Cash Management and Financial Performance of Listed Manufacturing Firms in Nigeria

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Abstract
This study examined the impact of cash management on financial performance of quoted manufacturing firms in Nigeria. The cash management variables examined in the study include cash conversion cycle (CCC), Creditors payment period (CPP), and Cash flow margin (CFM). The Arellano and Bond dynamic panel data estimation was employed in the analysis to address the potential effects of endogeneity in the relationship. The findings reveal that Cash conversion cycle has a positive and significant impact on financial performance, Creditors' payment Period (CPP) has a positive impact on the firm financial performance, which is significant at 5%. Furthermore, cash flow margin (CFM) positively impacts financial performance, which is also significant at 5%. The following policy recommendations are provided in light of the study's findings. Firstly, firms should not depend so much on debt, especially in the light of macroeconomic instability and rate volatility but instead should look at how to develop strategies to lower their cash conversion cycles. Secondly, firms should seek long-term financing arrangements with longer payback periods, enabling them to properly utilise these funds with convenient investment timelines. Thirdly, firms should maintain a high cash flow margin by designing effective sales and marketing systems on the one hand and on the other hand to put in place a mechanism to minimise credit sales where possible and ensure timely payment arrangements where credit sales are involved.

Keywords: Cash Management, Cash conversion cycle, Creditors payment period, Cash flow margin, Working capital management

JEL Classification Code:

1. INTRODUCTION

Cash is the lifeline of any organisation and, if not correctly and prudently managed, can affect the operations of such an organisation. Cash management is one of the critical aspects of efficient working capital management. Cash management is concerned with managing cash (inflows and outflows). Kyomukama (2013) sees cash management as a broad term referring to the collection and disbursement of cash. Some sources of cash inflow include cash from operating activities, sale of business assets, and dividends received from other companies, while cash out flows include settling creditors, purchasing inventory, and payments for expenses (Festus, 2011). Cash and cash equivalents are a precondition to ensure that firms can meet their short-term obligations as they fall due while ensuring that profitability is not affected. Overall, cash management is crucial if corporations are to ensure sustained financial performance both in the short and long run.

The firm's liquidity position is critical in pursuing sustained positive financial performance. Consequently, a large holding of current assets, significantly cash, strengthens the firm's liquidity (and reduces risks) but also reduces the overall profitability. For example, a firm may adopt an aggressive cash management policy with cash management practices that creates a low level of current assets as a percentage of total assets for its working capital. In this case, the firm is willing to adopt risky positions such as accommodating a longer debtor's collection period, a short creditor's payment period and lower cash flow margin and a longer cash conversion cycle. If all goes well, the returns in terms of profitability are usually high for firms adopting more risk.

However, if the risk strategy does not go as planned, the firms face the risk of liquidity struggles and stockouts, resulting in difficulties in maintaining smooth operations (Van Horne & Wachowicz, 2004). Hence recommending that firms adopt risky cash management practices to drive corporate profitability may not be absolute. On the other hand, corporations can adopt a conservative policy, where the practice is to monitor cash levels to ensure managers put the high investment of cash management in short-term or current assets as compared to long-term assets. This can be in the form of negotiating short debtors collection periods, longer creditors payment periods and higher cash flow margins and can negatively impact profitability (Van Horne & Wachowicz 2004), creating high levels of idle cash. Therefore, efficient cash and working capital management to drive financial performance require a clear understanding of the economics of trade-off between risk and return and what nature of cash management practices to adopt.

The extant research on the issue of cash management measures (cash conversion cycle, creditor's payment period and cash flow margin) and firm profitability is still a very debatable and inconclusive area of research, and the findings of several studies in this area is still very much inconclusive and exhibits serious empirical disharmony indicating that the area is still very much an issue for consideration. For example, on one side of the debate are studies showing a negative relationship between cash management variables and financial performance (Akinyomi, 2014; Haji 2013; Dong & Tay Su, 2010; Bhutto, Abbas, Rehman & Shah, 2011). On the other side of the debate are those studies showing a positive relationship (Charitou, Lois and Halim 2012; Muhammad and Syed 2011; Malik, Waseem and Kifayat 2011). In addition to the inconclusiveness of the research area, all of the studies examined are characterised by a key limitation that also forms the gap and basis for this present study. These studies have all largely ignored the possibility of reverse causality between cash management and profitability. A most recent study by Dina and Silvije (2018) has shown that in models testing the impact of cash management and profitability; there may be a problem of endogeneity resulting from reverse causality. Utilising the ordinary least squares (OLS) estimator or the fixed effects (FE) estimator in the presence of endogeneity will yield bias estimators. Hence, this study employs the dynamic Arellano-Bond estimator, which seems appropriate considering the dynamic nature of the company's profitability and controls for potential endogeneity problems.

