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The Impact of Cash Management on Firms' Financial Performance: A Study of Some Selected Manufacturing Firms in Nigeria

Onyemaobi Chinenye Anthonia
M.sc. Management Scholar, Bayero University, Kano, Nigeria

Abstract: This study, "The Impact of Cash Management on Firms' Financial Performance of Some Selected Manufacturing firms" was undertaken to ascertain the relationship between cash management and financial performance of some selected firms in the manufacturing sector in Nigeria.The research examined the relationship between Cash conversion cycle, cash conversion efficiency of manufacturing firms' profit margin and return on investment.. Four hypotheses were formulated, correlation and linear regression were conducted in testing the hypotheses. The ex-post facto and analytical research designs were employed in the study. The time series data covering a period of eleven(11) years (2000-2010) and cross sectional data of seventeen (17) firms were utilized to carry out analyses to validate the result obtained.The result confirms the theoretical negative relationship between cash conversion cycle and cash conversion efficiency of manufacturing firms. This implies that the profitability of manufacturing firms increases with shorter cash conversion cycle. A probable explanation to this finding is that when the cash conversion cycle is relatively shorter, the firm may not need external financing, which results in incurring less borrowing cost. Hence, profitability increases. It was therefore recommended that in order to increase returns on investment, manufacturing companies in Nigeria should ensure efficient cash management both in the short term and in the long run. In addition, it was suggested that in order to increase profitability, manufacturing firms in Nigeria should avoid under capitalization and under trading.

Keywords: cash management, profit margin, cash conversion cycle, profitability, manufacturing firms

1. Introduction

Cash management has become an important topic of discourse in contemporary finance. The reason is not far from the fact that absence of management of organization's cash not only constitute threat to performance but exposes the firm to the danger of insolvency especially in such instances as when bank suspends overdraft facilities, or creditors demand immediate payment on delivery for supplies even when the company is not able to realise sufficient amount of its current assets quickly into cash. In a situation where a bank suspends overdraft facilities to a company during cash shortage, the firm may face loss of reputation. In addition, the company may loss its strategic suppliers to competitors. Apparently, every business needs adequate liquid resources to maintain daily cash flow; it needs enough money to pay wages, salaries and creditors if it is to keep its workforce and ensure provision of supplies.

Since resources are scarce, business organizations want to make maximum use of available capital in order to ensure optimal returns from among alternative investments opportunities. To avoid a situation of cash shortage when cash is highly needed or cash surplus when there is little or no need for cash, many companies have now embraced the idea of effective cash management.

Therefore, this paper focuses on the impact of cash management on a firm's performance. According to Horne and Wachowitz (1998), cash management is very vital for production firms whose assets are mostly composed of current assets. Cash management directly affects liquidity and profitability of any firm (Raheman and Nasr, 2007). Particularly, it centres on measuring the effect of cash management on profitability just as it dwells on establishing, if any, the association between liquidity and profitability of firms.

2. Statement of the Research Problem

Cash management is a significant determinant of a firm's profitability and performance. It thus requires expert management and planning of all inflows and outflows from an organization for the purpose of achieving profitability and performance on the part of Nigerian industries. But many firms in Nigeria especially manufacturing industries lack adequate technical competence and managerial acumen to achieve efficiency of cash management. This to a large extent has been responsible for the incessant liquidation and closure of many organizations in the country.

Many manufacturing companies in Nigeria operate at a profit but they still run into serious financial problem resulting from inadequate capital to provide the cash needed to pay debts as they fall due because of overtrading. In order to reduce accounts receivable, many firms in Nigeria embraced strict collections policies and limit sales credits to their customers to maximize and increase cash inflow. But this strict collection policies and restriction on sales credits has led to lost sales which ultimately reduce profits.

As a result of the trade-off between liquidity and profitability of firms, many of the Nigerian firms that focus on effective cash management to achieve the objective of liquidity have lose hold of the profitability goal. In the same vein, even as they centre on profitability objectives, many are facing difficulty of illiquidity. The challenge therefore lies on how to achieve profitability goal without losing grip of the liquidity objective since inadequate cash may lead to lost sales and thus may affect the profitability.

