Journal of Global Accounting
Vol. 6 No. 1 June, 2019. ISSN: 1118-6828
www.unizikjga.com

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THE EFFECT OF CASH CONVERSION CYCLE ON CAPITAL STRUCTURE: EMPIRICAL EVIDENCE FROM QUOTED MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

Capital structure decision is one of the basic decisions in a firm and liquidity management is known to affect corporate finance. Empirical studies in this area are noted to be insufficient in Nigeria, especially for firms with low profitability profile. This study examined the effect of cash conversion cycle on capital structure of manufacturing firms in Nigeria from 2012 to 2018. Three hypotheses were formulated for this study and tested using linear regression analyses at 5% level of significance. Ex-post facto (causal comparative) research design was adopted. The population and sample of the study is made up of the twenty – two quoted manufacturing firms on the Nigerian Stock Exchange as at year end 2018. The findings reveal that Receivables' Collection Period, Inventory Turnover Period, and Payables Payment Period have a significant effect on components of capital. It is concluded that cash conversion cycle has significant effect on capital structure. This study recommends among others that manufacturing firms should decrease their inventory period and accounts receivables' period, by instituting adequate control and flexible credit policy.

Keywords: *cash conversion cycle, capital structure, working capital*

Article Info: **Received** June 7, 2019; **Reviewed** June 27, 2019; **Accepted** July 3, 2019.

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Introduction

Liquidity management is a very important component of corporate finance because it could affect the capital formation and profitability of a firm. Working capital is the general term representing the liquidity level of an enterprise. The components of working capital include cash, inventory, receivables and payables. These are collectively known as life giving force for any economic unit and its management is considered among the most important function of corporate management. Due to that, every organization whether profit or not, irrespective of size and nature of business, requires necessary amount of working capital management (Achuthan & Kajanthan, 2013). The benefits of cash planning and management in an organization, is somewhat similar to the benefits derivable from standard costing as identified by Iliemena and Amedu (2019) to include enhancing management control and efficiency of operations. Since every corporate organization is extremely concerned about how to improve profitability and sustain growth, it becomes necessary to monitor factors that could counteract profitability and growth.

In this regard, liquidity management having its implications on risks and returns of the corporate organizations cannot be overlooked by these organizations and hence cash conversion cycle being indicator of the liquidity management needs to be explored as to how it may affect the capital formation for the envisaged growth and profitability of the corporate units. Working capital management is a simple and straight forward mechanism of ensuring the ability of the firm to fund the difference between the short term assets and short term liabilities (Achuthan & Kajanthan, 2013). Today, due to changing world economy, advancements in technology and increased global competition among the companies, every company is striving to enhance their profits and for that companies are putting every effort to bring their cash conversion cycle at optimum level to increase profitability and sustain survival. There needs to be a balance between the achievement of profitability and liquidity which could be detrimental to capital formation and growth of corporations. If firms do not care about profit, they cannot survive for a longer period (Duru, 2014). Conversely, if firms do not care about liquidity, they may face the problem of insolvency or bankruptcy, for these reasons cash conversion cycle should be given proper consideration and attention. This will ultimately affect the profitability of the firm (Ricci & Vito, 2011).

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In order to manage capital structure efficiently, a firm has to be aware of how long it takes on average to convert their goods and services into cash. This length of time is formally known as the cash conversion cycle (CCC).

Objectives of the Study

The objectives of this study are specifically to;

1. Assess the effect of Receivables' Collection Period on long-term debt.
2. Investigate the effect of Inventory Turnover Period on equity.
3. Determine the effect of Payables Payment Period on retained earnings

Review of Related Literature

2.0 Conceptual Review

2.1.1 Concept of Cash Conversion Cycle (CCC)

Every business establishment ultimately strives for profitability and growth. The attainment of this motive is also dependent on its ability to generate cash receipt in excess of its cash disbursements in order to maintain liquidity. The cash flow problems of many businesses are exacerbated by poor financial management and in particular the lack of planning for cash requirements (Jarvis, Carran, & Lightfoot, 1996). A manufacturing company which needs to measure how well it manages its working capital should employ cash conversion cycle management. Cash to cash cycle as a financial performance metric was developed by Richards and Laughlin (1980). This metric measures the length of time it takes a firm between paying its suppliers and being paid by its customers on credit sales. The concept of cash conversion cycle further referred as CCC is a composite metric that has been described by Stewart (1995) as "the average days required turn a dollar invested in raw material into a dollar collected from a customer". Besley and Brigham (2005) described CCC as the length of time from the payment for the purchase of raw materials to manufacture a product until the collection of account receivable associated with high profitability because it improves the efficiency of using the working capital.

