

The Nexus between Working Capital Management and Profitability: The Case of Listed Food and Beverage Firms in South Africa

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Abstract: The purpose of this study was to assess the relationship between working capital management and profitability. It was based on a sample of 12 food and beverage firms listed on the Johannesburg Stock Exchange (JSE) in South Africa. Our study spanned 10 years from 2007 to 2016. Notwithstanding the existing literature on this relationship, very few notable studies have investigated this phenomenon in this particular industrial sector. We used gross operating profit (GOP) to measure profitability, while inventory conversion period (ICP), average collection period (ACP) and average payment period (APP) were used to proxy working capital management. Applying the generalized method of moments (GMM) model, we established a negative relationship between ICP and profitability, as well as between ACP and profitability. However, we determined that there is a positive relationship between APP and profitability for our sampled firms. Based on these findings, we recommend that financial managers of such firms maintain optimal threshold levels of the various working capital components (inventory stock, accounts receivable, and accounts payable) through the adoption of an aggressive working capital management strategy to generate shareholder wealth, by enhancing the profitability of their firms.

Keywords: working capital management; cash conversion cycle; profitability; gross operating profit

JEL Classification: G3; G32; M400

1. Introduction

Corporate finance literature extends across long-term financial decisions such as capital structure, investment, dividends and firm valuations (Garcia-Teruel & Martinez-Solano, 2007). Yet, most firms have a substantial sum of cash invested in working capital, as well as extensive quantities of short-term payables, as a source of financing (Deloof, 2003). As working capital management has a direct effect on liquidity and profitability (Deloof, 2003), the lack of attention on liquidity management process may lead to severe financial difficulties and losses as a result of unfavourable short-term expansions even for a firm with favourable long-run expectations (Richards & Laughlin, 1980).

The cash conversion cycle (CCC) is frequently used as a measure of working capital management. It refers to the elapsed of time between the spikes at which a firm pays for raw materials and at which it secures payment for finished goods (Megginson, Smart & Graham, 2010). We employed CCC components such as inventory conversion period (ICP), average collection period (ACP) and average payment period (APP) as proxies of working capital management, consistent with other studies such as Omesa, Maniagi, Musiega and Makori (2013; Hassan, Imran, Amjad and Hussain (2014); and Kumaraswamy (2016). Singh and Kumar (2014) argued that a longer CCC means more investment in short term assets and short-term liabilities, which has a negative impact on cashflows and firm

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performance. However, managing working capital by reducing the CCC to a minimum level, generally, leads to an increase in profitability (Deloof, 2003; Karaduman, Akbas, Caliskan & Durer, 2011).

Profitability ratios, on the other hand, measure management's dimensions to use a firm's assets proficiently to generate sales and profit (Parrino, Kidwell & Bates, 2011). For instance, the greater the profitability ratios, the better firm performance will be. We used gross operating profit (GOP) to measure profitability, defined by Almazari (2014), as the cost of goods sold from the total assets.

A large body of research studies has been conducted on the management of working capital and profitability in developed economies (Deloof, 2003; Banos-Caballer, Garcia-Teruel & Martinez-Solano, 2011). However, not much scholarly work has been done in developing and emerging market economies (Makori & Jagongo, 2013; Mbithi, Muiruri & Kingi, 2015). It is important to manage work capital adequately since it has a direct effect on profitability, liquidity and growth of the firm (Atrill, 2006). Mathuva (2010) contends that if firms have substantial sales owing to soft credit policy, this, in the long run, enhances the cash cycle. Hence, an extensive CCC, in this case, may increase the firm's profitability. On the other hand, a traditional view concerning the CCC and profitability relationship is that an extensive cycle can hurt the profitability of the firm (Deloof, 2003). As a result, financial managers of these firms need to look after working capital carefully to improve their firm's profitability, in order avoid suffering financial loss emanating from spoilage products, a problem generic to the industry.

