Working Capital Management and Profitability of Firms: A Study of Listed Manufacturing Firms in Ghana

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Abstract

The efficient management of working capital is crucial to the profitability of firms therefore, it is prudent that management of firms make available in the right amount, resources to manage working capital. The main objective of the study was to establish a statistical relationship between profitability measured by the return on assets and the elements of working capital such as the cash conversion cycle (CCC), average collection period (ACP), average payment period (APP) and inventory turnover days (IT). Growth, size and leverage were control variables identified. A sample size of four (4) companies listed on the Ghana Stock Exchange (GSE) out of a population of five (5) listed trading companies for the 2006 to 2010 financial years. The results showed a fairly negative significant relationship between the cash conversion cycle, average collection period and average payment period implying that a reduction in the periods for receiving cash, an increase in the period for paying cash a reduction in the cash conversion cycle will cause an increase in profit. The inventory turnover days as well as all other control variables showed a positive relationship with profitability. Hence, study recommends that trading companies should manage their working capital more efficiently so as to keep it in equilibrium.

Keywords: Profitability, Capital Management, Growth, Resources, Size, Ghana Stock Exchange

1. Introduction

The efficient management of working capital is crucial to the survival of firms therefore; it is provident that management of firms make available, the right amount of resources to manage their working capital (Mensah, 2014; Lazaridis & Tryfonidis, 2006). This assertion is evidenced by the numerous arguments advanced by academia in recent times seeking to access the effect of working capital management on firm's profitability. Bhumia (2010), established that, lack of or excess liquidity should not be attained by any firm which could create difficulties in achieving short term obligations. The operational activities of a firm can be extremely affected by the management of working capital and in that regard; this research becomes significant for all investors who might rely on it for decision making and to have an idea of the company's operational efficiency. The question however is, to what extents will the management of a company's current assets and current liabilities affect its profitability? Will there be a need to manage the working capital of the company effectively and efficiently?

According to Weetman (2006), Working Capital as the amount of long-term finance the business has to provide in order to keep current assets working for the business. Working Capital as explained is the financing of the firm's liabilities from their current assets and involves the usage of the component of current asset thus, inventory, account receivables and cash to meet the firm's liabilities. For an organization to thrive and survive, it pays for it to be endowed with enough current assets that can meet its obligations in the short term. However, failure by management to put into reality such a practice will lead to the eventual insolvency of the business (Chakraborty, 2008; Bhunia, 2007). In essence, the effective management of working capital produces a promising drive in ensuring that a firm's current assets are in a better position to meet its current liabilities as and when the need arises.

Although working capital management plays a momentous role in the successful functioning of a business firm, Mensah (2014), revealed that there has not been much empirical work on its relationship with profitability of listed trading companies in Ghana. Efficient operations of listed companies are characterized by the proper utilization of resources such as accounts receivables, accounts payables and inventory. The efficient management of the above should be geared towards attaining equilibrium. It was against this background that, the research was carried out to evaluate and establish the relationship between Working Capital Management and the profitability of listed trading companies on the Ghana Stock Exchange.

1.1 Objectives

To achieve the main objective of this study, the following specific objectives were sought.

1. Establish the relationship between Cash Conversion Cycle and Profitability of listed trading Companies in Ghana
2. Establish the relationship between Average Collection Period and Profitability of listed trading Companies in Ghana.
3. Establish the relationship between Average Payment Period and Profitability of listed trading Companies in Ghana.

4. Establish the relationship between inventory turnover Days and Profitability of listed trading Companies in Ghana.

1.2 Hypothesis of the Study

H_{01}:   There is a significant positive relationship between the Cash Conversion Cycle and profitability of listed trading companies in Ghana.

H_{A1}:   There is no significant positive relationship between the Cash Conversion Cycle and profitability of listed trading companies Ghana.

H_{02}:   There is a significant positive relationship between the Average Collection Period and profitability of listed trading companies Ghana.

H_{A2}:   There is no significant positive relationship between the Average Collection Period and profitability of listed trading companies Ghana.

H_{03}:   There is a significant positive relationship between the Inventory Turnover and profitability of listed trading companies Ghana.

H_{A3}:   There is no significant positive relationship between the Inventory Turnover and profitability of listed trading companies Ghana.

H_{04}:   There is a significant positive relationship between the Average Payment Period and profitability of listed trading companies Ghana.

H_{A4}:   There is no significant positive relationship between the Average Payment Period and profitability of listed trading companies Ghana.

2. Review of Literature

According to Hampton (2003), working capital is all the short-term assets used in the daily operations of firms. He further explained working capital as the difference between current assets and current liabilities. Atrill (2009) considered working capital as current assets less current liabilities. Working capital measures the liquidity of firms by considering the adequacy of short-term cash in fulfilling the firm's obligation (Hampton, 2003). A firm is highly liquid when it has enough cash to pay off its liabilities as and when they arise.

