

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

Dr. Maxwell Dela Yao Gakpo¹, Dr. Isaac Newton Fausi²

¹Trimonde Ghana Limited, Accra Ghana.

²lengineering Limited, Ghana.

ABSTRACT: This study critically examines the imperative for enhanced working capital management (WCM) among Ghanaian firms, with a particular focus on the performance of manufacturing and distribution companies listed on the Ghana Stock Exchange (GSE) between 2003 and 2015. Addressing a significant gap in the extant literature, the research investigates the nexus between working capital management, trade credit, and firm performance within the underexplored Ghanaian context. A quantitative analysis was conducted on panel data from 18 purposively sampled firms using Pearson correlation and multiple regression techniques, while controlling for firm-specific effects. The empirical findings indicate that, among the components of WCM, only the average collection period demonstrates a statistically significant and causal impact on return on assets (ROA). Complementary qualitative insights gathered through interviews with industry practitioners reveal a strong consensus on the pivotal role of effective WCM in enhancing firm profitability. The study concludes with practical recommendations aimed at strengthening working capital strategies to improve the financial performance of firms operating in emerging economies such as Ghana.

KEYWORDS: working capital management, trade credit, firm performance.

INTRODUCTION

Working capital (WC) is regarded as the excess of current assets over current liabilities (Ndonye, 2021; Padachi, 2006). Assets are benefits that accrue to a firm or resources that a firm control because of past events and from which the firm expects to derive future benefits (Oseifuah & Gyekye, 2018). Current assets are those assets whose benefits the firm expects to derive in the ensuing year (12 months or less). Liabilities on the other hand are obligations that have arisen because of past events whose settlement is expected to take away resources from the firm the 2010 International Accounting Standards Board (Oseifuah, et al., 2018). Current liabilities are those obligations falling due in 12 months or less. Thus, working capital management (WCM) is concerned with matching the short-term assets and liabilities to ensure that the firm can meet its liabilities as they fall due. Firms that fail to meet their obligations stand the risk of insolvency. Efficient management of WC is crucial as it has a bearing on the long-term survival of a firm (Bagchi, Chakrabarti & Basu Roy, 2012). Working capital management is thus regarded as a crucial aspect of financial management of firms (Banerjee, et al., 2023; Madura, Hoque & Krishnamurti, 2018). Working capital management, capital budgeting, and capital structure form the three main aspects of finance of all firms operating across the globe (Demissie, 2022).

The concern of the present study is the link between WCM and firm profitability as well as the drivers of trade credit (TC). There are about 30 manufacturing and distribution companies listed on the Ghana stock exchange (GSE). A close look at the financial statement of these companies shows that a significant proportion constantly report losses. Also, their financial reports show that many of them are faced with challenges in their trade credit (TC) as they keep huge balances of account receivables and account payables (Afrifa & Tingbani, 2018).

While some studies link WCM to bankruptcy of firms (Aggarwal & Essa, 2022; Kušter, 2023). Other findings establish linkages among WCM, profitability, and liquidity of firms (Demissie, 2022; Hashmi & Iqbal, 2022). Other findings also focus on WCM and its impact on firm's profitability, risk, and value (Afrifa, et al., 2018; Afza & Nazir, 2007; Banerjee, et al., 2023; Baños-Caballero, García-Teruel & Martínez-Solano, 2014). There are, however, few empirical studies on Ghana to assess the veracity of this widely held belief. It is against this background that this study was conducted to determine if, in-deed, relationships existed between key WCM variables and the profitability of firms, taking the GSE manufacturing and distribution firms as a case (Fiador, 2016; Tuffour

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

& Boateng, 2017). This study also fills the gap by looking at relationships in the context of listed manufacturing and distribution firms in Ghana.

The structure of the study is organized as follows: Section 2 provides a review of the relevant literature. Section 3 outlines the data and methodology employed in the research. Section 4 presents the results and discussion, while Section 5 concludes with key findings and policy implications.

LITERATURE REVIEW

The theoretical foundation as shown in Table 1, is based on the interplay of theories on WCM, TC, and performance, as there is no single theory that can fully explain all aspects of these areas. Table 1 explains the theoretical literature.

The literature supports the view that efficient WC improves firm performance. According to Deloof (2003), the excessive holding of stocks leads to high stock handling costs, deterioration in the value of stocks due to damage and obsolescence, theft or pilferage by employees, and wastage that collectively costs the firm and thus, reduces its profitability. Also, inadequate stocks lead to stock out costs and loss of goodwill of the firm, leading to fall in firm performance. Holding high level of inventories leads to high capital tied up in stocks. This tied up capital means decrease in firm performance due to forgone interest income which would have been earned if the capital tied up in stocks were invested (Afrifa & Tingbani; 2018).

The exact nature of the linkage between WCM and firm performance remains interesting (Raheman & Nasr, 2007; Banerjee, et al., 2023; García-Teruel & Martínez-Solano, 2007). While some studies reported significantly positive relationship between WCM and firm performance, others found significantly negative relationships. Some researchers also found no relationship, while others found non-linear relationship between them. Those who reported significantly negative relationship argued that firms with a shorter CCC have the capacity to enhance their performance due to their ability to internally generate funds as opposed to relying on external finance that often turns to be expensive (Baños-Caballero, et al., 2014; Hayati, 2020). Also, various variables have been used to represent WCM and performance. The objective of the quantitative aspect of this study was to ascertain the relationship between WCM and performance of firms in Ghana and the overriding hypothesis of the study was that there would be no statistically significant relationship between WCM and firm performance.

Baumol's Cash Management Model

This model was designed to minimize the sum of opportunity costs associated with holding cash and trading costs associated with converting non-cash items to cash. The procedure is very similar to the Economic Order Quantity Model for inventory size, but it deals with different variables. It assumes that the firm holds a portfolio of marketable securities which can easily be converted into cash (Baumol, 1952). To this model, cash is assumed to start from a replenishment level, and then declines smoothly to a zero value that is immediately replenished at a trading cost (Cornett, McNutt, & Tehranian, 2009). In this model, the financial manager exploits the trade-off between cash and marketable securities to enhance firm performance (Cornett et al., 2009; Pandey, 2008). Though this model helps to explain the cash management (CM) aspect of WCM, it suffers from unrealistic assumption of a constant, perfect disbursement rate for cash, no cash inflows, and not allowing for any safety stock of extra cash to buffer the firm against unexpectedly high demand for cash (Cornett et al., 2009; Pandey, 2008).