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CCC is also defined by Churchill and Mullins (2011) the length of time a company's cash is tied up in working capital before that money is finally returned when customers pay for the products sold or services rendered. The process for calculating CCC requires adding days of inventory plus days of accounts receivables and subtracting the number of days of accounts payables. A shorter CCC implies that fewer days' cash are tied up in working capital and not offset by "free" financing in the form of deferred payments, results in more liquidity for the firm Soenen (1993). It is argued that a short cash conversion cycle is indirectly related to firm value.

The components of CCC are:

i. **Inventory (Stock) Turnover Period**

Determined as;

$$\textbf{ITP} = \frac{\text{Net sales}}{\text{Average Inventory}}$$

A certain level of inventory is normally maintained by manufacturing companies. This is in a bid to ensure continuous production flow and decrease risk of stock-out. When the stock level is inadequate, the sales volume falls due to stock shortages. On the other hand, excessive stock leads to unnecessary stock holding costs, capital tie-down added to risk of obsolescence and physical deterioration. A balance therefore needs to maintained on the average inventory holding period without detrimental effect on capital formation

ii. **Receivable (Debtors) Collection Period**

Determined as;

$$\textbf{RCP} = \frac{\text{Average receivables}}{\text{Sales x365 days}}$$

Studies reveal it is necessary to appropriately manage the time it takes to make sales and the time it takes to receive payment on the credit sales made. When funds are left in the hands of customers over the necessary period, it has liquidity implications which could lead to gearing to meet up with financial obligations

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iii. **Payables Payment Period**

Determined as;

$$\textbf{PPP} = \frac{\text{Accounts payables}}{\text{Cost of sales x 365}}$$

This represents the period of time it takes between the credit purchase of materials and the payment of creditors. Aligning the management between cash inventory and payable are important, and a stimulus to researchers studies to integrate the working capital management (WCM) components (Duru, 2014). It is a good practice for firms to ensure that the PPP is always longer than the RCP to avoid situations were Creditors are settled from retained earnings or loan capital. traditional measures of liquidity such as the current ratio reveal little about a firm' s management of working capital (Eljelly, 2004), hence, the use of CCC. According to Richard and Laughlin (1980), the limitations of these traditional liquidity measures have led to the rising popularity of the cash conversion cycle or cash gap as a means for analyzing working capital management.

2.1.2 Concept of Capital Structure

The capital structure of a firm is comprised of equity capital and debt capital as discussed below:

Debt Capital is borrowed fund in the business which could be long term or short term according to different authors but for the purpose of this study, Debt is seen as the part of capital representing borrowed fund in the businesses which are long term in nature. This includes long term loan, debenture stock, bond etc. the long term loan of a business are reported in the statement of financial position under Non-current liabilities.

Equity Capital is that capital that belongs to the shareholder in the business Example shareholder capital, retained earnings, Equity, share premium etc. these are different from borrowed fund as they are owned by the business itself. Equity capital is reported in the statement of financial position annually under equity as different from liabilities.

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The financing option of an organization could be purely equity, debt or a combination of debt and equity. The introduction of debt capital into the business is called gearing. Debt finance comes with implicit and explicit costs and the higher the level of gearing, the higher the cost of finance. Studies showed that capital structure has become one of the most important issues in organizations where the CCC is not properly managed. Every organization should desire optimum capital structure so as survive in a competitive business environment.

2.1.3 Capital Structure and CCC

Manufacturing organisations that are able to achieve efficiency in their CCC management can finance a greater portion of their operations through longer PPP. This reduces the need to depend on external debt for business operations. Achieving higher turnover of inventory and receivables while extending the time period taken to pay non-interest-bearing current liabilities should allow a firm to operate with lower levels of external debt and equity capital. Winborg and Landstrom (2001) and Ebben and Johnson (2006) found in studies of bootstrapping that speeding up collections and delaying payments to suppliers were identified by small firm owners as important methods for reducing the need for outside debt and equity financing.