Working capital has gained a significant position for the twin objects of liquidity and profitability (Vijayakumar, 2001), hence continues to hold a central position in the fast changing business environment (Hrishikes, 2009). It is a functional area of finance that covers all the current accounts of the firm and concerns itself with the policies for managing current assets and liabilities as well as technical measures for maximizing the benefits from its management (Hampton, 2003).

There are two types of working capital namely the Gross working capital and the Net working capital. The Gross working capital refers to the firm's investment in all the current assets taken together. Net working capital is the excess of total current assets over total current liabilities. The working capital requirement of a firm depends, to a great extent upon the operating cycle of the firm. Operating cycle is the duration starting from the procurement of goods or raw materials and ending with sales realization (Rustagi, 1999).

2.1 Working Capital Management

Working capital management is an important aspect of the short-term planning of the business. Changes in the business environment affects working capital therefore management efforts must be made at identifying such changes and efforts made consciously at curtailing them to ensure an efficient level of investment in working capital (Atrill, 2009). Unless the required working capital for a project is ascertained, investment decision cannot be said to be complete. The total amount of working capital needed by firms varies from period to period with regards to production (Ghosh, 2010).

Factors Affecting Working Capital Management

Hampton (2003) postulated that working capital management is affected by the following factors.

1. Sales volume: firms maintain current assets to meet operational activities that result in sales.
2. Seasonal and cyclical factors: the fluctuations in demand for a firm's goods and services amidst changes in economic conditions call for the maintenance of adequate working capital.
3. Changes in technology: development in technology affects the maintenance of working capital. If a firm acquires a machine that produces large amount of goods at any stage of production calls for keeping huge amount of stock at all time.
4. Policies of the firm: the firm at a point in time can decide to alter the amount of working capital to maintain at a point in time.

Working capital management includes and refers to the procedures and policies required to manage the working capital. It may be noted that long term profitability of a firm depends on the investment decision of a firm (Rustagi, 1999).

2.2 Inventories Management

Inventories are the total amount of goods or materials contained in a store at any given time. They are held by firms for the purpose of meeting day-to-day demands of customers and production. Storage cost, financing cost

and opportunity cost forgone in tying up funds impose on management the responsibility of minimizing the amounts of inventories held. According to Kotler & Keller (2007) inventory management refers to all activities involved in developing and managing the inventory levels of raw materials, semi-finished materials, work-in-progress and finished goods so that adequate supplies are available and the costs of over or under stocks are low. Atrill (2009) suggested some techniques to be employed in order to manage inventories. The techniques are as follows.

Forecasting future demand: realistic forecast of trends in demands of goods and services as well as related prices of inventories must be ensured by management.

Financial ratios: the average inventories turnover period determined in order to maintain an appropriate period for holding them. This is given by Atrill (2009) as,

$$\frac{average\ inventories\ held}{cost\ of\ sales} \times 365$$

Recording and reorder systems: Maintaining sound mechanism for recording the inflow and outflow of inventories must be maintained. The time for reordering inventories must be observed as well.

Inventories Management Models
Economic Order Quantity
This model tells the amount of inventories a firm should order. It assumes that demand is constant, so that inventories will be depleted evenly over time, and replaced at the time it runs out. This is given by Atrill (2009) as:

$$EOQ = \sqrt{\frac{2\ CoD}{CH}}$$

Where: D implies the demand for the inventories expressed in units, C implying the cost of placing an order and H representing the cost of holding one unit of inventories for a year.

Materials Requirement Planning Systems
This is a computerized system that is used to schedule the timing of inventories delivery. It ensures that the required inventories are delivered at the time of need.

Just-In-Time Inventories Management
A system designed to ensure that firms order only the amount of inventories needed to satisfy a particular production.

2.3 Managing Receivables
Hampton (2003), defined receivables as assets account representing amounts owed to the firm as a result of the sale of goods and services in the ordinary course of business. Management at any point in time must consider the customers to receive goods on credit, the amount to be offered on credit, the time frame for payments, collection policies, and measures of reducing the risk associated with noncompliance and above all, whether discounts should be offered.

Purpose of Receivables
Every commitment of financial resources in a firm is expected to contribute to the goal of maximizing the present value of the firm in the market place. The commitment of funds to accounts receivable is no exception. In support of this objective, three goals have been identified.