Miller-Orr Cash Management Model

This model presents a more realistic approach to CM over Baumol's model (as cited in Cornett et al., 2009). The model manages to achieve a reasonable degree of realism by asserting that the adequacy of cash and current assets together with their effective handling virtually determines firm performance (Kayani, Gan, Choudhury & Arslan, 2025). Specifically, the model suggests that when cash balance reaches an upper limit, firms must buy sufficient securities to return their cash balance to normal level and then sell securities to bring the balance back to return point when cash balances reach a lower limit to efficiently manage their WC in their bid to enhance their performance (Pandey, 2008). It posits that firms not maintaining cash at an ideal level will result in stock outs, interruption in operations (Kayani, Gan, Choudhury & Arslan, 2025), reckless purchasing of raw materials, increased cost due to mishandling, waste, and theft (Padachi, 2006). This model is unable to explain the situation where profitable firms with no liquid cash are forced into winding up by their creditors.

Risk and Return Theory

This theory is one of the most critical theories in the field of portfolio management in business, economics, and finance (Brealey, Myers, & Allen, 2011; Stewart, Piro & Heisler, 2019). It relies on firm owners' temperament toward risk bearing to explain WCM and hence firm performance. It suggests that risk seekers focus on opportunities for gain by pursuing aggressive WC policies while risk-averse exploit the trade-off between liquidity and profitability by pursuing defensive WC policies in their quest to enhance

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

firm performance (Kontuš & Mihanović, 2019). The risk and return theory say that risk neutrals will roll out conservative WC policies concerning the composition of accounts receivable, inventories, incentives, and stocks in exploiting the trade-off between liquidity and profitability. It generally accepts that firms will seek to enhance their performances when they perceive to gain by risking their inputs within the environment in which they operate (Nocco, et al., 2022).

The Operating Cycle Theory

This model is the most central theory in explaining WCM because it encompasses all the concepts and components of WC, ranging from raw materials to finished products, and outputs representing inventory levels, to receivables and payment representing the cash aspect. It asserts that the number of times with which firms convert the totality of their raw materials stock, work in progress (WIP), and ultimately the finished goods into product sales reflect a firm's WCM practices and hence firm performance (Richards & Laughlin, 1980; Yilmaz, 2023). It reveals that changes in collection and credit policy have a direct effect on annual sales, accounts receivable balance, and, consequently, firm performance. The theory helps financial managers and all related financial analysts to appreciate that, at an intuitive level, all WC investments do not have the same life expectancy, and their transformation rate to usable flows of liquidity is always not at the same speed (Yilmaz, 2023). It helps explain variations in the extent of efficiency on both WCM and firm performance within the same industry and across industries.

Table 1. Theoretical Foundation of WCM

Name of Theory	Author(s)	Main Idea
Traditional theories	Sagan (1955) Van-horne (1969); Walker (1964); Warren & Shelton (1971); Welter (1970); Weston & Brigham (1972)	WCM is driven by physical, financial, technical and environmental factors.
Cash management model	Baumol (1952); Cornett et al. (2009); Pandey (2008)	WCM is based on the real cost associated with holding cash and trading costs linked with converting other inputs into cash
Miller-Orr Cash Management Model	Kayani, Gan, Choudhury & Arslan (2025); Padachi (2006)	Adequacy of cash and current assets together determine WCM and firm performance.
Risk and return Theory	Brealey, Myers, & Allen, 2011; Tiegen & Brun (1997).	Trade-off between risk and return affects WCM and firm performance
Operating Cycle Theory	Richards & Laughlin (1980) Yilmaz (2023)	WCM varies with firm performance hinge on WC components.

Source: Adapted from Mathuva, 2010, Kayani et al., 2025

SYNTHESIS OF LITERATURE

Firstly, though, there is a comprehensive listing of publications from researchers and practitioners across the globe on WCM, firm performance, and TC, review of these extant literatures revealed an apparent dearth of studies in Ghanaian context. Secondly, there have been many studies exploring the relationship between WCM and firm profitability at the expense of firm performance as a broader measure of firm's overall efficiency. Thirdly, using different approaches of qualitative, quantitative and mixed designs, data-bases and regression specifications, the nexus between WCM and firm performance has offered contradictory results, thereby suggesting that the link between WCM and firm performance demands careful consideration as quality data becomes available overtime. For instance, while Yamini and Gajanand (2022), showed that longer CCC increases the firm's profitability, others concluded that shorter CCC increases the firms' profitability (Dalci, Tanova, Ozyapici & Bein, 2019). Researchers like Samiloglu and Demirgunes (2008) as cited in Aggarwal & Essa (2022), concluded that there is no significant relationship between CCC and profitability. Fourthly, it emerged that the dominant research design in studies on the relationship between WCM and firm performance was the quantitative research design.

Again, it emerged that efficient WCM enhances firm performance that manifest in the form of profitability, efficiency, increased sales, prudent in-puts procurement and employment of more hands. Additionally, Raheman, and Nasr (2007) suggested that further research be conducted on the same topic with different firms. They also argued that further research be extended to cover other WCM components including cash and marketable securities. Thus, in addressing these gaps in the previous studies,

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

the present study sought to examine the relationship between WCM and firm performance within the Ghanaian context with emphasis on the manufacturing and distribution sectors using mixed method design.

The literature on TC is growing, yet Rodríguez-Rodríguez (2008) conceded that considerable gaps and biases exist in the underlying theoretical dimensions in the sense that considerably less attention is given to determinants of TC in emerging economies such as Ghana. Also, while it is easy to measure economic dimensions of firm performance in financial terms, it is evident that firm performance as captured via non-financial or operational dimensions were based on behavioural, sociological and technological factors which are difficult to capture and assess (Hansen & Wernerfelt, 1989; Nocco & Stulz, 2022). To have a holistic idea about firm performance, a unified framework to measure both financial and non-financial dimensions would have been ideal but extant literature revealed such unified framework was lacking (Faisal, Abidin & Haryanto, 2021).