2.2 Theoretical Review

2.2.1 Operating Cycle Theory

To estimate the gross working capital requirements, the understanding of the operating cycle is very important (Duru, 2014). According to this theory, Organizational process starts with procurement of material input, input processing, and sell of finished goods to realize money and utilize the money, to procure material again and to continue the cycle all over again. During this period, various materials will be in different stages of production in different forms. Besides, the cost of material, labour charges, electricity, water, rent, etc. are also incurred during the period of processing. It is not necessary that all the goods will be in cash (Duru, 2014) because Storing of such finished goods involves cost of materials used in such finished products, labour and other manufacturing expenses incurred in producing them. Some goods will be sold on credit till such time sale proceeds are not realized,

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funds are tied down in such receivable. Finally when the sales proceeds are realized the funds are again used to procure materials as above and the whole process cycle starts all over again. If the turnover period for inventories and account receivable lengthen, or the payment period to account payable shortens, then the operating, cycle will lengthen and the investment in working capital will increase (Ghosh & Maji, 2004).

2.2.2 Trade-Off Theory

The trade - off theory refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the cost and benefit. An important purpose of this theory is to explain the fact that corporation usually, are financed partly with debt and partly with equity. It states that there is an advantage to financing with debt, the tax benefits of debt and then is a cost of financing with debt the costs of financing distress including bankruptcy cost e.g. staff leaving, suppliers demanding disadvantage payment term; bondholder/stockholder infighting, etc. the marginal benefits of further increase in debt declines as debt increases while the marginal cost increases, so that the firm that is optimizing its overall value will focus on this trade - off when choosing how much debt and equity to use for financing (Duru, 2014).

Review of Empirical Literature

Among the few studies that tested the effect of cash conversion cycle on profitability is the study of Mccarty and Lyroudi (1993) which found that cash conversion cycle is negatively related with current ratio but positively related with quick ratio. Lyroudi and Lazaridis (2000) in their study which applied regression and correlation analysis, showed significant positive relationship between the cash conversion cycle and the current and quick ratios; also the cash conversion cycle was positively related to the ROA and the net profit margin but had no linear relationship with the leverage ratios Also, the two liquidity ratios had negative relationship with the debt- to -equity ratio, and a positive relationship with the times interest earned ratio, all the above with no difference between the liquidity of large and small firms.

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Kurt and Guluza (2002) examined the relationship of working capital management, cash conversion cycle with profitability, liquidity and debt structure using data for the period from 1995 to 2000, on 16 firms which listed on the Istanbul Stock Exchange (ISE). The results showed positive relationship between cash conversion cycle and liquidity ratios am negative relationship with return on asset and return on equity, also the result suggested that higher leverage ratio affects adversely the liquidity and profitability. On other hand there is no significant relationship between the cash conversion cycle and the leverage ratio.

Deloof (2003) in his study found out that there is a negative relationship between profitability that measured by gross operating income and cash conversion cycle as well as number of days accounts receivable and inventory. He suggested that managers can increase corporate profitability by reducing CCC. Kwasi (2010) which found a significant negative relation between profitability and number of day's account receivable, and trade cycle. The managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories. Sharma and Kumar (2011) examined the effect of working capital on profitability of India firm. They collected data about a sample of 263 non-financial BSE 500 firms listed at the Bombay Stock Exchange (BSE) from 2000 to 2008 and evaluated the data using ordinary least square (OLS) multiple regression.

Duru (2014) examined the impact of working capital management on the profitability of Nigerian quoted Manufacturing firms. The working capital variables studied comprise accounts payable, accounts receivable, cash conversion cycle, stock/inventory turnover and liquidity. This study also used sales growth and Debt as control variables in examining the impact of working capital management on the profitability of Nigerian firms. Secondary sources of data were sourced from the Annual Reports of the 22 manufacturing firms selected for this study for the period 2000-2011. The findings of the study show that, accounts payable ratio [AP] had negative relationship with the industries' profitability. Results also show that firms cash conversion cycle [CCC] had positive but non-significant relationship with the industries profitability, and Liquidity ratio had negative relationship with the industries profitability.

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Murtala and Sani (2016) studied the effect of cash conversion cycle or corporate profitability of the ICT firms listed on the floor of the Nigerian Stock Exchange. Data were collected from all the listed firms from 2010 to 2014. The data were analyzed using multiple linear regression analysis and the robustness check shows that the data are normal. The findings indicate significant positive relationship between cash conversion cycle and corporate profitability.

