

**THE EFFECT OF WORKING CAPITAL MANAGEMENT ON
PROFITABILITY OF THE MANUFACTURING FIRMS LISTED AT
THE NAIROBI SECURITIES EXCHANGE**

BY


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DECLARATION

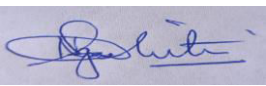
I hereby, do declare that this research is my original work and has never been presented for the award of degree at this University or any other Institution of higher learning.

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This research proposal has been submitted for presentation with my approval as the University Supervisor

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DEDICATION

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TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS	iii
DEDICATION	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABSTRACT	x
LIST OF ABBREVIATIONS AND ACRONYMS	xi
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of the study	1
1.2 Research Problem	9
1.3 Research Objective	11
1.4 Significance of the Study	11
CHAPTER TWO	13
LITERATURE REVIEW	13
2.1 Introduction	13
2.2 Theoretical Review	13

2.3 Determinants of Profitability	22
2.4 Leverage.....	23
2.5 Firm Liquidity	23
2.5 Empirical Review.....	24
2.6 Summary of Literature Review.....	26
2.7 Conceptual Framework.....	26
CHAPTER THREE	28
RESEARCH METHODOLOGY	28
3.1 Introduction.....	28
3.2 Research design	28
3.3 Population	28
3.4 Data collection	29
3.5 Data Analysis	29
3.6 Diagnostic Test	29
3.7 Analytical Model	30
3.8 Operationalizing the study variables.....	30
3.9 Test of significance	31
CHAPTER FOUR.....	32
DATA ANALYSIS, RESULTS AND DISCUSSION	32

4.1 Trend Analysis	32
4.2 Descriptive Statistics.....	37
4.3 Correlation Analysis.....	39
4.4. Diagnostics Tests	40
4.5 Multiple Regression	43
4.6 Interpretation of the Findings.....	44
CHAPTER FIVE:	47
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	47
5.1 Introduction.....	47
5.2 Summary	47
5.3 Conclusion	48
5.4 Recommendation for Policy	49
5.5 Limitations of the Study.....	51
5.6 Suggestions for Further Research	52
REFERENCES	53
Appendix 2: Data	59

LIST OF TABLES

Table 4. 1: Descriptive Statistics	39
Table 4. 2: Correlations Matrix.....	40
Table 4. 3: Variance Inflation Factor	42
Table 4. 4: Shapiro-Wilk W test for normal data.....	42

LIST OF FIGURES

Figure 2. 1: The Miller-Orr Model	16
Figure 2. 2: The Operating Cycle	20
Figure 2. 3: The Conceptual Framework	26
Figure 4. 1: Return on Assets.....	31
Figure 4. 2: Firm size	32
Figure 4. 3: Average receivable period.....	32
Figure 4. 4: Inventory period	33
Figure 4. 5: Average Payment Period.....	34
Figure 4. 6: Cash Conversion Cycle	34
Figure 4. 7: Liquidity Ratio	35
Figure 4. 8: Leverage Ratio	36
Figure 4. 9: Heteroscedasticity	41

ABSTRACT

The main objective for carrying out this research was to establish the effect of working capital management on the profitability of the manufacturing firms that are listed at the Nairobi securities Exchange. The objectives of this study included the determination of the effect of inventory conversion period, effect of cash conversion cycle, effect of average collection period and the effect of the payables period on the profitability of the listed manufacturing firms at the NSE. Return on Assets (ROA) was used as a measure for profitability. The study employed the use of descriptive design to describe the effects of working capital management on firm profitability. The study's population consisted of all the 9 manufacturing firms that were listed at the NSE from 2017 to 2021. Secondary data was used to collect data which was obtained from the annual financial reports of the manufacturing firms listed at the NSE for the period 2017 to 2021. Stata version 14 was used to enter the collected data and analysis was done through the aid of multiple linear regression method. The research discovered a negative correlation between average receivables period, average payment time, and leverage ratio for manufacturing firms listed on the Nairobi security exchange indicating that a reduction in the accounts receivable time will increase profitability and vice versa. This suggested that firms who collect their debts early generate more profits than those that collect their receivables late. Firm size has a substantial beneficial influence on profitability, as assessed by ROA, with a p-value of 0.032 compared to the conventional significance values of 0.05 and 0.01. However, the other components (average receivable period, inventory period, liquidity ratio, and leverage ratio) are less significant than the traditional significance levels of 0.05 and 0.01. In consequence, the cash conversion cycle slowed as businesses, on average, delayed to pay their suppliers. Because of this, the CCC has a positive impact on company profits. This study concludes that WCM is significant since it influences a company's profitability and liquidity, and hence it's of value and thus, effectively managing working capital will improve managerial performance

LIST OF ABBREVIATIONS AND ACRONYMS

AAI Average age of Inventory or ICP

ACP Average Collection Period

ABC Activity Based Costing

APP Accounts Payable Period

CA Current assets

CCC Cash Conversion Cycle

CL Current liabilities

EOQ Economic Order Quantity

ERS Economic Recovery Strategy

FA Fixed Assets

GDP Gross Domestic Product

ICP Inventory Conversion Period

NSE Nairobi Securities Exchange

NWC Net Working Capital

OC Operating Cycle

R&D Research and Development

ROA Return on Assets

ROE Return on Equity

SSPS Statistical Package for Social Sciences

WC Working Capital

WCM Working Capital Management

WIP Work in progress

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The major purpose of any firm is maximizing the shareholders' wealth. It is therefore, important for the Financial Managers of the manufacturing firms to make optimal choice on maintaining the levels of liabilities and assets. Shin & Soenen (1998) argued that working capital structure and the review of liquidity play a critical part in the maximization of shareholders' prosperity. Thus, working capital efficiency is important in all businesses. Large possession of short-term assets, like cash, improves the position of liquidity of a firm, lowering riskiness, however, it lowers the firm's general profitability. It is in this regard, that a trade-off of return and risk is entailed in holding of short-term assets.

According to Pandey (2008) working capital (WC) includes two concepts-the gross concept as well as the net concept. NWC is that difference that exists between short-lived assets and short-lived liabilities. Current liabilities are obligations to outsiders that need to be settled within a duration of twelve months and they include creditors, bills payable and accrued or expenses that are outstanding. NWC can be negative or positive. A positive WC arises if short-term assets are in excess of short-term liabilities. Negative WC happens if the current liabilities figure is higher the current assets figure. The gross WC simply means the investment in short-term assets (Pandey, 2008). Short-term assets refer to assets that are easily transformed into cash within a short duration, usually twelve months. Current assets consist of cash, accounts receivable, short-term securities, bills receivables and inventory.