It is also clear from extant literature that factors that drive firm performance are numerous and varied and consist of inherent organizational factors like owners' managerial skills, level of education and experience; industry related factors like owners' ability to deduce market demand and expectations; macroeconomic factors like inflation, exchange rates and employment conditions; inputs in the form of land, labour, and access to finance and technology; policies in the form of taxes; and cultural factors in the form of attitude to work and towards risk management (Zainudin, Samad & Altounjy, 2019). Additionally, it is evident that a large number of firms fail for non-financial reasons like poor WCM and unfriendly Ghanaian culture in supporting businesses (Nsor-Ambala, 2023).

Finally, it emerged that drivers of firm performance depended on the industry, sector, region, and type of enterprise (Felsmann, 2018).

RESEARCH METHODOLOGY

Purpose and Research Design

The purpose of this study was to investigate the relationship between trade credit, working capital management (WCM), and firm performance in Ghana. Using data from manufacturing and distribution firms listed on the Ghana Stock Exchange (GSE) from 2003 to 2015, the research aimed to identify the key drivers of trade credit and assess the impact of WCM on firm performance. The overarching objective was to determine whether a convergence exists between the use of trade credit and the empirical relationship between WCM and firm performance.

For this study, WCM is broadly defined as the efficient management of a firm's current assets and liabilities to ensure financial sustainability and operational continuity. The quantitative analysis was anchored on the Cash Conversion Cycle (CCC) theory, while Return on Assets (ROA) served as the performance metric (Farhan & Yameen, 2020). The findings reinforce the notion that prudent WCM practices are essential for enhancing firm performance in Ghana.

Though, several models are applicable to studying the linkage between WCM and firm performance, a model that accounts for heterogeneity of firms, less multicollinearity between variables, offer more informative data, reflect market conditions, firm input mix, allow for greater degree of freedom as well as accommodate constrained by environment, resources, culture, technology and the peculiarities of Ghanaian manufacturing and distribution firms seemed appropriate for this study. Thus, consistent with previous studies (Banerjee, et al., 2023; Afrifa, et al., 2018), on the impact of WCM on firm performance, this study adopted a modified panel data model setup to ensure more efficiency and unbiasedness in its estimation. These additions were allowed because drivers of firm performance are dynamic and tend to vary across industries and jurisdictions. The implication of this is that the key factors that drive firm performance are far from an exact science.

Additionally, the fact that there is no universally accepted measure for firm performance means that a model for firm performance can be modified to suit the peculiarities of a firm, industry, and/or jurisdiction (Selvam, Gayathri, Vasanth, Lingaraja & Marxiaoli, 2016). Furthermore, growth poles of technological advances and innovations have radically shifted from the West to the East where E7 countries currently rival the G7 countries as sources of technological innovations. Again, the case where large firms were innovators and adopters of technology have altered in favour of SMEs size firms. These developments have invariably influenced the cost of technology and thus the pace of technological diffusion across firms, industries and the globe. The implication of this requires Ghanaian manufacturing and distribution firms listed on the GSE to rely on technology as a matter of necessity in managing their WC in their bid to enhance corporate performance (Akoto, Awunyo-Vitor & Angmor, 2013).

Again, reliance on panel data regression permitted the researcher to use several cross-sectional units as were observed over the study period to better capture the dynamics of adjustment and effects that are simply not detectable in pure cross-sections or pure time-series data (Raheman & Nasr, 2007). Also, multiple regression, as used in this study allowed the researcher to gauge the behaviour of the dependent variable by flexibly incorporating several variables that are useful for generalizing functional relationships among the study variables.

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

Consistent with previous studies, the impact of WCM on firm performance was modelled via these linear regression equations whose general form is expressed as:

$$ROA = f(ACP, ICP, APP, S, CCC, CR, CA, SC, CT, IT, C) \quad (1)$$

The general equation was linearized in the following equations:

$$ROA_{it} = \alpha_0 + \alpha_1 ACP_{it} + \alpha_2 \ln S_{it} + \alpha_3 CR_{it} + \alpha_4 CA_{it} + \alpha_5 SC_{it} + \alpha_6 CT_{it} + \alpha_7 \ln f_t + \alpha_8 GDPgr_t + \alpha_9 ManX_t + \alpha_{10} ExchRate_t + \alpha_{11} ElecStab_t + \varepsilon_{it}$$

$$ROA_{it} = \alpha_0 + \alpha_1 ICP_{it} + \alpha_2 \ln S_{it} + \alpha_3 CR_{it} + \alpha_4 CA_{it} + \alpha_5 SC_{it} + \alpha_6 CT_{it} + \alpha_7 \ln f_t + \alpha_8 GDPgr_t + \alpha_9 ManX_t + \alpha_{10} ExchRate_t + \alpha_{11} ElecStab_t + \varepsilon_{it}$$

$$ROA_{it} = \alpha_0 + \alpha_1 APP_{it} + \alpha_2 \ln S_{it} + \alpha_3 CR_{it} + \alpha_4 CA_{it} + \alpha_5 SC_{it} + \alpha_6 CT_{it} + \alpha_7 \ln f_t + \alpha_8 GDPgr_t + \alpha_9 ManX_t + \alpha_{10} ExchRate_t + \alpha_{11} ElecStab_t + \varepsilon_{it}$$

$$ROA_{it} = \alpha_0 + \alpha_1 CCC_{it} + \alpha_2 \ln S_{it} + \alpha_3 CR_{it} + \alpha_4 CA_{it} + \alpha_5 SC_{it} + \alpha_6 CT_{it} + \alpha_7 \ln f_t + \alpha_8 GDPgr_t + \alpha_9 ManX_t + \alpha_{10} ExchRate_t + \alpha_{11} ElecStab_t + \varepsilon_{it}$$

Where:

α_0 = intercept of the regression

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8$ = coefficient of each respective explanatory variable

i = firms and t = time

ACPit = average collection period – for firm i at corresponding time t

ICPit = inventory conversion period – for firm i at corresponding time t

APPit = average payable period – for firm i at corresponding time t

CCCit = cash conversion cycle – for firm i at corresponding time t

$\ln S_{it}$ = size of firm i at corresponding time t

CRit = current ratio for firm i at corresponding time t

CAit = current asset to total asset ratio for firm i at corresponding time t

SCit = stock to current asset ratio for firm i at corresponding time t

CTit = current liabilities to total asset ratio for firm i at corresponding time t

$\ln f_t$ = Inflation (CPI) at corresponding time t

GDPgrt = Real GDP growth rate for Ghana at corresponding time t

ManXt = Manufactures exports (% of merchandise exports)- at corresponding time t

ExhRatet = Exchange Rate (LCU per US\$)

ElecStabt = Electricity production from hydroelectric sources (% of total)

ε_{it} = is stochastic disturbance term – for firm i at corresponding time t

The inclusion of the variables in the model was inspired by the findings of Deloof (2003), Afrifa & Tingbani (2018) on the drivers of firm performance with focus on WCM and TC. According to their findings, these variables have statistically significant influence on firm performance in at least the clear majority of studies on WCM and firm performance across the globe and sectors. Further, the regressors capture some structural characteristics of the manufacturing and distribution firms and the economy to help policy makers adjust to enhance firm performance.

