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Operating Cash-Flow and Working Capital Management in Nigerian Industrial Sector

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Abstract
This study titled 'operating cash-flow and working capital management of Industrial Goods firms in Nigeria, seeks to ascertain the relationship between working capital management and operating cash-flow of companies in the industrial sector of the economy. Variables examined were NWC_TA being the dependent variable and standing as a measure of working capital requirement, while operating cash-flow, firm size, return on assets and firm growth are independent variables and were obtained from Mechamestat data base on which multiple regression techniques were run as appropriate. Firm size, return on assets and firm growth were treated as control variables. The result suggests that firms' size and firms' growth are negative and insignificant in relation to working capital requirement, while return on assets was negative and significant. On the overall only operating cash-flow was positive and significant in relation to working capital requirement of the industry. The conclusion is that operating cash-flow is positive and highly significant in working capital requirement of the industry.

Keywords: *Operating cash-flow, working capital requirement, Industrial Sector, and Nigeria*

Introduction

Working capital management becomes more interesting to academics and manager, in recent decades, owing to financial crises which began in the late summer of 2007 which results in the deterioration of the financial system felt everywhere around the world. According to report, the reasons for the financial crisis were a combination of banks restrains in lending, worldwide insecure consumers and firm specific problems in some industries (EconomicWatch.com). For instance, excess capacities in the automobile industry, particularly among car manufacturers. Hofmann, Maucher, Piesker and Richter (2011) state that financing of companies became increasingly difficult owing to previously enacted Basel II, which marked a period of restraint in granting of credit by banks, demand for capital from the supply chain increased. Hence, the importance of effective working capital management became apparent to company operators.

The significance of adequate working capital can be appreciated in uninterrupted production activities of firms, reduced investment in raw materials and minimum reordering costs with resultant increased in cash flow. On the other hand, anomalies do arise as a result of over investment in working capital requirement. For instance, a study of 2000 largest American and European companies revealed that US$1tr are tied up in working capital annually (Monto, 2013). Tied up funds are idle and gradually lose their initial value with time. A related study also reveals that generally firm's investment in current assets are of significant proportion in relation to the total assets (Suleiman & Hassan, 2015). Garcia-Teruel and Martinez-Solano (2007) report that current assets could average 69 percent of enterprise total assets and 52 percent of current liabilities in a Spanish economy. Worst still in Africa, working capital for businesses are expensive and can be as high as 20 percent above other developing markets (Private equity and Venture Capital Association, 2019). Therefore, the subject of working capital deserves a serious attention for the success of organization's management. Hence, the attention paid by both practitioners and academics so far documented is a commendable effort.

Studies of working capital requirement is relatively scanty, particularly in Africa's developing economy like Nigeria. Important attributes in working capital requirement study includes operating cash flow. Mazlan and Leng (2018) argue that cash flow is good test of firm's profit quality and a confirmation to its survival, and in a study of Chinese Electronic

Industry Rajabi (2016) finds no significant relationship with working capital requirement. Firm size proxy by total sales. A large firm is an indication of a well-established firm, such a firm can use its size to influence its suppliers and buyers in giving long credit and or reducing cost of receivables. That given, therefore a negative relationship is expected in the relationship between firm size and working capital requirement. Nazir and Afza (2009) find negative relationship between firm size and working capital requirement, however, Anjum and Malik (2013) find positive relationship between firm size and working capital requirement.

Return on assets is equally another important attribute which indicates the profitability of a firm, an indication of working capital management efficiency. Taking pecking-order assumption into consideration, therefore a negative relationship is expected between return on assets and working capital requirement. Earlier studies by AL-Taleb et al. (2010) find positive relationship, however, Azeem and Marsap (2015) find negative relationship between return on assets and working capital requirement. That notwithstanding, within a firm, working capital does vary with time, define by number of factors which can be industry specific, firm specific and macroeconomic factors. The significance of these factors to business enterprise is not only associated with the profitability and liquidity position of the firm, but more seriously as Saarani and Shahadan (2012) confirm, could lead a firm to insolvency and bankruptcy.