In line with the above stated problems, this paper is an attempt to provide answers to the following questions:

What is the relationship between cash conversion cycle and a manufacturing company's profit margin?

What is the impact of cash conversion cycle on the profit margin of firms' in the Nigerian manufacturing sector?

What variation of manufacturing firm's profit margin that is explained by cash management?

What is the relationship between liquidity and profitability of firms in the manufacturing sector?

3. Research Design the Study Employed *Ex Post Facto* Research Design

The *ex post facto* research design is justified by the fact that both the independent variables (cash conversion cycle and cash conversion efficiency) and dependent variables (return on investment and profit margin) are already in existence and are observed at the same time because the effects of the former on the latter took place before the study was carried out.

4. Data Presentation and Analysis

The computed cross sectional data for year 2009 with respect to cash management and financial performance of the seventeen sample companies of the study are shown on Table 1. Similarly, the time series data covering a period of eleven years beginning from 2000 – 2010 in respect of cash management and financial performance of Northern Nigeria Flour Mills (NNFM) are shown in Table 2.

Years	CCC	TOTAL ASSETS	TOTAL ASSETS (LN)	CCE	ROI	PM
2000	-80.9805	703601	13.46	0.0860	8.3792	4.9427
2001	-68.5943	754448	13.53	0.0365	7.3488	4.0071
2002	-67.4397	1093757	13.91	0.0097	13.6813	5.6115
2003	-80.8459	1252275	14.04	0.0105	11.9170	5.6260
2004	-128.6506	1600867	14.29	0.0539	8.6515	5.5413
2005	-94.3129	1927234	14.47	0.0416	7.6170	3.9222
2006	-109.6670	1918967	14.47	-0.0313	2.8698	1.7163
2007	-92.7797	1975702	14.50	0.0601	-5.2845	-1.9563
2008	-54.2391	2358347	14.67	0.0889	2.4418	1.2825
2009	-29.1159	2759655	14.83	0.0452	8.5619	3.6273
2010	-40.9565	2567244	14.76	-0.0443	15.9784	6.1860
Total	-847.5821	18912097	16.76	0.3568	82.1621	40.506
Mean	-77.05	1719282	14.34	0.03	7.47	3.68

Table 1: Time Series Data on Cash Management and Financial Performance of Northern Nigeria Flour Mills Plc
Source: Computed by the researcher from data extracted from the financial statements of Northern Nigeria Flour Mills Plc from 2000-2010.

Table 1 was computed by utilizing time series data from year 2000 to 2010 in respect of NNFM. It illustrates the time series cash management and financial performance statistics of NNFM beginning from 2000 – 2010. It shows the sum and mean values with respect to the independent variables of Cash Conversion Cycle and Cash Conversion Efficiency and the dependent variables of Return on Investment, Profit Margin. The dependent variable displayed by the table comprises Return on Investment (ROI), Profit Margin (Margin), while the independent variables consist of Cash Conversion Cycle (CCC) and Cash Conversion Efficiency (CCE).

An analytical look at Table 1 reveals that the total Cash Conversion Cycle and Total Assets of NNFM equals -847.5821 and 18912097 (natural log equals 16.76) and mean statistics equal to -77.05 and 1719282 (natural logarithm of 14.34). The table also exhibits that while the firm's total for CCE, ROI and PM equals 0.3568, 82.1621 and 40.506 the company's mean values equal to 0.03, 7.47 and 3.68 in that order.

