"Does working capital management impact an enterprise's profitability? Evidence from selected Nigerian firms"

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DOES WORKING CAPITAL MANAGEMENT IMPACT AN ENTERPRISE'S PROFITABILITY? EVIDENCE FROM SELECTED NIGERIAN FIRMS

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Abstract

This study examined the impact of working capital management on the profitability of selected quoted agricultural and agro-allied companies (from 2012 to 2016) in Nigeria. Secondary data were extracted from eighteen quoted agricultural and agro-allied companies in Nigeria, four of which are agricultural companies out of the twenty-three in Nigeria. Descriptive research design and regression analysis were used. Working capital management was measured using the trade receivables collection period, trade payables, payment period, inventory turnover period, and cash conversion cycle, while profit before interest and tax measured profitability. This study found that working capital management and profitability are related to the agriculture and agro-allied sector in Nigeria. The result shows the trade receivables collection period and profitability are negatively related. The result also shows the trade payables payment period and profitability are positively related. The result shows that the inventory turnover period and profitability are related, the cash conversion cycle and profitability are positively related. The conclusion is that working capital management and profitability are related. If the management of firms takes efficient and effective decisions in managing the company's working capital, all things being equal, the maximization of the firm's profitability, value, and shareholders' wealth can be guaranteed. Consequently, agency costs asserted by agency theory would be eliminated automatically.

Keywords	cash conversion cycle, corporate governance, inventory turnover, trade payables, trade receivables
JEL Classification	G30, G31, G32, G39

INTRODUCTION

Working capital management (WCM) involves finding the balance between liquidity and profitability of firms in terms of their liquidity and inventory. Mathuwa (2009) believes that WCM is basically about how companies manage current assets and liabilities. Enyi (2011) agrees that a business is as essential and liquid as its working capital volume. This is why NorEdi and Noriza (2010) agree that without successful WCM, businesses cannot operate successfully. The primary objective of WCM is to guarantee that firms are proficient in handling operational expenses, as well as discharging short-term debt obligations through the retention of sufficient cash flows. This is because the going concern capacity of a firm is sustained through the sustained solvency of that firm. This means that the WCM in any organization is central to its growth and survival.

The Nigerian economy is characterized by a decline in profits in the energy sector and rising rate of unemployment. Hence, Nigerians are quickly turning towards agriculture as their primary source of living

and income. This is why agriculture and agro-allied firms are springing up very quickly to bridge the large gap in unemployment. However, the capacity of these companies to successfully generate and uphold employment of a significant proportion of the unemployed depends mainly on their financial performance, which can be measured by profitability (Otekunrin et al., 2018). Egbide (2009), as well as Nwankwo and Osho (2010), opined the significant problems facing agricultural and agro-allied firms in Nigeria, including improper WCM and inhospitable operating environment.

The inability to understand these problems and respond to them has caused many firms to lose profit because of over/under-investment in inventory, a large number of outstanding debts, and other issues that affect the profitability of any firm. One of the factors that can influence the profitability of agriculture and the agro-allied firm is short of apposite WCM. This is why there is a need for proper WCM in any organization as the benefits of WCM far outweigh the costs. Profitability is vital to the existence and continued survival of business because any firm that makes no profit is not achieving the objectives it was set up for and in most cases organizations are set up to make a profit (Otekunrin et al., 2019). WCM is also vital for the continued survival of business because poor WCM can affect the firm's profitability. Hence, it is vital to examine the connection involving WCM and profitability.

1. LITERATURE REVIEW

1.1. Working capital management

WCM is an element of corporate finance as it unswervingly impinges on the profitability of an organization and consequently affects shareholder's value (Yahaya & Mohammed, 2018). Deloof (2003) confirmed the mechanism of working capital to be inventory, trade receivables, and trade payables and cash, which is the most liquid of all assets. Mandal, Mahavidyalaya and Goswami (2010) acknowledged two significant approaches to determining a firm's working capital, which are the balance sheet and operating cycle approach. Different authors have discovered many approaches to analyzing the working capital of various entities. According to Nwankwo and Osho (2010), good WCM involves striking an appropriate balance between companies' current assets and liabilities. Part of the variables used as a proxy for WCM is the trade receivables collection period (TRCP). Accounts receivable can be either trade credit or consumer credit or both (Moles et al., 2011). An essential consideration in trade receivable is credit policy variables. This policy comes with two options to offer.