The industrial sector in Nigeria has associated with issues relating to working capital requirement. For instance, it has been criticized as being small in relation to the size and expectation of the economy. It is said to account for only about 1 percent of the GDP. According to the Central Bank of Nigeria (CBN), (2008) in an earlier submission, pointed out that the underperformance of the sector was attributed to deficient infrastructural facilities, in form of inadequate and costly telecommunication services, unpredictable electric and water supply, poor road and other transportation problems. This has led to the escalation of cost of production as industrial firms decide to make provision for that in their production activities. Low investment in the manufacturing sector owing to low savings in the domestic economy and poor inflow of foreign investment due to poor enabling environment.

Furthermore, funds needed for refurbishment and or replacement of old and worn out machineries and equipment, to diversify product lines and production process has been lacking. Others are, low innovation in product and production processes owing to inadequate investment in basic industrial research. Accordingly, Nigeria's corporate research and development outlay is not more than 0.3 percent of gross sales compared to about 3 percent of turnover by some developing economies of South East Asia provision. Weak demand for locally manufactured goods, hence, heightening the existing lack of competitiveness of the Nigerian manufacturers. In addition, this study introduces additional variable, operating cash flow to help evaluate the liquidity problems face by the firms in Nigeria and complicated by inflation and devaluation of the Naira. Furthermore, the deplorable state of the naira underscores the important place of working capital management/requirement for the sustainability of the industrial sector operations in Nigeria

Suleiman and Hassan (2015) observed that the Nigerian context of working capital requirement studies as a whole is relatively scanty. Needless to state of specifics as, literature on firm size and working capital requirement generally, reveals high concentration of study on foreign based economy; and foreign based evaluation cannot be relied upon to explain Nigerian situation given that the divergence in socio-cultural conditions and business environment is obvious. Therefore, these poses a threat to the growth and expansion of the industrial sector in Nigeria.

Hence, this study is set to achieve the understanding of the underlying factors that determine working capital requirement of listed industrial firms in Nigeria need be established. Having stated thus, the remainder of the study examines first, the literature review in relation to working capital requirement in the industrial sector so far studied, followed by research methodology adopted, then the result and discussion, and finally the conclusion.

Literature Review

Working Capital has been defined in different ways by different authors depending on economic conditions and time. Working capital may be viewed as a financial measurement index, representing the operating liquidity available to a business entity. Atseye, Ugwu and Takon (2015) referred to working capital as money utilized by business firms in their daily activities or operations. This may vary in quantum among business entities depending on the industry to which the entity belongs to. Working capital can also be defined as the available capital for conducting day-to-day operations of an organization represented by its net current assets (Adeniji, 2008 in Atseye et al. (2015). In a broader sense working capital has been viewed as items that are required for operational activities of a business firm, which is recurrent in nature. According to Kim and Jain (2005) working capital is defined as the portion of firms' current assets which are financed from long–term sources. It is also finance from short-term sources, as in supply of raw materials for production. In another development, working capital is referred to as circulating capital, which describes how the fund moves in a circular manner within the firm. Working capital funds are generated and circulated in the business, in accordance with pecking-order theory. A firm can exist and survive without making profit, for some time, as in a commencement situation, but no business can survive without working capital funds, such business is on course to bankruptcy. Chakraborty (1973) opines that return on assets (ROA) stands as an aggregate measure of the overall efficiency in running a business. It is a technique that assess the efficiency of management in generating earnings given a firm's assets. Benos-Caballero et al. (2010) reports that working capital management and better performance of a firm have mutual effect, a negative influence on measures of working capital management, for the reasons of easy access to capital and better bargaining power with suppliers. ROA is arrived at through the analysis of a firm's annual earning and the total assets (Crosson, Needle, Belverd & Powers, 2008). This implies that ROA can be used to evaluate earnings relationship with a specific Asset. It should be noted that there is substantial variation among ROAs of public liability companies, which suggests caution when comparisons are required between industries to guard against spurious conclusions. It has been argued that ROAs are best compared based on sequential figures of the same company and within an industry.