The study's main objective is to examine the relationship between cash management variables (cash conversion cycle, creditor's payment period and cash flow margin) and the financial performance of listed manufacturing firms in Nigeria.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1 Cash Conversion Cycle and Financial Performance

The definition of Cash Conversion Cycle reflects "the length of time between cash payment for the purchase of resale of goods and collection of account receivables generated by the sale of these goods" (Akinyomi 2014). According to Charitou, Lois and Halim (2012), one of the most commonly accepted definitions of the Cash Conversion Cycle measures the interval between the time cash expenditures are made to purchase inventory for use in the production processes and the time that funds are received from the sale of finished products. This time interval is measured in days and is equal to the net of the average age of the inventory plus the average collection period minus the average age of accounts payable. A shorter CCC results in a higher present value of net cash flows generated by the assets and, therefore, a higher firm value. Furthermore, a short CCC implies that a lesser day's cash is tied up in working capital not offset by free financing in the form of deferred payments and results in more liquidity for the firm. Hence, the length of Cash Conversion Cycle is expected to be negatively associated with a firm's profitability (Akinyomi, 2014).

Charitou, Lois and Halim (2012) investigated the relationship between the cash conversion cycle and the firm's profitability for an emerging Asian country by focusing on 718 firms listed on the Indonesia Stock Exchange for 13 years, 1998-2010. Based on multivariate regression analysis, their findings revealed

that Cash Conversion Cycle positively affects the firm's profitability. Ugwunta, Ani and Okwo (2012) studied working capital management as measured by the cash conversion cycle (CCC), and how the individual components of the CCC influence the profitability of world-leading beer brewery firms. The analysis indicates that the cash conversion cycle impacts beer brewery firms' profitability. In light of the above, the hypothesis is specified.

$H_{01:}$ *Cash Conversion Cycle has no significant positive relationship with Financial Performance of listed manufacturing firms in Nigeria.*

2.2. Creditors' Payment Period and Financial Performance

The credit period specifies the maximum number of days to pay suppliers. Credit policy and collection procedures affect cash inflows, sales, and the risk of bad debts (Dong & Tay Su, 2010). Any changes in credit policy will directly impact working capital performance. For example, management's decision to reduce or increase the credit period influences the cash conversion cycle. A credit policy usually includes credit standards, credit periods, and cash discounts (Gitman, 2003). Collection procedures aim to reduce delays in collecting outstanding receivables. Melita, Maria and Petros (2010) empirically investigated the effect of creditor's payment period and cash conversion cycle on a firm's financial performance in an emerging market. Their data set consists of firms listed on the Cyprus Stock Exchange from 1998 to 2007. Using multivariate regression analysis, their results indicate that the creditors' payment period is associated with the firm's profitability.

Similarly, Muhammed (2015) examined the effects of Working Capital Management on firms' profitability, showing that creditors' Payment Period has a significant positive relationship with firms' profitability. Shadrack, Jane, and William (2015), using tourist hotels in Mombasa country, Kenya, found that the Creditors' Payment Period has a significant positive relationship with financial performance. In light of the above, the hypothesis is specified.

$H_{01:}$ *Creditors payment period has no significant positive relationship with Financial Performance of listed manufacturing firms in Nigeria.*

2.3. Cash Margin and Financial Performance

Bushuru, Basweti and Mukonyi (2015) analysed the association between cash margin and profitability of listed firms in Nairobi Securities exchange (NSE), Kenya. Using a multiple regression model, the study revealed a positive relationship between cash margin and profitability of listed firms in Kenya. Panigrahi (2014) examined the association of cash margin measure and firm profitability. The study found that even with having a high cash margin has, a positive relationship with profitability exists.