Firstly, they could choose not to offer credit to customers no matter how strong their credit ratings are. Secondly, they could also offer credit to all customers no matter their credit ratings (Prasana, 2000). However, to steer clear of bad debts, before granting credit to the customer, it is vital to consider the customers' credit rating (Moles et al., 2011).Trade payables payment period (TPPP) is also an important component used to appraise the effectiveness of WCM (Brigham & Houston, 2007). It is also used as a proxy for WCM in this study. Trade payables embody a substantial percentage of short-term finance to the organization as it enables them to pay outstanding debts to their suppliers over a short period of time Prasana (2000). There are instances where using trade payables as a source of finance may be free or costly. It is free if there are no costs for using it, such as if no discounts are being offered by the seller. On the other hand, it is costly if the seller offers a discount, and the company may have to lose out on such discounts (Brigham & Houston, 2001).

Another proxy used for WCM in this study is the Inventory turnover period (ITP). ITP is a valid predictor of the profitability of a firm; this is because inventories are assets of the firm held for the purpose of turning these assets into cash to realize a profit. However, where inventory is not converted into cash, the working capital will be tied up in them, thereby restricting the liquidity of the firm, as well as their profitability. An optimal ITP would help an organization increase its comparative advantage in terms of higher profitability (Ahm et al., 2018).The overall measure for WCM is the cash conversion cycle (CCC). It is derived from the summation of TRCP, TPPP and ITP. Hence, in this study, it is the last proxy used for WCM. It is the period when raw materials are purchased

to when cash would be received from customers (Falope & Ajilore, 2009; Uremadu et al., 2012).The primary focus is on the period between when a firm pays for raw materials and when cash is received from customers. Lesser CCC is more beneficial to the firm than long or longer CCC (Falope & Ajilore, 2009; Uremadu et al., 2012).

1.2. Profitability

The primary aim of every business organization is to make a profit; therefore, profit maximization is the driving force of the organization Profitability is the proficiency of every firm (Agha, 2014). It indicates how efficient management is in utilizing the business resources to generate profit. The profit of a firm is obtained by deducting from the revenue of the firm, the expenses incurred in generating that income, thus, profitability is calculated in terms of revenue and expenses. Return on assets (ROA), return on investment (ROI), return on equity (ROE), and profit before interest and tax (PBIT) are used to measure firms' profitability in extant studies (Ricci& Vito, 2000; Owolabi & Alu, 2012; Otekunrin et al., 2019). In line with Sandhar and Janglani (2013), PBIT was adopted as a proxy for a firm's profitability in this study. PBIT includes all incomes and expenses that would include operating and non-operating except interest expenses and income taxes. It is calculated by deducting all expenses from the gross profit except fixed interest charges and income taxes.

1.3. Agency theory

An agency relationship exists where an agent acts on behalf of the principal on contractual terms to perform specific tasks and make decisions (Ross, 1973; Jensen & Meckling, 1976). Hence ownership of the firm belongs to the principal (i.e. shareholders), and daily management and control of the firm' business resources (which include trade receivables, trade payables and inventories) is in the hands of the agent (i.e. the manager), and the manager decides on the firm' business resources on a daily basis. Otekunrin et al. (2019, p. 154) assert that "the separation between ownership and control gives room to agency cost where conflict of interest arises between the principal and the agent." Agents being a rational human being "will usually take a decision that will maximize their benefits

instead of making a decision that would maximize the profitability of the firm and consequently maximizing shareholders wealth" (Otekunrin et al., 2019, p. 155). It is believed that appropriate WCM can eliminate the agency cost where decisions on firms' working capital would be in the interest of the owners of the business and thereby enhance profitability and shareholder wealth. Agency theory is adopted in this study to illuminate the link between the WCM and the profitability of agriculture and agro-allied companies.