Therefore, this study aimed to assess the relationship between working capital management components and the profitability of listed food and beverage firms in South Africa. We were keen to examine this particular sector as the firms focus on perishable and fast-moving consumer goods, requiring them to turn over inventory quickly to generate high sales volumes, while simultaneously maintaining adequate inventory levels without running out of stock. We assert that therefore they would employ different working management capital strategies from those of companies in other industries such as manufacturing or retail.

This study was limited to food and beverage firms listed in the Johannesburg Stock Exchange (JSE) from 2007 to 2016. We used the above period because we were looking at a 10-year period after the financial crisis, which forced many firms to consider creative ways of generating profits to appease shareholders. This paper aims to contribute to the existing literature on financial management, specifically focusing on working capital management and firm profitability. By identifying the variables that impact firm profitability, financial managers can better formulate strategies that will enhance the short-term financial statuses of their companies within the different industry sectors. There is no generic or one-size-fits-all approach as company profiles and activities differ. Hence, it would be expected that the management of working capital strategies of FMCG firms would vary immensely from other economic industries such as mining or construction. The sampled firms in this study are deemed important given their significant role in the South African economy as food and beverage manufacturer's and processors, at a time when the country is facing ongoing electricity generation challenges which could have a significantly bad effect on these firms as they deal with sensitive perishable and spoilage goods.

The remainder of this article is organised as follows: the next section discusses the related literature regarding working capital management and profitability of firms. This is followed by the methodology

wherein we detail our research approach. The findings are presented and discussed thereafter. The article winds up with a conclusion and recommendations.

2. Literature Review

The cash conversion cycle (CCC) is a process by which firms follow a cycle in which they purchase inventory, sell goods on credit and then collect accounts receivable (Brigham & Daves, 2010). There are three components of CCC such as inventory conversion period (ICP), average collection period (ACP) and average payment period (APP) (Gitman et al., 2010). ICP measures the time required to change raw materials into finished goods and then to sell those goods (Besley, Brigham & Sibindi, 2015). While, ACP is defined as the time taken to gather cash from consumers (Makori & Jagongo, 2013). Furthermore, APP is the average length of time between the purchase of raw materials and labour and the payment of cash for them (Besley et al., 2015). On the other hand, profitability enables financial analysts to estimate the firm's profits regarding a given level of sales, a certain level of assets (Agha & Mphil, 2014).

Every organisation needs efficient management of its short-term and long-term assets to ensure its sustained growth. In as much as crucial decisions of any firm primarily focus on long-term investment and assets, it in most cases results in financial managers not considering the importance of working capital (Singhania & Mehta, 2017). Yet in the present intense and uncertain financial markets, it restricts external financing for short-term assets and liabilities, thus they need to be managed effectively (Singhania & Mehta, 2017). In their pioneering work, Walker (1964) and Smith (1980) contend that managing working capital is crucial to firm survival since it affects a firm's profitability and risk; and ultimately the firm and shareholder value. In the process of managing a firm, an asset-liability mismatch may arise, resulting in an improvement in profitability in the short run, yet threatening liquidity. In showing how changing the level of the company's current assets ratio influences its profitability and risk, the trade-off will be indicated by using the current assets to total assets ratio. This ratio shows the percentage of total assets that is current (Gitman et al., 2010).

2.1. Theoretical Framework

There are two key theories that underpin working capital management, and they are derived from capital structure aspects of financial management. The first is Jensen and Meckling's (1979) agency theory, which posits that there should be a separation of ownership between managers of the firm (agents) and shareholders of the firm (principal). Conflicts between agent and principal could have a negative impact on investment and other financial management decisions for the firm by managers. The other applicable theory is Myers' (1984) pecking order theory which relates to the choice of source of funding for firms. Assuming that there is no agency problem between managers and shareholders, then firms would ideally use internal funds such as retained earnings, followed by debt and lastly the issuance of new equity shares in order to finance the business. Such action by managers would thus allow the firm to maximize profits and earnings by using low cost internal funding, which would later translate to higher shareholder wealth, reflected in an increased share price (Nyeadi, Sare and Aawaar, 2018).