Furthermore, the selection of the variables corresponds to the theoretical and empirical literature on drivers of firm performance and accepted regression equation set up. Finally, the specification of the model regarding the linear form might be questioned. However, at the firm level, panel cross-sectional data analysis, the influence that WCM has on firm performance are frequently modelled in a linear semi-log form (Bagchi, Chakrabarti & Roy, 2012). In general, the overall fit and the significance of the coefficients improve considerably when determinants of firm performance are modelled in their semi-log form. On the other hand, since firm performance on an annual base can be increasing, constant, or decreasing to signify either losses or profits means that when natural logarithm was used it could cause the number of observations for the considered sample to drop considerably. More worryingly, excluding only those observations for the time period for which firm performance signifies losses was likely to bias the sample.

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

Table 2. Summary of Variables in the model

Variables	Formula/Measurement
Return on Asset	Net Profit /Total Asset
Average Collection Period	Account Receivable / Sales × 365
Inventory Collection Period	Inventories/ Cost of Goods Sold × 365
Average Payable Period	Account Payables / Cost of Goods Sold × 365
Cash Conversion Cycle	ACP + ICP – APP
Firm Size	Natural Logarithm of Sales
Current Ratio	Current Asset /Current Liabilities
Current Asset to Total Asset Ratio	Current Asset /Total Asset
Stock to Current Asset Ratio	Inventory/Current Assets
Current Liabilities to Total Assets Ratio	Current Liabilities /Total Assets Ratio
Inflation	Consumer Price Index (CPI)
Exchange Rate	Local Currency Unit (LCU) per US\$
GDP Growth	Real GDP growth
Manufactures Export	Manufactures exports (% of merchandise exports)
Electricity Stability	Electricity production from hydroelectric sources (% of total)

Sources: Author's Compilation, 2025

Objectives and Limitations of the Study

This study aims to critically examine the impact of working capital management (WCM) on corporate financial performance and operational sustainability. Specifically, it seeks to analyze the relationship between efficient WCM and key financial indicators such as profitability, liquidity, and firm value. By evaluating the cash conversion cycle and industry-specific WCM practices, the study seeks to identify best practices that enhance financial efficiency. Furthermore, the study explores challenges that businesses encounter in managing working capital, including liquidity constraints, credit policies, and macroeconomic factors. The findings provide valuable insights for corporate managers, financial analysts, and policymakers in optimizing working capital strategies to drive sustainable business growth.

Despite its contributions, the study is subject to some limitations. Industry-specific variations in WCM practices may limit the generalizability of findings across different business sectors. External economic conditions, regulatory frameworks, and time constraints may also affect the scope and applicability of the study's conclusions. Moreover, unforeseen global market dynamics and financial disruptions may introduce variability that is difficult to control within the study's timeframe. These limitations provide a more balanced interpretation of the research findings and directions for future studies.

Population and sample of the Study

In terms of the quantitative data, the target population of this study was 30 listed manufacturing and distribution firms in Ghana. The study's accessible population, however, comprised 20 listed manufacturing and distribution firms in Ghana with accessible data for the period spanning 2003 to 2015. Again, the reason for restricting to this period was to use a historical and long-range data for the investigation. Also, primary data from interviewing one senior management staff in each of the firm whose quantitative data was captured, resulting in a target population of 18 senior finance professionals in the listed companies.

In terms of the qualitative phase of the study, a total of five senior finance professionals from the listed manufacturing and distribution firms were purposively selected and interviewed. Issues of trade credit, WCM, and firm performance featured prominently in the interview. One highly trained interviewer and the researcher conducted the interviews to explore factors that account for the extension and usage of trade credits among listed manufacturing and distribution firms in Ghana. The researcher assured respondents that the study was strictly for academic purposes and that participation was completely voluntary, anonymous, and confidential.

Research Questions and Hypotheses

R1. What factors account for the extension and use of trade credit?

R2. What is the relationship between WCM and performance of firms in Ghana?

In ascertaining the relationship between WCM and firm performance (FP), the following hypotheses was employed.

H1: There is no significant relationship between WCM and firm performance in Ghana.

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

The CCC theory suggests that there are three components of WCM. As such the following three sub hypotheses were also formulated and tested.

H1a: There is no significant relationship between Average Collection Period (ACP) and firm performance

H1b: There is no significant relationship between Inventory Conversion Period (ICP) firm performance

H1c: There is no significant relationship between Average Payable Period (APP) and firm performance

RESULTS AND DISCUSSION

Correlation analysis

Correlation analysis is a statistical method that seeks to measure the direction and strength of the relationship between two numerical quantities (Zaid, 2015). The purpose of correlation analysis is to determine the degree and nature of association between variables that are being studied together using numerical coefficients. In terms of the nature of association or relationship, the sign of the coefficient indicates whether there is a direct or inverse relationship between any pair of variables. A positive coefficient tells of a positive or direct relationship between the pair of variables while a negative sign indicates a negative or inverse relationship between the two variables. A positive relationship means that when one of the variables in question increases, the other also increases. On the other hand, a negative relationship means that when one of the variables in questions increases, the other decreases. The correlation coefficients can range from -1 to 1 (Zaid, 2015). The stronger the relationship, the closer the value is to 1.

Different techniques exist that can be used to estimate the correlation between pairs of variables. Some of them are the Spearman rank technique, Kendell rank technique, Point-Biserial technique, and the Pearson product moment technique. This study relied on Pearson Product moment technique in the estimation of the bivariate relationship between various pairs of variables. The results of the correlation analysis are presented in Table 15.