Many firms infuse remarkable funds in working capital and utilize accounts payables as their main source of funding (Deloof, 2003). Cash management therefore, significantly

influences profitability. Efficient use of components of WC enables a firm to be profitable and elevate revenue that resulted from the available unutilized cash invested (Lazaridis & Tryfonidis, 2006).

According to Raheman & Nasr (2007) managers may improve the value of Shareholders by lowering the inventories days, accounts receivable days to the lowest level. Eljelly (2004) stated that efficient WCM mainly involve managing the components of working capital effectively so as to honor current obligations.

It is crucial to have knowledge of and understand impact of WCM on profitability. Several researches have been performed in Kenya and abroad to determine how WCM affects profitability. For example, Gachau (2021) researched on how profitability of Kenyan pharmaceutical companies in the manufacturing sector is affected by WCM where the regression analysis used indicated CCC to have no significant effect on profitability, there was an inverse but insignificant impact of inventory conversion days on profitability, a direct impact of average payment days on profitability, firm size had a positive as well as significant impact on profitability and leverage had no significant impact on profitability. Another researcher, Syeda (2021) investigated on how WCM impacts profitability using data on 15 trading companies based in the US where the results indicated that: accounts receivable days had an inverse impact on profitability, the payment period significantly and positively effects profitability and CCC had a inverse relationship with profitability.

In view of the above scenario, the current study aims to know how WCM influence the profitability of listed firms in the manufacturing industry. This is because only a few studies have been done in the industry especially in Kenya.

1.1.1 Working Capital Management

WCM means the strategy that firms employ in order to manage their cash, inventories and any marketable securities (Hampton 1989). Shin (1998) refers to working capital management as a strategy that is pursued in monitoring the current liabilities and current

assets of a company. Firms adequately meet their daily obligations by managing their cash in a proper manner. Firms will suffer financial distress and hence, be exposed to business risks if they fail to manage their cash and inventories properly. Therefore, WCM is critical since it ensures that the inventories, receivables account and payables account of a firm are not mismanaged. If these current assets are mismanaged then, firms will suffer from poor performance.

According to Rogers (2017) managing working capital efficiently integrates different business areas including management of sales, cash collection and payment, and timely ordering of inventories. These business areas will ensure growth of a firm and improve its financial performance. Profitability is determined by its operations. According to Rogers (2017) there exist two important stages for ensuring WCM is effective; Resource planning and Resource controlling. These allow businesses to prevent over or under investment in current resources.

Conservative and aggressive policies can be utilized the managing of working capital (Ashta, 2018). For us to know whether a firm is using a conservative or aggressive working capital policy, we need to measure the short-term assets levels by relating it to the long-term assets. To get CA/FA ratio, we divide current assets (CA) by fixed assets (FA). If we assume a given level of permanent assets, a greater CA/FA ratio implies a WC policy which is conservative while a CA/FA which is lower indicates WC policy that is aggressive (Pandey, 2010). The aggressive WC policy indicates higher risk and poor liquidity while a conservative policy indicates greater liquidity and lower risk. An effective working capital management enables the firm not to borrow funds from external sources so in order meet its current obligations.

The objectives of firms involve maximizing shareholders' wealth by maximizing profits, simultaneously, they need to preserve their liquidity. The main challenge of improving profitability at the detriment of liquidity is that it may cause the business to suffer from cash-flow problems (Shin & Soenen, 1998). With regards to this, there must be a trade-off between the two firms' objectives. The three main business operations where WC

investments and the related current finances come from include – purchasing, production and selling

Saad (2018) asserts that the receivables component and the payables components are very critical for the growth of a firm and its sustainability. It's critical for the firm to establish policies for controlling costs of selling goods and services on credit. Ashta (2018) posit that it is important for the managers of the firms to formulate credit policies. The payables deferral period shows the days that are taken by a business to honor its creditors. It indicates how the cash outflows of a company are managed. This is computed by taking the payables account then dividing it the by cost of sales, the results are then multiplied by 365 days.

Inventory management and cash management are also critical components of WCM. It is vital for firms to ensure that they lower their inventory period period through effective policies. Inventory period is gotten by taking the inventories and then divide by sales, the results are then multiplied by 365 days (Rogers, 2017). Cash management is also important as it makes sure that a company has sufficient cash for operations.

Sherr (1989) asserts that it is not necessary to have WCM in a “perfect” environment because in such an environment, there wouldn't be uncertainty, no costs of searching information, no transaction charges, no scheduling charges, no production or technology constraints. There wouldn't be variance between unit cost of production and the amount of units produced. This is unrealistic. Sherr (1998) further asserts that reality is characterized by uncertainty in demand, quality, market prices and availability of a firm's goods and those of its vendors. Thus, WCM offers a significant benefit over other techniques that are available to the business (Sherr, 1998).

Sharma & Kumar (2011) stated that measurement of WCM can be done using CCC which is the number of days taken by a firm to purchase stock and transform it into cash. A shorter CCC indicates that WCM of the firm is better. WCM can also be measured

using payables deferral period, inventory conversion days as well as average receivable days which are also the WC constituent parts. The CCC can be summarized as follows:

$$\text{CCC} = \text{ICP} + \text{ACP} - \text{APP}$$

Where, ICP means inventories conversion period; ACP refers to the average collection period while APP is the average payables days or period.

1.1.2 Profitability

Profitability implies the capacity of a business to make adequate profits on capital invested (Wild, Larson & Chiapetta, 2007). Profitability of the firm relates to overall firm performance in relation to profit and loss. It shows the level of firm's goal achievement while controlling risks. Firms are concerned with the ability to efficiently use assets to generate return as well as cash-flows which are positive. Eshna (2016) posits that profitability measures encompass the financial performance of a firm. The information about financial performance for a firm is very important to the various stakeholders including shareholders, the firm's creditors/lenders, the management of the firm among others. In regards to this, it is very important for firms to undertake financial analysis regularly in order to establish whether it is making profits or losses. Information on the profitability of a firm can be obtained from the financial statements of the firm. Eshna (2016) posits that maintaining accurate income statement and the balance sheet for a firm is very important.

