

Full Length Research Paper

Working capital management and profitability: Evidence from Ghanaian listed manufacturing firms

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Working capital management plays a vital role in the success of businesses because of its effect on profitability and liquidity. The purpose of this study is to examine the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana. The study used secondary data collected from all the 13 listed manufacturing firms in Ghana covering the period from 2005-2009. Using panel data methodology, the study finds a significantly negative relationship between profitability and accounts receivable days. However, the firms' cash conversion cycle, current asset ratio, size, and current asset turnover significantly positively influence profitability. The study suggests that managers can create value for their shareholders by creating incentives to reduce their accounts receivable to 30 days. It is further recommended that, enactments of local laws that protect indigenous firms and restrict the activities of importers are eminent to promote increase demand for locally manufactured goods both in the short and long runs in Ghana.

Key words: Manufacturing firms, working capital management, Ghana stock exchange, cash conversion cycle, profitability.

INTRODUCTION

Working capital management (WCM) refers to all management decisions and actions that ordinarily influence the size and effectiveness of the working capital (Kaur, 2010). It is a managerial accounting strategy which focuses on maintaining efficient levels of current assets and current liabilities to ensure that a firm has sufficient cash flow in order to meet its short-term obligations. WCM is an essential part of financial management and contributes significantly to a firm's wealth creation as it directly influences organisational profitability and liquidity (Raheman and Nasr, 2007; Naser et al, 2013). The most important issue in WCM is the maintaining of liquidity in the day-to-day operations of the firm. This is crucial so as to prevent creditors and suppliers whose claims are due in the short-term from exerting unwarranted pressure on

management and thus ensure the smooth running of the firm. This suggests that, the main objective of WCM is to ensure the maintenance of satisfactory level of working capital in a way that will prevent excessive or inadequate availability of working capital (Filbeck and Krueger, 2005). It is important for us to note that inefficient WCM may not only reduce profitability but also lead to financial crises and its associated effects. According to Padachi (2006), management of working capital is important for the financial health of all businesses, irrespective of type and size. Specifically, in manufacturing firms, large amount of money is often invested in inventory and work-in-progress which are key components of working capital and thus adequate management of these resources is paramount if the firm must succeed financially. Among other things,

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sound WCM ensures that organisations have the ability to meet their short-term liabilities adequately and on time. This further makes it possible to curb the situation where firms have accumulated idle resources which may not generate any income or as indicated earlier prevent unavailability of sufficient financial resources needed for meeting short-term financial obligations. Thus, this therefore explains why it is often argued that efficient WCM is very crucial in achieving the over-arching goal of the firm, which is shareholders value maximisation.

In Ghana, working capital management is very important as most providers of credit prefer the short-term credit market to the long-term market. This behaviour may be attributed to the relatively higher inflation rate in Ghana compared to other developed or emerging countries, which have the tendency of reducing the purchasing power of future cash flows. Given the above circumstances coupled with the fact that other sources of financing the firm are scarce, it has become imperative therefore for businesses in Ghana to efficiently manage their working capital in order to become profitable. Furthermore, the importance of efficient WCM by manufacturing firms in Ghana cannot be over emphasised as this is extremely needed to boost profitability and increase expansion, which are prerequisites in solving the country's unemployment issues and ensuring economic stability. Buttressing this point, the World Bank Annual Report (2007) observes that developing countries can considerably resolve their socio-economic challenges when they take significant steps to revive and develop their manufacturing base. Resulting from the above, several interventions were undertaken by various Ghanaian governments aimed at revamping the country's manufacturing sectors in order to create employment and also boost Gross Domestic Product (GDP). However, given these developments, it is intriguing to note that there are no known evidence-based studies that have investigated how profitable manufacturing firms manage their working capital in Ghana. This study therefore attempts to fill this gap and contribute to the extant literature by using panel data methodology to investigate how profitable manufacturing firms listed on the Ghana Stock Exchange covering the period from 2005-2009 manage their working capital. To achieve this, the following research questions are posed: 1) what is the relationship between profitability and accounts receivable days of listed manufacturing firms in Ghana? 2) What is the association between profitability and accounts payable days of listed manufacturing firms in Ghana? 3) What is the association between profitability and cash conversion cycle of listed manufacturing firms in Ghana? 4) How does current ratio affect the profitability of listed manufacturing firms in Ghana? 5) How does size influence the profitability of listed manufacturing firms in Ghana? 6) How does current

asset turnover impact the profitability of listed manufacturing firms in Ghana? The main objective of the study therefore is to examine how the working capital management practises of listed manufacturing firms in Ghana impact their profitability for the period covering from 2005-2009. Among other things, the findings of the study may guide managers of listed manufacturing firms in Ghana and other similar economies to understand how working capital management impacts their profitability, which may enhance their short term financial decision making. The rest of the paper is divided into four sections. Section 2 reviews the extant literature. Section 3 considers the research methodology. Section 4 presents and discusses the results, while section 5 concludes the paper.