- To achieve growth in sales: If a firm permits sales on credit, it usually can sell more goods than if it insisted immediate cash payment.
- To increase profits: if the direct result of maintaining receivables is to increase sales, an indirect result is that the additional sales normally results in higher profits for the firm. This is the case when the marginal contribution or gross margin is greater than the additional costs associated with administrating the credit policy. If the firm does not realize higher profits from its credit policy and receivables, it should consider an all-cash sales program.

2.4 Managing Trade Payables
Trade credit arises from the fact that most businesses buy their goods and services requirements on credit. In effect, suppliers are lending the business money, interest free, on a short-term basis. Trade payables are the other side of the coin from trade receivables. One business's trade payable is another one's trade receivable, in respect of a particular transaction. Trade payables are an important source of finance for most businesses. They have been described as a spontaneous source, as they tend to increase in line with the increase in the level of activity achieved by a business. Trade credit is widely regarded as a free source of finance and, therefore, a good thing for a business to use.

2.1.6.1 Controlling Trade Payables
To help monitor the level of trade credit, management can calculate the average settlement period for trade payables given by Atrill (2009) as;

Average settlement period for trade payables $= \frac{average\ trade\ payables}{Credit\ purchases} \times 365$

2.5 Cash Conversion Cycle

The cash conversion cycle according to Ghosh (2010), focuses on the time between payments made for materials and labor as well as payments received from sales. The cash conversion cycle is hence given as the inventory conversion period plus receivables collection period less payables deferral period. The longer the cash conversions cycle of a firm, the higher its profitability achieved through higher sales. The profitability of the firm however, decreases when the cost of higher investment in working capital accelerates at a faster rate than the benefits of holding more inventories or granting more credit to customer (Raheman & Nasr, 2007). It is with this regard that the measure of the effect of working capital management is substituted with the cash conversion cycle.

The cash conversion cycle with its study and calculation proves to change the policies relating to credit purchase and credit sales. The standard of payment for credit purchase or the receipt of cash from our debtors can be changed on the basis of reports of the cash conversion cycle. If it better explains the cash liquidity position, past credit policies can be maintained.

2.5 Profitability

Weetman (2006) defines profitability as the ability to generate profit based on a comparative measure. For instance, the average collection period, the average payment period and the average inventory period. The profitability of firms is influenced by the operating decisions of management regarding the efficient use of assets to increase profit. Operational efficiency and profitability is achieved by dividing sales or revenue with total assets (Sari, 2007). Ratios are used to evaluate management's ability to create incomes from revenue-generating bases within the organization. A profitability ratio measures the total performance of firms. Profitability is measured based on sales and investments.

2.1.8.1 (Return on capital employed (ROCE)

This is a ratio that shows the efficiency and profitability of a company's capital investments and given by Weetman (2006) as

$$\text{ROCE} = \frac{Profit\ before\ interest\ and\ tax}{Capital\ employed} \text{ x } 100$$

2.1.8.2 Net Profit Margin

$$\text{Net Profit Margin} = \frac{Profit\ before\ interest\ and\ tax}{Sales\ or\ turnover} \text{ x } 100$$

2.1.8.3 Net Asset turnover

$$\text{Net Asset turnover} = \frac{Sales\ or\ turnover}{Capital\ employed}$$

2.1.8.4 Gross Profit Margin

$$\text{is } \frac{Gross\ Profit}{Sales\ or\ turnover} \text{ x } 100$$

2.5 Empirical Literature

Lazaridis & Tryfonidis (2006), empirically tested the relationship between corporate profitability and working capital management on the Athens Stock Market. Out of 131 companies sampled for the period 2001-2004, the study established the statistical relationship between profitability and the individual components of the cash conversion cycle. The study revealed a negative relationship between profitability measured by operating gross profit and working capital management measured by the cash conversion cycle. A firm's profitability is hence dependent on the operational activities of owners geared at managing working capital. They observed that lower gross operating profit is related with an increase in the number days of accounts payables leading to the conclusion that less profitable firms take much time to pay their debts. In addition, the negative relationship between number of days in inventory and profitability proposes that an unexpected drop in sales accompanied with a mismanagement of inventory will lead to tying up excess capital at the expense of profitable activities. Furthermore, the negative relationship between accounts receivables and profitability was as a result of less profitable firms reducing the gap in the cash conversion cycle leading to a decrease in accounts receivables. With regards to the above, it was concluded that by efficiently managing the components of the cash conversion cycle at an ideal level, the profitability of firms is maximized.