Profitability measures are very crucial to all financial statement users. Profitability measures, such as profitability ratios, indicate the overall efficiency and performance of a firm. Two main kinds of profitability ratios exist which include the margin ratios and the return ratios. Ratios relating to margin indicate the capability of a firm to translate its revenue into profits at the numerous stages of measurement. Return ratios show the ability the firm to measure the general efficiency in creating Shareholders' return.

According to James (2015) the most commonly used measures of profitability are the financial measures like profit before tax as well as return on assets. In relation to Hagel (2019), profit earned before charging tax as the profit that a firm earns before paying its corporate tax.

The main profitability measures include net profit margin, the return on common stockholders' equity as well as the return on assets. These measures are determined as indicated below:

Net Profit Margin is gotten by dividing net income with net sale

The ratio indicates how much a firm earns in terms profit after paying all its expenses. Its main drawback is that it includes every item in the financial statement including one-time expenses and gains. For one to evaluate the net profit margin, one must take into account the industry as different industries require different profit margins.

The Return on total assets (ROA) = Net Income divided by Total assets

ROA measures a firm's profitability in relation to the firm's total assets (Davison, 2019). Hagel (2019) asserts that return on assets indicates the Management's efficiency at using the firm's assets to increase earnings

The Return on Equity (ROE) = Net Income divided by Total Equity

ROE measures how stockholders' fared in a particular period of time. Normally, a favorably high ROE is often considered as the main reason to buy a firm's stock.

The main aim of running a business is to generate wealth for the owners. A firm that does not generate profits cannot last in a competitive business environment. Consequently, a firm which earns large profits has the ability to recompense its shareholders with larger yields on their invested capital. Among the most important duties of a firm's Manager is increasing profitability. According to Rafuse (1996) managers continuously search for

means to transform the business so as to enhance profitability. For the sake of this research, we will utilize ROA as a proxy for Profitability.

1.1.3 Working Capital Management and Profitability of the Firm

In relation to Shin & Soenen, 2018, the profitability is equivalent to the organization's effectiveness as well as efficiency of management of its WC. The main aim of the firm involve maximizing its profits while at the same time, maintaining sufficient liquidity. Excessive investment in WC positively affect liquidity but negatively affects firm's profitability. Conservatism WC policy might lead to reduced liquidity and greater profitability and might sometimes lead to unfulfilled customer demands. WCM consequently, is critical as it manages the relationship to ensure optimal financial performance. It is important for firms to create a balanced trade-off of its liquidity and performance through enhancing working capital management (Reheman and Nasr, 2017).

According to Rogers (2017) sustainable growth refers to the maximum growth rate of a firm that depends on internal funding. The said growth doesn't rely on the added financial support that can involve acquiring new financiers or long-term obligations. The firm can attain value creation by way of profitable investments through the use of loans to meet its fund requirements and hence, minimize investment in short-term resources. These WCM measures can lead to increased return to shareholders. Rafuse (2016) posits that most small business in the developing countries and even developed counties, fail because of having limited funds. The author further asserts that underinvestment in the temporary resources could lead to liquidity and insolvency problems. This therefore, calls for a proper balance in WCM so as to improve profitability and increase the survival for the firm.

1.1.4 Manufacturing Firms listed at the NSE

A large Manufacturing industry exists in Kenya that serves the local market as well as the East African Region. This sector is made up of Agro-processing, automotive, chemical and allied, building, energy, mining and construction, electrical & electronics, leather & footwear, food & beverages, metal & allied, pharmaceutical & medical equipment, paper, plastics & rubber among others.

Manufacturing sector is very critical in the general growth of the economic, thus, it needs extensive analysis at the firm level and also the industry level. It may be due to the fact that the sector generated around 10.1% of GDP of Kenya and serves the native market and the East African market, this is according to (NSE Handbook 2010 & 2011). According to Lawrence and Chad (2012) manufacturing industries refer to those industries that manufacture and process goods, and engage in value addition or make new products. The final product can either utilized as an intermediate good required for making other goods or be sold as finished products (Lawrence and Chad, 2012).

The manufacturing firms in Kenya are not very many but they are more sophisticated as compared to other similar firms in the East African region. This sector has continuously grown since the 1990s and are very diverse. This is because Kenya is the investors' most favorite destination, since its workforce is among the best in Africa. Kenya has a rich agricultural sector making it a reliable spring of raw materials for the agriculture-based manufacturing. Kenya's location is also an advantage making it the gateway and a launch pad to most landlocked countries in the East and Central Africa like South Sudan, Burundi, Rwanda, Uganda and Eastern Democratic Republic of Congo.

The main aims of the Manufacturing sector include: strengthening capacity of production and the local content of locally made good; raising the products-share in the regional markets from 7%-15%; increasing the generation as well as utilizing results Research and Development (R&D); and developing a niche product for both new and existing markets.

The manufacturing sector has been affected by many challenges such as, use of obsolete technologies, low capital injection, limited access to finance, high operational costs that result from poor state of physical infrastructure, inadequate managerial skills among others. However, implementing the Economic Recovery Strategy (ERS) from the year 2003 to the year 2007 has resulted in the improvement in the manufacturing sector's performance.

In Kenya, the manufacturing sector currently has nine (9) firms that are listed at the NSE. The role of WCM to these firms can't be ignored. Nonetheless, the degree to which WCM influences profitability of manufacturing firms especially in Kenya is still unclear.

1.2 Research Problem

According to Lazaridi and Tryfonidis (2006) a good WC is very important in the achievement of organizational goal and its survival and should be adopted so as to increase the organization's financial performance. An efficient WCM is the key and influences liquidity and profitability of a firm directly. Improper WC practices may cause a firm to be bankrupt even though the firm could be recording profits. Inefficient WC practices have been attributed to be the main cause of business failures for small businesses in the developing as well as some of the developed economies. It is critical to note that excessive maintenance of current assets could lead to foregoing the implicit cost of unearned returns if these funds were otherwise put in long-term ventures. On the contrary, maintaining the current assets at a level way below the optimal level could lead the business into crisis due to insufficient funds to cover its obligations. Therefore, WCM is the avenue for ensuring that there is an agreeable balance between the CA and CL. This may be achieved by ensuring that the CCC is short because it ensures that cash is received faster which in turn reduces instances of cash shortage which directly affect the financial performance (Gitman,1974).

Owing to the competitive kind of the business environment in Kenya, firms need to remain competitive and profitable. As a result, firms have devised various strategies to

ensure proper monitoring and management of CL as well as CA. These strategies include prompt payment of accounts payable as they fall due, continuously maintaining the credit terms as per the agreement, ensuring prompt collection of accounts receivables and utilizing any trade discounts offered in the market (Roy, 2014).