NAME OF COMPANIES	CCC	TOTAL ASSETS	TOTAL ASSETS (LN)	CCE	ROI	PM
PZ CUSSONS	-150.4305	32843523	17.31	0.1163	9.1462	7.2212
CHELLARAMS PLC	-102.2809	2442684	14.71	-0.0728	-13.8752	0.4848
DN MEYER PLC	-526.1094	807003	13.60	0.0266	-77.7034	15.3967
MAY AND BAKER NIG PLC	-157.3715	3515948	15.07	0.1743	6.6008	40.8743
NIGERIAN ROPES PLC	-528.9027	292705	12.59	0.0608	-43.8745	3.2436

UNILEVER PLC	-34.8977	11277070	16.24	0.1494	36.3022	15.8742
IPWA PLC	-1288.6940	426834	12.96	0.0284	-1.0397	2.7176
ASHAKA CEM PLC	-77.4872	15970229	16.59	0.1599	-5.9086	25.5274
GUINESS NIGERIA PLC	-62.7427	42726779	17.57	0.2222	31.6925	22.2175
NORTHERN NIG. FLOUR MILL	-29.1159	2759655	14.83	0.0452	8.5619	3.6273
FIDSON HEALTHCARE PLC	-625.4070	5267324	15.48	0.2381	-3.6824	12.4116
NATIONAL SALT COY PLC	-2.9776	4631532	15.35	0.1699	39.7783	30.9916
DANGOTE FLOUR PLC	8.7819	26886137	17.11	0.3264	19.9354	17.8320
DANGOTE SUGAR REF. PLC	-18.5083	41612797	17.54	0.0983	31.6864	23.7724
NEIMETH INT. PHARM. PLC	-699.3857	1072787	13.89	0.0982	-29.6625	-8.0576
SEVEN-UP BOTTLING COY PLC	-418.1726	7984017	15.89	0.1352	19.1592	11.8688
PHARMA DEKO PLC	1136.5567	-646407	13.38	-0.3494	71.3942	-42.6589
TOTAL	-3577.1	199870617.0	260.1	1.6	98.5	183.3
MEAN	-210.4	11757095.1	15.3	0.1	5.8	10.8

Table 2: Cross Sectional Data on Cash Management and Financial Performance of Sampled Companies
Source: Computed by the resercher from data extracted from year 2009 financial statements of the sampled companies

Table 2 demonstrates the cross sectional performance and cash management statistics of the seventeen sample companies of the study for year 2009.
It shows the mean with respect to the independent variables of cash conversion cycle (CCC) and Cash Conversion Efficiency (CCE) and the dependent variables of return on asset (ROI), profit margin (PM).
Relationship between Cash Conversion Cycle and Manufacturing Firms' Financial Performance

		CCC
PM	Pearson Correlation	-.406
	Sig. (2-tailed)	.216

Table 3: Time Series Pearson Correlation Matrix with respect to significant relationship between Cash Conversion Cycle and Manufacturing Firms' Financial Performance

		CCC
PM	Pearson Correlation	-.291
	Sig. (2-tailed)	.257

Table 4: Cross Section Pearson Correlation Matrix with respect to significant relationship between Cash Conversion Cycle and Manufacturing Firms' Financial Performance