Chauhan and Bhayani (2013) used data collected from BSE Sensex -30 companies' dividend payout regressed on firms' profitability and working capital. The study's results showed that profitability for companies is highly influenced by cash margin planning. Oladipupo and Okafor (2013) examine the extent to which current ratio and cash margin impact firm profitability. Financial data were obtained from twelve manufacturing companies quoted on the Nigeria Stock Exchange over

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five years period (2002 to 2006). The results reveal that cash margin has a significant effect on firm profitability, but the current ratio result was insignificant. Khaldun (2014) noted that there is a weak significant relationship between cash margin measures (current ratio, quick ratio, cash ratio) and gross profit margin, and those ratios together significantly impact the growth of profit of industrial companies. Tugas (2012) used three cash margin ratios (current ratio, quick ratio, cash ratio) to identify the extent of its relationship with operating profit margin and found a positive relationship. In light of the above, the hypothesis is specified.

$H_{03:}$ *Cash margin has no significant positive relationship with Financial Performance of listed manufacturing firms in Nigeria.*

3. THEORETICAL FRAMEWORK

Agency Theory
From the agency perspective, cash management is a managerial activity that managers are expected to efficiently monitor and manage to make a profit and maximise the owners' value (Dierks & Patel, 1997). Based on the agency as managers managed working capital according to prescriptive theory, it would manage cash, accounts receivable, inventory, accounts payable, the cash conversion cycle and measure and analyse performance to ensure that the long-term assets are utilised effectively and efficiently. Thus, each of the cash management components helps in the management of firms. Therefore, the theory that underpins this study is agency theory from efficiency and prescriptive perspectives. Finally, the theory provides a framework and a logical linkage between cash management and shareholder wealth.

4. METHODOLOGY

This study adopts the ex-post facto research design to examine the relationship between the variables and the degree to which the independent variables influence the dependent variable. A sample used in the study covers 14 food and beverage firms, which were selected using the simple random sampling technique. Secondary data was collected from the selected companies' audited annual reports and accounts from 2010-2018. In order to examine the relationship between cash management and performance, several statistical techniques were used in the study. Firstly, the study employs the use of descriptive statistics. Secondly, the study utilises the Pearson correlation analysis to provide insight into the degree and direction of the relationship between the dependent and independent variables. Thirdly, the study employs the Panel data regression techniques will to estimate the relationship between working capital policy variables and firm profitability. Finally, the fixed and random effects estimations were conducted, and the Hausman test was employed to select between the effects estimations. Finally, the Arellano-bond dynamic estimation was conducted to address endogeneity issues between working capital and firm profitability.

Model Specification
For the purpose of examining the relationship between cash management and financial performance of listed manufacturing firms in Nigeria. The study adapts that of Muhammed (2015) which is presented below;

$$ROA = \beta0 + \beta_1 CCC + \beta_2 SIZE + \beta_3 LEV + \beta_4 GROWTH + \beta_5 GDP + e_{it} \ldots\ldots (i)$$

Where; ROA is the return on assets, CCC is the cash conversion cycle, Size is the firm's size, Lev is total debt to total assets, Growth is the firm's sales growth, GDP is annual growth domestic product, and e_{it} **is** regression residuals.

The present study adapts the model by bringing in additional cash management variables such Cash flow margin and eliminating LEV, SIZE, GROWTH and GDP, which are macro-variables and not within the purview of interest of this study. The functional model for the study is thus presented below;

$$PM_{it} = f(CCC_, CPP \ CFM), \ .... \ (ii)$$

The econometric model is presented thus;

$$PM_{it} = \beta_0 + \beta_1 \ CCC_{it} + \beta_2 \ CPP_{it} + \beta_3 \ CFM_{it} + e_{it} .... \ (iii)$$

Where, PM = profit margin
CCC = cash conversion cycle
CFM= Cash flow margin
CPP = creditors payment period
e = error term
i= ith firm
t= time

Table 1: Variable Measurement and Source

Variable	Measurement	Source	Aprori sign
Financial performance	The measure for financial performance or profitability used in this study is profit margin measured as the ratio of Profit-cost of sales.	Sohail, Rasul and Fatima (2016)	
Cash conversion cycle (CCC)	Measured as Receivable days + Inventory days– Payable days	Charitou, Lois and Halim (2012)	+
Creditors payment period (APP)	CPP is the average length of time between the purchase of material and labor and the payment of cash for them.	Muhammed (2015)	+
(CFM) Cash Flow margin	Cash margin measured as quick ratio.	Tugas (2012)	+

Source: Researchers compilation (2019)