Several researches have been done on WCM. Bammeri & Dehani (2013) developed a framework that includes different components of WC in a way that liquidity and profitability are optimized so as to maximize shareholders' wealth. A scholar, Mashar (2014) performed a research to determine how WCM influences profitability of commercial banks in Malaysia and discovered that WCM had insignificant impact on the profitability of commercial banks in Malaysia. Another scholar from Pakistan, Rehman (2006) sought to establish the impact of WCM on profitability using 94 Pakistan firms that were listed on the Islamabad Stock Exchange (ISE) for the time 1999 to 2004. The research found a significant negative effect between WC and profits for the aforementioned companies.

Several researches have also been carried out in Kenya in relation to WC: Mutula (2018) investigated how WCM affects the financial performance of SMEs in Nairobi City County. Another scholar, Ragen (2014) investigated the association between WCM and manufacturing firms' financial performance that were based in Nairobi City County. Owino (2014) investigated how WCM affected profitability of Kenyan manufacturing companies during the period from 2008 to 2012. Even though several researches have been carried out on WCM, most of these research were conducted abroad and those that were conducted in Kenya mostly focused on other sectors and were based on WCM and performance, WCM and capital structures, among other areas. Few studies have examined the impacts of WCM on the bottom line of NSE-listed manufacturing companies. To make up for this deficiency, the present investigation focuses on publicly traded manufacturers. The purpose of this investigation is to answer the following question: How does effective WCM affect the NSE-listed manufacturing firms?

1.3 Research Objective

The main objective of this study is to investigate the effect of WCM on profitability of listed manufacturing firms at the Nairobi Securities Exchange.

1.3.1 Specific Objective

In order to achieve the general objective of this Research, the specific objectives listed below were used:

- i. To establish the effect of cash conversion cycle (CCC) on the profitability of the firm.
- ii. To examine the effect of accounts receivable period (ACP) on the profitability of the firm.
- iii. To determine the effect of inventory conversion period (ICP) on the profitability of the firm.
- iv. To ascertain the effect of average payment period (APP) on the profitability of the firm.

1.4 Significance of the Study

The results of the current study will be beneficial to future researchers as well as scholars who will undertake similar study as it will enable them to understand the topic better and also enable them to advance their literature review based on the results of this research.

The research's results will also be beneficial to the manufacturing sector's policy makers because it will enable them to understand how WCM affects the profitability of firms in the manufacturing industry and hence take more appropriate action in managing WC so as to increase performance.

The results of this research will as well be used in the validation or invalidation of the previous research findings on the same research topic.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Earlier researches have been done on WCM and firm profitability. The chapter examines the targeted literature relevant to this research. It will identify the theories that support this study as well as other researchers' previous findings on the same topic. The aim is to gain a better theoretical foundation about the topic that leads to finding the gaps in knowledge that need further research. The chapter covers the theoretical review as well as empirical review including summary of the study.

2.2 Theoretical Review

WC simply means CA less CL (Guthmann & Dougall, 1948). It is that capital that is utilized in the daily operations of a firm. Current pertains to the duration of twelve months or even less (Emery & Finnerty, 1997).

According to Gitman (2009) the aim of WCM involve the minimization of capital immersed in CA of a firm, that is, minimize the cash conversion circle (CCC). It centers on managing the inventory investment and controlling the accounts receivables and their collection process. WCM is especially crucial for the survival of any business, its sustainability and directly impacts the business' performance. The most vital CA consist of cash, inventory and accounts receivables. Current liabilities include payables account, taxation liabilities, accrued expense, short term debts like commercial papers and the provisions for CL like declared dividends that are yet to be paid (Gitman, 2009).

When a decision is taken on any working capital component, it impacts the rest of the components. For the business' performance to be maximized, WCM should be consolidated into the process of making financial decision that is short term (Crum, Klingman, & Tavis, 1983). NWC investment is very important and aids in the analyzing

a firm's capital budgeting. The WC may be put in the funding sources which are short-term such as inventories, cash, notes receivables & accounts receivables. WC can be minimized when settlements are done the payables accounts, notes payables and liabilities that have accrued. The WC component of liquidity has to be managed using suitable techniques so as to balance out costs and benefits. This can be done by raising or lowering cash, inventories, accounts receivables and accounts payables (Gitman, 2009).

2.2.1 Cash Management Models

There are several theories which have been developed to explain cash management. Some of these theories, such as the Miller-orr Model and the Baumol Model, attempt to explain how the optimal cash balance can be computed (Terry, 2002)

2.2.1.1 The Baumol Model

In his model, Baumol (1952) made assumptions that the cash inflows and outflows of a firm are constant and normally steady but cash inflows are less than cash outflows. Therefore, a firm has to periodically replenish its cash because of the constant drain from the firm. This Model helps the firm in determining cash balance that is optimal under certainty. Inventory management and cash management are the same according to the Baumol Model. Thus, firms strive to keep at a minimum the carrying cost & cost of transforming salable securities into cash.

The Baumol Model banks on trade-off which exists between that liquidity provided by carrying cash and the forgone interest through carrying assets in terms of money that does not bear interest. This Model is based on a number of beliefs; that the firm has the ability to predict its cash needs with certainty, the implicit cost of carrying cash is well known and is constant over a given period of time, cash outflows occur at known and regular intervals, money market securities can be changed into cash at any point in time without incurring extra transaction costs (Madura, 1988).

The Baumol cash management model equation is as follows:

Transaction cost = $c(T/C)$

Holding cost = $k(C/2)$

Total cost = Transaction cost + Holding cost

Total cost = $c(T/C) + k(C/2)$

Where:

k = the opportunity cost

T = Total fund requirement

C = Cash balance

c = the cost per transaction

The optimal cash balance (C^*) can be achieved when the total cost is at its minimum and is given by:

$$C^* = \sqrt{2cT/k}$$

Baumol cash management model has got some limitations. Some of these limitations are; it assumes a continuous interval of fund disbursements which is not the case in real life as cash transactions occur at varied occasions and payments also occur on different dates; it will take a limited time to dispose inventory hence, no safety stock is needed (Baumol,1952). The model also requires that the excess cash holding to be invested in money market securities and sold so as to take care of any cash shortages.