A consistent argument with pecking-order theory, Lin et al. (2014) opine that operating cash flow determines the level of working capital management in a firm. Operating cash flow stability is important in facilitating steady investment in working capital of a firm, this is premised on the increase cash holding and investment in short term securities. Availability of free cash flow encourages a company to pursue conservative working capital policy, converse is the case where the operating cash flow is negative and this constrains for external financing. Investment in working capital will be positively affected by fluctuations in operating cash flow due to the increase in cash holdings and short-term investments. It is obvious that high operating cash flows warrants a company to adopt a conservative working capital policy, a negative operating cash flow firms will be constraint to finance from other sources outside the firm. Hence, Wassiuzaman and Arumugam (2013) opine that the effect of operating cash flow on working capital requirement is non-directional. Following, empirical evidence supports the proposition that firms with high operating cash flow would have more investment in current assets (Benos-Caballero et al., 2010).

Return on Assets and Working Capital Requirement

Chakraborty (1973) opines that return on assets (ROA) stands as an aggregate measure of the overall efficiency in running a business. It is a technique that assess the efficiency of management in generating earnings given a firm's assets. Benos-Caballero et al. (2010) reports that working capital management and better performance of a firm have mutual effect, a negative influence on measures of working capital management, for the reasons of easy access to capital and better bargaining power with suppliers. ROA is arrived at through the analysis of a firm's annual earning and the total assets (Crosson, Needle, Belverd & Powers, 2008). This implies that ROA can be used to evaluate earnings relationship with a specific Asset. It should be noted that there is substantial variation among ROAs of public liability companies, which suggests caution when

comparisons are required between industries to guard against spurious conclusions. It has been argued that ROAs are best compared based on sequential figures of the same company and within an industry. Empirical evidence confirms that return on assets and working capital management are highly correlated (Goel & Sharma, 2015). Higher return on asset implies more profit per unit of asset, which indicates a higher overall efficiency in assets utilization and by implication higher efficiency in managing investment in working capital. Onaolapo and Kajola (2015) crudely report significant positive relationship among non-financial firms quoted on the Nigerian Exchange. Although Ogundipe, Salawu and Ogundipe (2012) earlier finds significant negative relationship in a study of non-financial firms quoted on the Nigerian Stock Exchange. In a study of sea food processing enterprise in Vietnam, Cuong and Cuong (2016) find positive significant relationship between ROA and working capital management. Nazir and Afza (2009) report a significant positive relationship in a study of 14 industrial goods firms in Pakistan between 204-2007. Pius (2014) reports significant positive relationship in Kenyan manufacturing and Construction Company.

The relationship between return on assets and cash conversion cycle was also examined by Manoori and Muhammad (2012) who find positive and significant effect among Singapore firms. Goel and Sharma (2015) find in the overall significant and positive relationship in the study of Indian manufacturing firms. Naser et al. (2013) find insignificant negative effect among Abu-Dhabi listed firms

Operating Cash Flow and Working Capital Requirement

A consistent argument with pecking-order theory, Lin et al. (2014) opine that operating cash flow determines the level of working capital management in a firm. Prawirodipooero, Rahadi and Hidayat (2019) argue that adequate cash flow supports efficiency in firm's performance. Operating cash flow stability is important in facilitating steady investment in working capital of a firm, this is premised on the increase cash holding and investment in short term securities. Availability of free cash flow encourages a company to pursue conservative working capital policy, converse is the case where the operating cash flow is negative and this constrains for external financing. Investment in working capital will be positively affected by fluctuations in operating cash flow due to the increase in cash holdings and short-term investments. It is obvious that high operating cash flows warrants a company to adopt a conservative working capital policy, a negative operating cash flow firms will be constraint to finance from other sources outside the firm.