LITERATURE REVIEW

Evidence-based studies that investigated the association between profitability and working capital management practices of manufacturing firms from emerging market perspective are rare. This may be due to the relatively greater attention that is given to manufacturing firms by developed markets since it is perceived as the main driver of those economies. Thus, most of the empirical studies that abound in working capital management in the manufacturing industry are drawn from developed markets. Chatterjee (2010) studied the relationship between working capital management practices and the profitability of listed firms on the London Stock Exchange. Using a sample of 30 UK firms and employing the Pearson correlation data analysis technique, the study confirms a significantly negative association between profitability and working capital management variables. Specifically, the study observes a significantly negative relationship between profitability and liquidity and also significantly negative relationship between total debt and profitability. The study further finds a significantly positive association between profitability and firm size. The implication is that, profitability of firms increase when they improve upon their working capital management. Particularly, holding highly liquid assets is important as it significantly enhances firms' profitability. This is because assets can easily and quickly be sold off and the revenue re-invested in other relatively higher short-term assets and coupled with the fact that it also prevents court actions and its associated cost emanating from the firm's inability to pay its short-term creditors. The findings further imply that a high level of debt use is unhealthy for the financial success of the firm whereas increases in sales encourage firm profitability.

Similarly, Dong and Su (2010) examined working capital management effects on firms' profitability of listed Vietnamese firms from 2006-2008. The authors find that,

a significantly negative relationship exists between profitability, measured as gross operating profit and the components of cash conversion cycle (inventory days, and receivable days). Furthermore, the study also observes a statistically significant positive association between profitability and accounts payable days. These findings imply that increasing firms' inventory and receivable days lead to a decreasing profit while significant financial success can be attained with increased payable days.

Gill et al. (2010) also studied the relationship between working capital management and profitability of 88 US firms listed on the New York Stock Exchange. Using data from 2005-2007, the authors find no statistically significant relationship between average payable days and profitability and also between average inventory days and firm profitability. Similarly, they also observe no significant relationship between firm size and profitability but notice a negative association between accounts receivable and profitability. This suggests that managers can enhance the profitability of their firms by reducing the number of days for their account receivables.

In a related study, Karaduman et al. (2010) investigated the impact of working capital management practices on the profitability of 140 randomly selected companies listed on the Istanbul Stock Exchange. Using data from 2005-2008, their findings indicate a statistically significant negative association between firm profitability, measured as return on assets on one hand and accounts receivable and inventory days on the other hand. The study further reveals a significantly positive relationship between accounts payable days and firm profitability. Thus, the study has reiterated the importance of effective and efficient working capital management in ensuring firms' profitability.

Afza and Nazir (2009) investigated the traditional relationship between working capital management policies and a firm's profitability for a sample of 204 non-financial firms listed on the Karachi Stock Exchange (KSE). Using regression analysis technique and data from 1998-2005, the study relates a significantly negative relationship between the profitability of firms and degree of aggressiveness of working capital investment and financing policies. The study further indicates a significant difference among the working capital requirements and financing policies across different industries. The authors suggest that managers can create value if they adopt a conservative approach towards working capital investment and working capital financing policies.

In addition to the above, Falope and Ajilore (2009) examined the effects of working capital management on the profitability of 50 quoted non-financial Nigerian firms. Using panel data methodology and data from 1996-2005, the authors observe a significantly negative relationship between net operating profit and working capital management variables, namely: average collection

period, inventory days, and cash conversion cycle. However, the study notices no significant variations in the effects of working capital management between large and small firms. An important lesson therefore is that, prudent working capital management is critical for the profitability of firms of all sizes.

Mathuva (2009) examined the influence of working capital management components on corporate profitability of 30 Kenyan listed firms. Using panel data methodology and data covering the period from 1993-2008, the study finds a significantly negative relationship between accounts collection days and profitability, a significantly positive association between inventory conversion period and profitability and a significantly positive relationship between average payment days and profitability. The findings of this study therefore confirm the traditional view of efficient working capital management and its effects on profitability.