2.2.1.2 The Miller-Orr Model

It was developed because of drawbacks of Baumol model which doesn't allow fluctuation of cash flow. In real world, firms neither use their cash balances in a uniform manner nor

are they capable of predicting their daily cash outflows and cash inflows. The model defeats this limitation as it allows for fluctuations in daily cash flows (Terry, 2002). This model assumes normal distribution of net cash flows with the mean and the standard deviation having zero values. Under this model, firms permit cash balances to navigate within the two control limits; the lower limit & the upper limit. Hence, a firm can purchase or dispose its salable securities when the cash balance is equivalent to whichever of the mentioned limits. If the cash balance of the firm shifts and strikes the upper limit, then the firm purchases adequate salable securities to enable it to return to the desired level. Likewise, if a firm's cash balance strikes the lower-limit, the firm disposes its marketable securities so as it reinstates the cash balance to the desired level.

Miller-Orr model is very important to the working capital administration because it helps in deciding the point of confinement within which a firm can hold its cash balance and consequently its working capital management. This model can be applied in determining the suitable prices that can be used to purchase or sale the salable securities, determining minimum level attainable of the targeted cash balance. Studying the rates of interest besides computing the regular cash-flows' standard deviation. The Miller-Orr model depicts the following diagram:

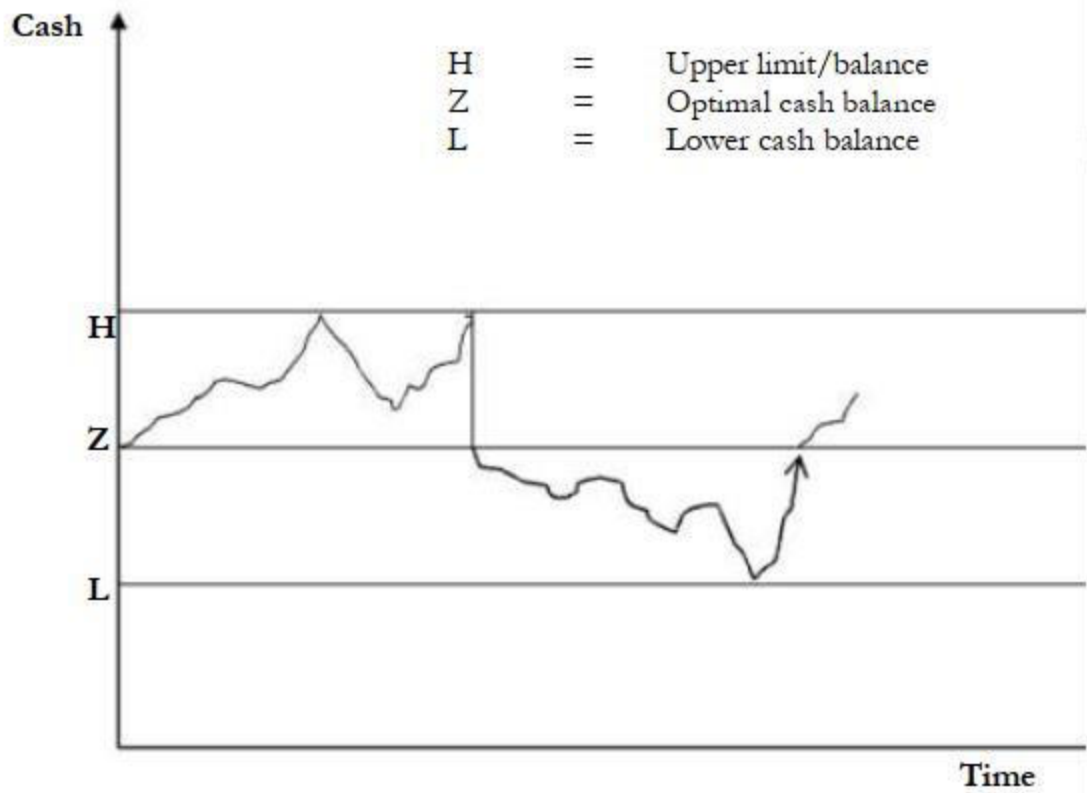


Figure 2. 1: The Miller-Orr Model

The moment cash balance hits lower-limit (L), marketable securities are sold so as to raise the cash to the target cash (Z) or return-point. Similarly, the moment the cash balance strikes the upper-limit (H), the firm purchase salable securities so as to reinstate the cash balance to the return point (Z). The firm has to set its lower-limit based on its desired minimum cash balance. A firm also determines: an average rate for its salable securities (i), the permanent transaction cost of purchasing and disposing salable securities (c), and a standard deviation (σ) of the regular cash-flows of the firm.

2.2.2 Cash Conversion Cycle Theory

According to Gitman (2009), a company's cash budget is a projection of its future cash inflows and outflows and an illustration of how that cash may be put to work in the

company's operational operations. CCC is that duration in which cash is tied-up in stock of goods and receivables account. CCC relates to the duration of time the resources of a firm are tied up and for this reason, firms have to find the appropriate policy that will enable it to shorten the CCC.

The moment firms experience a longer cash conversion cycle; they'll need to invest huge amounts in the remaining components so as to enable them to cover their operational needs. As per Gitman (2009), the CCC is mathematically expressed as follows:

$$\text{CCC} = \frac{\text{Account receivables}}{\text{Sales}} * 365 + \frac{\text{Inventories}}{\text{Purchases}} * 365 - \frac{\text{Account Payable}}{\text{Purchases}} * 365$$

$$\text{CCC} = \text{OC} - \text{APP}$$

Where;

OC = Operating cycle

APP = Average payables period

The time taken to convert cash outflows into inflows is determined through the analysis of the period which passes from the moment a firm acquires particular products to the moment the firm collects revenues from sales. A shorter CCC implies a better working capital management.

2.2.3 Receivables management Theories

The accounts receivables represent the amount that credit customers owe to the firm. Firms normally sell goods on credit so as to increase their sales volume. Firms usually set the time limit within which payment from debtors is expected to be received, the payment mode and the credit terms.

One of the theories which tries to explain the reason as to why firms give credit to customers is the Transaction Cost Theory. In relation to Ferris (1981) the reason why trade credit exists is to allow customers to have flexibility of making payment and also to enable a firm to accumulate payment of suppliers in order to enable them make lump-sum payment and thus save on the transaction cost. It also allows purchasers to carry lower cash balances and put aside cash accordingly. Another theory is known as the financial model which is based on the imperfections of capital market that relate to asymmetry of information. In relation to Schwartz (1974) firms which have greater access to institutionalized capital and have lower financing cost give credit to their customers with high cost as they borrow from financial middlemen. Trade credit may also assist in mitigating rationing of credit while giving a signal on a buyer's quality to the financial middlemen (Frank & Maksimovic, 1998). The rest of the models claim that a vendor may have an edge over the financial middlemen in terms of acquisition of information and control of the purchaser.

