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Working Capital Management and Firm Performance: The Moderating Effect of Inflation Rates

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ABSTRACT

The economic crisis that occurred between 2007 and 2008 in Nigeria resulted in serious liquidity crises for firms operating in the country. This was demonstrated in firms' inability to purchase inventories needed for production. As a result, firms were faced with declining performance. Previous studies have shown that working capital management (WCM) provides liquidity in the form of cash flow and improves firms' performance under regular macroeconomic conditions. However, few studies have focused on determining the influence of WCM on firm performance, especially during a financial crisis. This study adopts the Contingency Theory to determine the effect of inflation rates on WCM and firm performance under conditions of crisis. The study utilizes panel data of 675 firm-year observations derived from the listed firms on the Nigerian Stock Exchange from 2007- 2015. The data gathered were analyzed using the fixed effect model. The findings demonstrate a mixed and inconsistent relationship between WCM variables and firm performance. Furthermore, the findings indicate that inflation rates significantly moderate the relationship between WCM and firm performance in terms of Return on Assets and Return on Equity. The results of this study imply that the effectiveness of WCM on firm performance is influenced by inflation rates. Thus, this study recommends managers to appropriately align their WCM strategies and policies to fit the contingencies of their operating environments to enhance performance.

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INTRODUCTION

The study of working capital management (WCM) has become critical to 21st century business due to the recurring global economic challenges, which constitute detrimental pressures to the liquidity and profitability of companies. As such, the financial performance of firms can be enhanced through WCM (Afrifa & Padachi, 2016; Deloof, 2003; Makori & Jagongo, 2013). This is because WCM sustains firms financially during the time-gap between the process of selling finished goods and the final realization of cash flow. Hence, an efficient WCM generates cash to fund firms' internal operations, while the firm awaits cash receipts from customers (Nzioki et al., 2013). According to theorists, current assets and current liabilities are important components of WCM (Deloof, 2003; Eljelly, 2004; Raheman & Nasr, 2007; Simon et al., 2017). In other words, the efficient optimization of both current assets and current liabilities improves the liquidity and profitability of firms.

Previous studies on WCM have explored its importance to firm performance. However, these studies have not really considered the influence of macroeconomic conditions such as inflation rates on WCM variables (Zingwiro, 2006). Most of these studies (Abuzayed, 2012; Afrifa & Padachi, 2016; Deloof, 2003; Filbeck & Krueger, 2005) focused on the direct impact of WCM on firm performance and found mixed and inconsistent findings. However, the interactions of macroeconomic factors such as inflation rates, interest rates, and GDP on the relationship between WCM and firm performance have received less attention (Filbeck & Krueger, 2005; Mirza & Javed, 2013; Mathuva, 2014). Drawing insight from Baron and Kenny (1986) and Hayes (2009), the inconsistent findings from previous studies suggests the introduction of macroeconomic factor such as inflation rates as moderating variable.

Inflation is considered the most influential macroeconomic factor in the current economic crisis confronting Nigeria. This is because the inflation rate has remained one of the long-standing challenges faced by firms in Nigeria and has been stuck in the double-digit range over a considerable length of time and may continue to increase despite fiscal efforts to reduce it (Asekunowo, 2016; CBN, 2016, 2017; Emejo, 2016). Evidently, the increase in inflation rates is responsible for the hike in the prices of goods and services. Alli (2016) also reiterated that high-inflation rates have impaired the ability of firms in Nigeria to acquire raw materials for production. In addition, reports from Alli (2009), CBN (2017), and Uzor (2016) illustrated how Nigerian firms had shut down operations due to the detrimental effects of high inflation rates. Despite all these challenges, limited studies have focused on assessing the interaction of inflation with WCM on firm performance under conditions of economic crisis.

Consequently, this study draws from Contingency Theory, which asserts that economic and financial variables are interdependent, with the effect of one variable such as inflation affecting WCM, which, in turn, affects a third variable such as firm performance. It is in this sense that Donaldson (2001) defined the contingency approach, which this paper adopts. However, under this approach, the macroeconomic environment is unsteady and unpredictable. Therefore, it is subject to fluctuations and prevent firm from being able to plough back their profits for the purpose of WCM. In addition, such adverse and unpredictable conditions could have implications for firm productivity and financial performance (CBN, 2017; Smith, 1980; Sundar, 1980). Therefore, determining the moderating effect of inflation rates on the relationship between WCM and firm performance is necessary.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

WCM and Firm Performance

The concept of WCM has been used to highlight the management of operational finances of firms, such as the management of short-term assets and liabilities (Simon et al., 2017). WCM refers to the ability of a firm to control effectively and efficiently the current assets and current liabilities in a manner that will enhance their return on the capital employed (Makori & Jagongo, 2013). WCM is important to all firms because it affects firms' liquidity (Eljelly, 2004), profitability (Deloof, 2003; Padachi, 2006; Simon et al., 2017; Singh & Kumar, 2014) and maximizes shareholders' value (Afrifa & Padachi, 2016; Deloof, 2003; Smith, 1980; Ukaegbu, 2014). WCM has been frequently measured using variables such as accounts receivable management, accounts payable management, inventory management, cash conversion cycle, and cash conversion efficiency (Afrifa & Padachi, 2016; Deloof, 2003; Filbeck & Krueger, 2005).

Accounts receivable management refers to the process, policies, and practices firms adopt to collect payment for goods sold on credit to customers while accounts payable management denotes suppliers whose invoices for goods or services have been accessed and processed but are yet to be paid (Falope & Ajilore, 2009). Inventory management constitutes the supply and usage of goods and products a firm prepares for sale. These include raw materials, work in progress, and finished goods. In addition, the cash conversion cycle is a metric that expresses the length of time in days that a firm takes to convert material input into cash, in other words cash conversion cycle refers to the movement of cash from the suppliers' end to inventory, receivables to the bank until cash is recovered again. Whereas, cash conversion efficiency emphasizes the dynamic change in the operations of the firms that will create operational efficiency.

Several studies have examined these variables. For example, Deloof (2003) examined the effect of WCM on the profitability of 1,009 Belgian firms for a 5-year period from 1991 to 1996. Using the panel data method and an OLS model,

the study found a significant and negative relationship between the accounts receivable period, the accounts payable period and the inventory period and the profitability of firms measured by gross operating income. The cash conversion cycle had a negative result as expected but was insignificant. In line with the findings of Deloof (2003), Lazaridis and Tryfonidis (2006) provided evidence of a significant and negative relationship between the cash conversion cycle, the accounts payable period, and accounts receivable and profitability measured by gross operating income. The relationship between inventory and gross operating profit revealed a negative result but was insignificant. Hence, Deloof (2003) and Lazaridis and Tryfonidis (2006) recommended that attaining an optimal level of working capital investment was beneficial for all firms.