Raheman and Nasr (2007) studied the effect of different variables of working capital management including average collection and inventory days, cash conversion cycle, and current ratio on the net operating profitability of 94 listed Pakistani firms. Using regression analysis and data covering the period from 1999-2004, the authors find a significantly negative association between working capital management variables and profitability of the firms. The authors further report a significantly negative relationship between corporate debt and profitability but a significantly positive association between size and profitability. The implications of these findings are that prudent management of working capital, reasonable levels of debt use and increase sales are all very crucial in enhancing the profitability of the modern firm.

Lazaridis and Tryfonidis (2006) examined the relationship between profitability and working capital management of 131 firms listed on the Athens Stock Exchange. Using regression estimation approach and data covering the period from 2001-2004, the authors find a statistically significant inverse relationship between profitability, measured as gross operating profit and the cash conversion cycle, accounts receivables days and inventory days. They also observe a significantly positive association between profitability and accounts payable days. This study re-emphasises that, firms can enhance profitability by prudently keeping their working capital management components (accounts receivables, accounts payables, and inventory) within optimal levels.

In another study, Eljelly (2004) examined the relationship between profitability and working capital management on a sample of 929 Saudi firms spread across three industries. Using correlation data analysis and regression data estimation technique, the author finds a significantly negative relationship between the firms' profitability and liquidity level, as measured by current ratio and cash conversion cycle. The study further

observes variations in the cash conversion cycle among the industries used in the study and conclude that short cash conversion cycle and large firm size is associated with enhance profitability.

RESEARCH METHODOLOGY

Panel data methodology has been employed to achieve the objective of the study. This methodology involves the pooling of cross-sectional units of observations over several time dimensions and produces estimates that are more robust than employing cross-sectional or time-series estimation technique alone (Baltagi, 2005). This advantage is eminent since the methodology allows several data points to be pooled on each variable, which increases the degrees of freedom necessary in realising more robust economic estimates. This study employed data on all the 13 manufacturing firms listed on the Ghana Stock Exchange covering the period from 2005 to 2009. Data which were the audited annual financial reports were collected from the Fact Book of the Ghana Stock Exchange and the web portals of the firms. To examine the effects of WCM practices on profitability of listed manufacturing firms in Ghana, the model used by Raheman and Nasr (2007) has been adopted and adapted. Generally, this model is specified as:

$$Q_{it} = \alpha + X_{it}'\beta + \varepsilon_{it} \quad 1$$

Where,

Q_{it} = Profitability (return on equity)

α = the intercept

β = coefficient of independent variables

X_{it} = independent variables of firm i at time t

ε = error term

Specifically, the relationship between WCM practices and profitability of listed manufacturing firms in Ghana has been modelled below and estimated using the Ordinary Least Square (OLS) regression technique.

$$ROE_{it} = \alpha + \beta_1 ARD_{it} + \beta_2 APD_{it} + \beta_3 CCC_{it} + \beta_4 CR_{it} + \beta_5 LOS_{it} + \beta_6 CAT_{it} + \varepsilon_{it} \quad 2$$

Where:

ROE is return on equity and is the dependent variable in the study. This ratio has been used by several authors in the financial literature including Gatsi and Akoto (2010) to proxy firms' profitability. It is computed as net profit divided by total asset. All else equal, firm profitability increases when companies improve upon their WCM practices. The independent variables in the study are discussed below.

ARD is accounts receivable days and used to proxy the cash collection policy of the listed manufacturing firms in Ghana. It is computed as average accounts receivable divided by sales, all multiplied by 365 days. It is expected that this ratio should relate negatively with profitability in manufacturing firms. In their studies, Dong and Su (2010) and Gill et al. (2010) all observe an inverse relationship between profitability and accounts receivable days.

APD is accounts payable days and used to proxy how long it takes the firm to repay its short-term creditors. It is computed as average accounts payable divided by cost of sales multiplied by 365 days. It is expected that accounts payable days should relate positively with firm profitability. This is because, as accounts payable days increase, the firm tends to have more time to reinvest

and earn some interest on creditors' money or could use it to acquire other short-term assets, turn them over, before repaying their creditors. Empirically, Dong and Su (2010) and Karaduman et al. (2010) all observe positive association between profitability and accounts payable days in their studies.