Accounts receivable management starts with a credit policy. However, monitoring is also important. A good receivables control system is needed in order to monitor the accounts receivables.

Investing in accounts receivable relies heavily on sales volume made on credit as well as the collection period. The most frequently used payment term is *Net 30* which implies that payment is due at the expiry of 30 days from the invoice date and the customer is free to pay before the due date. Most firms offer discount for early payment. According to Terry (2008) an aging schedule is part of the process of managing receivables. It lists all the outstanding balances together with their credit limits like net 30, net 60, net 90, etc.

There are two credit policies; the stringent and the lenient credit policies. A firm that follows the stringent credit policy is guided by customers' credit worthiness. On the other hand, those that follow the lenient credit policy sell products to customers on very liberal terms.

2.2.4 The Operating Cycle Theory

This is among the most important WCM theories. Among the measures of the WCM is operating cycle which refers to the time between the start of the process of production and the receipt of cash from the selling inventories (Gitman, 2009). This theory suggests that incorporating working capital measure like the inventory period and accounts receivable into the OC concept gives a proper management's view of liquidity than those of other traditional measures like acid-test ratio and current ratio. The operating cycle is mathematically denoted as below:

$$\text{OC} = \text{AAI} + \text{ACP}$$

Where; OC = operating cycle

AAI = Average age of inventory

ACP = Average collection period

The accounts receivable days and the average age of inventory provide a measure for the operating cycle. The inventory period and the accounts receivables days provide a firm's liquidity indicator and also a measure of profitability.

Accounts receivables period shows the speed with which the accounts receivables of a firm are converted into cash. When a firm changes its credit policy and collection policy, it will influence the balance of the outstanding accounts receivable that is maintained as per annual sales of the firm. Granting customers more liberal terms would raise greater and potentially less liquid short-term investment in accounts receivables.

Average inventory days show the days that a firm takes to transforms stock or raw materials, WIP and finished products into revenue products.

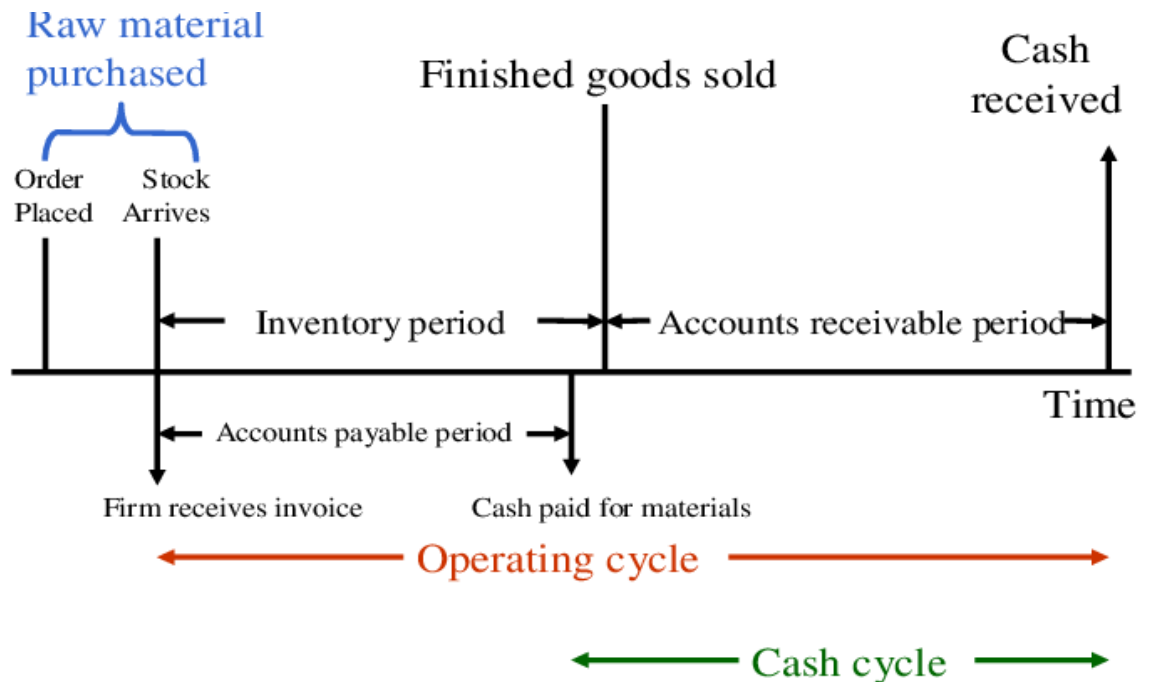


Figure 2. 2: The Operating Cycle

2.2.5 Inventory Management Models

Bolten (1976) refer to inventory as the quantity of goods that a company offers for purchase and the parts used to produce the products. The inventories consist of raw materials, WIP & finished goods. Management and inventory control involve establishment of the control type that is needed, safety stock and the order point, and basic EOQ.

The management of inventory involve the minimization of investment in inventory and fulfillment of demand for the product through the organization of the production and sale operation efficiently. Inventory enables a firm to to function smoothly. However, only optimal level of inventory should be maintained (Brigham & Houston, 2007).

2.2.5.1 ABC System

This is one of the widely used techniques for the identification of the various items of inventory for the aim of controlling inventory. It relies on the belief that firms do not need to exercise the same level of control on all inventory products. The firm should rather maintain extra rigorous control on costly items, while less expensive items should be given little control effort (Brigham & Houston, 2007).

2.2.5.2 Economic Order Quantity (EOQ) Model

EOQ is the order level of inventory which minimizes the full cost that is linked with the management of inventory. The aim of inventory is to set up the carrying and ordering cost at minimum level. It assumes constant product demand over the year. It also assumes that the cost for each order placed is constant, every new order is fully delivered the moment the level of inventory reaches zero, and that there exists holding cost for every stored unit (Lewis & Kirkpatrick, 1975).