Several studies have examined WCM in various contexts. Al-Debi'e's (2011) study confirmed the findings of Deloof (2003) and Lazaridis and Tryfonidis (2006). Al-Debi'e (2011) examined WCM and profitability of industrial firms in Jordan. A sample of 77 companies met the criteria for evaluation from 2000 to 2010. Al-Debi'e's findings showed a significant and negative relationship between the measures of WCM (cash conversion period, accounts receivable period, accounts payable deferred period, and inventory conversion period) and gross operating income. The study concluded that measures of WCM significantly affected the profitability of firms, but its efficiency was influenced by external variables like small market size, competition, and many other external variables. In addition, Enqvist, Graham, and Nikkinen's (2014) study found a negative relationship between all the measures of WCM (cash conversion cycle, accounts receivable periods, accounts payable, and inventory) and firm performance represented by return on assets and return on investment. All the variables were significant except for accounts receivable. These findings resulted from a sample of 1,136 firm-year observations from 1990 to 2008. They concluded that WCM enhanced the profitability of firms, but its efficiency increased with better sales growth and better economic conditions. This suggests that WCM exerts a measurable influence on a firm's performance within different economic periods examined—normal and boom periods. Also, Tauringana and Afrifa (2013) evaluated the importance of WCM on the profitability of SMEs. They used a sample of 133 SMEs listed on the Alternative Investment Market (AIM) in the United Kingdom (UK) from 2005 to 2009. They found a negative relationship between accounts receivable, accounts payable, inventory and cash conversion period and profitability. The significance test showed that accounts receivable and accounts payable were significant while inventory and the cash conversion cycle had insignificant results.

On the other hand, some studies have found a significant and positive relationship between WCM and firm profitability. In Jordan, Abuzayed (2012) examined

WCM and firm performance with a sample of 52 non-financial firms listed on the Amman Stock Exchange from 2000 to 2008. The findings revealed a positive relationship between WCM measures and gross operating profits while the market-determined variable, Tobin's Q, revealed a negative relationship. Confirming the findings of Abuzayed (2012), Nyamao et al. (2012) found comparable results when they investigated the effect of WCM on the financial performance of firms in Kenya. Their findings came from a sample of 113 small-scale enterprises evaluated between 2007 and 2010. They found a significant and positive relationship between the measures of performance (growth in profit, growth in sales, growth in assets and growth in market) and WCM measures (efficiency of cash management, efficiency of receivable management, and efficiency of inventory management). Moreover, Ali and Ali's (2012) results supported the findings of Abuzayed (2012) and Nyamao et al. (2012). Ali and Ali (2012) advanced a question—whether WCM affected the profitability of Pakistan firms. They evaluated a sample of 15 companies from 2003 to 2008 and found a significant and positive relationship between WCM and firm profitability and total assets of Pakistan firms.

El-Maude and Shuaib (2016) examined WCM with respect to profitability for 10 food and beverages listed firms in Nigeria. Using a sample of 10 firms examined from 2010 to 2014, they found a significant and positive association between inventory and accounts receivable with profitability while the cash conversion cycle and accounts payable showed a significant and negative association with profitability. Their study concluded that managers should optimize their WCM policy by decreasing the cash conversion cycle and make free cash flow available to fund their operations and add value to their firms. Murthy (2015) examined the interrelationship between WCM, financing constraints and firm financial performance in the six Gulf Cooperation Council (GCC) countries with a sample of 153 large manufacturing firms. Murthy's study found that the average receivable period levels significantly influenced the performance of GCC manufacturing firms measured by pre-tax return on sales. This suggests that the average receivable period had a significant and negative impact on the performance of GCC manufacturing firms. The study also found that inventory levels did not have any impact on the performance of firms. This means that lower investment in accounts receivable results directly in better profits with minimal assets. This will lead to better pre-tax return on assets. Wasiuzzaman's (2015) study on firm value in an emerging market in Malaysia and the influence of WCM using 192 firms from 1999 to 2008 confirmed Murthy's (2015) findings. Wasiuzzaman (2015) found that improvement in working capital efficiency increased firm value. The result was significant for financially constrained firms, while it was insignificant for unconstrained firms.

Arising from the mixed and inconsistent findings between these schools of thought,

this study reexamines the relationship between WCM variables and firm performances. In view of this, the following non-directional hypotheses (H_1 *and* H_2) are formulated between WCM variables and firm performance.

H1a-1e: *There is a significant relationship between WCM variables and ROA*

H2a-2e**:** *There is a significant relationship between WCM variables and ROE*

Inflation, WCM, and Firm Performance

Two peculiar conditions motivate the testing of inflation rates as a moderating variable on the relationship between WCM and firm performance. First, as the discussion in the above section shows, mixed and inconsistent findings exist among scholars who have examined WCM and firm performance. In view of this, studies such as Filbeck and Krueger (2005), Mirza and Javed (2013) and Mathuva, (2014) had suggested inflation rates to be one plausible reason for the mixed and inconsistent findings in WCM studies. This illustrates a major pitfall of ignoring the multiplier effect of the macroeconomic environment in which a firm operates on WCM effectiveness by previous studies. Apparently, this constitutes a learning gap this study close.

Second, as the fundamentals of Contingency Theory stipulate, the effectiveness of business operations, structure, and strategy are contingent on the environment in which a firm operates (Donaldson, 2001). This implies that, when a firm's strategy fits the contingencies of its environment, this fit results in higher performance. However, when the strategy misaligns with the contingency of its operating environment, a lower performance is the consequence (Donaldson, 2001). Meanwhile, the inflation rate is a macroeconomic factor, which refers to a general rise in the price of goods and services in the economy and has negative effects on investments (Bawa & Abdullahi, 2012). This study further argues that the effect of inflation is more apparent on the WCM requirements (Enqvist et al., 2014; Filbeck & Krueger, 2005; Mathuva, 2014; Zingwiro, 2006). Applying the Contingency Theory, this current study argues that during an inflationary period WCM requirements will be altered. In other words, the consequences of inflation increase the financial requirements of WCM (Mathuva, 2014; Smith, 1980; Sundar, 1980).

The consequences of inflation on WCM variables are enormous. During inflationary pressure, for example, firms may find acquiring inventory difficult due to high prices. This changes the normal amount required for the purchase of inventory thereby causing depression of capital. Meanwhile, according to Patra and Ratha (2012), most classical models of inventory management assume that inflation will remain constant over time. High inflation creates pressure for investment in inventory, during which it competes for value and increases costs beyond value (Enqvist et al*.,* 2014). During such periods, poor inventory decisions result

in value deterioration, and the replacement of such inventory/stock becomes an issue with which firms must contend (Everett & Watson, 1998). The difficulties in replacing the stock of inventories lead to either a stoppage or a distortion of operations or incurring higher costs. Additional costs are incurred to guarantee the continuance of business operations at an optimal level, and this consequently leads to a decline in performance. Based on the aforementioned reasoning, the link between inflation, inventory management and firm performance is that, when the production capacity of firms is reduced owing to the inability of firms to acquire inventory due to inflationary pressure, firm performance will be affected.