CCC is cash conversion cycle and used to proxy the length of time in days it takes for a company to convert resource inputs into cash flows. The cycle is extremely important for firms because it measures how quickly a firm can convert its products into cash through sales. The shorter the cycle, the less time capital is tied up in the business process and the better for the company and vice versa. It is computed as accounts receivable days plus inventory days less accounts payable days. In their study, Falope and Ajilore (2009) find a significantly negative relationship between profitability and CCC of 50 Nigerian listed non-financial firms.

CR is current ratio and used to measure liquidity of the firms. It is calculated as current assets divided by current liabilities. Firms are expected to increase profitability as their current ratio falls but not below one (1) as this prevents capital from being tied up in the business process. In a study of some selected Saudi firms spread across 3 industries, Eljelly (2004) observes that a significantly negative relationship exists between profitability and current ratio of the firms.

Firm size, which is represented with LOS and defined as natural logarithm of sales and current assets turnover, represented with CAT and computed as sales divided by current assets have been used as control variables in the study and consistent with Lazaridis and Tryfonidis (2006).

α is a constant, $\beta_1 \dots \beta_6$ are the coefficients of their respective variables while i and t are firm specific and time respectively. ε_{it} is the error term. The definition of all the variables in the model follows standard finance literature.

RESULTS AND DISCUSSION

Description statistics

Table 1 shows the descriptive statistics of the variables used in the study. It embodies number of observation, minimum, maximum, mean, and standard deviation of the variables used.

The table shows that average return on equity (ROE) is 3.5% with a maximum of 43% and a minimum of -67.5%. The standard deviation is 23.1%, suggesting a wide variation in return on equity across the listed manufacturing firms in Ghana over the period under investigation. Account receivable days (ARD) has overall mean of 30 days with a maximum of 76 days and a minimum of 1 day. This means that on average listed manufacturing firms in Ghana do not extend credit to their customers beyond 30 days. Also, the average time taken for the firms to pay their suppliers or creditors (APD) is 41.7 days, with a maximum of 74 days, minimum of 14 days and a standard deviation of 18 days. Furthermore, it also takes on average 112 days for the listed manufacturing firms in Ghana within the period under investigation to convert their input resources (CCC) into cash. However, some of the firms could take as long as 326 days and a minimum of 6 days to achieve this. Current ratio (CR) has overall mean of 1.7 with a maximum of 9.8 and minimum of 0.4. This implies that on

Table 1. Descriptive summary statistics of the dependent and independent variables.

Variables	N	Minimum	Maximum	Mean	Std. deviation
ROE	65	-0.675	0.432	0.035	0.230
ARD	65	1	76	30.000	20.773
ID	65	18	293	123.680	64.298
APD	65	14	74	41.680	18.271
CCC	65	6	326	112.000	77.077
CR	65	0.35	9.81	1.726	1.679
LOS	65	13.22	18.94	16.490	1.644
CAT	65	0.77	5.49	2.302	1.019

Source: authors' calculation.

Table 2. Summary of the coefficients of the regression model.

Independent variables	Coefficient	Std. error	t-statistics	P-values
CON	-1.453	0.313	-4.642	0.000
ARD	-0.296	0.1298	-2.280	0.026
APD	0.046	0.118	0.389	0.697
CCC	0.347	0.12618	2.750	0.045
CR	0.343	0.10214	3.358	0.001
LOS	0.523	0.10951	4.776	0.000
CAT	0.298	0.10848	2.747	0.045
F-value	7.660	P-value	0.000	
R-Sq.	44.2%,			
Adj. R-Sq.	38.4%,			

Source: Authors' calculation. Dependent Variable: ROE.

average the firms always keep enough current assets to offset their current liabilities. Size (LOS) has a mean of 16.5 with maximum of 18.9 and minimum of 13.2. Its standard deviation is 1.6. The overall mean of current asset turnover (CAT) is 2.3 with a maximum of 5.5, minimum of 0.8 and a standard deviation of 1.