2.3 Determinants of Profitability

WCM is among the major components that determine firm's profitability. There exist other factors which also influence profitability of a firm other than the working capital. These other factors that influence profitability are discussed as follows:

2.3.1 The Firm Size

This is the production capabilities of a firm, its sales, and its skill capabilities. A firm's size is among the primary factors which determine profitability owing to economies of scale concept. The concept discloses that, contrary to smaller firms, bigger firms can produce items on costs that are much lower. According to the concept, there exists a relationship, which is positive, between a firm size and the profitability. Larger firms also have more resources thus enabling them to invest in physical assets and have effortless access to financing. Thus, they have the ability to obtain funds for investment and fulfil

their obligations, achieving profitability. According to Rogers (2017) big firms that effectively manage their WC can attain more growth than medium and small firms can achieve. The measurement of the size a firm can be done by looking at the quantity of its sales and production.

2.4 Leverage

Another determinant of profitability is leverage which can be computed using various financial ratios. (Ross et al., 2002) refer to leverage as the ratio between total debt and total assets or the ratio between total debt and total equity. Leverage negatively affects profitability because higher debt values need more firm's resources in so as to repay the debt and thus decreasing the available finances for investment. According to Tobias (2010) having too much debt can pose danger to the firm and its investors. If debt levels are not controlled, it could lead to downgrade of credits. On the contrary, having too little debts may as well be questionable. If a firm can create a rate of return that is larger than the interest rates on loan from operations, then the debt is serving to propel profits growth. The inability or unwillingness to borrow money might be a sign that profit margins are tight.

2.5 Firm Liquidity

Liquidity means a firm is able to convert its assets into ready cash. Firm liquidity is very beneficial in the achievement of profitability and growth. The firm's ease of transforming its assets to cash allows it to honor its current obligations that would in other ways, impact the firm's operations and decrease its productivity (Rafuse, 2016). Moreover, liquidity helps firm in benefiting from investment opportunities which may allow the firm to improve its revenue. Measurement of liquidity may be done using through the use of current ratio. CA is CA divided by CL.

2.5 Empirical Review

Prior empirical studies that were done by various scholars in this study topic are analyzed in this part. These studies cut across different economies and will enable us to get a comparative view of findings, thus enabling us to locate areas that require further research. The findings are quite mixed, however, majority conclude that there is an existence of a negative relationship between profitability of the firm and WCM. Researches that have been reviewed employed different variables in analyzing the association, using divergent methodologies like panel data regression and linear regression.

Syeda (2021) examined how WCM impacted profitability on 15 trading firms in the US in which the use of regression analysis, correlation matrix and descriptive statistics were utilized to reach the conclusions. The results showed a negative correlation between CCC and profitability, a positive correlation between the payment terms of creditors and profitability, and a direct correlation between debtor collection days and profitability. As a result, the study found that WCM had a significant impact on a company's bottom line.

Aldubhani et al (2022), performed an investigation to establish how WCM impacts profitability of all manufacturing firms listed at the Qatar Stock Exchange 2015-2019. Multiple regression analysis was utilized for testing the developed hypothesis of the investigation. The results indicated that those firms that had shorter CCC, shorter receivables collection period, longer accounts payables days and longer inventory conversion days were profitable.

Another researcher from South Africa, Kasozi (2017), researched on how WCM affects profitability of the 69 listed firms on the Johannesburg Securities Exchange (JSE) that were in the manufacturing sector using panel data with various regression estimators in data analysis. The research's findings indicated an existence of a negative and significant link between profitability and creditors deferral period and between profitability and the receivable collection days. Moreover, this study indicated a positive but statistically

significant link between profitability and inventory days. However, the study could not ascertain whether profitability was enhanced by a shorter or longer CCC since the findings on that were weak.

In Kenya, WCM and profitability have also been the subject of research. Using multivariable regression, Gachau (2021) carried out a research on the effect of WCM on the profitability of 23 pharmaceutical manufacturing companies in Kenya between 2016 and 2020. The results established a positive influence of the payables days on the profitability, negative but insignificant effect of inventory conversion days and profitability, and no significant effect of CCC on profitability of the firms.

Kiiru (2020), researched on how WCM influences the profitability of 36 flour milling companies that are Kenya-based. The researcher utilized a multiple regression analysis in the analysis of the data for the duration 2015 to 2019. The findings of the study were that the accounts receivables management, inventory management and accounts payables management affected the profitability of flour milling companies in Kenya negatively but significantly. However, the research found a positive link to exist between profitability and cash management.

Musyoka (2018) researched about the impact of WCM on profitability of 10 firms that were in the oil & gas industry for the period 2012-2017. The study employed pooled ordinary least square method in establishing the effect of the different components of WCM on profitability. The research results showed that there existed a positive and significant effect of the accounts payables days on profitability. There was no significant impact of the inventory conversion days and the accounts receivable days on profitability of firms.

Wanjohi (2021) performed a research on the link between WCM and earnings management of several companies that were in the manufacturing sector in Kenya. Data collected was for the period 2016 to 2020. A descriptive cross-sectional approach was adopted to investigate the variables connections. In the determination of the link between

the variables, a multiple linear regression was utilized. The research's findings were that WCM produced a positive but insignificant effect on earnings management.

2.6 Summary of Literature Review

Majority of researchers found similar results from the above studies. The results of these studies established that the accounts receivable had a negative link with the firm profitability implying that firms that are profitable have lower collection period. The inverse association between the payables account and firm profitability indicate that firms which are not very profitable usually take longer time to honor their obligations meaning that they fully utilize the credit period granted to them by their creditors. Similarly, an inverse relationship exists between inventory and profitability meaning that profitable businesses take shorter period of time to convert their inventories. It is also evident that different researchers used several ways to calculate profitability including ROA, the return on sales, return on invested capital, ROE, net operating income and gross profit.

Even though the studies have been conducted, there still exist a gap that require further research. There still exists ambiguity in terms of the suitable variables that might be used as WCM proxies. There is limited evidence that WCM increases firm profits, according to the empirical studies. A small but growing body of literature examines how WCM might boost the bottom line for Kenyan firms, with a focus on the country's manufacturing sector. Also, the studies have produced contradictory findings. Therefore, the purpose of this research is to help close the knowledge gap about how WCM affects the bottom line of NSE-listed manufacturing firms.

2.7 Conceptual Framework

The framework indicates independent and dependent variables that are utilized in this research. According to Kothari (2014), conceptual framework gives the basis for development of study variables.

Independent variables

Accounts Receivables Management

- Accounts receivables days

Accounts Payables Management

- Accounts payables days

Inventory Management

- Average inventory days

Cash Management

- Cash conversion cycle

Firm size – Log of sales
Firm leverage –Debt/assets
Firm liquidity - Current ratio

Control Variables

Dependent Variables

Profitability

- Return on Assets



Figure 2. 3: The Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the methods that were used in this study to objectively assess the effect of WCM on manufacturing firms' bottom lines. The methods of data collection and analysis, as well as the study's population, variables, and sample size, are laid out in this section.

