286) lesser than the mean. This hints at some level of normality in the distribution of the data. However, the difference between the maximum (0.900) and the minimum (0.212) value is huge, which needs to be considered. The average number of board meetings held by the sampled firms in the fifteen-year period was 4, with a minimum of 3 meetings and a maximum of 10 meetings. The normality test on residuals is further presented in table 3.

Table 3 Shapiro Francia Normality Test

Variable	Obs	W'	V'	z	Prob>z
Residual Terms	300	0.996	0.939	-0.134	0.553

Source: Stata 13

Table 3 shows that the p-value of the residual term is 0.553 which is greater than the 0.05 significance level. Therefore, there is no sufficient evidence to conclude that the residual terms are not normally distributed. The result of pair wise correlation matrix is further presented in Table 4.

Table 4 Correlation Matrix

Variable	BS	BI	BM	FS
BS	1			
BI	-0.34	1		
BM	0.124	-0.11	1	
FS	0.503	-0.49	0.267	1

Source: Stata 13

Table 4 indicates that moderate negative correlations exist between board size and board independence. As board size increases, board independence tends to decrease, but not strongly. Additionally, board size has a slight positive relationship with the frequency of board meetings while moderate positive correlation exists between firm size and board size, larger firms tend to have larger boards. Board independence has a very slight inverse relationship with the number of board meetings, meanwhile moderate negative correlation exists between board independence and firm size which indicate that more independent boards tend to be associated with smaller firms. Based on the correlation coefficients presented in Table 4, this study concludes that there is no severe multicollinearity among the independent variables as none of the correlation is up to the maximum threshold of 0.8. This is further verified by the result of variance inflation factor presented in Table 5.

Table 5 Variance Inflation Factor

Variable	VIF	1/VIF
FS	1.66	0.601444

BS	1.36	0.734722
BI	1.33	0.751064
BM	1.08	0.928097
Mean VIF	1.36	

Source: Stata 13

Table 5 reveal that all the predictor variables have a very low VIF which further indicate the absence of multicollinearity among the independent variables. The overall mean VIF is also below the maximum threshold of 10, this further affirms the result of correlation matrix presented in Table 4. The results of the post-estimation tests are presented in Table 6.

Table 6 Variance Inflation Factor

Variables	Statistics	P-value
Hettest	20.35	0.12
xttest0	496.56	0
Hausman	1.82	0.769

Source: Stata 13

Table 6 shows that the p-value of the heteroskedasticity test is 0.120 which is greater than the significance level (0.05), therefore this study fails to reject the null hypothesis. This indicates that there is no evidence of heteroscedasticity in the error terms, meaning the variance of the errors is constant. The p-value of the Lagrangian multiplier test is 0.000 which is less than 0.05, suggesting panel effect and a further need for Hausman specification test to determine whether random or fixed effect is most appropriate for the model. The result of the Hausman specification test revealed a p-value of 0.769 which means that random effect is most appropriate for the model. Hence the result of the panel regression is presented in Table 7 with all the specification tests incorporated.

Table 7 Variance Inflation Factor

CCC	Coef.	Std. Err.	t	P>t
BS	-1.944	0.468	-4.16	0
BI	-4.355	3.824	-1.14	0.256
BM	2.833	0.87	3.26	0.001
FS	4.085	1.295	3.16	0.002
_cons	18.105	9.902	1.83	0.069
No. of obs. = 300				

Prob > F = 0.000				
R-squared = 0.115				

Source: Stata 13

Table 7 reveals that the overall model is statistically significant as denoted by the F-statistics which has a p-value of 0.000 < 0.05 but the model has a relatively low R-squared of 0.115, indicating that the board size, board independence, board meeting and firm size combined only explain about 11.5% of the variation in the cash conversion cycle of these sampled firms. The regression results show that board size (BS) has a negative and significant coefficient of -1.944 (p 0.000 < 0.05). This suggests that larger boards are associated with more efficient working capital management, as indicated by a shorter cash conversion cycle. Hence this study rejects the null hypothesis 1 which states that board size has no significant effect on working capital management of listed manufacturing firms in Nigeria. This result is in agreement with the findings of (Chaudhry & Ahmad, 2015; Jamalinesari & Soheili, 2015; Sathyamoorthi et al., 2018) However, the findings of (Ahmed et al., 2018; Kamau & Basweti, 2013; Narwal & Jindal, 2018) are conversely not in line with the findings of this study.

