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MODERATING EFFECT OF FIRM SIZE ON THE RELATIONSHIP BETWEEN CASH CONVERSION CYCLE AND FIRMS' VALUE OF LISTED INDUSTRIAL-GOODS FIRMS IN NIGERIA

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Abstract

Management of working capital is a challenging issue for financial managers because the success or otherwise of the management of financial ratios affect firms' value. In this regard, this study examined the Moderating Effect of Firm Size on the Relationship Between Cash Conversion Cycle and Firms' Value of Listed Industrial-Goods Firms in Nigeria. Eleven (11) out of twelve (12) Industrial-goods firms listed on the Nigerian Stock Exchange for the period of 2009-2019 were considered. Data were sourced from the annual Reports/Financial statements of the sample firms. The study adopted ex-post facto research design. Regression analyses were conducted using Feasible generalized least square and Het-corrected standard errors. Primary finding revealed that cash conversion cycle has positive significant effect on Tobin's Q, but secondary finding revealed that cash conversion cycle has insignificant effect on Tobin's Q as a result of firm size moderation. In view of the findings, this study concluded that firm size do not significantly moderate cash conversion cycle. Therefore, recommends that Managers of Industrial-goods firms in Nigeria should not invest too much in non-current assets as it reduces the amount of liquidity of the firms; Similarly, Managers should reduce the number of days of converting stock to cash; Managers should equally reduce the account receivable period but increase the account payable period. Thus, the firms can be more liquid which can use for investment in other profitable portfolios that can increase the value of the firms thereby enhancing and maximizing the shareholders wealth.

Keywords: Cash Conversion Cycle, Firm Size, Sales Growth, Tobin's Q

Introduction

Working capital management (WCM) is one of the most challenging issues for financial managers as the successor failure of effective management of the financial ratios affects firms' value either positively or negatively. The consequences of ineffective WCM are the inability of the firm to meet its financial obligations and to be liquid. WCM is indispensable in strengthening firms' liquidity position. A weak liquidity position poses a threat to the solvency of a firm and makes it unsafe as well as unsound (Micheal, Segun & Taiwo, 2017). Cash conversion cycle (CCC), which is a cross-cutting issue for working capital management, equates to the difference between operating cycle and payment period to sellers.

CCC is of great importance for firms in its entire period of operations and financing decisions. A Firm with a high CCC level needs more funds to financially support their working capital and at this point the firm usually resorts to floating debt. Firms should shorten their CCC and try to complete their cash cycles as soon as possible without damaging their operations. Shortening days inventory outstanding, day's sales outstanding and lengthening days payable outstanding may reduce the duration of cash conversion without increasing costs and bringing damage to sales. The shortening of the CCC decreases the net current assets requirement and increases the degree of free cash flow, therefore, creating an impact on the firm value (Ehrhardt & Brigham, 2009).

Improving cash flow management and accounts receivables process, collecting accounts receivables faster, disbursing accounts payable more slowly, and managing inventory more efficiently may be very useful in shortening CCC (Deutsch, 2017). On the other hand, extra investment in receivables and inventories increase profitability to a certain point, but above the point, extra investments may reduce profitability. Similarly, the use of trade liability will increase profitability up to a point, but reduce profitability above that point. Therefore, there is usually a negative link between CCC and profitability; it is also possible that a positive link exists (Erem Ceylan, 2021).

In Nigeria, firms are faced with liquidity problems which led to the either total collapsed of businesses or decline of businesses' operations which lead to decline in profit. Many firms have laid off some of their staff, both seniors and juniors, due to lack of cash as a result of Corona Virus Infectious Disease, 2019 (COVID-19) that affected there smooth operations. These and many other issues relating to the WCM and value of firms in Nigeria have become an issue of concern to the management of firms and investors. These concerns are aggravated by the economic crisis of recession which either directly or indirectly affects the liquidity position of the firms (Eya, 2016).

The survival of firms therefore, depend on the ability of managers to effectively manage stock and cash so as to the firms continue to be liquid in order to sustain their operations. The determination of appropriate balance between the volume of stock and cash at hand calls for effective management of both. By implication, holding excess stock jeopardizes the liquidity position of the firms so also keeping excess cash tantamount to keeping idle resources with the tendencies of jeopardizing the growth and value of the firms. It is evident that most firms do not hold the right amount of stocks and cash; as a result, they are unable to meet their maturing short term obligations and its upcoming operational needs (Stephen, 2012). Indeed, it's of tremendous importance to strike a balance between the stock and available cash.