3. Measurement of Variables

Variables are factors or conditions that are changeable during the course of an experiment. It is a common language used in quantitative research to establish a relationship among two or more items or things. As per the research, two variables were identified to test the hypothesis of the study. The dependent variable denotes the output or effect of another factor. It is said to be the factor that is being measured in an experiment and usually responds to the independent variable. With regards to the above, the study quantified profitability as Return on Assets Ratio (ROA). Return on Assets (ROA) is a performance appraisal ratio that shows how profitable a firm is relative to its total assets. It gives a picture of how efficient management has been with regards to the usage of its assets to produce earnings. The higher the ratio, the higher the profitability of the firm. Weetman (2006), mathematically presented return on assets as

$$\frac{operating\ profit\ before\ interest\ and\ tax}{total\ assets} X\ 100\%$$

Independent Variable

It is further explained as a factor or phenomenon whose value determines or influences another associated factor called the dependent variable. This is normally tested to see if it is the cause of an outcome. For the purpose of the study, four (4) independent variables were identified and they are explained below.

1. Cash Conversion Cycle (CCC)

The cash conversion cycle according to Ghosh (2010) focuses on the time between payments made for materials and labor as well as payments received from sales. The longer the cash conversions cycle of a firm, the higher its profitability achieved through higher sales. The profitability of the firm however, decreases when the cost of higher investment in working capital accelerates at a faster rate than the benefits of holding more inventories or granting more credit to customer (Raheman & Nasr, 2007).

The cash conversion cycle is hence given as the inventory conversion period plus receivables collection period less payables deferral period.

2. Average Collection Period (ACP)

This is the amount of time that a firm takes to receive payments owed in terms of receivables from its customers and clients. It measures the period of credit allowed to credit customers. An increase in this measure would indicate that a company is building up cash flow problems, although an attempt to decrease the period of credit allowed might deter customers and cause them to seek a competitor who gives a longer period of credit (Weetman, 2006). Calculation of the average collection period for trade receivables is given by Atrill (2009)

as $\frac{average\ trade\ receivables}{credit\ sales} X\ 365$

3. Average Payment Period (APP)

This ratio denotes the number of days a firm takes to pay off credit purchases. It measures the average period of credit taken from suppliers of goods and services. An increase in this measure could indicate that suppliers have allowed a longer period to pay. It could also indicate that the company is taking longer to pay, probably because of cash flow problems. If payment is delayed then the firm may lose discounts available for prompt payments. The Average Payment Period is given by Atrill (2009) as;

$\frac{average\ trade\ payables}{Credit\ purchases} X\ 365$

4. Inventory Turnover of days (IT)

The inventory turnover days measures the average period during which stocks of goods are held before being sold or used in the operations of the firm. One point of view is that the shorter the period, the better. An opposite view point is that the too short a period may create a greater risk of finding that the firm is short of a stock item (Weetman, 2006).

Inventory Turnover days is given by Atrill (2009)

as, $\frac{average\ inventories\ held}{cost\ of\ sales} \times 365$

Another variable chosen for the model specification used was the control variable comprising of Leverage (LEV), Size (SIZE) and Growth (GROWTH).

Control Variable

Control variables are elements that remain unchanged and intensively impact values. They are held constant to test the relative impact of an independent variable. They are also called constant variables because they are preferably expected to remain the same. In other words, it is a variable that must not be changed throughout a study because it affects the independent variables and thus affects the outcome of the study. The control variables identified are as mentioned and explained below.

Size of Firm

Companies that have more assets obviously have more profitability as well. Hence the company size variable is used to control the effect of this purpose. The company size may be measured by natural logarithm of sales or natural logarithm of total assets. The natural logarithm of total assets was used by the research team. Firm size is measured by level of total assets in the current period.

It is computed as; **SIZE = In$_{Total\ Assets}$ (Natural Logarithm of Total Assets)**

Leverage (LEV)

Leverage is a term that refers to borrowing. It is the ratio that compares the total debts to total assets and is mostly concerned with whether the company has sufficient assets to meet all its liabilities as and when due. When a company is leveraged, it implies that the company has borrowed money to finance the purchase of assets. The other way to purchase assets is through the use of owner's funds, or equity. One way to determine leverage is to calculate the Debt-to-Equity ratio, showing how much of the assets of the business are financed by debt and how much by equity (ownership). Leverage is not necessarily a bad thing. It is useful to fund the growth of a company growth through the purchase of assets. But if the company has too much borrowing, it may not be able to pay back all of its debt. It is computed as;

LEV (Debt ratio) $= \dfrac{\text{Total Debt}}{\text{Total Assets}}$

➢ **Growth**

Growth as used in the study tells the revenue or sales generated by a company for a financial or operation period. A company is said to be growing when its sales is increasing. It is computed as; $(\text{Sales}_t - \text{Sales}_{t-1}) \div \text{Sales}_{t-1}$