At the same time, inflation has a negative and deleterious effect on both creditors (comprising borrowers and suppliers) and debtors (payments) (Ali & Khan, 2011; Filbeck & Krueger, 2005; Mathuva, 2014). This is because, when the cost of capital rises during inflationary periods, the decisions of creditors and suppliers on the amount to lend and the quantity and quality of goods they advance to firms on credit will be affected. These situations lead to higher interest rate charges and lower productivity, whereas, for debtors, the affect is two-fold. On one hand, inflation may benefit debtors if it raises their nominal income above their nominal cost. On the other hand, if their nominal income remains the same while nominal costs increase, inflation may create difficulties for customers in settling their debts. This means that during inflationary periods, the rate of default will be high. While the former situation benefits debtors, the latter may be considered unfavorable for debtors. By way of contrast, inflation is indisputably bad for the firms being owed (creditors) because during such periods firm investments lose value and the amounts repaid eventually may be unable to finance the same level of activities proportionately. Notably, the attitudes of both debtors and creditors during inflationary periods bring cash flow difficulties in the form of financial instability and lowers productivity respectively. In other words, inflation affects both creditors and debtors. Therefore, the hypothesized relationships between accounts receivable management and firm performance and accounts payable management and firm performance would hinge on how firm performance could be affected by cash flow difficulties and operating challenges brought by the effect of inflation.

During inflationary periods, firms experience a longer cash conversion cycle while the efficiency of operational activities (here referred to as: cash conversion efficiency) reduces. This is due to inventory being tied up and receivables not materializing (Mathuva, 2014). Therefore, the relationships between inflation, cash conversion cycle and firm performance on the one hand, and inflation, cash conversion efficiency and firm performance on the other hand are based on the adverse effects of inflation that are manifested in cash-flow shortages, low productivity or production capacity and payment default, all of which affect the activity level of firms. This notion

is in line with several studies conducted on WCM (Ali & Khan 2011; Filbeck & Krueger, 2005; Mathuva, 2014). Arising from this, the following hypotheses (H_3 *and* H_4) are developed:

H3a-3e**:** *Inflation rates significantly moderate the relationship between WCM variables and ROA.*

H4a-4e**:** *Inflation rates significantly moderate the relationship between WCM variables and ROE.*

RESEARCH METHOD

Population and Sample

The population of this study consists of 124 non-financial firms listed on the Nigerian Stock Exchange as at 22 September 2016. Financial firms (such as banks and insurance companies) were excluded because they had an operational definition of WCM that was different from the one adopted in this study (Afrifa & Padachi, 2016; Deloof, 2003; Lazaridis & Tryfonidis, 2006; Tauringana & Afrifa, 2013). Thus, extant WCM practices differ between financial and non-financial firms. The selection of sample in this study covered the period from 2007 to 2015. This period is considered suitable because Nigeria started experiencing high inflation around 2007, which led to the decline in firm performance (CBN, 2017; Njiforti, 2015).

Three criteria were used to determine the sample size of this study. First, the firms must have operated within the period of this study (2007–2015). Second, firms with missing substantial yearly figures in their annual reports were excluded. Third, firms delisted within the period of this study were also excluded. These specifications for sample determination were critical because this study employed balanced panel data. The implementation of these criteria resulted in the selection of 75 firms from a population of 124 non-financial firms for the period between 2007 and 2015. Thus, the sample size of this study comprised 75 firms for the period of nine years, thereby generating a total of 675 firm-year observations for the study variables.

Variables and Measurement

The dependent variables to be analyzed are return on assets (ROA) and return on equity (ROE). These variables have been adopted as measures of firm performance based on their extensive usage in the extant WCM literature (Afrifa & Padachi, 2016; Azam & Haider, 2011; Salman et al., 2014). ROA is a measure used to determine the performance of a firm relative to its total assets. It reveals how effectively the total assets of a firm are used to generate profits. ROA is measured in this study as profit after tax divided by total assets. Like ROA, ROE is a measure used to determine the rate of returns accruable to shareholders for their investments (stock) in a firm. ROE shows the efficiency and effectiveness with which firms generate returns based on investments from shareholders' contributions and not because of additional investment in equity. ROE is measured in this study as profit after tax divided by shareholders' equity. The WCM variables adopted in this study are defined as follows: Accounts Receivable Management (ARM) is measured

as [(accounts receivable/sales) x 365]. Meanwhile, Accounts Payable Management (APM) is measured as [(accounts payable/purchases) x 365]. Inventory Management (INVM) is determined by [(inventory/cost of sales) x 365]. Cash Conversion Cycle (CCC) is obtained with reference to [ARM + INVM – APM] while the Cash Conversion Efficiency (CCE) is defined as [cash-flow from operations/sales]. The moderator was Inflation Rates (INFLAR).

The rate of inflation is measured in this study by reference to consumer price index (CPI) based on the definition provided by the World Bank. This is similar to the approach adopted by Smith, N'Cho-Oguie, Murray and Blakley (2003) in determining the effect of macroeconomic instability and inflation on sustainable real growth in South African firms. Moreover, the CPI is widely used in Nigeria to determine inflation rates as opposed to other measures because its construction excludes certain volatile components in order to focus on core inflation (Bernanke et al., 1999; NBS, 2017). Therefore, this study adopts CPI as a surrogate for measuring inflation. Drawing on previous studies, this study includes a set of control variables. The study controls for firm size, sales growth, and debt ratio. Firm Size (FIRMSIZE) is measured as the natural log of sales. Sales Growth (SALESGROWTH) is ascertained by [current year's sales – previous year's sales/previous year's sales] while the Financial Debt Ratio (FDR) is obtained by dividing total liability by total assets. The data used in this study were obtained from various sources. Firm performance, WCM, and the control variables were derived from the annual financial reports of non-financial firms listed on the Nigerian Stock Exchange while inflation rates (CPI) was derived from the World Bank (World Bank Development Indicators).

METHOD

This study employed an econometric analysis (a panel regression) over the period of 2007 to 2015. Data collected were winsorized at 3% to reduce the effect of outliers (Dehnel, 2014). The decision to winsorize is in line with Afrifa and Padachi (2016) and Kieschnick et al. (2006). To ensure normality, ROE was logged. Furthermore, the Hausman specification test was conducted to make a choice between the fixed effect (FE) and the random effect (RE) models (Greene, 2008). The results of the Hausman specification test were all significant, indicating *p*-values of 0.0017 and 0.0636 for the ROA and ROE models for the direct relationships, respectively. The results revealed FE to be the appropriate model for this study. The various models are estimated accordingly:

$$ROA_{it} = \beta_0 + \beta_1 ARM_{it} + \beta_2 APM_{it} + \beta_3 INVM_{it} + \beta_4 CCC_{it} + \beta_5 CCE_{it} + \beta_6 FIRMSIZE_{it} + \beta_7 SALESGROWTH_{it} + \beta_8 FDR_{it} + e_{it} \quad [1]$$

$$ROE_{it} = \beta_0 + \beta_1 ARM_{it} + \beta_2 APM_{it} + \beta_3 INVM_{it} + \beta_4 CCC_{it} + \beta_5 CCE_{it} + \beta_6 FIRMSIZE_{it} + \beta_7 SALESGROWTH_{it} + \beta_8 FDR_{it} + e_{it} \quad [2]$$