Studies in Nigeria on WCM and financial performance centered on a limited areas which include: Manufacturing - (Ademola & Kemisola, 2014; Ailemen & Folashade, 2014; Micheal, et al., 2017; Olaoye, Adekanbi & Oluwadare, 2019; Owolabi, & Alayemi, 2012; Owolabi & Alu, 2012; Salman, Oyetayo, & Oriowo, 2014); Oil and gas - (Joseph & Chiemeka, 2020); Conglomerates - (Abdulazeez, Babab, Fatima & Abdulrahamand, 2018); Food and Beverage Industries - (Eya, 2016); Nigerian Cement Industry - (Angahar & Alematu, 2014) and Cross-Sectional - (Kolapo, Oke & Ajayi, 2015). The mentioned studies reported the primary findings of WCM on profitability. It is evidence that a gap exists as no study considers the influence of firm size as a moderating variable in carrying out the study. Therefore, this study examined the Moderating Effect of Firm Size on the Relationship between Cash Conversion Cycle and Firms' Value of Listed Industrial-Goods Firms in Nigeria for the period of eleven years (2009-2019). To this end, three hypotheses were formulated and tested.

Hypotheses

H₀₁: Cash conversion cycle has no significant effect on firms' value of listed Industrial-goods firms in Nigeria.

H₀₂: Firm size has no significant effect on firms' value of listed Industrial-goods firms in Nigeria.

H₀₃: Cash Conversion Cycle moderated by firm size has no significant effect on firms' value of listed Industrial-goods firms in Nigeria.

The rest of the paper is divided into -Literature Review, Methodology, Results and Discussion, Conclusion and Recommendations.

Literature Review

Conceptual Framework

Cash Conversion Cycle (CCC) referred to as span of time, in days, it takes for a firm to convert stock into cash. The cycle is important for firms as it measure how quickly a firm can convert its available stock into cash. As the cycle takes longer, so also the length of time capitalist i.e dupin stock; and negatively affects the firm's liquidity level and operations of the firm and vice

versa. CCC is the most popular index for WCM (Zaibi & Agha, 2018). Therefore, CCC has been interpreted as a time interval between the cash outlays that arises during the production of output and the collection of accounts receivable (Dong, & Su, 2010). CCC is likely to be negative as well as positive (Padachi, 2006). A positive result indicates the number of days a company must borrow or tie up capital while awaiting payments; and a negative result indicates the number of days a company has received cash from sales before it must pay its suppliers (Richards & Laughlin, 1980).

Tobin's Q (TQ) was introduced by Tobin as a measure of firm performance in 1969. According to Santosa (2020), TQ is regarded as a better measure than accounting returns because it minimizes the risk of accounting distortion and it reflects the total value of a firm including capitalization, total assets, and total debt. This study used TQ as a measure of firms value.

Moderating variables are variables that have effect whether to strengthen or weaken the effect of the

independent variable on the dependent variable (Effendi & Setiawan, 2014). Santosa (2020); Sari, Netti and Sulastri (2019); and Wu and Ko (2013) pointed out that firm size is an influential factor which affects the relationship between X and Y, because small firms are much more exposed to risks than large firms. Therefore, this study used firm's size as a moderator.

Control variable is used to maintain the firm performance free from possible influence and are lagged by one level to address the problem of endogeneity. Control variables repeatedly used in the literature include: $Size_{it-1}$ is the log of total assets, $Growth_{it-1}$ is the sales growth rate, and financial $Leverage_{it-1}$ is the ratio of total debts to total assets (Gao, & Wang, 2017; Jamalinesari & Soheili, 2015; Tahir, & Anuar, 2016); Tran, Abbott, & Jin Yap, 2017). In this regard, this study used sales growth as a control variable.