5. PRESENTATION AND ANALYSIS OF RESULT

Table 4.1. Descriptive statistics

	CCC	CPP	PATM	CFM
Mean	90.5868	232.0519	10.14239	10.28096
Median	27.79842	129.5514	5.040354	12.16903
Maximum	910.8297	1626.78	696.536	205.9169
Minimum	8.9	7.154281	-2224.2	-951.956
Std. Dev.	718.2315	843.57	352.8799	52.35464

Skewness	-14.6783	16.19919	16.53528	-14.2997
Kurtosis	259.1868	299.2908	342.4392	261.5808
Jarque-Bera	1227359	1639799	2146938	1249296
p-value	0.0000	0.000	0.000	0.000

Source: Researchers compilation (2019)

The descriptive statistics of the data is presented in table 4.1 above. As observed, CCC has a mean of 90.58 days, about three months. The maximum and minimum CCC is 910 days and approximately 9 days, respectively. The standard deviation is 718.2315 is large and confirms substantial variations in CCC across the firms in the sample. A shorter CCC results in a higher present value of net cash flows generated by the assets and, therefore, a higher firm value.

Furthermore, a short CCC implies that lesser days' cash is tied up in working capital not offset by free financing in the form of deferred payments, resulting in more liquidity for the firm. The mean for CPP is 232 days, which shows, on average, the time firms in the sample take to pay their accounts payables. Hence, the value shows that, on average, manufacturing firms pay their creditors or account payables within one accounting year. The maximum observed in the sample is 1626 days, about 4 years and 6 months, while the minimum is about 7 days. The standard deviation of 843.57 confirms substantial CPP variations across the sample firms. The mean PM is 10.14% with maximum and minimum values of 696.536 and -224.2%. The standard deviation of 352.8799 confirms substantial PM variations across the sample firms. The mean CFM is 10.28% with maximum and minimum values of 205.9169 and -951.956%. The standard deviation of 52.3546 shows that variations in CFM across the firms in the sample is less than that observed for other cash management variables. The Jacque-bera statistics for all the variables reveals that the series are normally distributed given that the J.B values are all less than 0.05. This implies the absence of significant outliers in the data.

Table 4.2. Correlation Statistics

	CCC	CPP	PM	CFM
CCC	1			
CPP	-0.47626	1		
PM	-0.50691	0.342843	1	
CFM	0.313597	-0.44259	-0.73796	1

Source: Researchers compilation (2019)

The Pearson product-moment correlation is examined to provide insight into the direction and degree of association between firm profitability and the cash management variable in the study. As observed, a negative correlation between CCC and PM (r=-0.707) suggests that CCC delays can be associated with a decline in firm

profitability. A positive correlation is observed between CPP and PM (r=0.7428), suggesting that firms fulfilling their accounts payable timelier can positively affect profitability. A negative correlation is observed between CFM and PM (r=-0.737), suggesting that firms with a higher cash flow margin are associated with lower profitability. The variance inflation test is examined below to investigate the presence of multicollinearity between the variables and the results is presented below;

Table 4.3. Variance Inflation Factor Test

Variable	VIF
C	NA
CCC	8.44755
CPP	6.85979
CFM	3.843297

Source: Researchers compilation (2018)

The variance inflation factor (VIF) explains how much of the variance of a coefficient estimate of a regressor has been inflated as a result of collinearity with the other regressors. Essentially, VIFs above 10 is seen as a cause of concern as observed; none of the variables have VIF values more than 10, and hence none seriously indicated multicollinearity.

4.4. Regression Results

	Aprori sign	FE-Estimator	RE-estimator	Arrelano and bond estimator
C		-69.6145* (32.275) {0.0316}	-181.5898** (100.6902) {0.0720}	
CCC	+	0.1151* (0.0332) {0.0006}	0.0223 (0.1255) {0.8589}	0.6578* (0.0112) {0.0000}
CPP	+	0.2652* (0.1085) {0.0149}	0.136460* (0.06658) {0.0410}	0.69446* (0.0121) {0.0000}
CFM	+	-0.67357* (0.3355) {0.0453}	-2.14735* (0.67522) {0.0016}	2.92237* (0.0289) {0.0000}
PATM(-1)				0.00417* (6.42E-05) {0.0000}
R^2		0.4862	0.641289	
Adj R^2		0.4252	0.636364	
S.E. of regression		140.15	208.3217	

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F-statistic		7.97472	130.2086	
Prob(F-statistic)		0.000	0.000000	
d.w.		1.71	0.568	
hausman		0.021		
J-statistic				36.26935
Prob(J-statistic)				0.409251
AR(1)				0.6693
AR(2)				0.264