Regression results

Table 2 reports the empirical regression results of the variables used in the study. Accounts receivable days (ARD) portray a negative and statistically significant relationship with return on equity (ROE). This finding implies that listed manufacturing firms in Ghana will tremendously increase their profitability if they reduce their average collection period. This finding is consistent with prior studies including that of Dong and Su (2010) and Gill et al. (2010) who stress the importance of reducing the firm's average collection period in order to enhance profitability. Accounts payable days (APD) show positive but statistically insignificant relationship with return on equity (ROE). This suggests that, though long

accounts payable days are good for explaining the financial success of listed manufacturing firms in Ghana, it is not a critical factor to consider when taking decision to improve profitability. This observation supports Gill et al. (2010) who also find no statistically significant association between profitability and average payable days of some selected listed US firms. We also find a positive and statistically significant relationship between profitability (ROE) and cash conversion cycle (CCC). This finding which is inconsistent with many prior literature including that of Lazaridis and Tryfonidis (2006) and Eljelly (2004) implies that, listed manufacturing firms in Ghana will be profitable if the number of days taken to convert input resources into cash is rather prolong. A key contributing factor to this observation may be the preference of imported products by most Ghanaian to locally produced products. It is important for us to observe that this phenomenon has the tendency to cause demand for locally produced goods and thus their profit levels to fall in the short-run, but increase in the long-run when bottlenecks of importation emerge. With the prevalence of this condition, the cash conversion cycle will definitely be prolonged for the local manufacturing

firms. The regression results also indicate a positive and statistically significant association between profitability (ROE) and current ratio (CR). This suggests that profitable listed manufacturing firms in Ghana must hold more current assets to enable them repay their current liabilities. Though this finding is contradictory to most previous studies including that of Raheman and Nasr (2007) and Eljelly (2004), it is critical for us to note that increasing the current asset base may not be value destroying for shareholders in the Ghanaian case, given that the country's money market is not well developed, which is one of the key platforms through which excess current assets can be reinvested to create value. The results further reveal that there is a positive and statistically significant relationship between profitability (ROE) and firm size (LOS). In support of Chatterjee (2010), this finding implies that listed manufacturing firms in Ghana will enormously enhance their profitability if they increase sales. We finally observe that current assets turnover (CAT) is also positive and statistically associated with profitability.

CONCLUSION AND IMPLICATIONS

Several authors including Raheman and Nasr (2007) and Naser et al. (2013) have stressed the importance of efficient WCM in creating value for shareholders. In developing countries, the call to embark on optimal WCM practices is even more pronounced, given that it has the potential of revamping the manufacturing sector with its attendant benefits of job creation and tax contributions (World Bank Report, 2007). Whilst empirical evidence on the benefits of prudent WCM in developing economies exists with mixed results, the influence of WCM on corporate profitability in Ghana remains largely under studied. This study therefore attempts to fill this gap by using panel data methodology to investigate the effects of WCM practices on the profitability of listed manufacturing firm in Ghana using data from 2005-2009.

We find that accounts receivable days significantly negatively influence profitability of listed manufacturing firms in Ghana. This means that to improve profitability, managers of listed manufacturing firms in Ghana should reduce their average collection period (Dong and Su, 2010; Gill et al., 2010) to specifically around 30 days. The positive and insignificant relationship between accounts payable days and profitability implies that managers should concentrate more on other aspects of WCM than payable days in their deliberations to improve profitability of listed manufacturing firms in Ghana. We also observe that cash conversion cycle (CCC) significantly positively affects profitability of listed manufacturing firms in Ghana. This draws our attention to the fact that, enactments of local laws that protect indigenous firms and restrict the activities of importers are eminent to promote increase demand for locally manufactured goods both in the short

and long runs in Ghana. It is generally argued that, a short CCC is ideal for enhancing profitability and creating value for shareholders (Falope and Ajilore, 2009; Lazaridis and Tryfonidis, 2006). The study further finds that, current asset is also significant and positively impact profitability. Thus, managers of listed manufacturing firms in Ghana should keep enough current assets to match their current liabilities. In addition to the above, we also show that sales significantly and positively affect profitability of listed manufacturing firms in Ghana. In this light, managers should enhance their product quality and also embark upon effective advertising in order to boost sales. Also, the significantly positive association between profitability and current assets turnover implies that managers of listed manufacturing firms in Ghana should increase their current asset holdings in order to generate more sales. In summary, managers of listed manufacturing firms in Ghana should institute prudent WCM policies so as to overcome liquidity crisis and enhance their profitability. The matching of current assets and current liabilities should be maintained at an optimum level since it influences how short-term obligations are honoured. Also, managers can improve the profitability and value of their firms by reducing their accounts receivable days and also work towards maintaining an optimal cash conversion cycle level.

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