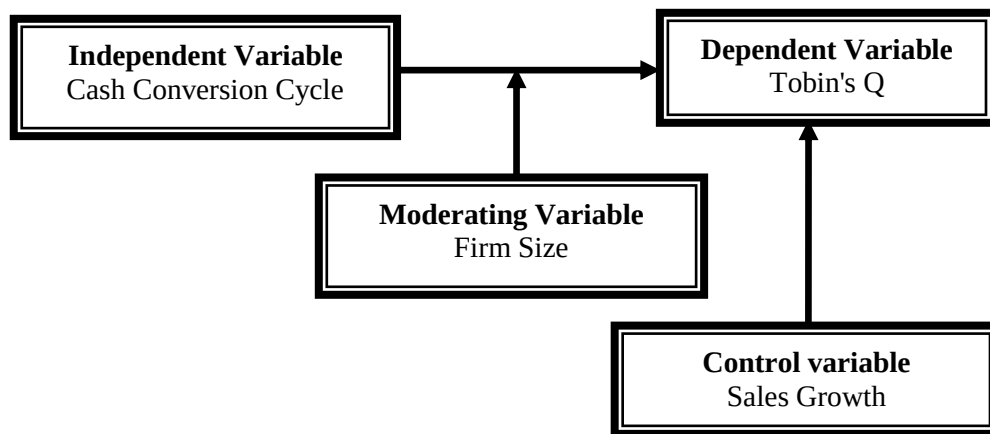


Figure 1: Conceptual Framework of the Study

Empirical Review

Joseph and Chiemeka (2020) examined the effect of working capital management and the financial performance of listed oil and gas companies in Nigeria. Cash conversion circle, average period of debt settlement, average period of collection of receivables and inventory retention proxied working capital management while Return on Assets proxied financial performance. The study used secondary data collated from the annual and financial reports of the 11 oil and gas companies for the period of 8 years (2011-2018).

Correlational research design and Robust Generalized Least Squares (GLS) multiple regression technique were used to analyze the collated data. The findings from the study revealed that cash conversion cycle has negative significant effect on ROA.

Dalci, Tanova, Ozyapici and Bein (2019) investigated whether firm size moderates the CCC and profitability which was proxied by return on assets (ROA) over 8-year period for 285 German non- financial firms. The study revealed that firm size moderated CCC and

profitability; consequently as firm size decreases, CCC lengthens while the profitability decreases; however, as firm size increases, CCC lengthens, while ROA increases. Similarly, Zalaghi et al. (2019) examined the moderating role of firms characteristics on WCM and financial performance of the firms listed in Tehran Stock Exchange during 2008–2017 period. WCM was proxied by CCC while financial performance was proxied by ROA. The study used firm size and debt ratio as moderating variables. Multivariate regression model analysed the panel data. The study revealed that CCC has negative significant effect on ROA while sales growth has positive significant effect on ROA. And firm size positively and significantly moderated CCC and ROA.

Faisal, et al., (2019) studied the moderating effect of firm size and financial leverage on the Working Capital Finance–Profitability Relationship of Chinese companies during 2000–2017. Working capital finance (WCF) as independent variable while ROE as dependent variable. Firm size, sales growth and financial leverage served as moderating variables. The result on firm a strong moderating role of firm size and financial leverage in the WCF–ROA. Arthur and Ruslan (2018) examined the effect of working capital and firm value of 167 listed firms on Indonesia Stock Exchange in the period 2007–2016. Net Trade Cycle represented WCM while TQ firm value. Firm size served as control variable. The study used linear model to analyse the panel data and shows that Net Trade Cycle, has a negative significant effect on firm value while firm size has insignificant effect on firm value.

Sianipar and Prijadi (2018) examined Working Capital and Firm Value 167 non-financial companies listed on the Indonesia Stock Exchange in the period 2007–2016 using panel data analyzed using linear model regression with firm size as the control. The study revealed that CCC has negative significant effect on Tobins' Q while sales growth, firm size and financial leverage have positive significant effect on Tobins' Q. Arachchi, Perera and Vijayakumaran (2017) studied working capital management and firm value of 44 companies

listed on the Colombo Stock Exchange for the period 2011–2015. WCM was measured by CCC while firm value was measured by TQ. Firm size, financial leverage and sales growth were used as control variables. The study found that CCC and financial leverage negatively and significantly affect TQ, while firm size has positive significant effect on TQ, sales growth has positive insignificant effect on TQ and financial leverage negative insignificant on firms value.

Ali, Mukulu, Kihoro and Nzulwa (2016) examined the moderating effect of firm size on the relationship between management participation and firm performance of 176 manufacturing firms comprising twelve sub sectors firms in Nairobi and surrounding areas. The study used multiple regression to analyze data. The findings revealed that firm size does not moderate the relationship between management participation and firm performance by revealing an insignificant moderating effect. In a study of fifty four (54) non-financial quoted firms on the Nigerian Stock Exchange for the period 1995–2009, Ogundipe, Idowu, and Ogundipe (2012) reported that CCC has negative significant relationship with market valuation (TQ). However, they found that Debt ratio (financial leverage) is positive significant related to market valuation (TobinQ).