2.2. Empirical Evidence

Deloof (2003) assessed a sample of 1009 Belgium firms and found a negative linear relationship between net working capital and firm profitability. Later, Banos-Caballer et al. (2011) investigated the effect of working capital management on firm profitability using a sample of 1008 small and medium enterprises in Spain between 2002 and 2007. Their study found a concave relationship between working capital levels and profitability, which implies that SMEs have an optimal level of working capital that enhances their profitability.

Jana (2018) conducted a study on the effect of the management of working capital on profitability on 15 listed FMCG firms in India from 2013 to 2017. Employing panel data analysis, the results of the study showed a positive and significant relationship between working capital management and profitability. Korent and Orsag (2018) studied the effect of working capital management on profitability and risk of software firms in Croatia for a period of 6 years from 2008 to 2013. Their findings indicated that after controlling for characteristics of the firm and macroeconomic conditions, management of working capital significantly affects the profitability of software firms in Croatia.

Paul and Mitra (2018) conducted a study on the management of working capital with profitability of 35 steel firms in India from 2000 to 2016, and concluded the existence of a positive and statistically significant relationship between the management of working capital and profitability. Munir (2019) also investigated the impact of working capital management and profitability of the leading dairy food sectors in Indonesia, results which revealed a positive and significant impact on day payables outstanding, and the current ratio on return on equity. Moreover, the results of their study showed a negative but insignificant effect of working capital on return on equity. Furthermore, the study suggested that managers of these firms can optimise their return on equity by balancing profitability and liquidity, and paying more attention to the efficiency of short-term assets and liabilities.

Soukhakian and Khodakarami (2019) assessed the impact of working capital management on 111 listed manufacturing firms in Iran during the period of 2010 to 2016. Adopting OLS to analyse their panel data, they found a negative relationship between the cash conversion cycle and return on assets, as well as refined economic value added (REVA), respectively; implying that the shorter the period between purchasing input materials and collecting money due from debtors, the higher the performance of the firm (Soukhakian & Khodakarami, 2019). However, when the endogeneity problem is controlled for, CCC was found to lose its association with refined economic value added (REVA). Macroeconomic factors of inflation and GDP were found to not play a moderating role in the relationship between working capital management and firm performance.

A large number of research studies has been done on the management of working capital and profitability in developed countries, with relatively few studies in developing countries. Mathuva (2010) investigated a study on the management of working capital with profitability using a sample of 30 firms listed on the Nairobi Stock Exchange (NSE) in Kenya between 1993 and 2008. His study revealed a highly significant but negative link between ACP and profitability, but a positive and highly significant link between ICP and profitability, as well as APP and profitability.

Godswill, Ailemen, Osabohien, Chisom and Pascal (2018) examined working capital management and bank performance of 10 deposit money banks in Nigeria from 2010 to 2016. Their findings highlighted that the management of working capital has a significant impact on bank profitability, when profitability is assessed using the return on assets proxy. Kabuye, Kato, Akugizibwe and Bugambiro (2019) considered the effect of internal control systems, and working capital management

on financial performance of 110 supermarkets in Uganda, through a survey questionnaire. Their findings suggest that short-term assets and liabilities are a significant predictor of financial performance of firms. They argue that once the firm has effective short-term assets and liabilities, it is expected to also have effective internal control systems to improve financial performance (Kabuye et al., 2019).

3. Methodology

3.1. Data and Variables

The study applied econometric panel data as it considered to be more superior to other approaches. Panel data give more explanatory power, less collinearity offers more degrees of freedom, caters for heterogeneity and is more efficient than simple time series (Baltagi, 2008).

In this paper, we examine the relationship between the management of working capital and profitability using a sample of 12 food and beverage firms listed on the Johannesburg Stock Exchange (JSE) in South Africa between 2007 and 2016. Our study employed audited financial statement data derived from the iress McGregor database to calculate the applicable financial ratios.

Gross operating profit (GOP) was used as a proxy of profitability, and is the dependent variable of the study. GOP is considered to be a good indicator of the efficacy with which a firm uses its assets for the desire of making earnings (Singhania, Sharma & Rohit, 2014). The greater the value of the ratio, the greater the efficiency in the firm in utilising its assets. We used inventory conversion period (ICP), average collection period (ACP), average payment period (APP) as the independent variables and applied control variables of the size of the firm measured by total assets, the current ratio (CAR), as well as market size proxied by GDP. The choice of variables is grounded on previous researchers work in the field (Deloof, 2003; Mathuva, 2010; Mosa *et al.*, 2012).