Board independence (BI) has a negative but insignificant coefficient of -4.355 (p 0.256 > 0.05). This means that while board independence is associated with more efficient working capital management, the effect is not statistically significant in this sample. On the other flip, board meetings (BM) has a positive and significant coefficient of 2.833 (p 0.001< 0.05). This implies that more frequent board meetings are related to less efficient working capital management, as indicated by a longer cash conversion cycle, this result is unsurprisingly in contradiction with the finding of Achchuthan and Kajananthan (2013) and Ahmed et al. (2023) whereas, the result is in consonance with the findings of Kengatharan and Tissera (2019) and Narwal and Jindal (2018)

The research findings reveal some compelling insights into how corporate governance mechanisms impact the working capital management of Nigerian manufacturing companies. Notably, the study indicates that larger board sizes are associated with more efficient working capital management, leading to a shorter cash conversion cycle. This suggests that a diverse pool of directors can contribute to better decision-making and operational oversight within organizations, ultimately enhancing financial performance. Moreover, the analysis highlights the role of board independence, indicating that while it is linked to improved working capital management efficiency, the effect is not statistically significant in the sample studied. Additionally, the study reveals that more frequent board meetings are paradoxically associated with less efficient working capital management, leading to a longer cash conversion cycle. This counterintuitive result prompts a deeper examination of the relationship between board engagement and working capital.

CONCLUSION AND RECOMENDATION

Based on the findings attained in this study, it is concluded that larger board sizes are associated with more efficient working capital management, this suggests that increasing the size of the board may enhance the firm's ability to manage its working capital effectively. In other words, the larger the size of the board, the more experience and expertise put into reducing the cash conversion cycle which will lead to more efficiency. Moreover, while there might be a tendency for independent boards to improve working capital management, the effect is not strong enough to be conclusive within the sample in this study. This could be as a result of the fact that independent directors are not actively involved in the day to day operations of the firms and as such, their presence or absence has little or no effect on the cash conversion cycle. Therefore, the impact of board independence on working capital management remains unpronounced in this study. The study further concludes that excessive board meetings might lead to inefficiencies or distractions that hinder effective working capital management.

Based on the findings of this study. It is recommended that manufacturing firms in Nigeria should consider having a diverse and larger pool of directors to enhance decision-making processes and operational oversight, this may ultimately lead to improved working capital. While the presence of independent directors on the board is expected to enhance working capital management policies, the lack of statistical significance in this study

highlights that their non-involvement in the day to day operations of the firm results in little or no effect in improving the working capital. In other words, there is need to focus more on other mechanisms that significantly affect working capital management. The study further reveals a paradoxical relationship between board meetings and working capital management efficiency, where more frequent board meetings mean more cash conversion cycle days which translates to less efficient management of working capital. It is recommended that firms should strategically plan board meetings to ensure they are productive and focused on key issues impacting working capital. Quality over quantity is essential in this regard.

REFERENCES

1. A Abid, G., Khan, B., Rafiq, Z., & Ahmad, A. (2014). Theoretical perspectives of corporate governance. Bulletin of Business and Economics, 3(4), 166-175.
2. Achchuthan, S., & Kajananthan, R. (2013). Corporate governance practices and working capital management efficiency: Special reference to listed manufacturing companies in Sri Lanka. International Journal of Business & Management Review, 1(1), 72-85.
3. Adams, R. B., Hermalin, B. E., & Weisbach. M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. Journal of Economic Literature, 48(1), 58-107.
4. Ahmad, B., Ahmed, I., & Samim, M. M. (2018). Working capital management efficiency and corporate governance in manufacturing sector of Pakistan. European Online Journal of Natural and Social Sciences, 7(1), 67-86.
5. Akinlo, A. E. (2019). Working capital management and profitability: Evidence from Nigerian firms. Ife Journal of Entrepreneurship and Business Management, 3(1), 66-90.
6. Ali, B., & Shah, S. (2017). The impact of corporate governance on working capital management efficiency: A quantitative study based on Pakistani manufacturing firms. City University Research Journal, 7(2), 272-284.
7. Arora, A., & Sharma, C. (2016). Corporate governance and firm performance in developing countries: Evidence from India. Corporate Governance, 16(2), 420-436 http://dx.doi.org/10.1108/CG-01-2016-0018
8. Atseye, F. A., Ugwu, J. L., & Takon, S. M. (2015). Determinants of working capital management: theoretical review. International Journal of Economics, Commerce and Management, 3(2), 1-11.
9. Chaudhry, A., & Ahmad. N. (2015). Does corporate governance affect working capital management efficiency of firms? Evidence from manufacturing sector of Pakistan. Science International (Lahore), 27(6), 6255-6260.
10. Chowdhury, A. Y., Hamid, K., & Sultana, S. (2018). Impact of working capital management on profitability: A case study on pharmaceutical companies of Bangladesh. Journal of Economics, Business and Management, 6(1), 27-35.
11. Daqar, M. A. (2020). The impact of corporate governance on working capital management efficiency in the manufacturing firms. Journal of Accounting Research, Business and Finance Management, 1(1), 4-12. http://doi.org/10.5281/zenodo.3733986
12. Donaldson, L., & Davis, J. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. Australian Journal of Management, 16(1), 49–64.
13. Emmanuel, E. A. (2017). Overcoming the challenges of the manufacturing sector in Nigeria and the outlook for 2017. Conference: Manufacturing & Equipment Expo Nigeria 2017.
14. Fiador, V. (2016). Does corporate governance influence the efficiency of working capital management of listed firms: Evidence from Ghana. African Journal of Economic and Management Studies, 7(4), 482-496.
15. Gbalam, E., & Uzochukwu, A. (2020). Working capital management and firm profitability: An empirical examination. IOSR Journal of Economics and Finance, 10(2), 45-51.
16. Gill, A., & Biger, N. (2013). The impact of corporate governance on working capital management efficiency of American manufacturing firms. Managerial Finance, 39(2), 116-132.
17. Gill, A., & Shah, C. (2012). Determinants of corporate cash holdings: Evidence from Canada. International Journal of Economics and Finance, 4(1), 70-79.
18. Gorondutse, A. H., Ali, R. A., Abubakar, A., & Naalah, M.N.I. (2017). The effect of working capital management on SMEs profitability in Malaysia. Polish Journal of Management Studies, 16(2), 99-109.