Design and Methodology

The study adopted ex-post facto (causal comparative) research design. The period covered in this study is from 2012-2018 which represents the period of IFRS Reporting in Nigeria. The population and sample of the study is made up of twenty – two quoted manufacturing firms on the Nigerian Stock Exchange. Data used for this study were obtained mainly from the annual reports and stock exchange fact books. Other sources include Published Journals, Conference papers, Articles and Internet resources.

Model Specification

The regression models below were formulated for the study and tested using regression analyses.

Generally,

CCC = f (RCP, ITP, PPP) . . . . (1)

Where:

CCC = Cash conversion cycle

RCP= Receivables' Collection Period

ITP = Inventory Turnover Period

PPP= Payables Payment Period

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Receivables' Collection Period and Long-Term Debt

$LD = a_0 + a_1RCP + a_2LRE + e_t$ . . . . (2)

Inventory Turnover Period and Equity

$LEQ = a_0 + a_1ITP + a_2LRE + e_t$ . . . . (3)

Payables Payment Period and Retained Earnings

$LRE = a_0 + a_1PPP + a_2LD + e_t$ . . . . (4)

Where:

LD = Log of long-term debt

LRE = Log of retained earnings

LEQ = Log of equity

e_t = error term

Methods of Data Analyses

In this research study, data used were obtained from Annual Report and Accounts of companies quoted on the Nigerian Stock Exchange [NSE]. The study employed multiple regression technique with the aid of *SPSS ver. 23*.

Results and Discussion

Test of Hypothesis One

Ho[1]: Receivables' collection period has no significant effect on long-term debt.

Table 1: Descriptive statistics

	Mean	Std. Deviation	N
RCP	12.1881	5.35191	14
LD	554.0374	72.30462	14
RE	22620.8360	82916.54708	14

Source: SPSS ver. 23

Table 2: Correlation results

		RCP	LD	RE
Pearson Correlation	**RCP**	1.000	.404	.627
	LD	.404	1.000	.062
	RE	.627	.062	1.000
Sig. (1-tailed)	**RCP**	.	.076	.008
	LD	.076	.	.416
	RE	.008	.416	.
N	**RCP**	14	14	14
	LD	14	14	14
	RE	14	14	14

Source: SPSS ver. 23

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Table 3: Model summary

					Change Statistics				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.726[a]	.527	.441	4.00120	.527	6.129	2	11	.016

Source: SPSS ver. 23

Table 4: ANOVA

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	196.253	2	98.126	6.129	.016[a]
Residual	176.106	11	16.010		
Total	372.358	13			

Source: SPSS ver. 23

Table 5: Coefficients

	Unstandardized Coefficients		**Standardized Coefficients**		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
Constant	-3.714	8.573		-.433	.673
RE	.027	.015	.366	1.763	.106
RCP	3.901E-5	.000	.604	2.909	.014

Source: SPSS ver. 23

From the model summary table, it shows that 72 percent of the dependent variable is explained by the independent variables. The analysis also shows that the probability value (0.016) is less than the alpha value (0.05), the researcher therefore accept the alternative hypothesis and conclude that RCP has a significant effect on long-term debt manufacturing firms with a correlation value of 0.404.

Test of Hypothesis Two

Ho^2: Inventory turnover period has no significant effect on equity.

Table 6: Descriptive statistics

	Mean	**Std. Deviation**	**N**
ITP	11.9643	7.22409	14
EQQ	267.7689	55.98884	14
RE	22620.8360	82916.54708	14

Source: SPSS ver. 23

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Table 7: Correlation results

		ITP	EQQ	RE
Pearson Correlation	**ITP**	1.000	.532	.556
	EQQ	.532	1.000	.306
	RE	.556	.306	1.000
Sig. (1-tailed)	**ITP**	.	.025	.020
	EQQ	.025	.	.143
	RE	.020	.143	.
N	**ITP**	14	14	14
	EQQ	14	14	14
	RE	14	14	14

Source: SPSS ver. 23

Table 8: Model summary

					Change Statistics				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.674[a]	.454	.354	5.80499	.454	4.566	2	11	.036

Source: SPSS ver. 23

Table 9: ANOVA

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	307.760	2	153.880	4.566	.036[a]
Residual	370.678	11	33.698		
Total	678.437	13			