$$ROA_{it}=\beta_0+\beta_1ARM_{it}+\beta_2APM_{it}+\beta_3INVM_{it}+\beta_4CCC_{it}+\beta_5CCE_{it}+\beta_6INFLAR_{it}+\beta_7ARM*INFLAR_{it}+\beta_8APM*INFLAR_{it}+\beta_9INVM*INFLAR_{it}+\beta_{10}CCC*INFLAR_{it}+\beta_{11}CCE*INFLAR_{it}+\beta_{12}FIRMSIZE_{it}+\beta_{13}SALESGROWTH_{it}+\beta_{14}FDR_{it}+e_{it}.....[3]$$

$$ROE_{it}=\beta_0+\beta_1ARM_{it}+\beta_2APM_{it}+\beta_3INVM_{it}+\beta_4CCC_{it}+\beta_5CCE_{it}+\beta_6INFLAR_{it}+\beta_7ARM*INFLAR_{it}+\beta_8APM*INFLAR_{it}+\beta_9INVM*INFLAR_{it}+\beta_{10}CCC*INFLAR_{it}+\beta_{11}CCE*INFLAR_{it}+\beta_{12}FIRMSIZE_{it}+\beta_{13}SALESGROWTH_{it}+\beta_{14}FDR_{it}+e_{it}..... [4]$$

Where;

Subscript $_{it}$ represents the panel data notation, i = the firm (cross-sectional unit), t = the time period, that is, from 2007 to 2015, e = the error term, while β is the regression slope coefficient. Models 1 and 2 test hypotheses H_1 and H_2, while models 3 and 4 test hypotheses H_3 and H_4.

To determine the goodness–of-fit of the model adopted in this paper and avoid spurious regression results, heteroskedasticity and auto/serial correlation tests were conducted. The Modified Wald test for group wise heteroskedasticity conducted suggests the presence of heteroskedasticity for all the models. This is because the chi-squares obtained for the models [1 = (21468.97), 2 = (16757.38), 3 = (25602.08) and 4 = (15851.55)] were all statistically significant at 1%. This leads to the rejection of the null hypothesis, and the conclusion that the residuals of the models are heteroskedastic. In addition, the Wooldridge test for autocorrelation in panel data was conducted, and its null hypothesis (H0) assumes no first-order autocorrelation. The results of the test show that the *f*-values for models one and three were 1.447 and 1.318, while their associated probabilities were not statistically significant (*p*-value > 0.10), thereby denoting the acceptance of the null hypothesis of no first-order autocorrelation. However, models two and four provided *f*-values of 23.631 and 21.462, which were statistically significant at 1% (*p*-value < 0.01), suggesting that auto/serial correlation existed among these models. To remedy the issues of heteroskedasticity and auto/serial correlation, this study adopted the "VCE" robust and cluster approach to all models, as Baum (2006) suggested.

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics for all the variables of this study. The descriptive analysis shows that the dependent variable-firm performance varies for each measure. For example, ROA had a mean value of 0.054 with a standard deviation of 0.097, while ROE had a mean value of 0.233 with a standard deviation of 0.225.

The mean and standard deviation of ARM were 66 and 85.91, respectively. The mean value indicates that it takes about 2 months and 6 days for firms to collect cash from customers after sales. The variable APM revealed a mean value of 71 days, suggesting that firms make payments to their suppliers within a period of 2 months and 11 days after goods are supplied to them. APM had a standard deviation of 79.66. The mean and standard deviation for INVM were 100

Table 1

Descriptive statistics

Variables	Mean	Median	Standard Deviation	Min	Max	Skewness	Kurtosis
ROA	0.0539211	0.0511312	0.0974374	-0.2003407	0.2857245	-0.2054961	4.097238
ROE	0.2332133	0.1571171	0.2255173	0.000063	0.9758307	1.662434	5.48206
ARM	65.81284	33.98553	85.91416	1.614762	404.844	2.511986	9.408382
APM	71.40689	42.26579	79.66378	1.691966	335.38	1.846047	5.923211
INVM	100.0844	82.88017	83.46253	1.989002	358.2027	1.339954	4.699067
CCC	98.03848	69.8113	120.9543	-121.1655	469.8565	1.217954	4.880861
CCE	0.1064187	0.1023664	0.2442265	-0.6259259	0.7416459	-0.3135631	5.377915
INFLAR	112.4799	110.8408	28.9964	70.65815	158.9435	0.101972	1.717299
FIRMSIZE	9.878679	9.860165	0.8014258	8.269192	11.26919	-0.0638473	2.308822
SALESGROWTH	0.1325887	0.0856619	0.340373	-0.5409587	1.264393	1.192165	5.809239
FDR	0.5731376	0.5613916	0.2724106	0.0767562	1.399866	0.7752867	4.23238

Note: All the variables except INFLAR were winsorized at 3%, both at the top and the bottom. This was done to mitigate the effect of outliers in this study.

and 83.46, respectively. INVM indicates the inventory conversion period and suggests that the average time for firms to turn over inventory was more than 3 months. With respect to CCC, Table 1 shows a mean of 98 days, indicating that the firms' cash will remain tied up for more than 3 months while they source other ways to finance their operational activities. This means that cash is being tied down for a longer period. The descriptive statistics also revealed that the CCE had a mean value of 10.6% while inflation rates for the period were high and varied substantially. This is evidenced in the mean value of 112.48. With respect to the control variables, the means (FIRMSIZE, SALESGROWTH, and FDR) were 9.88, 0.13 and 0.57, respectively. Table 1 also revealed that the data for this study were normally distributed, as the skewness and kurtosis ranged from −0.06-1.8 and 1.7-9.4, respectively. These show that the data were within the expected range for normal data, as the skewness and kurtosis fell below the threshold value of ±3 and ±10, respectively, as Kline (2011) suggested. The statistical findings of this study are like the findings presented in previous WCM literature.

Correlation

This study carefully examined the correlation coefficients presented in Table 2 and found that no correlation coefficient between a pair of variables in this study exceeded the threshold of 0.80, which Field (2005) suggested as an indication of multicollinearity. Thus, the conclusion can be made that the choice of these variables would not result in misspecification. This was also confirmed by the variance inflation factor (VIF), which showed a value of 1.7. This value is less than the threshold value of 10, and therefore suggests no serious problem of multicollinearity according to Field (2005).

Regression Analysis Results

In this section, the results of the relationship between WCM and firm performance and the moderating effect of inflation on WCM and firm performance are presented.