3.2. Hypotheses

Given that this paper aims to assess the relationship between working capital and profitability of listed food and beverage firms in South Africa, we hypothesise the following, based on the three elements of the cash conversion cycle (CCC), which is a proxy of effective working capital management by firms.

Hypothesis 1:

H₀: there is a positive relationship between ICP and profitability of firms.

H₁: there is a negative relationship between ICP and profitability of firms.

Hypothesis 2:

H₀: there is a positive relationship between ACP and profitability of firms.

H₁: there is a negative relationship between ACP and profitability of firms.

Hypothesis 3:

H_0 : there is a positive relationship between APP and profitability of firms.

H_1 : there is a negative relationship between APP and profitability of firms.

Our study employed panel data methodology used by scholars such as Deloof (2003) and Singhanian and Mehta (2017), to examine the management of working capital with the profitability of food and beverage firms listed in South Africa. We estimated the following model:

$$GOP_{it} = \beta_0 + \beta_1 ICP_{it} + \beta_2 ACP_{it} + \beta_3 APP_{it} + \beta_4 SIZE_{it} + \beta_5 CAR_{it} + \beta_6 GDP_{it} + \varepsilon_{it} \quad (1)$$

Where i indicates the cross-section; t shows the time-series dimension, β_0 is the beta coefficient, and ε_{it} denotes the error term. The GOP represents gross operating profit measured by sales minus cost of goods sold divided by total assets minus financial assets, ICP is the inventory conversion period, ACP represents the average collection period, and APP indicates the average payment period. The control variables include the current assets ratio (CAR) measured by current assets \div current liabilities, size of the firm calculated as the natural logarithm of total assets (TA), and the size of the market proxied by GDP.

Hausman's (1978) estimation test was employed when choosing a suitable approach, either fixed-effect methods (FEM) or random-effect methods (REM). FEM is appropriate in situations where the individual-specific intercept may be correlated with one or extra regressors (Brooks, 2008). While, REM is centred on the belief that there is a correlation among the regressors and distinct or cross-section precise intercept (Gujarati & Porter, 2009). On the other hand, Arellano-Bond estimators entail that the error term is serially uncorrelated (Arellano & Bond, 1991). The Sargan test was applied in this study to check for the validity of credentials' limitations, i.e. whether the model is well specified.

4. Results

This section reports the outcomes from the hypothesis testing and econometric models applied in this study. Table I below presents the summary of descriptive statistics of variables used in the estimations for the sample of 12 listed food and beverage firms.

Table I. Summary of Descriptive Statistics

Variable	Obs	Mean	Standard deviation	Minimum	Maximum
GOP	120	-.054489	0.02232521	-0.2422291	0.5519764
ICP	120	76.62488	75.57057	8.264296	377.6299
ACP	120	82.24973	62.71593	32.38038	348.2824
APP	120	66.76958	53.89306	-318.259	293.8481
CAR	120	1.890464	1.014991	0.2752075	7.012863
GDP	120	2807246	617954.3	1857779	3795141
TA	120	7234298	6278701	355510	3.02E+07

Source: Author's own computations

For the proxy of profitability, the mean value of GOP under review was -0.054, with a standard deviation of 0.22%. The minimum of GOP as a percentage of the value of -0.24%, while the maximum was 0.55%. On average, firms take 76.62 days to turn their inventories into sales, with a standard deviation of 75.57 days, whereas the ICP had a minimum of 8.26 days and maximum of 377.63 days. The mean for ACP was 82.22 days, with a standard deviation of 62.72 days, while the minimum of ACP was 32.38 days and maximum of 348.28 days. The mean of APP as a measure of short-term assets and liabilities was 66.77 days, with a standard deviation of 53.89 days. The mean value for CAR was 1.89, while the minimum value was 0.28%, and the was 7.01%. Lastly, the mean value of size for these firms under review measured by the natural logarithm of total assets was R7.2 million, with a standard deviation of R6.2 million. The minimum size of these firm was R3.55, with a maximum value of R3.02 million.