19. Gulzar, I., & Haque, S. M. I. (2023). The implications of corporate governance on the working capital efficiency of manufacturing companies: Evidence from emerging market. Jindal Journal of Business Research, 12(2), 1–14.
20. Homayoun, S., & Homayoun, S. (2015). Agency theory and corporate governance. International Business Management, 9(5), 805-815.
21. Ibrahim, K. Y., Usaini, M., Elijah, S. (2021). Working capital management and business performance. Nigerian Journal of Marketing (NJM), 7(1), 1-17.
22. Itan, I., & Angelina, B. (2022). The mediating role of board size and working capital management in corporate governance on firm performance. Journal of Accounting, Finance and Auditing Studies, 9(1), 172-198.
23. Jamalinesari, S., & Soheili, H. (2015). The relationship between the efficiency of working capital management companies and corporate rule in Tehran stock exchange. Procedia-Social and Behavioral Sciences, 205, 499-504.
24. Kajananthan, R., & Achchuthan, S. (2013). Corporate governance practices and its impact on working capital management: Evidence from Sri Lanka. Research Journal of Finance and Accounting, 4(3), 23-31.
25. Kamau, S., & Basweti, K. (2013). The relationship between corporate governance and working capital management efficiency of firms listed at the Nairobi securities exchange. Research Journal of Finance and Accounting, 4(19), 190-199.
26. Karabay, G., Kaya, Y., & Gunaydin, K. G. (2022). Comparative analysis of working capital management in Turkish apparel industry in terms of firm size. Industrial Textila Journal, 73(3).
27. Kengatharan, L., & Tissera, W. S. S. (2019). Do corporate governance practices influence working capital management efficiency? Evidence from listed manufacturing companies in Sri Lanka. Research in World Economy, 10(3).
28. Khan, A., Yaqub, R. M. S., & Javeed, A. (2021). Mediating role of working capital management in the relationship of corporate governance measures and firm performance: Panel Study from Pakistan. Journal of Accounting and Finance in Emerging Economies, 7(2), 273-286. https://doi.org/10.26710/jafee.v7i2.1655
29. Kumar, V., & Jindal, S. (2019). Impact of corporate governance on the profitability and working capital management: An empirical study of Indian manufacturing sector. Science, Technology and Development, 8(10).
30. Kyereboah-Coleman, A. (2008). Corporate governance and firm performance in Africa: A dynamic panel data analysis. Studies in Economics and Econometrics, 32(2), 1-24.
31. Lamichhane, P. (2019). Efficiency of working capital management and profitability: Evidence from manufacturing firms of Nepal. Management Dynamics, 22(1), 21-34. https://doi.org/10.3126/md.v22i1.30236
32. Lawal, B. (2012). Board dynamics and corporate performance: Review of literature, and empirical challenges. International Journal of Economics and Finance, 4(1), 22–35.
33. Leah, K. N., Samuel, E. A., & Mustapha, L. O. (2022). Working capital management and profitability of listed consumer and industrial goods companies in Nigeria. Gusau Journal of Accounting and Finance, 3(1), 20-20.
34. Majanga, B. B. (2015). Cash conversion cycle and firm profitability in Malawi manufacturing sector. Journal of Commerce & Accounting Research, 4(3).
35. Manoori, E., & Muhammad, D. J. (2012). Determinants of working capital management: Case of Singapore firms. Research Journal of Finance and Accounting, 3(11).
36. Megeid, N. S. A. (2015). Effect of corporate governance on working capital management and financial performance. (Accounting and finance department Arab academy for science, technology and maritime transport college of management and technology). http://search.mandumah.com/Record/662397
37. Narwal, K. P., & Jindal, S. (2018). Working capital management impact on corporate profitability relation with corporate governance: Evidence from Indian manufacturing sector. Journal of Commerce & Accounting Research. 7(3).
38. National Bureau of Statistics (2022). Nigeria Multidimensional Poverty Index (2022). https://nigerianstat.gov.ng/elibrary/read/1241254
39. Nigerian Code of Corporate Governance 2018 - SCGN (corpgovnigeria.org)