Hence, Wassiuzaman and Arumugam (2013) opine that the effect of operating cash flow on working capital requirement is non-directional. Following, empirical evidence supports the proposition that firms with high operating cash flow would have more investment in current assets (Benos-Caballero et al., 2010). Naser, Nuseibeth and AL-Hadeya (2013) find negative and insignificant relationship in non-financial firms quoted on the Abu Dhabi Stock Exchange. Haron and Nomran (2015) find insignificant relationship in Malaysia before the global financial crises, however, during and after the global financial crises show positive significant relationship. Manoori and Muhammad (2012) find significant negative relationship between operating cash flow and working capital management in Singapore firms. Wasiuzzaman and Arumugan (2013) also find significant positive relationship between operating cash flow and working capital management. Gao, Hayford and Li (2013) find significant positive relationship in a comparative study of public and private firms in the US. Mongrut, O'Shee, Zavaleta and Zavaleta (2014) find significant positive relationship between in Latin American companies. Kaur & Kaur (2014) find insignificant relationship in automobile industry in India, in the study passenger segment of the transport industry. Kwenda and Holden (2014) find insignificant relationship between operating cash flow and working capital requirement among the selected quoted firms on Johannesburg Stock Exchange. Abbadi and Abbadi (2013) find positively significant in the study of Palestinian industrial study. Although this is yet to be tested in Nigeria of which this study is set to be undertaken (see also AL Taleb et al. 2010; Vijayalakshmi & Bansal, 2013; Azeem & Marsap, 2015) for positive significant relationship in Jordan, India, and Pakistan firms.

A study of operating cash flow and cash conversion cycle by Naser et al. (2013) reveals negative and significant relationship based on correlational statistics result. Mangrut et al. (2014) finds significant positive relationship among Latin American country firms. Moussawi et al. (2006) study of corporate working capital management's determinants and their consequences finds significant positive relationship. Manoori and Muhamad (2012) find significant positive relationship between operating cash flow and cash conversion cycle among Singapore firms. On the other hand, Rajabi (2016) finds insignificant negative effect between cash flow and working capital requirement based on cash conversion cycle.

Research Methodology

The population of this study comprises the twenty-six (26) Industrial Goods companies listed on the Nigerian Stock Exchange (NSE) as at December 2015. Two conditions were set for the sampling frame. The first condition is that a company must be listed as at 2015 on the Nigerian Stock Exchange and have all or some of the data (as unbalance panel regression analysis is considered) required for the study period 2007 - 2015. Secondly, a company has to be consistent with regards to its listing and availability of audited financial statements of the study period. On the basis of the conditions, eight (8) companies were filtered out. Thus, eighteen (18) companies that satisfied the criteria were used for the analysis. The study of the relationship between operating cash flow and working capital requirement in the industrial goods companies listed in Nigeria, was based on multiple regression. Multiple regression analysis used for the analysis because of its ability to predict and explain expected variation in working capital management as a result of variation in any of the proxies of the variables. Therefore, the panels data methodology was used for the analysis since the data to be analyzed have both time series and cross-sectional attributes. The analysis also applies Pearson correlation analysis to show the nature, direction and strength of the relationship among the dependent and independent variables. When the correlation coefficient is positive, it reveals that as one variable increases, the other one also increases. A negative Pearson correlation coefficient indicates that an increase in one variable results in a decrease in the other or an inverse relationship. The magnitude of the coefficient signifies the strength of the relationship between the variables under study. The model specification

$$WCM_{it} = \beta_0 + \beta_1 FSZ_{it} + \beta_4 ROA_{it} + \beta_7 OCF_{it} + \beta_5 GRW_{it} + \varepsilon_{it}$$

Results and Discussion

This section starts with analyzing the trend of the variables using descriptive statistics, for the variables. This is followed by the presentation and analysis of the correlation matrix, and the presentation and discussion of the robustness test result. In addition to that the results of the two models estimations and the inferences drawn from the tests of the hypotheses are also given. Hence, findings are discussed and policy implications were analyzed.