The correlation matrix shows a negative correlation between ACP and ROA with a coefficient of -0.0787 at $p=0.00057$. This is interpreted to mean that shorter account collection period is associated with higher ROA. A longer ACP requires a higher investment in AR which signifies less available cash to cover cash outflows (Akoto et al., 2013). A longer ACP requires a higher investment in AR, which signifies less available cash to cover cash outflows (Akoto et al., 2013). The correlation analysis also returned a negative coefficient of -0.195 at $p=0.025$ for ICP, indicating an inverse relationship with ROA; however, the relationship is not statistically significant. This suggests that firms with shorter inventory conversion periods report higher performance, compared with firms with longer inventory conversion periods. This result is consistent with the view that firms with higher profits have shorter ICP (Banerjee, et al., 2023), as they are able to quickly turn over their stocks, leading to higher sales and consequently higher profits. Additionally, a longer ICP could be due to poor sales and thus lower profits (Eljelly, 2004). Besides, a shorter ICP also means lower chances of obsolescence and lower storage costs which feeds into the profits of the firm (Afza & Nazir, 2007).

The correlation coefficient between APP and ROA for this study is -0.265 at $p=0.089$; however, the relationship is not statistically significant. The inverse relationship shows that firms that pay early for goods acquired on credit, are more profitable. This must be true particularly for firms with liquid funds. While profitability does not indicate liquidity, the ability to pay debts quickly is mostly due to the firm being liquid. The liquidity of a firm is enhanced with shorter ACP and ICP (Makori & Jagongo, 2013; Mathuva, 2010). Thus, if a firm can turn raw materials quickly into finished goods and is able to collect revenue quickly from its debtors, it is expected that that firm will also pay its creditors quickly. This cycle of events will make the firm more profitable. Though the components of CCC discussed above have mainly shown negative correlation with ROA, CCC itself shows positive relationship with ROA (0.009).

Big firms are expected to be more profitable than smaller firms. The correlation coefficient between firm size and ROA for this study is positive indicating that big firms tend to be more profitable since they tend to have greater bargaining power and can obtain more favorable credit terms from suppliers and can buy in bulk (Baños-Caballero et al. 2014; Faisal, Abidin & Haryanto, 2021). In addition to that, they are also more likely to be diversified in scope and structure (Nocco & Stulz, 2022). The coefficient of correlation between CR and ROA is 0.167 and the coefficient between CA and ROA is 0.206. This suggests that the correlation with ROA is stronger for CA than the CR and both are representative of the sample. This is expected as CA has the same denominator with ROA, which is total assets, and so would move in the same direction more than CR which only uses current assets, a component of asset. By the definition of CA in this study, it can be said that firms who invest more of their funds in WC would attain higher ROA.

Apart from exchange rate, all other macroeconomic variables have positive correlation with ROA. The information contained in these coefficients indicates that, when the cedi depreciates, listed manufacturing and distribution firms perform poorer. That is to say that a stronger domestic currency is associated with higher performance for listed manufacturing and distribution firms.

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

This is partly explained to be due to the dependence of local industries on imported inputs. A weaker currency will increase their cost of production and decrease profits.

The correlation results ($r = 0.014$) also show that higher GDP growth is associated with better firm performance and stable electricity supply ($r = 0.029$) is associated with better firm performance. The two results are consistent with expectation. Economic growth is usually accompanied by increased spending as household incomes increase. This increased spending will improve firm sales and profits. Electricity stability on the other hand is expected to result in better performance for firms, particularly manufacturing firms who depend on electricity for their production. Inflation also has a positive relationship with performance. This is expected as higher inflation would lead to higher prices for the firms, hence, higher nominal profits. Manufacturing exports as a percentage of total merchandise exports (ManX) also has a positive relationship with firm performance. When foreign demand for local production increases, it is expected that firms would record higher profits. This can be explained partly by the weak domestic currency.

Overall, the correlation analysis shows that there exist important relationships between the working capital variables used in this study and those relationships include positive and negative directions (Banerjee, et al., 2023; Gakure, et al, 2012; Onsongo, 2018). Also, the degree of relationship varies to a considerable extent for each variable. The strength of the associations was also higher for WC variables than macroeconomic and was less diverse in direction for macroeconomic variables. The significance of the strength and direction of these associations will be discussed in the regression section that follows.

Table 3. Correlation Matrix

	ROA	ACP	ICP	APP	CCC	FirmSi ze	CR	CA	SC	CT	Inf	GDPg r	Man X	ExhRa te	ElecSt ab
ROA	1.000 .000														
ACP	- 0.078 *	1.000 .000													
ICP	- 0.195 .000	0.148 *	1.000 .000												
APP	- 0.265 .000	0.163 *	0.388 *	1.000 .000											
CCC	0.009 .000	0.577 *	0.566 *	- 0.327 *	1.000 .000										
FirmSi ze	0.254 *	- 0.289 *	- 0.588 *	- 0.359 *	- 0.353 *	1.000 .000									
CR	0.167 *	0.273 *	0.067 .000	- 0.250 *	0.393 *	-0.167 .000	1.000 .000								
CA	0.206 *	0.175 .000	0.110 .000	- 0.153 .000	0.301 *	0.225* .000	0.081 .000	1.000 .000							
SC	0.043 .000	- 0.236 *	0.485 *	0.143 .000	0.131 .000	- 0.358* .000	- 0.257 *	- 0.230 *	1.00 0 .000						
CT	- 0.743 *	- 0.034 .000	- 0.164 .000	0.073 .000	- 0.249 *	0.133 .000	- 0.472 *	0.217 *	- 0.13 9	1.000 .000					
Inf	0.020 .000	0.206 *	0.069 .000	0.043 .000	0.143 *	-0.186 .000	0.120 .000	0.030 .000	0.04 9	- 0.094 .000	1.000 .000				