1.4. Resource-based theory

Any productive activity must involve teams to cooperate and coordinate resources. At the same time, the capability of a firm is considered from the viewpoint of its team's ability to perform effectively at any task assigned to them based on the number of resources in their care (Grant, 2001). This means that a firm's capability is measured by the number of resources they possess. In this context, resource-based theory deals with how persons in charge of resources used their capacity to guarantee that existing company assets are managed effectively (Alvarez & Busenitz, 2001). It is of this essence that resource-based theory is adopted in this work, since WCM is part of handling firm resources.

1.5. Cash conversion cycle (CCC) theory

Many academics, including Richards and Laughlin (1980) and Gitman (2003), have implemented and suggested CCC theory to determine the efficiency and effectiveness of WCM. CCC is the summation of TRCP, TPPP, and ITP.WCM also has long-term implications on the value of the shareholder, even though it is concerned with current assets and liabilities, it is to need to be given careful attention (Adam et al., 2017).Oseifuah and Gyekye (2016) affirm that, in line with Richards and Laughlin (1980), the CCC theory states that, all being equal, a short CCC will increase the liquidity, profitability, and value of a company, while a long CCC will have a opposite effect. This is why this research adopts the concept of the CCC to explore the connection between WCM and profit before interest and tax of selected quoted farming and agro-allied companies.

1.6. Empirical framework

Shahid (2011) revealed there was a significant and negative connection between TRCP, TPPP (both proxy for WCM) and ROA (a proxy for profitability). He also found a favorable connection between average days in inventory, CCC and ROA of companies that indicated a longer CCC would be worthwhile in the selected companies in Pakistan. He sampled 160 firms. Ahmadi (2012) showed there was a significant connection between average days in receivables, average days in payables, inventory turnover period and CCC (all proxy of WCM), and operational net profit of companies (a proxy for profitability). He concluded that a more extended average day in receivables, average days in payables, inventory turnover period and CCC would lead to decreasing profitability in the companies. He sampled 33 firms in Iran from 2006 to 2011.Jakpar et al. (2017) found TRCP and profitability were positively related. They also found that ITP and profitability were positively related. They found CCC and profitability were insignificantly and negatively related. They selected 164 firms in Malaysia from 2007 to 2011.

Maisiba et al. (2017) found TRCP and TPPP (both proxies for WCM) negatively impacted profitability. They selected 44 retail trades in Kenya. They added that liquidity ratio, debt ratio, and current ratio had a significant effect on profitability. Kasozi (2017) found TRCP and TPPP (both proxies for WCM) impacted profitability negatively, while ITP and inventory were positively and significantly related. He selected 69 firms of Johannesburg from 2007 to 2016. Falope and Ajilore (2009) found that WCM impacted big and small firms alike. They used TRCP, TPPP, ITP, and CCC as a proxy for WCM. They selected quoted non-financial companies in Nigeria from 1996 to 2005. Ukaegbu (2014) found ITP and profitability were positively related. He found TRCP and profitability were negatively related. He also found TPPP and profitability were negatively related, except for Egypt. He also found CCC and profitability were negatively related. He selected manufacturing firms in South Africa, Nigeria, Kenya, and Egypt from 2005 to 2009 with diverse industrial typologies.

Based on the above literature review, it has been observed that there are mixed observations about WCM and profitability measured by different variables. Some studies conclude that WCM and profitability are negatively related, while others conclude that they are positively related. It was also observed that there are few kinds of research in the area of the subject matter in Nigerian agricultural and agro-allied companies after the adoption of IFRS since 2012, and this leads to the aim of this study.

2. AIM AND RESEARCH HYPOTHESES

This study aims to examine if WCM and the profitability of agricultural and agro-allied firms are related to filling this gap. Regarding the arguments of literature review, in addition to the purpose of this study, the following are specific null hypotheses tested:

H1: *The trade receivables collection period and profit before interest and tax of agricultural and agro-allied firms are not significantly related.*

H2: *The trade payable payment period and profit before interest and tax of agricultural and agro-allied firms are not significantly related.*

H3: *The inventory turnover period and profit before interest and tax of agricultural and agro-allied firms are not significantly related.*