Table 1: Proxy variables definition and predicted relationship

Proxy Variables	Definitions	Predicted sign
CCC	(Average Collection Period plus Inventory Turnover) minus Average Payment Period	+/-
ACP	Accounts receivables divided by sale and multiplied by 365 days	+/-
APP	Accounts payables divided by cost of goods sold and multiplied by 365 days	+/-
IT	Inventory divided by average stock multiplied by 365 days	+/-
SIZE	Natural logarithm of company's total assets	+/-
GROWTH	$(\text{Sales}_t - \text{Sales}_{t-1})$ divided by Sales_{t-1}	+/-
LEV	Total Debt divided by Total Assets	+/-

Source: Authors Regression

CCC = Cash Conversion Cycle
ACP = Average Collection Period
APP = Average Payment Period
IT = Inventory Turnover Days
SIZE = Size
LEV = Leverage

Model Specifications

To analyze the data for the research, the general model used by Samiloglu & Demirgunes (2008) was employed. This is presented as follows:

$$\text{ROA}_{Yt} = \alpha_0 + \alpha n_{Yt} + \varepsilon$$

Thus, $\text{ROA}_{Yt} = \alpha_0 + \alpha_1 (\text{CCC}_{Yt}) + \alpha_2 (\text{ACP}_{Yt}) + \alpha_3 (\text{APP}_{Yt}) + \alpha_4 (\text{IT}_{Yt})] + \alpha_5 (\text{SIZE}_{Yt}) + \alpha_6 (\text{LEV}_{Yt}) + \alpha_7 (\text{GROWTH}_{Yt}) + \varepsilon$

Where;

ROA_{Yt}	= Return on Asset of company Y at time t
α_0	= Intercept of the equation
α	= Coefficient of n_{Yt} variables
n_{Yt}	= different independent variables for working capital management of company Y at time, t.
t: time	= 2006, 2007, 2008, 2009 and 2010 years.
Y: trading firms	= 1, 2, 3 and 4 companies.
ε	= error term.

Converting the model into a specific form, the following equations were generated.

Model 1: $\text{ROA}_{Yt} = \alpha_0 + \alpha_1 (\text{CCC}_{Yt}) + \alpha_2 (\text{SIZE}_{Yt}) + \alpha_3 (\text{LEV}_{Yt}) + \alpha_4 (\text{GROWTH}_{Yt}) + \varepsilon$ …………………………………………………………… (1)

The equation above establishes a relationship between Return on Assets, a measure of profitability and the Cash Conversion Cycle, as a measure of working capital management with size, growth, leverage and fixed assets to total assets as the control variables.

Model 2: $\text{ROA}_{Yt} = \alpha_0 + \alpha_1 (\text{APP}_{Yt}) + \alpha_2 (\text{SIZE}_{Yt}) + \alpha_3 (\text{LEV}_{Yt}) + \alpha_4 (\text{GROWTH}_{Yt}) + \varepsilon$ …………………………………………………………… (2)

The equation above establishes a relationship between Return on Assets, a measure of profitability and the Average Payment Period, as a measure of working capital management with size, growth, leverage and fixed assets to total assets as the control variables.

Model 3: $\text{ROA}_{Yt} = \alpha_0 + \alpha_1 (\text{ACP}_{Yt}) + \alpha_2 (\text{SIZE}_{Yt}) + \alpha_3 (\text{LEV}_{Yt}) + \alpha_4 (\text{GROWTH}_{Yt}) + \varepsilon$ ………………………………………………………… (3)

This equation establishes the relationship between Average Collection Period, as a measure of working capital management and Return on Assets, a measure of profitability with size, growth, leverage and fixed assets to total assets as the control variables.

Model 4: $\text{ROA}_{Yt} = \alpha_0 + \alpha_1 (\text{IT}_{Yt}) + \alpha_2 (\text{SIZE}_{Yt}) + \alpha_3 (\text{LEV}_{Yt}) + \alpha_4 (\text{GROWTH}_{Yt}) + \varepsilon$ ………………………………………………………… (4)

The equation above establishes a relationship between Return on Assets, a measure of profitability and the Inventory Turnover of days, as a measure of working capital management with size, growth, leverage and fixed assets to total assets as the control variables.