Raheman and Nasr (2007) examined the effect of working capital management and profitability of Pakistani Firms. Using secondary data, extracted from the financial statements of the sampled firms, Pearson's correlation and regression analysis models were employed to analyze the panel data. Their study revealed that cash conversion cycle has negative significant effect on profitability.

Theoretical Framework

This study was underpinned by operating cycle (OC) theory and Cash Conversion Cycle (CCC) theory. The OC theory was propounded in 1980 by Smith. The theory revolves around the working capital of a firm which covers the production process to collection of sales proceeds. It gives income statement measures of a firm's production, distribution, and collection (Falope &

Ajilore, 2009). However, this theory has been criticized for the reason that current liabilities are not important in the business operation of a firm thereby, distorting the essence of payables as a source of financing business obligations cannot be underestimated (Olaoye, et al., 2019). As a result, current liabilities are digest in the picture for the enhancement of the analysis by CCC theory.

The CCC theory was propounded by Richards and Laughlin in 1980. The theory integrates both sides of working capital, current assets, and current liability. It imbues current liabilities in the working capital so as to overcome the shortcoming of the operating cycle theory. The profinder asserted that the method is superior to other forms of working capital analysis that rely on ratio analysis or breakdown of working capital as claimed in the operating cycle theory.

Methodology

The study adopts ex-post facto research design. The regression analysis was carried out using Feasible Generalized Least Square (FGLS) and Het-Corrected Standard Errors (HCSE). The use of FGLS and HCSE were as a result of internal consistencies and diagnostic tests reported in Table 6. The population of the study is

eleven (11) out of twelve (12) Industrial-goods firms listed on the Nigerian Stock Exchange for the period of 2009-2019. Austin Laz & Co Plc. was listed in 2012 therefore did not meet the requirement of this study. The data used for the study were extracted from the annual reports/financial statements of the sample firms.

Model Specification

This study used a panel data regression model as used by (Zalaghi, et al., 2019).

$$TQ_{it} = \alpha_0 + \beta_1 CCC_{it} + \beta_2 SGRT_{it} + \varepsilon_{it} \text{ ----- (i)}$$

$$TQ_{it} = \alpha_0 + \beta_1 FSIZ_{it} + \beta_2 SGRT_{it} + \varepsilon_{it} \text{ -----(ii)}$$

$$TQ_{it} = \alpha_0 + \beta_1 CCC_{it} + \beta_2 CCC * FSIZ_{it} + \beta_4 SGRT_{it} + \varepsilon_{it} \text{ (iii)}$$

Where:

TQ_{it} = Tobin's Q

CCC = Cash Conversion Cycle

$FSIZ$ = Firm Size

$SGRT$ = Sales Growth

α = Constant (fixed effect parameter)

β_{1-4} = Coefficients of the study variables

I = Cross sections (Number of firms),

t = Time series (Number of years)

ε_{it} = Error term

The apriori expectation is that $\beta_1, \beta_2, \beta_3, \beta_4 > 0$.

Table 1: Variable, symbol, Measurement and Source

Variable	Symbol	Measurement	Source
Tobin's Q	TQ	Market capitalization + total debts to total assets	(Arthur & Ruslan, 2018; Santosa, 2020)
Cash Conversion Cycle	CCC	Inventory conversion period + Receivable conversion period – Payment conversion period.	(Linh & Mohanlingam, 2018; Phuonga & Hungb, 2020).
Firm Size	FSIZ	Natural log of total assets	(Dalci, et al., 2019; Sari, et al., 2019).
Sales Growth	SGRT	$(Sales_2 - Sales_1) / Sales_1$	(Faisal, et al., 2019; Zalaghi, et al., 2019).