H4: *The cash conversion cycle and profit before interest and tax of agriculture and agro-allied firms are not significantly related.*

3. DATA AND METHODS

The study examined if WCM and the profitability of Nigerian agricultural and agro-allied companies are related from 2012 to 2016. A descriptive research design was used in line with Osundina (2014) and Ukaegbu (2014). The sample size of the study was 18 firms (four of which were agricultural firms and 14 agro-allied) out of the population of 23 agro-allied companies listed on the Nigerian Stock Exchange (NSE), using proportional stratified random sampling. The proportional allo-

cation method was used here to pick the sample size for this study in line with the modern sample size calculator designed by Raosoft (Inc.). This research used a secondary source to gather its data from the 18 agricultural and agro-allied firms on the NSE. The statistical package used to construct the data collected is an analysis used to test and ascertain whether WCM and profitability of agricultural and agro-allied firms are positively related or not, using regression analysis on E-views (Econometric views).

3.1. Model specification

To explore whether WCM and profitability are related, two empirical models were used as adapted from Duru (2014) and modified to suit the research under study as follows:

$$
\begin{aligned}
PBIT = \beta_0 + \beta_1 ACP + \beta_2 APP + \\
+ \beta_3 ITP + \beta_4 CCC + \beta_5 DR + \\
+ \beta_6 CR + \beta_7 SOF + \beta_8 ASSTTUR + \\
+ \beta_9 AOF + \beta_{10} GRTH + \mu,
\end{aligned}
\tag{1}
$$

where $PBIT$ = Profit before interest and tax, CCC = Cash conversion cycle, $TRCP$ = Trade receivable collection period; $TPPP$ = Trade payable payment period, ITP = Inventory turnover period, $GRTH$ = Sales growth (control variable), DR= Debt ratio (control variable), CR = Current ratio (control variable), SOF = Size of the firm (control variable), $ASSTTUR$ = Assets turnover (control variable), AOF = Age of the firm (control variable), and μ = Random error.

4. RESULTS

4.1. Descriptive statistics

Table 1 analyzes PBIT, DR, CR, TRCP, TPPP, ITP, CCC, SOFIT, GRTHIT, AOF, and ASSTTUR employing descriptive statistics. TRCP has positives kurtosis (9.257067); hence it is leptokurtic. TPPP has positive (35.25017) kurtosis, hence it is leptokurtic. ITP has positive kurtosis (10.03579); hence it is leptokurtic, and CCC has positive kurtosis (33.28619); hence it is leptokurtic. Leptokurtic means a higher value than the sample mean for a variable and that signifies a peaked-curve. TPPP, TRCP, and ITP skewed to the right positively, and CCC skewed to the right negatively with the following figures: 5.315126, 2.339371, 2.435361 and –5.035045, respectively.

5. REGRESSION ANALYSIS

The results, as displayed in Table 2, reveal that TRCP (a proxy for WMC) and PBIT (a proxy for profitability) are negatively and significantly related with t-statistics of –1.74179 and the probability of 0.0855. This indicates that the lower the TRCP, the higher the PBIT of the firm, and vice versa. This shows that a shorter length of TRCP is related to an increase in the PBIT of the firm, and vice versa. Considering the above result, hypothesis 1($H1$), which states that the trade receivables collection period and profit before interest and tax of agricultural and agro-allied firms are not significantly related, is rejected. This finding is equiva-

Table 1. Descriptive statistics of variables under the model analysis

Source: Obtained from the researcher's computations based on the figures in firms' accounts from 2012 to 2016.