40. Njoku, G. (2017). The impact of corporate governance on working capital management in Nigerian organizations. (Walden dissertation and doctoral studies collections. Walden University).
41. Ochieng, R. M., Jagongo, A. O., & Ndede, F. W. (2020). Working capital management and financial performance of manufacturing and allied category of firms listed at the Nairobi securities exchange, Kenya. International Journal of Research in Finance and Marketing (IJRFM), 10(1).
42. Olaoye, F., Adekanbi, J., & Oluwadare, O. (2019) Working capital management and firms' profitability: Evidence from quoted firms on the Nigerian stock exchange. Intelligent Information Management, 11, 43-60. 10.4236/iim.2019.113005.
43. Olayiwola, K. (2018). Working capital management efficiency and firms' profitability. Nigerian Journal of Management Sciences, 6(2), 336-345.
44. Osundina, J. A., Olayinka, I. M., & Chukwuma J. U. (2016). Corporate governance and financial performance of selected manufacturing companies in Nigeria. International Journal of Advanced Academic Research Social & Management, 2(10), 29-43.
45. Salawu, R.O., & Alao, J.A. (2014). Determinants of working capital management: Case of Nigerian manufacturing firms. Journal of Economics and Sustainable Development, 5(14), 49-56.
46. Sathyamoorthi C. R., Christian J. M., Mapharing, M., & Selinkie, P. (2018). The impact of corporate governance on working capital management efficiency: Evidence from the listed companies in the consumer services sector in Botswana. International Journal of Economics and Finance; 10(12), 135-149.
47. Sisay, Y.H., & Nongmaithem, R.S. (2019). Effect of firm characteristics on working capital management of manufacturing firms in Amhara Ethiopia. Parikalpana - KIIT Journal of Management, 15, 9-28.
48. Stephen. A. E., & Benjamin U. E. (2013). Corporate governance issues and its implementation: The Nigerian experience. Journal of Research in International Business Management, 3(2), 53-57.
49. Tesfay, A., & Batra, G. S. (2018). Determinants of working capital management: evidence from Ethiopian corporate sector. International Journal of Management Studies, 5(4), 2231-2528.
50. Tjandra, C.K., Murhadi, W.R., & Herlambang, A. (2022). The determinants of working capital management in Indonesia and the Philippines. Jurnal Siasat Bisnis, 26(1), 110-120.
51. Umar, A. A., Nyor, T., Yahaya, O. A., & Mustapha, L. O. (2022). Corporate governance mechanisms and financial reporting quality of listed non-financial institutions in Nigeria: Moderating effect of institutional ownership. NDA Journal of Management Sciences Research, 2(1), 342-352.
52. Upreti, D. R., & Kulshrestha, S. (2022). A theoretical review on factors of working capital management. Nepal Journal of Multidisciplinary Research (NJMR), 5(3), 47-60.
53. Waheed, Z., & Nabi, A. A. (2018). Impact of working capital management on financial performance of the firm. Journal of Economic Info, 5(4), 1-6.
54. Wanjala, I., Ombaba, K.B. M., & Shitote, Z. (2019). Board attributes and working capital management of listed agricultural firms in Kenya; the effect of financial expertise. International Journal of Finance, Accounting and Economics (IJFAE), 2(4), 1-17.
55. Wasiuzzaman, S., & Arumugam, V. C. (2013). Determinants of working capital investment: A study of Malaysian public listed firms. Australasian Accounting Business and Finance Journal, 7(2), 63-82.
56. Wassie, F.A. (2021). Working capital management and its impact on firms' performance: An empirical analysis on Ethiopian exporters. Education Research International, Volume 2021, Article ID 6681572, 10 pages. https://doi.org/10.1155/2021/6681572.
57. Yahaya, A., Dantshoho, M.N., & Ambore, B.F. (2019). Impact of working capital management on the profitability of firms in Nigeria. African Journal of Management, 4(3), 60-74.
58. Yogendrarajah, R., & Thanabalasingam, S. (2011). Working capital management and its impact on financial performance: An analysis of trading firms. Presentation in the International Conference at Rajarata University – 2011.