The result of the time series data shows an insignificant negative relationship between cash conversion cycle and profit margin. This result is expectedly consistent with the a priori sign of a negative relationship between cash conversion cycle and profitability which is seen in the correlation coefficient of -0.406. Further, the results from the cross sectional data indicate that there is a negative relationship between cash conversion cycle and profit margin. The relationship is demonstrated by a correlation coefficient of -0.291.
Although, both results from time series and cross sectional analysis confirms the theoretical negative association between cash conversion cycle and manufacturing firm financial performance, further test was carried out using regression technique for the purpose of substantiating the correlation result.
From the correlation analysis it can be inferred that the profitability of manufacturing firms increases with shorter cash conversion cycle. A probable explanation to this finding is that when the Cash Conversion Cycle is relatively shorter, the firm may not need external financing, which results in incurring less borrowing cost. Hence, profitability increases.
For the purpose of carrying out the regression analysis in order to find out the value of the constant term and the coefficient of the explanatory variable which is CCC, a scatter diagram was first of all plotted for both time series and cross sectional data. The essence is to establish the linearity of the relationship between PM and CCC. The scatter plot diagram is shown below.
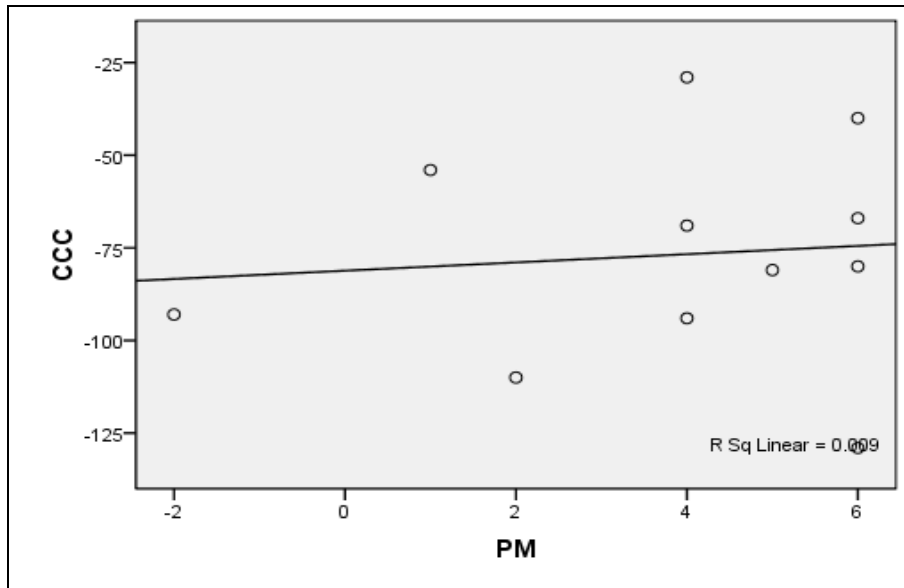
Figure 1: Time Series Scatter Plot of the Linearity between PM and CCC
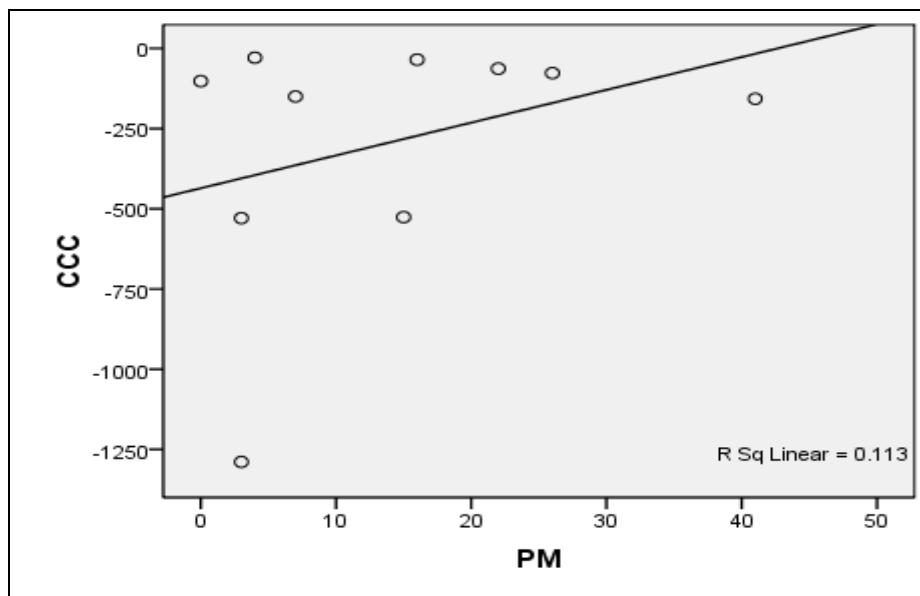

Figure 2: Cross Section Scatter Plot of the Linearity between PM and CCC

Figure 1 and 2 show the linearity between PM and CCC. While figure 1 depicts a time series linear regression relationship, figure 2 exhibits a cross sectional linear regression relationship. PM is the dependent variable and CCC is the explanatory variable. The scatter plot has shown some level of linearity between the two variables as seen in R Sq Linear = 0.009 in respect of time series analysis and R Sq Linear = 0.113 with respect to cross sectional analysis. The variability of PM appears to increase with decreasing CCC. Therefore, the resulting scatter plot appears to be suitable for linear regression. See table 5 below for coefficient of the estimate of the equation: $PM = \beta_0 + \beta_1 CCC + \mu$

R, the multiple correlation coefficient (see appendix), is the linear correlation between the observed and model predicted values of the dependent variable. Its value portrays a considerable relationship between PM and CCC. In a nut shell, the coefficient of determination is the squared value of the multiple correlation coefficients. In respect of the cross section analysis, it shows that about 9 percent (R = 0.291) of the total variation in PM is explained by the model whereas the time series analysis shows an explanation of about 17 percent (R = 0.406).