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

GDPgr	0.014	-	-	0.004	-	0.099	-	-	-	0.058	-	1.000			
	.000	0.018	0.079	.000	0.074	.000	0.023	0.010	0.02	.000	0.516	.000			
		.000	.000		.000		.000	.000	6		*				
ManX									.000		.000				
	0.014	-	0.068	-	0.021	-0.172	-	-	0.10	-	0.242	-	1.000		
	.000	0.081	.000	0.028	.000	.000	0.023	0.119	8	0.089	*	0.657	.000		
		.000	.000				.000	.000	.000	.000	.000	*			
ExhRat												.000			
	-	-	-	-	-	0.332*	-	0.045	-	0.217	-	0.460	-	1.000	
	0.122	0.047	0.152	0.023	0.134	.000	0.028	.000	0.16	*	0.342	*	0.636	.000	
e	.000	.000	.000	.000	.000		.000		9	.000	*	.000	*		
									.000		.000		.000		
ElecSt	0.029	-	0.026	0.044	-	-	0.016	-	0.07	-	0.296	-	0.402	-	1.000
	.000	0.009	.000	.000	0.015	0.116*	.000	0.055	4	0.053	*	0.022	*	0.285*	.000
		.000			.000	.000		.000	.000	.000	.000	.000	.000	.000	

From Table 4, ACP is the only working capital management variable that has significant relationship with ROA when the influence of other independent and macroeconomics variables is controlled. The relationship is positive and indicates that both ACP and ROA vary in the same direction. Therefore, the null hypothesis (H10), is rejected. This result is similar to finding by Tiringo (2013) who studied the impact of WCM on performance of Sixty-seven (67) micro and small enterprises in Ethiopia for the year 2011. He found that ACP as a measure of WCM had a strong positive impact on the sampled firms' profitability. This result is contrary to findings by Deloof (2003) and Abdulazeez, Baba, Fatima and Abdulrahman (2018). Also, Mathuva (2010) examined 30 listed firms on the Nairobi Stock exchange and found statistically significant negative relationship between ACP and firm performance. Other studies found contradictory relationships such as Ephrem (2011) who explored the relationships between ACP and corporate performance of thirty (30) selected SMEs in Addis Ababa for the period 2005 to 2009. They however measured performance using net operating profitability.

The result of ACP can be interpreted to mean that firms that extend longer credit period to customers are able to boost sales and for that matter performance. In other words, firms that delay collection of payment from their debtors also achieve better financial performance. When one allows longer credit periods, one is likely to sell more. This is particularly the case when interest rates are high as in the case of Ghana. When interest rates are high, buyers may resort to trade credit as a source of business finance and so firms that offer credit sales will sell more. Interest rates in Ghana have been historically high and rising over the study period. This means that businesses had to borrow at rates in excess of 40% (Alagidede & Ibrahim, 2017). Obtaining credit from one's supplier was thus an appropriate alternative to borrowing from the banks.

The relationship between ICP and ROA was found to be negative, but not statistically significant, with coefficient of -0.00007 and this is interpreted to mean that when the ICP was longer by one day for any firm, that resulted in a decline in ROA by 0.00007 for that firm. The null hypothesis (H1b) is rejected at 5% significant level. Thus, inventory conversion period (ICP), one of the three components of working capital management (WCM), has no significant relationship with firm performance (ROA) when the influence of other independent and macroeconomics variables are controlled. This result is similar to findings by Tuffour & Boateng (2017), who studied the effect of working capital management on six manufacturing listed firms in Ghana. They found no significant relationship between ICP and ROA. The finding is however contrary to the results by Mathuva (2010) who studied the effect of WCM on the Nairobi Stock Exchange and found a statistically positive relationship between ICP and ROA. It can therefore be deduced that though shorter ICP period is associated with higher ROA, the relationship does not imply causation. Thus, the null hypothesis for ICP cannot be rejected. That is, it can be concluded that ICP does not have any significant relationship with ROA for Ghanaian listed manufacturing and distribution firms.

Also, the regression analysis shows that APP has a positive, though not significant relationship with ROA (0.00005). This result is contrary the bivariate results obtained in the correlation analysis (-0.265), where the influence of other variables were not controlled. The null hypothesis (H1c) was thus not rejected with the conclusion that there is no significant relationship between accounts payable period and return on assets. This result is consistent with findings by Akoto, Awunyo-Vitor, and Angmor (2013), who studied the relationship between WCM and performance of 13 manufacturing firms listed on the GSE. They found no significant relationship between the study variables and concluded that APP was not a critical factor for manufacturing firms when taking decision to improve firm performance in Ghana. Though the direction of the relationship is in line with finding by Tuffour & Boateng (2017), their result was significant at 5% significance level. Mathuva (2010) also reported significant positive relationship between APP and ROA when he examined the influence of working capital management on corporate profitability in

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

Kenya. The positive relationship indicates that, firms with longer payment period, also tend to have improved profitability. This could be because firms are able to invest funds that are freed up from the delay in payment to earn interest and other returns.

This study examined the relationship between WCM and ROA, using CCC as a comprehensive measure of WCM. Unlike the direction of association that was observed in the correlation analysis, the relationship between CCC and ROA was positive, though not statistically significant at 5% when the influence of other independent and macroeconomic variables was controlled in the regression analysis. What this means is that when the CCC is longer by one day, it leads to an increase in the ROA by 0.00004 or 0.004%. This is not economically significant. As the composite measure of WCM for this study, the result indicates that there is no statistically significant relationship between WCM and firm performance. This is interpreted in part to mean that firms with better working capital management do not perform better. It is also interpreted to mean that any observed association between working capital management among Ghanaian listed manufacturing and distribution firms is by chance but not due to any advantages attributable to WCM. The overriding null hypothesis (H1) is not rejected at 5% significance level. It therefore means that there is no significant relationship between working capital management, as represented by CCC and firm performance, as represented by ROA when other independent and macroeconomic variables are controlled.

This result is in line with finding by Tuffour & Boateng (2017), when they examined the effect of working capital management on profitability of six listed manufacturing companies in Ghana. They found no significant relationship between WCM and ROA. Akoto, Awunyo-Vitor, & Angmor (2013) however found significantly positive relationship between working capital management and return on equity when they studied 13 manufacturing firms listed on the GSE. This result is also in contrast with findings by Abdulazeez, Baba, Fatima and Abdulrahman (2018); Deloof (2003) and Mathuva (2010), who all found significant negative relationship between CCC and firm performance.

Notwithstanding the conclusions above, some control variables were found to have significant relationship with ROA. These include firm size, CA, CR, and exchange rate. The results for firm size show positive significant relationship with ROA, while Current ratio (CT) shows negative and statistically significant result in the ACP specification. Also, CR shows statistically significant relationship with ROA, but the direction of influence is dependent on the measure of WC.