Relationship between WCM and Firm Performance. The analysis of results begins with an examination of the direct relationship between WCM and firm performances as presented separately in Table 3, where the dependent variables proxied by ROA and ROE are reported in columns 1 and 2, respectively. The Table shows that the R^2 of model 1 was 0.1192 while the R^2 of model 2 was 0.1112, indicating that WCM variables explain about 12% and 11% of the variations in ROA and ROE, respectively. The results presented show that ARM was negatively associated with ROA (−0.0000301), but positively related to ROE (0.0002337). The negative relationship between ARM and ROA implies that shorter ARM periods were associated with ROA. Thus, a decrease in the ARM periods by one day would increase ROA by 0.0000301. Regarding ROE, the results showed that a positive relationship exists between ARM and ROE. This positive relationship implies that an increase in ARM will lead to an increased ROE. This means that a day increase in ARM was associated

Table 2

Correlations

Variables	ROA	ROE	ARM	APM	INVM
ROA	1.0000				
ROE	0.1152***	1.0000			
ARM	-0.2401***	−0.0728*	1.0000		
APM	-0.1630***	0.0881**	0.4038***	1.0000	
INVM	-0.1442***	−0.0185	0.1932***	0.3215***	1.0000
CCC	-0.1643***	−0.1190***	0.5748***	-0.0958***	0.6465***
CCE	0.1739***	−0.0701*	-0.1464***	−0.0270	−0.0624
INFLAR	-0.1548***	−0.0747*	−0.0124	0.0593	−0.0332
FIRMSIZE	0.3264***	0.1162***	−0.3244***	−0.2848***	−0.3743***
SALESGROWTH	0.2276***	-0.0073	-0.0680 *	-0.0835**	-0.1058***
FDR	-0.2183***	0.3542***	0.0731*	0.0869 **	−0.0302

Variables	CCC	CCE	INFLAR	FIRMSIZE	SALESGROWTH	FDR
ROA						
ROE						
ARM						
APM						
INVM						
CCC	1.0000					
CCE	-0.1222***	1.0000				
INFLAR	−0.0594	0.0401	1.0000			
FIRMSIZE	-0.3418***	0.0189	0.0972**	1.0000		
SALESGROWTH	−0.0960**	−0.0371	−0.2170***	0.0647*	1.0000	
FDR	−0.0290	−0.0754*	−0.0089	0.0751*	−0.0259	1.0000

Notes: *, **, *** denote significance levels at 10%, 5%, and 1%, respectively.

with a 0.0002337% increase in ROE. The result with respect to ROA supports the assumption of WCM, which states that a shorter account collection period is beneficial but provides no statistical evidence to support the results found, as the relationship was statistically insignificant. Hence, Hypothesis 1a is not supported. However, the result is consistent with the findings of Deloof (2003) and Lazaridis and Tryfonidis (2006). The relationship between ARM and ROE is similarly insignificant and does not support Hypothesis 2a.

APM was found to be positive and insignificantly associated with ROA (β = 0.0001069, p > 0.10). This implies that extending payment periods to suppliers was associated with a higher ROA. Accordingly,

a day increase in APM periods leads to an increase in ROA by 0.0001069. The result established is not significant and does not provide evidence to support Hypothesis 1b. However, the result is consistent with the findings of Abuzayed (2012) but contradict the findings of Deloof (2003). Model 2 revealed that APM was negative and insignificantly associated with ROE (β = −0.0001617, $p > 0.10$), suggesting that paying suppliers early increases ROE. This result implies that a day decrease in APM will lead to an increase in ROE by 0.0001617%. Since the *p*-value is greater than 10%, Hypothesis 2b is therefore not supported. Meanwhile, the result is consistent with the findings of Deloof (2003) and Tauringana and Afrifa (2013), which stated that only unprofitable firms wait longer to pay debts, whereas profitable firms pay early and enjoy discounts and many other benefits. The result found between APM and ROE contradicts the earlier findings between APM and ROA, and confirms the intuitive conclusion often reached by most WCM studies (Makori & Jagongo, 2013; Yazdanfar & Öhman, 2014), to the effect that the relationship between WCM and profitability is mixed, meaning that it could either be positive or negative. In such a situation, Baron and Kenny (1986) suggested that introducing a moderator variable would account for such inconsistency. Based on this confirmation, this study further confirms the necessity for introducing a moderator.

Table 3 also shows that INVM was negative and insignificantly associated with ROA (β = −0.0002087, $p > 0.10$), but was positive and significantly associated with ROE (β = 0.0007018, $p < 0.10$). The negative relationship between INVM and ROA is in line with this study's prediction, previous findings (Al-Debi'e, 2011; Deloof, 2003; Lazaridis & Tryfornidis, 2006) and the assumptions of the WCM Theory. The results also suggest that reducing the INVM increases ROA. The positive relationship between INVM and ROE was inconsistent with the expectations of this current study and contradicts the shorter period assumption of the WCM Theory. However, it is consistent with some previous studies such as Abuzayed (2012) and Ali and Ali (2012), who stated that longer INVM or larger INVM provide a guarantee against the occurrence of a stock-out situation. Furthermore, the positive relationship between INVM and ROE means that higher inventory conversion periods increase the ROE of firms. Longer periods of INVM are arguably undesirable because a longer inventory period is associated with higher costs (holding cost, carrying cost, maintenance and risk of obsolescence), which decrease profitability. The implication of the positive relationship between INVM and ROE is that an increase in the INVM conversion period by one day increases ROE by 0.0007018%, while the negative relationship between INVM and ROA means that a decrease in the INVM conversion period by one day is associated with a 0.0002087 increase in ROA. The relationship found between INVM and ROA was statistically insignificant and does not

Table 3

Results of WCM and Firm Performance

Variables	ROA (Model 1)	ROE (Model 2)
ARM	−0.0000301(−0.21)	0.0002337(0.82)
APM	0.0001069(0.79)	−0.0001617(−0.53)
INVM	−0.0002087(−1.31)	0.0007018(1.95)*
CCC	0.0000921(0.82)	−0.0004003(−1.38)
CCE	0.0288087(1.88)*	−0.0356601(−1.05)
FIRMSIZE	0.0092749(0.55)	−0.045418(−1.23)
SALESGROWTH	0.0565906(3.81)***	0.007927(0.32)
FDR	−0.0487038(−2.33)**	0.2189426(3.77)***
CONSTANT	−0.0141502(−0.08)	0.5243154(1.43)
R^2	0.1192	0.1112
F-probability	4.91***	4.16***
rho	0.50676079	0.44872441

Notes: Variable results begin with their coefficients, *t*-statistics are in parenthesis, and *, **, *** denote significance levels at 10%, 5%, and 1%, respectively.

support Hypothesis 1c. The relationship found between INVM and ROE was statistically significant at 10% and supports Hypothesis 2c. Moreover, the need for moderation is further demonstrated in this result, as the INVM result was inconsistent with the ROA and ROE results.

CCC was found to be positively related to ROA (β = 0.0000921) but negatively related to ROE (β = −0.0004003). Both relationships were statistically insignificant, as their *p*-values were greater than the 10%, and do not support Hypotheses 1d and 2d. The positive relationship between CCC and ROA suggests that higher CCC leads to an increase in ROA. Thus, an increase in CCC by one day increases ROA by 0.0000921. This result contradicts the assumption of a negative relationship often advocated by the WCM Theory but reflects the economic situation of firms in Nigeria. The negative relationship between CCC and ROE implies that a reduction in the CCC increases ROE of firms. As such, reducing CCC by one day will result in ROE increasing by 0.0004003%. The result supports the WCM assumption but cannot be substantiated, as the result was statistically insignificant. Again, the findings between CCC, ROA, and ROE were inconsistent, like the results between INVM, ROA, and ROE, and thus demonstrate the need for moderation as Baron and Kenny (1986) suggested.