Table 2: Descriptive Statistics Table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	20	-15	22	6.90	8.361
ACP	20	12	103	45.25	23.570
APP	20	1	178	68.32	58.895
IT	20	6	39	13.95	8.224
CCC	20	-8	115	24.96	30.890
GROWTH	20	0	1	.28	.308
SIZE	20	16	19	17.94	.803
LEV	20	0	1	.60	.147
Valid N (listwise)	20				

Source: Authors Regression

Table 1 above shows the descriptive statistics of four (4) trading companies listed on the Ghana stock exchange for the financial periods of 2006-2010. The total number of observations as from the above sums to n= 20. The ROA has a mean value of 6.90% of total assets, and a standard deviation of 8.361% implying that the value of the profitability can diverge from mean to both sides by 8.361% at a maximum and minimum values of 22% and -15% respectively for a company in a year. The mean value of the average collection period was 45.25 days and a standard deviation of 23.570 days. It takes a company a minimum of 12 days to collect receivables and a maximum of 103 days for the same purpose. It takes an average 13.95 days to sell inventory with a standard deviation of 8.224 days. The maximum time of 39 days taken by a company to convert inventory into sales is relatively high. Firms wait an average 68.32 days to pay their purchases with a standard deviation of 58.895 days. The minimum time taken by a firm was 1 day and maximum time taken for the same purpose was 178 days.

The cash conversion cycle which is used as a proxy to check the efficiency in managing working capital was on average 24.96 days and standard deviation was 30.890 days. Here the minimum value was -8 days and maximum value for this purpose was 115 days. To check the firm size and its relationship with profitability, the natural logarithm of sales was used as a control variable. The mean value of log of total assets was 17.94 while the standard deviation was 0.803.The minimum value of log of total assets for a company in a year was 16 and the maximum was 19. To check the debt financing and its relationship with profitability, the debt ratio was used as control variable. The results of descriptive statistics show that the average debt ratio for the trading companies listed on the Ghana stock exchange was 60% with a standard deviation of 14 %.

Furthermore, to ascertain the growth of firms, the growth ratio [(sales – sales-1)/ sales-1] is used as a control variable. The average growth ratio is 28% with a standard deviation of 30%. The minimum growth ratio for a firm in a given is 0% with a maximum of 100%.

3.8.2 Quantitative Analysis

Two methods were applied by the research team: the correlation models, precisely the Pearson correlation to measure the degree of relationship between the dependent and independent variables under examination. In addition, the regression analysis was engaged to estimate the significance of the relationship between working capital variables (CCC, ACP, APP, and IT) and profitability.

Fitting the Linear Regression Models

The proposed models are of the form;

Model 1: $ROA_{Yt} = \alpha 0 + \alpha_1 (CCC_{Yt}) + \alpha_2 (SIZE_{Yt}) + \alpha_3 (LEV_{Yt}) + \alpha_4 (GROWTH_{Yt}) + \varepsilon$

Model 2: $ROA_{Yt} = \alpha 0 + \alpha_1 (APP_{Yt}) + \alpha_2 (SIZE_{Yt}) + + \alpha_4 (LEV_{Yt}) + \alpha_5 (GROWTH_{Yt}) + \varepsilon$

Model 3: $ROA_{Yt} = \alpha 0 + \alpha_1 (ACP_{Yt}) + \alpha_2 (SIZE_{Yt}) + \alpha_3 (LEV_{Yt}) + \alpha_4 (GROWTH_{Yt}) + \varepsilon$

Model 4: $ROA_{Yt} = \alpha 0 + \alpha_1 (IT_{Yt}) + \alpha_2 (SIZE_{Yt}) + \alpha_3 (LEV_{Yt}) + \alpha_4 (GROWTH_{Yt}) + \varepsilon$

Where α's are regression parameters.

Table 3: Correlation Matrix Table

	ROA	ACP	APP	IT	CCC	GROWTH	SIZE	LEV
ROA	1.000	-.194	-.234	.423	-.038	.331	.608	.277
		.206	.160	.031	.436	.077	.002	.118
	20	20	20	20	20	20	20	20
ACP	-.194	1.000	.873	-.301	.438	.002	-.418	-.712
	.206		.000	.099	.027	.497	.033	.000
	20	20	20	20	20	20	20	20
APP	-.234	.873	1.000	-.191	.534	-.093	-.576	-.842
	.160	.000		.210	.008	.348	.004	.000
	20	20	20	20	20	20	20	20
IT	.423	-.301	-.191	1.000	.543	.116	-.027	.318
	.031	.099	.210		.007	.314	.455	.086
	20	20	20	20	20	20	20	20
CCC	-.038	.438	.534	.543	1.000	-.103	-.677	-.302
	.436	.027	.008	.007		.333	.001	.098
	20	20	20	20	20	20	20	20
GROWTH	.331	.002	-.093	.116	-.103	1.000	.296	-.034
	.077	.497	.348	.314	.333		.103	.443
	20	20	20	20	20	20	20	20
SIZE	.608	-.418	-.576	-.027	-.677	.296	1.000	.369
	.002	.033	.004	.455	.001	.103		.055
	20	20	20	20	20	20	20	20
LEV	.277	-.712	-.842	.318	-.302	-.034	.369	1.000
	.118	.000	.000	.086	.098	.098	.443	.055
	20	20	20	20	20	20	20	20

Source: Authors Regression source

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The Pearson's correlation analysis was used for the data analysis to establish the relationship between variables such as those between working capital management and profitability.