Exchange rate showed strong significant coefficients in three of four specifications, the exception being the specification with ACP as a proxy for WC. Exchange rate also showed consistent direction of causal effect on firm performance. That is, a negative relationship between Exchange Rate and ROA which is interpreted to mean that depreciation of the local currency caused ROA to decrease on average. This can be explained by the dependence of Ghanaian manufacturing and distribution firms on imports as inputs for their manufacturing or for distribution.

Table 4. Regression Results

Variables	ROA	ROA	ROA	ROA
ACP	0.00057** (0.00024)			
ICP		-0.00007 (0.00010)		
APP			0.00005 (0.00009)	
CCC				0.00004 (0.00007)
Firm Size	0.11206*** (0.03522)	0.06920*** (0.01433)	0.07473*** (0.01359)	0.07792*** (0.01552)
CR	-0.06727*** (0.01290)	0.01510** (0.00750)	0.01670** (0.00760)	0.01506** (0.00755)
CA	0.75758*** (0.11673)	0.15201** (0.06698)	0.14285** (0.06571)	0.13601** (0.06660)
SC	0.10902 (0.10762)	-0.02724 (0.05790)	-0.05255 (0.04740)	-0.05475 (0.04772)
CT	-1.00705*** (0.04759)	-0.07897 (0.05350)	-0.07841 (0.05377)	-0.06365 (0.05508)
Inflation (CPI)	-0.00082	0.00356	0.00371	0.00389

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

	(0.00599)	(0.00298)	(0.00297)	(0.00298)
Real GDP growth	0.00631	0.00663	0.00690	0.00686
	(0.01123)	(0.00555)	(0.00554)	(0.00554)
Manufactures exports (% of merchandise exports)	0.00074	0.00185	0.00205	0.00205
	(0.00512)	(0.00255)	(0.00254)	(0.00254)
Exchange Rate (LCU per US\$)	-0.08071	-0.09423***	-0.10045***	-0.10143***
	(0.07141)	(0.03416)	(0.03413)	(0.03433)
Electricity production from hydroelectric sources (% of total)	0.00189	-0.00144	-0.00145	-0.00146
	(0.00347)	(0.00172)	(0.00172)	(0.00172)
Constant	-1.86759***	-1.09966***	-1.19487***	-1.24519***
	(0.58279)	(0.23010)	(0.21845)	(0.25074)
Observations	155	154	154	154
R-squared	0.87311	0.36347	0.36247	0.36272
Number of Company Code	18	18	18	18

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Research Data, 2017

DISCUSSION OF RESULTS

This study sought to address the context gap by focusing on working capital management, trade credit and firm performance with regards to the Ghanaian manufacturing and distribution industries. The study sought to specifically ascertain the relationship between working capital management and performance, as well as the factors that drive the use of trade credit among Ghanaian firms.

Working capital management, represented by CCC was found to be positive but not statistically significant. The positive relationship indicates that when CCC is longer, ROA tends to increase. This result is in line with findings by Deloof (2003), Mathuva (2010), and Onsongo and Onyiego (2018), who found significant positive relationship between working capital management and ROA. The empirical results revealed that, in the context of the sampled Ghanaian listed firms, there is no statistically significant relationship between CCC and ROA indicating that any perceived relationship maybe dependent on the sample choice, context, and characteristics of the firms or a combination of these factors identified by Richards and Laughlin (1980) as cited in Yilmaz (2023).

The relationship between ACP and ROA was significant and positive in the regression analysis (H1a). This means that longer credit period offered to debtors correlates positively with performance of the firms in this study (Karaduman et al., 2010; Kipkoech, 2015). The result is in support of the view expressed by the managers as to why they extended credit to their customers. This result is contrary with findings by Omesa, Maniagi, Musiega, and Makori (2013) who explored the relationships between WCM and corporate performance of 20 manufacturing firms listed on the Nairobi Stock Exchange for the period 2007 to 2011. That study found a negative and statistically significant relationship between ACP and firm performance, as did Gul, Khan, Rehman, & Khan (2013). Also, Mathuva (2010), found negative relationship in the case of Nairobi listed firms, when he examined the influence of WCM components on corporate profitability of thirty firms in Kenya. The rejection of H1a suggests that firms that allow longer credit periods are likely to be more profitable as they are able to boost their sales through extended credit period. Trade credit can be explained to be attractive to customers of the sampled firms because of the high interest rate in Ghana (Amoah & Amoah, 2018).

The relationship between ICP and ROA (H1b) was found to be negative but not statistically significant, suggesting that the length of inventory conversion does not have any significant influence on firm performance as represented by ROA. The result is consistent with Tuffour & Boateng (2017), who found no significant relationship between ICP and performance of listed manufacturing firms in Ghana. This result is however, in contrast with the findings by Mathuva (2010), who found significant positive relationship between ICP and ROA. Mathuva's (2010) results, however, suggest that shorter ICP periods is associated with higher ROA explaining that maintaining higher inventory level reduces loss of business as a result of shortage of stock. (Afza & Nazir, 2007; Almazari, 2013; Banerjee, et al., 2023).

APP was found to be positive but not statistically significant (H1c). What this means is that, though there appears to be positive effects of delayed payment on ROA for firms included in the sample, this may be due to chance. The result is consistent with

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

(Akoto et al., 2013). That means that longer payment periods are associated with improved ROA. This can be explained to be because longer payment periods may allow the firm to invest its liquid funds in other short-term income generating activities and so improve its ROA. Moreover, delayed payment could, all things being equal, reduce the firms need to obtain external debt financing for its activities hence reducing its costs and improving ROA. This is particularly true for Ghana, where interest rates have been rising over the period of this study (Amoah & Amoah, 2018). Lawal, Abiola, and Oyewole (2015) and Ephrem (2011) however found negative relationship between APP and firm performance of Nigerian manufacturing firms and SMEs in Ethiopia respectively. This can be interpreted to mean that context is important in determining the relationship and importance of APP on firm performance.

The aforementioned results have been largely consistent in showing that there is no significant relationship between the components of WCM and the performance of listed manufacturing and distribution firms. This led to failure to reject the null hypotheses of H1, H1b and H1c. The null hypothesis of ACP (H1a) was however rejected. The overall result is that WCM does not have any significant relationship with firm performance. In addition, the results are consistent with Almazari (2013), Gul, Khan, Rehman and Khan (2013), Gakure, et al., (2012), and Onsongo and Onyiego (2018).