	PBIT	DR	CUR. R	TPPP	TRCP	ITP	CCC	SOFIT	GRTHIT	AOF	ASETUR
Mean	12151675	0.579904	1.181489	181.7889	71.13333	87.58889	–23.05556	7.622222	12415076	1.487667	2.044522
Median	4243829.	0.582248	0.991697	122.0000	59.00000	71.50000	3.500000	8.000000	4134254.	1.605000	1.550184
Maximum	82513306	1.504471	7.389274	2070.000	365.0000	358.0000	317.0000	9.000000	1.11E+08	1.970000	14.53861
Minimum	–9922726.	0.177877	0.073989	2.000000	0.000000	15.00000	–1933.000	6.000000	–22781804	0.780000	0.092248
Std. Dev.	19263120	0.210699	0.890449	265.2777	71.35009	60.95677	273.9492	0.680016	22949590	0.314764	2.075675
Skewness	2.029992	1.700652	3.999858	5.315126	2.339371	2.435361	–5.035045	–0.018134	2.098270	–0.769768	3.112928
Kurtosis	6.417305	9.372815	27.52624	35.25017	9.257067	10.03579	33.28619	2.771707	7.687439	2.512177	16.81304
Jarque-Bera	105.6054	195.6811	2495.744	4324.033	228.9056	274.5983	3819.976	0.200375	148.4364	9.780523	860.8547
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.904668	0.000000	0.007519	0.000000
Sum	1.09E+09	52.19136	106.3340	16361.00	6402.000	7883.000	–2075.000	686.0000	1.12E+09	133.8900	184.0070
Sum Sq. Dev.	3.30E+16	3.951076	70.56805	6263131.	453084.4	330699.8	6679287.	41.15556	4.69E+16	8.817810	383.4501
Observ	90	90	90	90	90	90	90	90	90	90	90

Table 2. Regression analysis result

$PBIT = \beta_0 + \beta_1 TRCP + \beta_2 TPPP + \beta_3 ITP + \beta_4 CCC + \beta_5 DR + \beta_6 CR + \beta_7 SOF + \beta_8 ASSTTUR + \beta_9 AOF + \beta_{10} GRTH + \mu$				
Independent variables	Coefficient	Std. Error	*t*-Statistic	Prob.
C	−96204477	21426127	−4.49006	0.0000
DR	−45749634	11564780	−3.95595	0.00028***
CR	−5291872	1800410	−2.93926	0.0043***
TPPP	4462917	2556766	1.745532	0.0848*
TRCP	−4454442	2557391	−1.74179	0.0855*
ITP	−4449387	2557020	−1.74007	0.0858*
CCC	4436602	2555839	1.735869	0.0865*
SOFIT	16883977	2487431	6.787718	0.0000
GRTHIT	0.111759	0.069316	1.612323	0.1109*
AOF	2142519	5168171	0.41456	0.6796
ASSETTUR	1627980	897992.3	1.81291	0.0737*
R-squared	0.767765			
Adjusted *R*-squared	0.752450			
F-statistic	10.98731			
Prob(*F*-statistic)	0.000000			
Durbin-Watson stat	2.095556			
Dependent Variable: PBIT				

Note: ***Regression is significant at the 0.01 level. *Regression is significant at the 0.1 level.

lent to that of Shahzad et al. (2017), who revealed that the profit before interest and tax of sample firms is negatively related to TRCP.

The result of Table 2 reveals that TPPP (a proxy for WMC) and PBIT (a proxy for profitability) are positively and significantly related for the selected agricultural and agro-allied firms with *t*-statistics of 1.745532 and the probability of 0.0848. This indicates that the higher the TPPP, the higher the PBIT of the firm, and vice versa. This shows that a longer length of TRCP is related to an increase in the PBIT of the firm, and vice versa. Given the above result, hypothesis 2 (*H2*), which states that the trade payables payment period and profit before interest and tax of agricultural and agro-allied firms are not significantly related, is rejected. This finding agrees with Shahzad et al. (2017), whose finding revealed that the profit before interest and tax of sample firms is positively related to their trade payables payment period.

The results of Table 2 reveals that ITP (a proxy for WMC) and PBIT (a proxy for profitability) are negatively and significantly related with t-statistics of −1.74007 and the probability of 0.0858. This shows that a shorter length of ITP is related to an increase in the PBIT of the firm, and vice versa. Considering the above result, hypothesis 3 (*H3*),

which states that the inventory turnover period and profit before interest and tax of agricultural and agro-allied firms are not significantly related, is rejected. This finding agrees with those of Shahzad et al. (2017), whose conclusion showed that profit before interest and tax of sampled firms are negatively related to their number of days in inventory.