Source: SPSS ver. 23

Table 10: Coefficients

	Unstandardized Coefficients		**Standardized Coefficients**		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
Constant	-8.972	7.974		-1.125	.284
RE	.052	.030	.400	1.707	.116
ITP	.585	.316	.433	1.851	.091

Source: SPSS ver. 23

From the model summary table, it shows that 67 percent of the dependent variable is explained by the independent variables. The analysis also shows that the probability value (0.036) is less than the alpha value (0.05), the researcher therefore accept the alternative hypothesis and conclude that ITP has a significant effect on equity with a correlation value of 0.532.

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Test of Hypothesis Three

Ho[3]: Payables payment period has no significant effect on retained earnings.

Table 11: Descriptive statistics

	Mean	Std. Deviation	N
PPP	45.3574	16.28197	14
RE	22620.8360	82916.54708	14
LD	554.0374	72.30462	14

Source: SPSS ver. 23

Table 12: Correlation results

		PPP	LD	RE
Pearson Correlation	**PPP**	1.000	.200	.835
	LD	.200	1.000	.062
	RE	.835	.062	1.000
Sig. (1-tailed)	**PPP**	.	.247	.000
	LD	.247	.	.416
	RE	.000	.416	.
N	**PPP**	14	14	14
	LD	14	14	14
	RE	14	14	14

Source: SPSS ver. 23

Table 13: Model summary

					Change Statistics				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.848[a]	.720	.669	9.37323	.720	14.113	2	11	.001

Source: SPSS ver. 23

Table 14: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2479.902	2	1239.951	14.113	.001[a]
Residual	966.432	11	87.857		
Total	3446.334	13			

Source: SPSS ver. 23

Table 15: Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
Constant	-58.353	20.084		-2.905	.014
LD	2.914E-5	.000	.148	.927	.374
PPP	.186	.036	.826	5.163	.000

Source: SPSS ver. 23

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From the model summary table, it shows that 84 percent of the dependent variable is explained by the independent variables. The analysis also shows that the probability value (0.001) is less than the alpha value (0.05), the researcher therefore accept the alternative hypothesis and conclude that PPP have a significant effect on retained earnings with a correlation value of 0.83.

Summary of Findings

From the result, the researchers summarize that;

1. Receivables' Collection Period has a significant effect on long-term debt of manufacturing firms;
2. Inventory turnover period has a significant effect on equity of manufacturing firms; and,
3. Payables payment period have a significant effect on retained earnings of manufacturing firms.

Conclusion and Recommendations

This study investigated the effect of cash conversion cycle on capital structure of manufacturing firms in Nigeria in the period 2012 to 2018. Results showed; significant positive effect of RCP on long term debt; inventory turnover period and payables payment period on equity components. Thus, this study concludes that CCC has significant effect on capital structure of manufacturing firms. By implication, higher cash conversion cycle increases the potentials for debt finance while lower CCC moderates business operations and thus reduces the need for higher gearing. The following recommendations are made:

1. Manufacturing firms should decrease their day's inventory and day's accounts receivable cycle, by instituting adequate control and flexible credit policy.
2. Cash management measures should be installed by manufacturing companies to periodically monitor cash conversion cycle.

Suggestion for Further Study

Since this research study centered on manufacturing firms in Nigeria, a research of this kind should be carried out in other sectors and other countries to ascertain if it will yield the same results. Further study may also be conducted to cover more scope in period.

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Appendix 1:

Names of companies included in the sample:

1. Julius Berger Plc
2. Glaxo-Smith Kline consumer Nigeria Plc
3. Berger Paints Plc
4. Guinness Plc
5. Nigerian Breweries Plc
6. AG. Seventies (Nigeria) Plc
7. Portland paints & products Nigeria Plc
8. Chains Plc
9. Seven up Bottling co Plc
10. Dangote Flour mill Plc
11. Honeywell Flour mills Plc
12. Hydros Plc
13. Coca Cola Hellenic Plc
14. Landowne oil gas Plc
15. Champion Brewenes Plc
16. Dangote Cement Plc
17. University press Plc
18. Dangote Suger Plc
19. Dangote Tiger Brand Plc
20. Cadbury Nigeria Plc
21. Mrs Oil Nigeria Plc
22. Heineken Plc

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