One of the shortcomings of multiple regression analysis is multicollinearity. A correlation matrix, reflected in Table II below, was utilised to test our measures for any possible multicollinearity amongst them.

Table II. Correlation Matrix (at 5% Level of Significance)

	GOP	ICP	ACP	APP	TA	CAR	GDP
GOP	1.0000						
ICP	-0.3007*	1.0000					
ACP	-0.1507	0.2972*	1.0000				
APP	0.0929	0.2339*	0.0453	1.0000			
TA	0.0720	0.0796	0.0065	0.0272	1.0000		
CAR	0.0403	0.0564	0.5551*	0.1393	0.0870	1.0000	
GDP	-0.926	0.0312	0.0063	0.0122	0.3967*	-0.0476	1.0000

Standard errors in parentheses

***, **, * Denotes 1%, 5% and 10% level of significance, respectively

Source: Authors' own computations

It can be deduced from Table II above that none of the variables in this study portray any form of collinearity amongst them, hence we can conclude that multicollinearity is absent in this data set.

Table III. Estimation Results

	Pooled Effects	Random Effects	Differenced GMM	GLS	LSDVC
L. GOP	-0.112 (0.108)	-0.112** (0.0398)	-0.546*** (0.0272)	-0.0116 (0.0560)	-0.0264 (0.0957)
ICP	-0.00970 (0.00851)	-0.00970*** (0.00183)	-0.00549 (0.00695)	-0.00842*** (0.000441)	-0.00112 (0.0307)
ACP	-0.00582 (0.00474)	-0.00582** (0.00211)	0.00213 (0.00338)	-0.00539*** (0.000281)	-0.00202 (0.0183)
APP	0.00625 (0.0112)	0.00625*** (0.000552)	0.00811*** (0.000437)	0.00570*** (0.000327)	0.00532 (0.00473)
TA	0.317 (0.336)	0.317 (0.284)	1.562 (1.924)	0.265*** (0.0204)	3.113*** (0.525)
CAR	0.317 (0.291)	0.317** (0.0976)	-0.144 (0.532)	0.292*** (0.0122)	-0.0655 (0.261)
GDP	-3.038 (2.704)	-3.038 (2.629)	-4.652 (4.091)	-2.196 (0.421)	-7.647*** (1.932)
_cons	17.62 (15.24)	17.62 (17.13)		12.51*** (2.691)	
N	108	108	96	108	108
R ²	0.156				

Standard errors in parentheses;

***, **, * Denotes 1%, 5% and 10% level of significance, respectively

Source: Authors' own computations

We used a range of estimation techniques that included the pooled OLS, Fixed effects (FE) model, Random effects (RE) model, Generalized Method of Moments (GMM) model, the generalized least squares (GLS) and the least squares dummy variable (LSDV) corrected for Kiviet bias (see Kiviet, 1995), primarily as a means for rigorous testing (robustness). Table IV below shows the diagnostic statistics of all the estimation models presented in Table III above.

Table IV. Diagnostic statistics

	Pooled	Fixed effects	Random effects	Diff GMM	GLS	LSDVC
Observations	108	108	108	96	108	108
Groups	12	12	12	12	12	12
F-stats/Wald chi2	0.37	24289.49	1955.66	32482.64	1126.79	
Prob>F/Prob>Wald chi2	0.9160	0.0000	0.0000	0.0000	0.0000	
Hausman (Chi2)		2.25	2.25			
Prob>chi2		0.8956	0.8956			
R-SQUARED						
Within		0.0669	0.0483			
Between		0.0446	0.8744			
Overall	0.1563	0.0264	0.1563			
rho		0.2999	0.000			
Arellano-Bond AR(1)				-0.96		
Prob>z				0.338		
Arellano-Bond AR(2)				-0.99		
Prob>z				0.320		
Sargan test of overid				8.68		
Prob>chi2				0.123		
Hansen test of overid				3.15		
Prob>chi2				0.677		
Instruments				12		