Descriptive Statistics

Variable	Mean	Min	Max	Std. Dev
WCM	0.94	-0.87	28.46	3.28
FSZ	6.24	3.91	8.96	0.95
ROA	6.61	-70.34	53.95	13.17
OCF	0.63	-0.67	8.29	1.28
GRW	8.27	-37.47	108.34	17.34

(Source: Field study, 2019)

The variable WCM has a mean value of 0.94 i.e. 94 percent of the total assets in the sector. The average size of the firms is 6.24 with standard deviation of 0.95, and the minimum and maximum values of 3.91 and 8.96 respectively. Return on asset (ROA) has a mean of 6.61 percent with standard deviation of 13.17 percent, the minimum and maximum values of -70.34 and 53.95 percent respectively. Operating cash flows (OCF) as having a

minimum and maximum values of -0.67 and 8.29 respectively; this is accompanied by their respective averages and standard deviations of 0.63 and 1.28 respectively. Growth on the other hand, as one of the variables under investigation of working capital management proxy by sales volume deflated by total assets, has an average value of 8.27 percent meaning that on average the firm has a growth rate of 8.27 percent. The minimum and maximum values are represented by -37.47 and 108.34 respectively.

Correlation matrices of variables

Variable	FSZ	ROA	OCF	GRW
FSZ	1.000			
ROA	0.146	1.000		
OCF	-0.395	0.391	1.000	
GRW	0.176	0.308	0.072	1.000

(Source, Field study, 2019)

A critical look at the figures reveals an acceptable for regression, pattern of relationship between the variables. It is clear in some cases that almost no correlation exists. The correlation generally ranges between almost -0.395 and 0.072, i.e. from very weak correlation to weak correlation. In the overall, drawing from Afrifa (2013) who opines the correlation nexus of explanatory variables not exceeding 0.80 have no problem of singularity (i.e. a point at which a variable cannot be measured).

Presentation, Analysis and Discussion of Regression Results

The regression result of the dependent variable WCM and the independent variables (firm size, return on assets, firm growth, and operating cash flow) of the study. It follows with analysis of the association between dependent variables and each independent variable individually and cumulatively. Hence, the summary of the regression result obtained from the models is presented in below as follows:

$$\mathbf{WCM_{it} = \beta_0 + \beta_1 FSZ_{it} + \beta_4 ROA_{it} + \beta_7 OCF_{it} + \beta_5 GRW_{it} + \varepsilon_{it}}$$

Summary of Robust Ordinary Least Square Regression Result

WCM			
Variables	**Coefficients**	**z-values**	**p-values**
FSZ	-0.1526676	-0.75	0.455
ROA	-0.0764875	-2.01	0.045
OCF	2.359484	3.62	0.000
GRW	-0.0030819	-0.54	0.588
Intercept	1.418619	0.85	0.397
R2			**0.6859**
F-Stat			**310.15**
F-Sig			**0.0000**

(*Source: Field study, 2019)*

The results show that the estimated model of the study is fit because the f-statistics is 310.15, which is statistically significant at 1% level of significance. The outcome from this equation have semblance with one of the notable study conducted in this area by Chiou & Cheng (2006) in Onaolapo & Kajola (2015), who analyzed the same kind of variable except on industry effect, at which it differs from this study. From the first model only financial leverage, return on assets, and operating cash flow have significant influence on working capital management.

Firm Size and Working Capital Management

The expectation in this regards is that firm size is an important determinant of working capital management. Anjum & Malik (2013) state

Pecking order theory predicts a positive relation between firm size and working capital management, because they are better performers. Therefore, larger firms are expected to have a greater investment in working capital management in comparison with smaller firms (Onaolapo & Kajola, 2015). Hence, a positive relationship is expected. However, the coefficient beta value in respect of firm size in this study is -0.1526676 and a Z – value of -0.75, a p-value of 0.455 an insignificant value at any significant level (1%, 5%, and 10%). Depicting a negative and insignificant impact. Hence, the study fails to reject the null hypothesis that firm size has no significant impact on effective working capital management in listed industrial goods firms in Nigeria. In other words, as the firms' asset improves in quality/quantity, there is an insignificant reduction in working capital investment in the listed industrial goods firms' in Nigeria. The finding is consistent with notable studies like those of Nazir & Afza (2009), AL-Taleb et al. (2010), Abbadi & Abbadi (2013), Vijilakshimi & Bansal (2013), Kwanda & Holden (2014); Gao et al. (2013) although it contradicts those of Onaolapo & Kajola (2015), Salawu & Alao (2014), Ogundipe et al. (2012), Sabri (2012), Anjum & Malik (2015)