The analysis revealed that there is no overall significant relationship between working capital management and firm performance, managers interviewed, as part of the qualitative phase of this study, hold the view that efficient management of working capital positively relates to firm performance (theme 5). The factors that generally drive the use of credit emerged as sales growth (theme 2), customer retention (theme 1), competition (theme 3) as well as finance costs (theme 4). This result is consistent with findings from Carbo-Valverde et al. (2016) which indicated that sales growth is a factor of trade credit. Also, the results is compatible with results from Ennew, Binks and Chiplin (2015) as cited in Shrestha (2020). which suggested that trade credit with acceptable interest rate is positively related to customer satisfaction, which consequently leads to customer retention. Besides, results from this study is in agreement with Chod, Lyandres and Yang (2019) results which indicated that supplier competition is positively related with trade credit. The use of trade credit creates the need to manage working capital to ensure that customers pay for goods delivered to them on credit on time while making sure that sufficient fund is made available to pay suppliers for products purchased on credit. Intuitively, the granting of credit to customers can lead to increase in sales and consequently, increase profitability and this is confirmed empirically by the significant relationship found between ACP and firm performance. In addition, taking advantage of credit opportunities offered by suppliers, can save a firm some amount of financing costs and thus higher profitability. However, the management of the resultant working capital in the Ghanaian context, did not reveal any significant relationship with profitability as represented by return on assets (ROA).

This study filled an important gap in the Ghanaian context regarding the relationship between WCM and firm performance, as well as the drivers of trade credit. The study has, among other interests' things, demonstrated shows that, while direction of behavior of WCM variables towards performance among Ghanaian firms are similar to those in other parts of the world, the empirical evidence revealed no significant influence in Ghana. This shows that perhaps there are more pressing issues that determine performance among Ghanaian firms (such as macroeconomic environment and other firm characteristics) other than working capital management variables (H1).

CONCLUSIONS

No evidence was found to suggest that there is a significant relationship between working capital management (CCC) and firm performance (ROA). The null hypothesis (H1), was thus, not rejected. This conclusion is robust to the method of estimation. The research also examined the disaggregated components of ACP, ICP and APP. ACP was found to have significant positive relationship with ROA indicating that longer ACP could result in better performance for Ghanaian listed manufacturing and distribution firms. The null hypothesis H1a was thus rejected, Also, the research found no evidence to suggest that there is a significant relationship between ICP and firm performance. The null hypothesis (H1b) was thus not rejected indication that ICP has no significant relationship with ROA. This conclusion is robust to the method of estimation. Finally, the research found no evidence to suggest that there is a significant relationship between shorter or longer APP and better firm performance. The null hypothesis (H1c) is therefore not rejected. This conclusion is robust to the method of estimation.

Listed firms in Ghana are motivated by sales growth, customer retention, competition, as well as finance costs, to use trade credit. From the responses, the managers strongly believe that the use of trade credit positively relates to firm performance. The overarching conclusion, therefore, is that there is no compelling evidence to suggest that there is a significant relationship between working capital management proxies and firm performance for Ghanaian listed manufacturing and distribution firms. The generally held view held among finance managers of listed manufacturing and distribution firms in Ghana that their personal

Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

efforts at managing APP, ICP, and CCC could influence performance of their companies has no empirical support. The view by finance managers of manufacturing firms that well managed ACP has significant relationship with performance of their companies has some empirical support but only under firm specific conditions. Even so, longer ACP is what improves performance and not shorter ACP (table 4).

PRACTICAL RECOMMENDATIONS

Based on the research findings, the following recommendations are suggested:

1. The results of this study shows that WCM did not necessarily enhance the profitability of the firms in question. This observation suggests that an association between good WCM and profitability was probably coincidental or rather due to other practices or conditions within the firm's environment (internal or external). It is, therefore, recommended that Firms should therefore, focus more resources attention on other resource enhancing activities to increase their profits margins.

2. It was also gathered from the results that Trade Credit is an inevitable part of business in Ghana and it is difficult to make adequate sales without allowing customers to purchase on credit. This suggests that credit sales are necessary to increase the top-line of businesses. The results did not show that firms had to wait longer than a year to collect their receivables. Moreover, results did not show that bad debts were a problem for the firms that were sampled. It is therefore recommended that manufacturing and distribution firms should continue to allow credit sales to improve the top-line and ultimately the bottom line. They should, however, adopt precautionary measures to ensure that debtors pay up and to minimize the probability of default. If firms must allow credit sales, then obtaining credit from suppliers is a necessary condition. This can be sustainable if they obey the terms of credit purchases. It is, therefore, suggested that manufacturing and distribution firms should negotiate favorable credit terms from their suppliers and should strive to be faithful to the credit terms.

3. Finally, it is recommended that firms seeking to improve their profit position should look at the situation holistically. Observing the data on manufacturing firms, it was realized that many of them had more fundamental issues than WCM issues that were causing them to make losses. Firms should look at leakages and the middle-line items and minimize their impact on the bottom-line.

4. This study is a first attempt to examine the issue of WCM for listed manufacturing and distribution firms in Ghana and how this impact on profitability. Future studies should broaden the scope of the impact of WCM on businesses as a whole by looking at how it affects other aspects of businesses. An example would be how WCM affects market share, firm reputation, and firm growth. Future studies could also look at other factors that can impact on profits besides WCM. This could include, age of firms, internal processes, corporate culture and governance, and macroeconomic factors.

RESEARCH CONTRIBUTIONS

The contribution of this research can be described in two ways. Firstly, the findings of the study have demonstrated that the factors that drive firm performance differ across context. This implies that, findings in other countries cannot be entirely applied to other contexts. It has shown this fact in the case of working capital management as a driver of firm performance. While many studies have established causal relationship between WCM and firm performance for several countries, this study has demonstrated this is not always applicable to all contexts; very few studies have hitherto demonstrated this, and no study has previously demonstrated this in the Ghanaian context.

Secondly, this study has given empirical bases for analyzing the effect of WCM practices on performance in Ghana. It has shown that context matters, and the Ghanaian context is different. This implies that, while good WCM is generally regarded as important for financial management of firms, the extent to which it impacts upon the profitability of Ghanaian manufacturing and distribution firms is little. This was demonstrated for different WCM variables and for the different groups of firms.

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Working Capital Management and Performance of Manufacturing and Distributing Firms Listed on Ghana Stock Exchange

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