		β (estimates)	Std. Error	Sig.
1	(Constant)	-.303	2.378	.901
	CCC	-.039	.029	.216
a. Dependent Variable: PM				

Table 5: Time Series Coefficient of Estimates

Table 5 shows the time series coefficients of the regression line. Substituting the estimates into the equation it becomes: PM = -0.303 + (-0.039) CCC + μ. It states that the expected profit is equal to -0.303 + (-0.039) CCC with some margin of error. The margin of error is equal to 2.688. If Northern Nigeria Flour Mills plans to adjust CCC by say 1 percent, the predicted profit margin would be -0.039 * 10 – 0.303 = -0.342 or about 34 percent change in profit margin. As in the correlation analysis, the coefficient of CCC has a negative sign. That further confirm the negative relationship between PM and CCC. Similarly, a significance level of 0.216 > 0.05 reveals that even though CCC negatively relates to PM the relationship is not statistically different from zero even as the standard error is 0.029.

Model		β (estimates)	Std. Error	Sig.
1	(Constant)	8.493	4.826	.099
	CCC	-.011	.009	.257

Table 6: Cross Section Coefficient of Estimates

As in the cross section correlation analysis, the coefficient of CCC has a negative sign as seen in the coefficient of -0.011. That further substantiate the negative relationship between PM and CCC.
Impact of Cash Conversion Cycle on Manufacturing Firm's Profit Margin (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.817	1	12.817	1.774	.216[a]
	Residual	65.038	9	7.226		
	Total	77.854	10			
a. Predictors: (Constant), CCC						
b. Dependent Variable: PM						

Table 7: Time Series ANOVA on the Impact of Cash Conversion Cycle on Manufacturing Firm's Profit Margin (ANOVA)

Table 7 shows the time series analysis of variance with respect to the impact of cash management on the profit margin of manufacturing firm namely Northern Nigeria Flour Mills Plc. As displayed by the table, the regression and residual sum of squares equals 65.038 and 12.817 respectively. This implies that cash management impacted on about 13 percent of the model. The remaining 65.0 percent unexplained variation is due to other determinants and the error term. Thus, with the regression and residual mean square of 12.817 and 7.226 in that order, F-statistics equal to 1.774 and significance value of 0.216.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	460.703	1	460.703	1.389	.257[a]
	Residual	4973.608	15	331.574		
	Total	5434.312	16			
a. Predictors: (Constant), CCC						
b. Dependent Variable: PM						

Table 8: Cross Section ANOVA on the Impact of Cash Conversion Cycle on Manufacturing Firm's Profit Margin (ANOVA)

Table 8 depicts the cross section analysis of variance with respect of the impact of cash management on the profit margin of sample companies. As seen in the table, the regression and residual sum of squares equals 460.703 and 4973.608 correspondingly. This signifies that cash management impact on about 8.46 percent of the model. Hence, with the regression and residual mean square equal to 460.703 and 331.574 in that order, F-statistics equal to 1.389 and significance value 0.257, it can be deduced that cash conversion cycle (CCC) does not significantly impact on profit margin of a cross section of firms in the manufacturing industry in Nigeria especially in the chemical and paints, building materials, tobacco food and beverages, brewery, conglomerate and healthcare sectoral group.
This implies that apart from cash management there are many factors that accounts for manufacturing companies' profitability. Cash conversion cycle has an impact on manufacturing firms' financial performance. But the impact is not statistically significant. This result is reliable on account of the myriad of determinants that accounts for organizations financial performance. Organizational performance is influenced by multitude factors that are combined in unique ways to both enhance and detract performance. For instance, the other determinants of manufacturing firms' performance includes ownership structure (McGahan and Porter, 1997), Intangible measures include communication, learning, trust (Saad and Patel, 2006), stakeholder satisfaction, competitive position (Garrigos-Simon *et. al.,* 2005).