The result in Table 2 shows that CCC (a proxy for WMC) and PBIT (a proxy for profitability) are significantly and positively related with t-statistics of 1.735869 and the probability of 0.0865. This shows that a longer length of CCC is related to an increase in the PBIT of the firm, and vice versa. Considering the above result, hypothesis 3 (H3), which states that the cash conversion cycle and profit before interest and tax of agricultural and agro-allied firms are not significantly related, is rejected. This finding is equivalent to Shahzad et al.'s (2017) finding that the profit before interest and tax of sample firms are positively related to CCC.

6. DISCUSSION

This study examined if WCM and profitability are related. TRCP, TPPP, ITP and CCC were used as proxies for WCM and profit before interest and

tax (PBIT) was proxy for profitability. The regression analysis result above indicates a significant relationship between TRCP, TPPP, ITP, CCC, and PBIT, hence the study rejected the null hypothesis that no relationship existed between the independent variables and profitability. The regression analysis shows that as TRCP (one of the proxies for WCM) decreases, PBIT also increases. The finding is equivalent to Shahzad et al.'s (2017) finding that revealed that the PBIT of sampled firms was negatively related to their TRCP. Wang (2002) agreed to this result, as he recommended that firms should reduce their TRCP to reduce their CCC, therefore, increasing profitability.

The regression analysis shows that as TPPP (one of the proxies for WCM) increases, PBIT also increases as the funds not paid can be used for other investments, thereby bringing more profit to the company. The finding is equivalent to Shahzad et al.'s (2017) finding that the profit before interest and tax of sample firms is positively related to their trade payables payment period. Raheman and Nasr (2007) agreed to this result as they recommended that firms should increase their TPPP to reduce their CCC, therefore, increasing profitability. The regression analysis shows that as ITP (one of the proxies for WCM) decreases, PBIT increases. It means the earlier inventories are converted to cash through sales, the more profitable the company. This finding is equivalent to that of Shahzad et al. (2017)that PBIT of sampled firms is negatively related to their ITP. The regression analysis shows that as CCC (the overall proxy for WCM) increases, PBIT increases. This is likely an indication that TRCP and ITP are of the longer period than the TPPP in the sampled firms. This is because CCC is the summation of TRCP, ITP, and TPPP. It means CCC depends on how well the three (i.e. TRCP, ITP, and TPPP) other proxies for WCM are handled.

CONCLUSION

The conclusion is that working capital management and profitability are related. All the four proxies for working capital management (i.e. TRCP, TPPP, ITP and CCC) are significantly related to profitability (proxy by PBIT). The trade receivable collection period and profitability are negatively and significantly related. This indicates that the lower the trade receivable collection period, the higher the profitability of the firm, and vice versa. This shows that a shorter length of the trade receivable collection period is related to an increase in the profitability of the firm, and vice versa. Trade payable payment period and profitability are positively and significantly related for the selected agricultural and agro-allied firms. This indicates that the higher the trade payable payment period, the higher the profitability of the firm, and vice versa. This shows that a longer length of trade payable payment period is related to an increase in the profitability of the firm, and vice versa. Inventory turnover period and profitability are negatively and significantly related. This shows that a shorter length of the inventory turnover period is related to an increase in the profitability of the firm, and vice versa.

Cash conversion cycle and profitability are significantly and positively related. This shows that, ceteris paribus, a longer length of the cash conversion cycle is related to an increase in the profitability of the firm, and vice versa. However, a short CCC will increase the liquidity, profitability, and the value of a company. This shows that efficiency and effectiveness of CCC depends on the efficiency and effectiveness management of other components that formed the CCC, and these components are the trade receivable collection period, the trade payable payment period and the inventory turnover period.

AUTHOR CONTRIBUTIONS

Conceptualization: Otekunrin Adegbola Olubukola, Olowookere Johnson Kolawole, Oladipo Adenike.
Data curation: Otekunrin Adegbola Olubukola, Olowookere Johnson Kolawole, Oladipo Adenike.
Formal analysis: Otekunrin Adegbola Olubukola, Olowookere Johnson Kolawole, Oladipo Adenike.

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CONFLICT OF INTEREST

There is no conflict of interest on this study as it is not funded by any source.

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