Table 2 above presents the Pearson correlation coefficients for all variables under consideration.

The research team has started their analysis of the correlation results between the average collection Period (ACP) and Return on assets (ROA). Results of the correlation analysis show a negative coefficient of -0.194, with a P-Value of (0.206). This implies that there is a fairly significant relationship between return on assets and average collection period at $\alpha = 1\%$ significance. As a result, if average collection period was decreased, then that will put a positive impact on return on assets by increasing it. In addition, correlation results between average payment period and return on assets show a similar trend of -0.234 coefficient, with P-Value of 0.160 significant at $\alpha = 1\%$. It means that less profitable firms wait longer to pay their bills in that the higher the payment period, the lower the profit to be made.

The Correlation results between inventory turnover days and return on assets show a positive relationship between inventory turnover days and return on assets with a coefficient of 0.423 and P-Value of 0.031 and significant at $\alpha = 1\%$. It means the period taken by a firm to sell its inventory has a great effect on its profitability. The cash conversion cycle which is the main measure of working capital management has a negative coefficient -0.038 and P-Value of 0.436 at $\alpha = 1\%$ significant level. This indicates that if a company was able to decrease the cash conversion period, it can increase its profitability and otherwise.

With regards to the above results we conclude that if a company reduces these times period then the company will be efficient in managing working capital which eventually will lead to an increase in profitability.

The positive significant relationship between return on assets and growth, at a coefficient of 0.331, with P-Value of 0.077 indicates that profitability of the company increases as the company grows. The correlation between size which is measured as the natural logarithm of total assets and return on assets depicts a positive relationship with a coefficient of 0.608, with P-Value of 0.002 Significant at $\alpha = 1\%$. Meaning that, profitability was increased when size of the firm was increased. Above all, the positive relationship between return on assets and leverage, at a coefficient of 0.277, with P-Value of 0.118 Significant at $\alpha = 1\%$ indicates that profitability of the company increases as leverage increases.

From the correlation matrix table, a positive relationship exists between the Average Collection Period and the cash conversion cycle. The correlation coefficient is 0.438 and the *P*-Value is 0.027. That ratio is significant at $\alpha = 1\%$, which means that if a company takes more time to collect cash against the credit sales it

will increase its operation or cash conversion cycle.

The Average Payment Period and Cash Conversion Cycle have a positive relationship. The coefficient is 0.534, the P-Value is 0.008, highly significant at $\alpha = 1\%$. This implies that if companies take more time to pay their purchases than the time for collection and selling inventory, the cash conversion cycle will be increased.

A positive relationship also exists between Inventory Turnover days and the Cash Conversion Cycle meaning that if the firm takes more time to sell inventory it will lead to an increase in the cash conversion cycle as well. The correlation coefficient is 0.543 and the P-Value is 0.007 significant at $\alpha = 1\%$.

Table 4 summarizes the results of an analysis of variance.

Table 4: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	556.341	4	139.085	2.703	.071[a]
	Residual	771.869	15	51.458		
Total		1328.210	19			
2.	Regression	697.005	4	174.251	4.141	.019[a]
	Residual	631.204	15	42.080		
Total		1328.210	19			
3.	Regression	771.693	4	192.923	5.200	. .008[a]
	Residual	556.516	15	37.101		
Total		1328.210	19			
4.	Regression	860.373	4	215.093	6.896	.002[a]
	Residual	467.837	15	31.189		
Total		1328.210	19			

Source: Author's Regression

    a.   Predictors: (Constant), LEV, GROWTH, FIX, APP, IT, CCC
    b.   Dependent Variable: ROA

The table above demonstrates two sources of variation; regression and residual. The regression sources of variation is the quota of the variation in the dependent variable (ROA) that is explained by depending on the regression model while the residual variation is what the model could not explain. A dependable model will have a higher regression mean sum of squares than the residual mean sum of squares. The mean square of each sources of variation is obtained by dividing their respective sum of squares by their degrees of freedom. The F-value is obtained by dividing the regression mean square by the residual mean square. The universal rule is to verify the p-value of the F-value calculated with a stated significant level. Since the p-value of the model are nearly 0.00, it can be resolved that the regression model explains a significant quota of the variations in the dependent variables. Accordingly, the whole model is statistically significant. That is, one can depend on the models to predict ROA with high precision.

After proving that the model is accurate and dependable, the research team now estimates the regression coefficients as shown in tables below.