CCE was positive and significantly associated with ROA (β = 0.0288087, $p <$ 0.10), as shown in model 1. However, in model 2, CCE was found to be negative and insignificantly associated with ROE (β

= 0.0356601, $p > 0.10$). The relationship between CCE and ROA is consistent with the expectations of this current study and suggests that increasing the efficiency with which cash is realized from sales made increases ROA. Thus, a 1% increase in the efficiency that firms adopt to realize cash from sales made will increase ROA by 0.0288087. The relationship found was statistically significant at 10% and thus supports Hypothesis 1e. However, the relationship between CCE and ROE deviates from expectation, as the sign of the coefficient implies that a less efficient method adopted by firms to realize cash from sales is associated with a higher ROE and vice versa. Hence, a one-percentage decrease in CCE will result in a 0.0356601% increase in ROE. This result contradicts Hypothesis 2e and the WCM Theory, which stipulates that increases in CCE leads to higher profitability for firms.

In model 1, FIRMSIZE and SALESGROWTH were positively associated with ROA and have coefficients of 0.0092749 and 0.0565906, respectively. This suggests that an increase in FIRMSIZE and SALESGROWTH will bring about a 0.0092749 and a 0.0565906 increase in ROA correspondingly. However, no evidence exists to support the relationship between FIRMSIZE and ROA, as it was statistically insignificant. Evidence, however, exists to support the relationship between SALESGROWTH and ROA, as the relationship was statistically significant at 1%. FDR, on the other hand, was negative and significantly associated with ROA (β = −0.0487038, $p < 0.10$). The result aligns with the assumption of the Pecking Order Theory, which suggests that firms should adopt minimal debt and focus on strategies to generate free cash flow internally. In model 2, FIRMSIZE was negatively associated with ROE and statistically insignificant (β = −0.045418, $p > 0.10$). SALESGROWTH and FDR were also found to be positively associated with ROE and have coefficients of 0.007927 and 0.2189426, respectively. The relationship between SALESGROWTH and ROE was statistically insignificant, while the relationship between FDR and ROE was statistically significant at 1%.

Moderating Effect of Inflation on WCM and Firm Performance. Table 4 presents the regression results estimating the moderating effect of inflation rates on the relationship between WCM and firm performance. Overall, there is a significant evidence of moderating effect because the moderation models accounted for higher R^2 values (R^2 of model 3 = 20% and model 4 = 17%) than the R^2 values of the direct relationship between WCM and firm performance reported in Table 3 (model 1 = 12% and model 2 = 11%). Table 4 further revealed that the interaction term between INFLAR and ARM (ARM*INFLAR) was negatively related to both ROA (β = −0.00000998) and ROE (β = −0.00000779). The relationship obtained between ARM*INFLAR and ROA was statistically significant at 5% and led to the conclusion that inflation rates significantly moderate the relationship between ARM and ROA. This result supports Hypothesis 3a and the views of Contingency

Table 4

Results of Moderating Effect of Inflation Rates on WCM and Firm Performance

Variables	ROA (Model 3)	ROE (Model 4)
ARM	0.001067(2.23)**	0.0010864(1.28)
APM	−0.0006545(−1.16)	−0.0016714(−2.10)**
INVM	0.0010757(2.28)**	0.0025675(3.44)***
CCC	−0.0008563(−2.02)**	−0.002563(−3.48)***
CCE	0.071651(1.54)	0.2952339(1.92)*
INFLAR	−0.00000971(−0.05)	−0.0009627(−1.49)
ARM*INFLAR	−0.00000998(−2.26)**	−0.00000779(−0.93)
APM*INFLAR	0.00000689(1.36)	0.0000141(1.90)*
INVM*INFLAR	−0.0000114(−2.53)**	−0.0000171(−2.27)**
CCC*INFLAR	0.00000836(2.14)**	0.0000194(2.53)**
CCE*INFLAR	−0.0004087(−0.93)	−0.0030529(−2.19)**
FIRMSIZE	0.0348258(1.69)*	−0.0137077(−0.29)
SALESGROWTH	0.0383123(2.81)***	−0.0189698(−0.84)
FDR	−0.0412902(−2.15)**	0.2130905(3.72)***
CONSTANT	−0.2661609(−1.33)	0.3299263(0.77)
R^2	0.1993	0.1715
F-probability	6.03***	8.67***
rho	0.50129073	0.43609186

Notes: The definitions of variables remained the same as previously explained in the methodology, while other additional variables included are defined as follows: INFLAR denotes inflation rates while "*" represents the interaction sign. ARM*INFLAR, APM*INFLAR, INVM*INFLAR, CCC*INFLAR and CCE*INFLAR indicate the interaction of inflation rates with all the WCM variables. Variable results begin with their coefficients, t-statistics are in parenthesis, and *, **, *** denote significance levels at 10%, 5%, and 1%, respectively.

Theory. However, the relationship between ARM*INFLAR and ROE was statistically insignificant ($p > 10\%$). This suggests that inflation does not have any significant effect on the relationship between ARM and ROE. This finding contradicts Hypothesis 4a and the views of the Contingency Theory. A plausible explanation for this could be the inclusion of the healthcare sector in the sample of this study. Most firms in this category do not offer services on credit. However, the coefficient of the result is weak with the inclusion of INFLAR, therefore, demonstrating a negative effect of inflation.

Table 4 also shows that APM*INFLAR was positive and insignificantly related to ROA ($\beta = 0.00000689, p > 0.10$). The positive relationship between APM*INFLAR and ROA provides no statistical support for

Hypothesis 3b. Thus, the relationship between APM and ROA is not moderated by inflation rates. However, the changes in the parameter when compared to the direct relationship indicate that inflation is undesirable. Meanwhile, the relationship between APM*INFLAR and ROE was positive and statistically significant (β = 0.00000141, $p < 0.10$). This result provides support for Hypothesis 4b and implies that inflation rates significantly moderate the relationship between APM and ROE. The results also revealed that INVM*INFLAR was negative and significantly related to both ROA ($\beta = -0.0000114$, $p < 0.10$) and ROE ($\beta = -0.0000171$, $p < 0.10$). These results suggest a negative and significant relationship between INVM*INFLAR and ROA and ROE, respectively. The results imply that high inflation rates affect INVM, meaning that, for performance to result, a firm must manage its inventory optimally. The relationships found support Hypotheses 3c and 4c, implying that inflation rates significantly moderate the relationship between INVM and ROA and INVM and ROE respectively. Differences in the coefficients between the direct and moderating relationships with the introduction of INFLAR confirm the detrimental effect of inflation. This suggests that high inflation rates make investments in inventories unproductive.