Source: Compiled by Researchers (2021)

Results and Discussion

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Maximum	Minimum	Skewness	Kurtosis
TQ	121	6.8765	49.990	474.67	0.004	8.2691	72.283
CCC	121	2.0846	0.6607	5.194	0.173	2.3942	13.427

FSIZ	121	6.3211	1.3536	11.17	3.991	1.0325	4.0344
SGRT	121	0.1482	0.4287	2.012	-0.999	1.1865	7.7840

Source: STATA 16 Output (2021)

Table 2 shows that on the average, TQ has 6.876 which indicate low market value of some firms among the sample firms. TQ standard deviation of 49.990 which indicate a deviation from both sides of the mean by 499.9%. The maximum of market value is 474.67 indicating as high as 4746% of market valuation of the sample firms. However, the minimum market value experienced by the firms is 0.004 indicating that some firms recorded zero level of market valuation which can be referred to as loss on invested shares.

The table also shows that on the average, CCC (2.084) which means the average times the sample firms convert stocks to cash is 208days while the CCC standard deviation is 0.660 indicating a 66% deviation from times of converting stock to cash. The maximum period of CCC enjoyed by the firms is 519 days with a

minimum CCC period of 0.17 that is less than 24hours. In the same vein, the average firm size (moderating variable) is 63.2%. The maximum and minimum firm's sizes are 111.7% and 75.4% respectively; indicating two basic sizes of the firms.

The Table further shows that the skewness of the variables ranges from 1.0325 and 8.2691. The value of skewness is showing that the series of TQ is positively skewed. On the other hand, the Kurtosis ranges from 4.0344 and 72.283 depicting that the curve of the series of TQ is leptokurtic (Kurtosis is >3) indicating high peakedness of the data. This shows high divergent from the average value in determining the extent to which independent variables explained the dependent variables and are more peaked than a Gaussian distribution (positive and above 0).

Table 3: Correlation Coefficients Matrix

Variable	TQ	CCC	FSIZ	SGRT
TQ	1			
CCC	0.2085	1		
FSIZ	-0.0913	-0.069	1	
SGRT	-0.2246	0.0652	0.0813	1

Source: STATA 16 Output (2021)

Table 3 shows that TQ has positive correlation with CCC and negative correlation with FSIZ and SGRT. Similarly, CCC has negative correlation with FSIZ and positive correlation with SGRT. In the same vein, FSIZ

has positive correlation with SGRT. The correlation coefficients show absence of multicollinearity since the entire coefficients are less than 0.9 (Gujarati & Porter, 2010; Gujarati, 2003; Robinson & Schumacker, 2009).

Table 4: Variance Inflation Factor Test (Multicollinearity)

Variable	VIF	1/VIF (Tolerance)
CCC*FSIZ	3.76	0.265957
FSIZ	3.54	0.282485
CCC	1.67	0.597772
SGRT	1.14	0.870878
Mean VIF	2.52	

Source: STATA 16 Output (2021)

Table 4 shows that VIF ranges between 1.14 and 3.76 and the Mean VIF is 2.52 while the VIF tolerance level ranges between 0.265957 and 0.870878. These indicate

the absence of multicollinearity in the independent and control variables of the study. The benchmark values for VIF is between 1 to 4, the mean VIF is between 1 to

10 while the VIF Tolerance level is less than 1 (Mohammed, Joshua, Onipe & Terzungwe, 2018; Rajkumar & Hanitha, 2015).

Table 5: Shapiro-Wilk Test (Normality Test)

Variable	Obs.	W	V	Z	Prob>z
TQ	121	0.10917	86.325	9.992	0.0000
CCC	121	0.69976	29.095	7.555	0.0000
FSIZ	121	0.89052	10.609	5.293	0.0000
SGRT	121	0.80467	18.928	6.591	0.0000

Source: STATA 16 Output (2021)

Table 5 shows significant probabilities (Prob>z 0.000) of all variables indicating that the data residuals are not normally distributed. Lack of normality distribution of data residuals requires that regression analysis should

be based on robust regression technique (Gujarati, 2003). Robust standard errors generally improve the efficiency of the estimators (Green, 2008).

Table 6: Diagnostic Tests

Diagnostic variable	Probability	Appropriate Regression Tool
Hausman Test	chi4(4) 24.48 (0.0001)	Fixed effect models
Breusch-Pagan/Cook-Weisberg Test (Hetttest)	chi2(1)432.46 (0.0000)	FGLS/Het-corrected instead of Fixed effect models
Wooldridge Autocorrelation Test	F(1,10) 104.40 (0.0000)	FGLS instead of Fixed effect models
Link Test	_hat / _hatsq11.18(0.221)	Model well specified

Source: STATA 16 Output (2021)