4.4 Analysis of the Results

This section evaluates the relationship between working capital management and profitability of listed trading companies on the Ghana stock exchange with regards to the result of Tables 5 to 8 below. The average collection period (ACP), average payment period (APP), inventory turnover days (IT) and cash conversion cycle (CCC) are the measures of working capital whiles size, leverage (LEV) and growth are control variables in the regression models.

The B or the beta constitutes the regression coefficients with their corresponding independent variables. The unstandardized coefficients are the coefficients of the estimated regression model when the independent variables are measured in the same unit. Where the units of measurement are different the beta or the standardized coefficients are used. The unstandardized coefficients make the regression coefficients more comparable. Since all the independent variables are ratios, the analysis relied on the unstandardized coefficient. The t values and their corresponding p-values test the significant of each of the estimated regression coefficients. A significant coefficient means that the attached independent variable largely contributes to the significance of the overall regression model in explaining the variations in the dependent variable.

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Table 5 ACP Regression Analysis Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-109.101	44.592		-2.447	.027
ACP	.068	.103	.191	.661	.519
GROWTH	4.692	5.675	.173	.827	.421
SIZE	5.813	2.409	.558	2.413	.029
LEV	12.158	16.133	.213	.754	.463

a.   Dependent Variable:ROA

Source: Authors regression

From Table 5.1, the average collection period (ACP) with a positive coefficient of 0.068 and a p-value of 0.519 has a fairly statistical significance on profitability implying that the number of days it takes a company to collect its receivables has a fair impact on the profit of the company.

Table 6 APP Regression Analysis Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-164.572	50.020		-3.290	.005
APP	.109	.055	.767	1.969	.068
GROWTH	5.521	5.136	.203	1.075	.299
SIZE	7.801	2.434	.749	3.206	.006
LEV	37.253	19.677	.654	1.893	.078

a.   Dependent Variable: ROA

Source: Authors regression

In table 5.2 above, the average payment period (APP) with a coefficient of 0.109 and a p-value of 0.68 has a fair statistical significance on profitability which indicates that the time period taken by a company to pay its creditors will have an impact on profitability.

Table 7 IT Regression Analysis Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-114.852	34.153		-3.363	.004
IT	.470	.186	.462	2.532	.023
GROWTH	2.371	4.914	.087	.482	.636
SIZE	6.576	2.036	.632	3.230	.006
LEV	-5.675	11.230	-.100	-.505	.621

a. Dependent Variable: ROA

Source: Authors source

In Table 5.3, the inventory turnover days (IT) with a coefficient value of 0.470 and a p-value of 0.023 shows a partial statistical significance on profitability. This means that the length of time it takes a company to sell its inventory influences profitability.

Table 8 CCC Regression Analysis Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-188.010	41.897		-4.487	.000
CCC	.184	.057	.681	3.235	.006
GROWTH	3.036	4.449	.112	.682	.505
SIZE	10.329	2.368	.992	4.362	.001
LEV	6.895	9.528	.121	.724	.480

a. Dependent Variable: ROA

Source: Authors Regression

Table 5.4 above presents the cash conversion cycle with a positive coefficient of 0.184 and p-value of 0.006 has fairly statistical significance on profitability. This means that the time interval between the expenditure for the purchases of raw materials and the collection of sales from finished goods influences profitability of listed trading companies on the Ghana stock exchange fairly. It can be deduced from the four tables above that the three (3) control variables in the form of growth, size and leverage have a great positive statistical significance on profitability.

Conclusions

The study evidenced that variables of working capital management can be used in explaining the return on assets. The study examine the relationship between return on assets and several working capital management variables such as average collection period, average payment period, inventory turnover days and cash conversion cycle. It is observed so far, a negative relationship between profitability measured through return on assets and the cash conversion cycle which was used as the major measure of working capital management efficacy. Consequently the operational profitability dictates how managers or owners act in terms of managing the working capital of the firm. The study further observed that, lower gross operating profit is connected with an increase in the accounts payables period. It can be concluded from the above that, less profitable firms wait longer to pay their bills taking advantage of credit period granted by their suppliers. The negative relationship between average collection period and profitability of a company advocates that less profitable companies will seek a decrease of their accounts receivables in an effort to reduce their cash gap in the cash conversion cycle. Moreover, the positive relationship between inventory turnover days and profitability submits that a drop in sales as a result of mismanagement of inventory will lead to tying up excess capital at the expense of profitable operations. Therefore managers can create profits for their companies by handling correctly the cash conversion cycle and keeping each different component (accounts receivables, accounts payables, inventory) at equilibrium. In essence, the study accept alternative hypothesis which states that there is a negative relationship between the working capital management variables of a company and its profitability.

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