In addition, the coefficients of CCC*INFLAR was positive and significantly related to both ROA (β = 0.00000836, $p < 0.10$) and ROE (β = 0.00000194, $p < 0.10$). These results indicate a positive and significant relationships between CCC*INFLAR and ROA and CCC*INFLAR and ROE respectively, suggesting that during an inflationary pressure, CCC will be longer. These results are statistically significant at the 5% level and thus, support Hypotheses 3d and 4d. In addition, the results are consistent with Mathuva (2014) who stated that during inflation firms would experience longer CCC. Hence, this study concludes that inflation rates significantly moderate the relationship between CCC and firm performance. The interaction between inflation rates and cash conversion efficiency (CCE*INFLAR) was negative and insignificantly related to ROA ($\beta = -0.0004087$, $p > 0.10$) in model 3, but negative and significantly related to ROE ($\beta = -0.0030529$, $p < 0.10\%$) in model 4. These results imply a negative relationship between CCE*INFLAR and ROA and CCE*INFLAR and ROE, respectively. The results between CCE*INFLAR and ROA was statistically insignificant and do not support Hypothesis 3e whereas the relationship between CCE*INFLAR and ROE was statistically significant and supports Hypothesis 4e. This implies that inflation rates significantly moderate the relationship between CCE and ROA.

Furthermore, all the control variables were significant in model 3 and had the expected signs. For example, FIRMSIZE was positive and significantly associated with ROA ($\beta = 0.0348258$, $p < 0.10$), while SALESGROWTH was found to be positive and significantly associated with ROA ($\beta = 0.0383123$, $p < 0.10$). However, FDR

was found to be negative and significantly related with ROA (β= 0.0412902, p < 0.10). In model 4, the control variables demonstrated signs contrary to expectations. FIRMSIZE was negative and insignificantly associated with ROE (β= −0.0137077, p > 0.10), while SALESGROWTH was also found to be negative and insignificantly associated with ROE (β = −0.0189698, p > 0.10). FDR was found to be positive and significantly associated with ROA (β= 0.2130905, p < 0.10). The result is statistically significant at 1% but contradicts the assumptions of the WCM Theory and the Pecking Order Theory, as they reflect the high risk associated with such a business environment as Nigeria.

CONCLUSION

This paper examined the moderating effect of inflation rates on WCM and firm performance in Nigeria. Based on the findings of this study, WCM influences firm performance, but the significance of this influence is contingent on the peculiar macroeconomic circumstances driving the inflation rate in the environment in which a firm operates. This is reflected in the mixed findings established in the results of models 1 and 2. The study further revealed that inflation rates affected the viability of WCM variables in improving the performance of firms in Nigeria especially in terms of ROA and ROE. Hence, the results showed that inflation rates significantly moderate the relationship between WCM and firm performance. These findings have important theoretical and managerial implications. Theoretically, this study advances the WCM literature by providing evidence on the importance of incorporating macroeconomic factors such as inflation rates in formulating WCM policies. This is illustrated in the findings which show that inflation has a negative and detrimental effect on WCM and profitability of firms. In other words, during high-inflationary periods, firms cannot rely on their existing operational strategies to generate profit and sustain growth. Therefore, new operational and financial mechanisms are required to avoid the detrimental effects of high-inflation rates on firm performance.

The findings of this study have important managerial implications. First, it suggests that managers need to pay close attention to changes in the macroeconomic situations such as inflation rates in the environment where they operate. Second, the suggestions by existing studies that determine the direct relationship between WCM and firm performance are insufficient to respond to the business environment often characterized by high inflation rates. Consequently, managers know little about cash flow shortages caused by inflation. Therefore, an understanding of how inflation rates affect WCM and consequently lead to low performance as this study show will enable managers speed up their WCM processes and transactions to avoid the detrimental effect of inflation when it is expected. Meanwhile, during inflationary periods, managers should strategically

transfer both direct and indirect additional costs incurred because of high inflation rates to the price of a product.

This study has a few limitations and several directions for future research. For example, this study only focused on the moderating effect of inflation rates as a macroeconomic factor. However, other considerable macroeconomic factors such as interest rates and GDP exist. Future researchers may consider examining interest rates or GDP because they affect the relationships between WCM and firm performance. Another potential area of interest is to test the effect of inflation and interest rates on WCM and the performance of financial firms.

REFERENCES

Abuzayed, B. (2012). Working capital management and firms' performance in emerging markets: The case of Jordan. *International Journal of Managerial Finance, 8*(2), 155–179.

Afrifa, G. A., & Padachi, K. (2016). Working capital level influence on SME profitability. *Journal of Small Business and Enterprise Development*, *23*(1), 44–63.

Al-Debi'e, M. M. (2011). Working capital management and profitability: The case of industrial firms in Jordan. *European Journal of Economics, Finance and Administrative Sciences, 36*, 75–86.

Ali, A., & Ali, S. A. (2012). Working capital management: Is it really affects the profitability? Evidence from Pakistan. *Global Journal of Management and Business Research, 12*(17), 74–78.

Ali, S., & Khan, M. R. A. (2011). Searching for internal and external factors that determine working capital management for manufacturing firms in Pakistan. *African Journal of Business Management, 5*(7), 2942–2949.

Alli, F. (2009, July 24). 800 manufacturing companies close down in 9 years – MAN. *Vanguard Newspaper*. Retrieved March 10, 2017, from http://www.vanguardngr.com/2009/07/820-manufacturing-companies-close-down-in-9-years-man/

Alli, F. (2016, April 10). CBN averts closure of 200 manufacturing firms through forex access. *Vanguard Newspaper*. Retrieved March 20, 2017, from http://www.vanguardngr.com/2016/04/cbn-averts-closure-200-manufacturing-firms-forex-access/

Asekunowo, V. O. (2016). The causes of persistent inflation in Nigeria. *CBN Journal of Applied Statistics*, *7*(2), 49–75.

Azam, M., & Haider, S. I. (2011). Impact of working capital management on firm's performance: Evidence from non-financial institutions of KSE-30 index. *Interdisciplinary Journal of Contemporary Research in Business, 3*(5), 481–492.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

Baum, C. F. (2006). *An introduction to modern econometrics using Stata*. Texas, USA: Stata Press.

Bawa, S., & Abdullahi, I. S. (2012). Threshold effect of inflation on economic growth in Nigeria. *CBN Journal of Applied Statistics*, *3*(1), 43–63.

Bernanke, B. S., Laubach, T., Mishkin, F. S., & Posen, A. S. (1999). *Inflation targeting: Lessons from the international experience*. Princeton, USA: Princeton University Press.

CBN. (2016). Financial satiability report – December 2016. Retrieved June 29, 2017, from https://www.cbn.gov.ng/out/2017/fprd/fsr%20december%202016%20(2).pdf.

CBN. (2017). Economic report first quarter 2017. Retrieved January 20, 2018, from https://www.cbn.gov.ng/out/2017/rsd/cbn%20economic%20report%20for%20first%20quarter%202017.pdf

Dehnel, G. (2014). Winsorization methods in Polish business survey. *Statistics in Transition New Series, 15*(1), 97–110.

Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? *Journal of Business Finance and Accounting, 30*(3 & 4), 573–587.

Donaldson, L. (2001). *The contingency theory of organizations*. Thousand Oaks, USA: Sage.

Eljelly, A. M. (2004). Liquidity-profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management*, *14*(2), 48–61.

El-Maude, J. G., & Shuaib, A. I. (2016). Empirical examination of the association of working capital management and firms' profitability of the listed food and beverages firms in Nigeria. *Researchers World*, *7*(1), 12–22.

Emejo, J. (2016, May 1). Nigeria: Further rise in inflation imminent as economy hurts. *This Day Newspaper.* Retrieved April 11, 2017, from http://allafrica.com/stories/201605020730.html

Enqvist, J., Graham, M., & Nikkinen, J. (2014). The impact of working capital management on firm profitability in different business cycles: Evidence from Finland. *Research in International Business Finance, 32*(C), 36–49.

Everett, J., & Watson, J. (1998). Small business failure and external risk factors. *Small Business Economics*, *11*(4), 371–390.

Falope, O. L., & Ajilore, O. T. (2009). Working capital management and corporate profitability: Evidence from panel data analysis of selected quoted companies in Nigeria. *Research Journal of Business Management, 2*(3), 73–84.

Field, A. (2005). *Discovering statistics using SPSS* (3rd ed.). London, England: Sage.

Filbeck, G., & Krueger, T. M. (2005). An analysis of working capital management results across industries. *Mid-American Journal of Business, 20*(2), 11–18.

Greene, W. H. (2008). *Econometric analysis* (6th ed.). Upper Saddle River, USA: Prentice Hall.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408–420.

Kieschnick, R., Laplante, M., & Moussawi, R. (2006). Corporate working capital management: Determinants and consequences. *International Journal of Managerial Finance*, *3*(2), 164–177.

Kline, R. B. (2011). *Principles and practice of structural equation modelling* (3rd ed.). New York, USA: The Guilford Press.

Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in The Athens Stock Exchange. *Journal of Financial Management and Analysis, 19*(1), 26–35.

Makori, D. M., & Jagongo, A. (2013). Working capital management and firm profitability: Empirical evidence from manufacturing and construction firms listed on Nairobi Securities Exchange, Kenya. *International Journal of Accounting and Taxation, 1*(1), 1–14.

Mathuva, D. M. (2014). An empirical analysis of the determinants of the cash conversion cycle in Kenyan listed non-financial firms. *Journal of Accounting in Emerging Economies, 4*(2), 175–196.

Mirza, S. A., & Javed, A. (2013). Determinants of financial performance of a firm: Case of Pakistani stock market. *Journal of Economics and International Finance*, *5*(2), 43–52.

Murthy, S. R. Y. (2015). Working capital, financing constraints and firm financial performance in GCC Countries. *Information Management and Business Review*, *7*(3), 59–64.

NBS. (2017). Consumer price index: March 2017. (Base Period November 2009=100. Retrieved April 11, 2017, from https://www.google.com/search?q=Consumer+price+index%3A+March+2017.+(Base+Period+November+2009%3D100&oq=Consumer+price+index%3A+March+2017.+(Base+Period+November+2009%3D100&aqs=chrome..69i57.912j0j7&sourceid=chrome&ie=UTF-8

Njiforti, P. (2015). Impact of the 2007/2008 global financial crisis on the stock market in Nigeria. *CBN Journal of Applied Statistics*, *6*(1a), 49–68.

Nyamao, N. R., Patrick, O., Martin, L., Odondo, A. J., & Simeyo, O. (2012). Effect of working capital management practices on financial performance: A study of small scale enterprises in Kisii South District, Kenya. *African Journal of Business Management, 6*(18), 5807–5817.

Nzioki, P. M., Kimeli, S. K., Abudho, M. R., & Nthiwa, J. M. (2013). Management of working capital and its effect on profitability of manufacturing companies listed on Nairobi securities exchange (NSE), Kenya. *International Journal of Business and Finance Management Research, 1,* 35–42.

Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research Papers, 2*(2), 45–58.

Patra, S. K., & Ratha, P. C. (2012). An inventory replenishment policy for deteriorating items under inflation in a stock dependent consumption market with shortages. *International Journal of Transdisciplinary Research, 6*(1), 1–23.

Raheman, A., & Nasr, M. (2007). Working capital management and profitability – Case of Pakistani firms. *International Review of Business Research Papers, 3*(1), 279–300.

Salman, A. Y., Folajin, O. O., & Oriowo, A. O. (2014). Working capital management and profitability: A study of selected listed manufacturing companies in Nigerian Stock Exchange. *International Journal of Academic Research in Business and Social Sciences, 4*(8), 287–295.

Simon, S., Sawandi, N., & Abdul-Hamid, M. A. (2017). The quadratic relationship between working capital management and firm performance: Evidence from the Nigerian economy. *Journal of Business and Retail Management Research*, *12*(1), 94–108.

Singh, P. H., & Kumar, S. (2014). Working capital management: A literature review and research agenda. *Qualitative Research in Financial Markets*, *6*(2), 173–197.

Smith, K. (1980). Profitability versus liquidity tradeoffs in working capital management. In K. V. Smith (Ed.), *Readings on the management of working capital* (pp. 549–562). St. Paul, USA: West Publishing Company.

Smith, M. B., N'Cho-Oguie, C., Murray, L. W., & Blakley, D. (2003). The effects of macroeconomic instability and inflation on sustainable real growth in South African firms. *South African Journal of Economic and Management Sciences*, *6*(4), 666-692.

Sundar, N. (1980). Working capital management and finance. *Economic and Political Weekly*, *15*(8), M25–M31.

Tauringana, V., & Afrifa, G. A. (2013). The relative importance of working capital management and its components to SMEs' profitability. *Journal of Small Enterprise and Business Development, 20*(3), 453-469.

Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance*, *31*, 1–16.

Uzor, N. (2016, February 22). Firms to close down on raw material scarcity – MAN. *Vanguard Newspaper*. Retrieved June 27, 2017, from http://www.vanguardngr.com/2016/02/firms-to-close-down-on-raw-materials-scarcity-man/ .

Wasiuzzaman, S. (2015). Working capital and firm value in an emerging market. *International Journal of Managerial Finance*, *11*(1), 60–79.

Yazdanfar, D., & Öhman, P. (2014). The impact of cash conversion cycle on firm profitability: An empirical study based on Swedish data. *International Journal of Managerial Finance, 10*(4), 442–452.

Zingwiro, P. T. S. (2006). *Working capital management in hyper-inflationary economies: A case of Zimbabwe,* (Master's thesis, University of Kwa-Zulu Natal, South Africa). Retrieved March 10, 2017, from http://researchspace.ukzn.ac.za/xmlui/bitstream/handle/10413/1187/Zingwiro_Protase_Tichafa_Sanangurai_2006.pdf;sequence=1