Table 7: Regression Results for Primary CCC, FSIZ and CCC*FSIZ

TQ	FGLS Coefficient (Prob.)	FGLS (Coefficient (Prob.))	Het-corrected Coefficient (Prob.)	Std. Err.
CCC	16.953(0.010)***			
FSIZ		-2.643 (0.419)		
CCC*FSIZ			-24.572 (0.615)	
SGRT	-27.888 (0.006)***	-26.170 (0.012)***	-27.624 (0.008)***	
Constant	-24.331 (0.088)*	31.2408 (1.171)	-2.2176 (0.956)	
Wald-chi2(2)	13.51	7.66		
F-Statistics			16.95	
Prob. > F	0.0012	0.053	0.0000	
R-Squared	0.2554	0.2565	0.2689	
Adj. R-Sqd.	0.2252	0.2354	0.2471	

Source: STATA 16 Output (2021)

Note: ***, * implies 5% and 10% levels of significance P-Values in parenthesis ()

Errors Regression for CCC, FSIZ, CCC*FSIZ SGRT.

Table 7 presents the FGLS and Het-corrected standard

Table 7 shows Wald chi2(2) and F-statistics of CCC, FSIZ, and CCC*FSIZ as 13.51, 7.66 and 16.95

respectively at 5% level of significant which indicates 95% probability of confidence that the association amongst the variables are not just by chance. Similarly, the table shows probabilities of CCC, FSIZ and CCC*FSIZ as 0.001, 0.053 and 0.000 respectively at 5% level of significant which indicates 95% confidence in the models. Table 7 further shows that CCC, FSIZ, CCC*FSIZ, affected Tobin's Q with a coefficient of determination (R-Squared) of 0.2554, 0.2565 and 0.2689 respectively. These indicate that the variables explained: 25.5%, 25.6% and 26.8% of the variations in the Tobin's Q while 74.5%, 74.4% and 73.2% by other variables not contained in the models.

The CCC regression coefficient 16.953 and probability (0.010) revealed a positive significant effect on Tobin's Q. This means CCC statistically and significantly influence on Tobin's Q. The result is consistent with the finding of (Dalci, et al. 2019; Zalaghi, et al. 2019; Arthur & Ruslan, 2018) but inconsistent with the finding of (Joseph & Chiemeka, 2020, Raheman & Nasr, 2007). Similarly, the FSIZ regression coefficient -2.6434 and probability (0.419) revealed negative but insignificant effect on Tobin's Q. This means firm size has no statistical significant influence on Tobin's Q. The result is inconsistent with (Arthur & Ruslan, 2018) but inconsistent with (Sianipar & Prijadi, 2018).

The CCC*FSIZ regression coefficient -24.5725 and probability (0.615) revealed a negative but insignificant effect of CCC* FSIZ on Tobin's Q. It is clearly seen that interaction Term (CCC*FSIZ) is negative and it has an insignificant relationship with dependent variable which shows that moderation effect of firm size is negative between independent variable and dependent variable. These results are also in accordance

to correlation analysis results where firm size was negatively correlated with Tobin's Q (-0.0913). The finding is consistent with the finding of (Ali, Mukulu, Kihoro and Nzulwa (2016) and inconsistent with (Zalaghi, et al., 2019). The finding shows adverse relationship between CCC* FSIZ and Tobin's Q which is not in consonance with the Cash Conversion Cycle (CCC) theory.

Now, to check the effect of firm size of this moderation analysis the researchers compared the R^2 values as suggested by (Champoux & Peters, 1987). The R^2 of primary CCC and FSIZ which is 0.1037 and the value of R^2 in the presence of moderation term (CCC*FSIZ) i.e. 36.89%. So, ΔR^2 is (36.89% - 10.37%). This shows that R^2 has changed due to moderation term which means firm size has moderated the relationship between Cash Conversion Cycle and Tobin's Q and effect size is 26.52%.

Conclusion and Recommendations

In view of the findings, this study concluded that firm size do not significantly moderate CCC. CCC on its primary study enhances market value whereas firm size insignificantly moderated CCC. Therefore, this study recommends that Managers of Industrial-goods firms in Nigeria should not invest too much in non-current assets as it reduces the amount of liquidity of the firms; Similarly, Managers should reduce the number of days of converting stock to cash; Managers should equally reduce the account receivable period but increase the account payable period. Thus, the firms can be more liquid which can use for investment in other profitable portfolios that can increase the value of the firms thereby enhancing and maximizing the shareholders wealth.

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