Source: Authors' own computations using STATA

The R^2 shows that 16% of the variation in GOP was driven by the regressors. The F-statistic on the random-effects model is positive and significant at 1955.66, implying that the model was properly specified and unbiased. According to the post-estimation Arellano-Bond AR (1) and AR (2), the tests did not show any significant rejection of the null hypothesis that there is no first-order and second-order correlation in the estimated residuals; therefore, this paper's findings are consistent. The Hansen test with a p-value of 0.677 means that the instruments used in the empirical estimation are appropriate. Lastly, according to our Hausman test results, we fail to reject the null hypothesis, that the unobservable, firm-specific effects and the regressors are statistically independent (orthogonal). Therefore, the random-effects estimation results are analysed and discussed in the next section.

5. Discussion

The results of this study show that there is a negative but highly significant link between gross operating profit (GOP) and inventory conversion period (ICP), implying that if firms reduce their inventory levels, investment in short-term assets and liabilities will decrease and this will lead to an increase in the firm's profitability. This finding is consistent with that of Deloof (2003), Alipour (2011) and Tran, Abott and Yap (2017), who also concluded a negative association between inventory conversion period (ICP) and profitability. In addition, we found a negative but significant relationship between gross operating period (GOP) and average collection period (ACP), inferring that when firms

reduce their ACP, the cash conversion period (CCC) will decrease, and this may result in an increase in profitability. Lastly, this study avers the existence of a positive but highly significant relationship between average payment period (APP) and gross operating profit (GOP). This finding is in line with the aggressive working capital management theory, which posits that a decrease in the investment of working capital by reducing the average payment period (APP) can result in an increase in profitability (Tauringana & Afrifa, 2013).

With regard to the control variables, we note a positive but significant relationship between current assets ratio (CAR) and gross operating profit (GOP). This is an affirmation of earlier empirical studies by Reheman, Aftza, Qayyum, Bodla (2010) and Kaddumi and Ramadan (2012). We also found that the relationship between total assets gross operating profit, though positive, is statistically insignificant, meaning that as the size of these fast-moving consumer goods (FMCG) firms increases, the more profitable they become because of their ability to utilise their assets productively. Our results thus confirm that managing working capital of firms by shortening the cash conversion cycle can significantly improve the profitability of firms.

6. Conclusion and Recommendations

The main objective of this study was to determine the association between the various components of working capital and firm profitability using a sample 12 of listed food and beverage firms in South Africa from 2007 to 2016. In conveying the above objective, we used gross operating profit (GOP) as a proxy of profitability, tested against different components of working capital. With respect to our hypotheses, we rejected hypothesis 1 as we found a negative relationship between inventory conversion period (ICP) and profitability. Concerning hypothesis 2, we also reject the null hypothesis as we found a negative association between the average collection period (ACP) and profitability. Lastly, we failed to reject hypothesis 3 as we found a positive relationship between the average payment period (APP) and firm profitability, confirming that the more time firms take to settle their own bills, the more profitable they become. This action should however be used cautiously to ensure that the firms' credibility to meet short term obligations as they fall due, is not tarnished.

Based on the above findings, the following recommendations are projected to financial managers of food and beverage firms in South Africa. While food and beverage firms could enhance the inventory conversion period by increasing the cost of sales, this may lead to a reduction in sales, and likewise, a reduction in a firm's profitability. Hence, we recommend that financial managers shorten their ICP by cutting selling prices to improve sales revenue (sell more units at lower prices), and in the process - strengthen firm profitability. Moreover, we advocate that financial managers of food and beverage firms in South Africa enhance investment in working capital by increasing the time for APP to improve the profitability of these FMCG firms. A limitation of our study is that we used GOP only to measure profitability. We, however, do acknowledge that there are several other available proxies which may have yielded different outcomes. Hence, future studies could use other measures such economic value added (EVA), ROE and ROA to measure profitability, and later a comparative analysis of which proxy gives a better result for the firms under study.

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