		CCE
ROI	Pearson Correlation	-.455
	Sig. (2-tailed)	.160

Table 9: Time Series Pearson Correlation Matrix with respect to significant relationship between Liquidity and Profitability

Table 9 illustrates the Pearson correlation matrix of the association between liquidity (measured by cash conversion efficiency – CCE) and financial performance (measured by return on investment – ROI) for a single firm (time series analysis) in the manufacturing industry. In consistency with the expected sign of negative relationship the result as displayed by the table shows a negative relationship between cash conversion efficiency and return on investment as seen in the correlation coefficient of -0.455. However, the negative relationship between CCE and ROI is not significant at 5 percent level for a single firm in the manufacturing industry as seen in the significance value of 0.160.

		CCE
ROI	Pearson Correlation	-.107
	Sig. (2-tailed)	.683

Table 10: Cross Section Pearson Correlation Matrix with respect to significant relationship between Liquidity and Profitability

Table 10 illustrates the Pearson correlation matrix of the association between liquidity and profitability using cross sectional data. The expected sign of liquidity (measured by cash conversion efficiency) and profitability (proxied by return on investment) is negative since excess liquidity leads to a loss of profit. The correlation coefficient as shown by the table indicates that there is statistical evidence that the liquidity is negatively related to the profit margin of a cross section of firms in the manufacturing industry in the country. The Pearson correlation coefficient of CCE in relation to ROI equals -0.107. However, the significance value of 0.683 depicts that the association is not statistically significant at 5 percent level.

5. Summary of Findings
The following are the summary of the major findings of the study:
Cash management as measured by Cash Conversion Cycle for both time series and cross sectional data is negatively related to manufacturing firms profit margin across the manufacturing industries especially companies in the chemical and paints, building materials, brewery, conglomerate, and healthcare sectoral group.
Cash management as measured by Cash Conversion Cycle impact on the profit margin of manufacturing firms in Nigeria, particularly industries in the aforementioned sectoral group. In other words, Cash Conversion Cycle explains a substantial part of the profit margin of manufacturing firms implying that Cash Conversion Cycle accounts to some extent for the total variation in the profit margin of manufacturing firms.
The strength of the relationship between cash conversion cycle and profit margin of manufacturing firms in Nigeria in the aforementioned sectoral group range from 13 – 26 percent. This means that Cash Conversion Cycle cannot be used as a sufficient predictor of Profit Margin.
The study found a negative relationship between liquidity and profitability of firms. However, the result from both the time series and cross sectional analysis revealed that there is no significant relationship between liquidity (as measured by cash conversion efficiency) and profitability (as proxied by return on investment).

6. Conclusion
The following are the conclusions that are drawn from the findings of the study.
Cash management as measured by Cash Conversion Cycle relates to manufacturing firms profit margin in Nigeria. In comparison with the other determinants of financial performance of manufacturing firms', the significance of Cash Conversion Cycle may not be noticeable. In addition, the proportions of account receivables reduced by Cash Conversion Cycle management activities may have been much less when compared to the total assets and the sales made by the firms. The insignificance of the relationship as shown by the result of the study may have also resulted from the effect of fixed assets which forms part of the total assets of the companies. Thus, if the effect of the size of fixed assets is controlled, there is the tendency that the relationship will prove significant. The negative relationship as reveals by the result of the analysis shows that the decreasing returns on profit on the part of firms in the Nigerian manufacturing industry is a function of longer Cash Conversion Cycle. Thus, cash management is very important to generate the higher rate of return and to maximize the shareholders' wealth. When cash requirements are not properly managed and are allocated more than required, they reduce the benefits of short-term investments.
Cash management impacts on the profit margin of manufacturing firms in Nigeria. The impact is insignificant because of the wide range of factors that affects manufacturing organizations profitability.

7. References
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