Source: Researcher's compilation (2019) * sig @5%, **sig:10% , ( ) standard error and { } p-values

Table 4.4 shows the regression results of the Random effects (RE) and fixed effects (FE) models and Arellano and Bond dynamic panel estimation. To determine which model is better between the fixed and random effects estimations, the Hausman test is conducted and as observed the Hausman test statistic (Prob = 0.021) indicates that the RE method may give bias and inconsistent estimators when compared to FE model. Therefore, given that the FE is preferred to the RE. As shown in the results, the R^2 for the FE model is 0.4862 which implies that the model explains about 48.62% of the systematic variations in the dependent variable with an adjusted value of 42.52%. The F-stat is 7.97472 (p-value = 0.00) is significant at 5%, and suggests that the hypothesis of a significant linear relationship between the dependent and independent variables cannot be rejected. It is also indicative of the joint statistical significance of the model. The analysis of coefficients reveals CCC is positive (0.1151) and significant (p=0.0006) at 5%, which implies that an increase in the cash conversion cycle has a positive and significant effect on firm profitability. CPP has a positive beta (0.2652) and significant (p=0.0149) at 5%, implying that more extended periods for payables accounts settlement positively and significantly impact firm profitability. CFM has a

negative beta (-0.6736) and significant (p=0.0453), implying that Cash flow margin is a significant factor influencing firm profitability. The positive coefficient suggests that higher CFM levels will result in a decline in firm profitability.

Though the FE models mainly control for unobserved heterogeneity, they do not account for the endogeneity problem (Cameron & Trivedi 2005). To deal with this issue, the Arellano and Bond (1991) dynamic panel estimator is employed, which seems appropriate considering the dynamic nature of the company's profitability and controls for potential endogeneity problems. The Arellano and Bond estimation results show a substantial difference from the FE estimations with stronger beta's, confirming that the Arellano and Bond estimations results after correcting for endogeneity are more impressive.

The analysis of the coefficients reveals CCC has a positive (0.6578) significant effect (p=0.000) on firm profitability, and the estimates are higher than that observed for the FE estimation; hence the null hypothesis (H1) is rejected. The finding is in tandem with Charitou, Lois and Halim (2012) and Ugwunta et al. (2012). CPP has a positive impact (0.6944) on firm profitability, which is significant (p=0.00) at 5%, and hence the

hull hypothesis (H2) is rejected. The finding is in tandem with Melita, Maria and Petros (2010), Muhammed (2015) and Shadrack, Jane, and William (2015). CFM has a positive beta (2.9223) and significant (p=0.000) at 5%. The lag of PM is positive (0.00417) and significant at 5%. One point to be emphasised is that table 4.4 for the GMM estimation results is the J-stat test of overidentifying restrictions and the Arellano-Bond test for autocorrelation error. The J-stat tests yield all p-values above 0.10, which means that a null hypothesis could not be rejected. Hence, over-identification restrictions are valid. The AR (1) tests indicate that the residuals in the first differences are correlated as expected, while the AR(2) tests give p-values above 0.10, which means that a null hypothesis of no second-order serial correlation could not be rejected. Therefore, all results of the GMM model are valid.

5. CONCLUSION
This study has examined the impact of cash flow management on the financial performance of quoted manufacturing firms in Nigeria. The cash management variables examined in the study include cash conversion cycle (CCC), Creditors payment period (CPP), and Cash flow margin (CFM). The Arellano and Bond dynamic panel data estimation was employed in the analysis to address the potential effects of endogeneity in the relationship. The findings reveal that the Cash conversion cycle has a positive and significant impact on financial performance; the creditors' payment Period (CPP) has a positive impact on the firm financial performance, which is significant at 5%. Furthermore, cash flow margin (CFM) positively impacts the financial performance of the firms examined, which is also significant at 5%**.**

The following policy recommendations are recommended in light of the study's findings. Firstly, firms should not depend so much on debt, especially in light of macroeconomic instability and rate volatility, but rather look at developing strategies to lower their cash conversion cycles. Secondly, firms should seek long-term financing arrangements with longer payback periods, enabling them to properly utilise these funds with convenient investment timelines. Thirdly, firms maintain a high cash flow margin by designing effective sales and marketing systems on the one hand and, on the other hand, by putting in place a mechanism to minimise credit sales were possible and ensure timely payment arrangements where credit sales are involved.

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