Return on Assets and Working Capital Management

AL-Taleb et al. (2010) opined that firms with higher profits are less concern with efficient working capital management, hence, a positive sign could be expected from the relationship between return on assets and working capital requirement. The result reveals a beta coefficient value of -0.152 and a t - value of -3.42, a p value of 0.003 which is statistically significance at 1% level of significance. Hence, the study rejects the null hypothesis that return on assets have no significant effect on working capital requirement. This result is consistent with studies like those of Azzem and Marsap (2015), Goel and Sharma (2015) who found significant negative effect with working capital requirement; also found significant negative effect with working capital requirement, however, it is inconsistent with those of Onaolapo and Kajola (2015) found significant positive effect with working capital requirement; Kaur and Kaur (2014) who found insignificant positive effect with working capital requirement; AL-Taleb et al. (2010), Abbadi and Abbadi (2013), Cuong (2016), Nazir and Afza (2009) found significant positive effect with working capital requirement.

Operating Cash Flow and Working Capital Management

The regression result in respect of impact of operating cash flow on working capital management is expected to be a direct proportion. The expected relationship implies a rise in operating cash flow would trigger an increase in working capital management. Hence, a positive relationship is expected. The result reveals a beta coefficient value of 2.082 and a t - value of 3.11, a p value of 0.006 which is statistically significance at 1% level of significance. Hence, the study rejects the null hypothesis that operating cash flow have no significant effect on working capital management. The result is consistent with those of AL-Taleb et al. (2010), Abbadi and Abbadi (2013), Muhamad and Elias (2013), Azeem and Marsap (2015) who found significant positive effect with working capital requirement; however, is inconsistent with those of, Kaur and Kaur (2014) who found positive insignificant effect with working capital requirement; Nazir and Afza (2009), Rajabi (2019) found insignificant positive effect with working capital requirement.

Firm's Growth Opportunity and Working Capital Management

The expectation in respect of firms' growth measured as annual sales growth rate and working capital management is that an anticipated rise in growth rate would be associated with a proportional rise in investment with working capital management. Therefore, a positive relationship is expected. However, a negative and insignificant relationship between annual sales growth rate and working capital management is observed in this case. This may be interpreted as a unit rise in annual growth rate of the firms is associated with an insignificant 0.003-unit reduction in working capital management in the sector. This is evident by the coefficient beta value of -0.0030819 with a Z – value of -0.54, a p value of 0.588. Hence, the study fails to reject the null hypothesis that growth opportunity has no significant impact on effective working capital management in listed industrial goods firms in Nigeria. The result implies that growth (GRW) has a negative impact on the working capital management but the impact is not significance.

This may be associated with the uncertainties (characterize by insecurity and instability in foreign exchange) surrounding business operation in Nigeria in recent years. Insecurity and instability in the market can impede investment activities. This result is consistent with those of Onoalapo & Kajola (2015), Salawu & Alao (2014), Anjum & Malik (2013) but inconsistent with those of AL-Taleb et al. (2010), Gao et al. (2013)

Conclusion

The analysis carried out in this study clearly shows that, from the first model which evaluates the determinants of effective working capital in the listed industrial goods producing firms in Nigeria only financial leverage, return on assets, and operating cash flow variables have significant impact on firm value. Based on the above outcome, the study concludes that among variables analyzed in the study only return on assets, and operating cash flow has impact on working capital requirement of listed industrial goods producing firms in Nigeria.

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