3.2 Research design

This like a plan or blue print for collecting, measuring, and analyzing data. This study employed the use of descriptive research design which is quantitative in nature, to describe the effect that WCM has on the profitability of listed firms in the manufacturing sector. The descriptive research design indicates the standard deviation and the mean for the numerous variables that are being studied. It also shows both the minimum values and the maximum of the study variables. The choice of quantitative method relies on the use of the financial data that were employed from secondary database.

3.3 Population

According to Kothari (2014) a population represents subjects that have similar characteristics used for data collection. This study included all the listed 9 manufacturing companies. However, one firm is no longer trading hence, it was excluded during data collection. The choice of listed manufacturing firms is due to the fact that they are publicly traded entities and thus operate on stringent regulations of corporate governance and hence, their financial statements and their accounting disclosures are very reliable.

This research uses a census technique. This is because the population is relatively small, hence all the elements of the population were included.

3.4 Data collection

This study employed secondary data that were gotten from published annual financial reports of the firms from 2017 to 2021. The collected data was used in calculating the payables days, average inventory days, receivables days and CCC.

3.5 Data Analysis

According to Mugenda (2005) the analysis of data entails important procedures taken in order to bring meaning together with an order to the gathered data. The analytical tool that was used is the Stata version 14 for coding, processing and analyzing data. The study also applied the use of descriptive statistics that includes central's tendencies measures, distribution as well as variation. Moreover, inferential statistics like correlation matrix and multiple regression were also utilized.

3.6 Diagnostic Test

This study's model's viability was ascertained through the use of different diagnostic tests such as multicollinearity, normality and heteroscedasticity tests. The normality test indicates whether the residual of the dependent variable is normally distributed and is closer to the mean. The variables were also subjected to Shapiro-Wilk normality test to determine the significance of the p-value.

The use of Variance Inflation Factors (VIF) was employed in this study to assess multicollinearity. Breusch Pagan test was used to test heteroscedasticity. A robust standard error was used in case the collected data does not satisfy the assumptions of the homogeneity of variances.

3.7 Analytical Model

The study utilized the regression model below to examine the nature of correlation and the effect of WCM on profitability:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

Where:

Y = the dependent variable (Profitability/ROA)

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = **Regression coefficients of the independent variables**

X_1 = Firm size

X_2 = accounts receivable collection period

X_3 = inventory conversion period

X_4 = accounts payable days

X_5 = Cash conversion cycle

X_6 = Liquidity

X_7 = Leverage

ε = the error term

3.8 Operationalizing the study variables

The variables of the current research comprise of the independent variable as well as the dependent variable whose calculations are given below:

Variable	Abbreviation	Calculation/Formula
Return on Assets	ROA	Net Income/Total Assets
Firm size		Natural Logarithm of Sales
Accounts receivable period	ACP	Accounts receivable/Net sales * 365
Inventory Conversion Period	ICP	Inventory/Cost of sales/average *365
Average Payment Period	APP	Accounts Payable/Cost of Sales * 365
Cash Conversion Cycle	CCC	ACP + ICP - APP
Liquidity	CR	Current assets/Current liabilities
Leverage	DAR	Total debt/Total assets

The components of WC are the independent variables that consist of the accounts payable, inventories (raw materials, WIP as well as finished goods) and accounts receivables. Our dependent variable is the profitability (we use ROA as proxy for profitability).

3.9 Test of significance

This study made use of parametric tests to examine the relevance of the general model as well as of each variables. F-test indicated the overall model's significance with the aid of ANOVA while t-test signifies the significance of the coefficients and was carried out at 5% confidence level with p-value of 5% or less indicating significant results.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

The chapter covers trend analysis, the outcome of the diagnostic tests, the inferential statistics, as well as the findings explanation.

4.1 Trend Analysis

Profitability metrics from 2017 to 2021 are compared in the trend study. The indicators are firm size, cash conversion cycle, payables days, inventory days, receivable day, the leverage and the liquidity. It also shows the trend of profitability within this period.

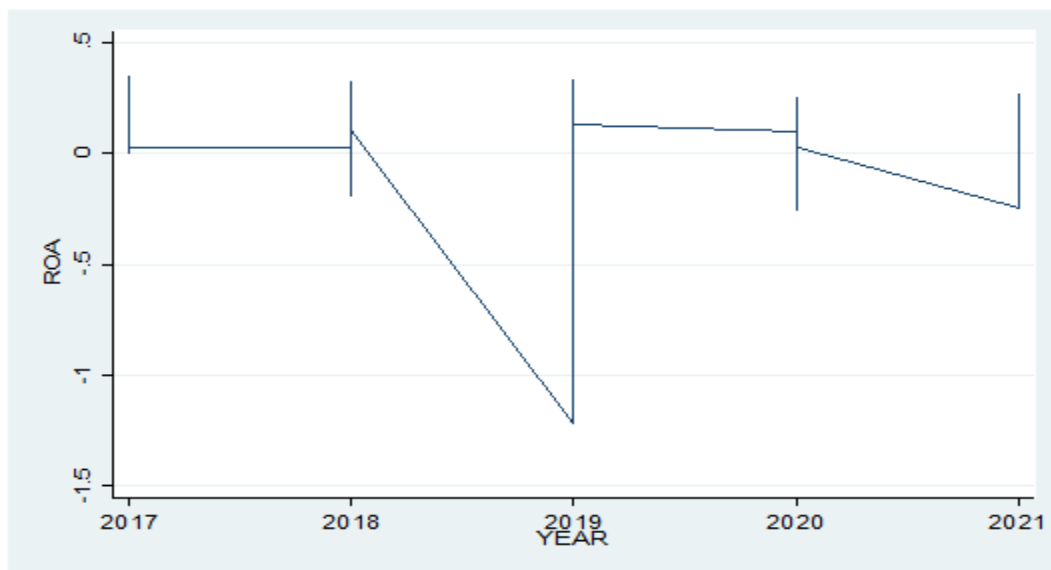


Figure 4. 1: Return on Assets

The return on asset (ROA), was constant between the year 2017 and 2018 as indicated by the graph above. Between 2018 and 2019 there was a steady decline in the ROA. The ROA was again constant between the year 2019 and 2020 and finally a slight decline between the year 2020 and 2021.

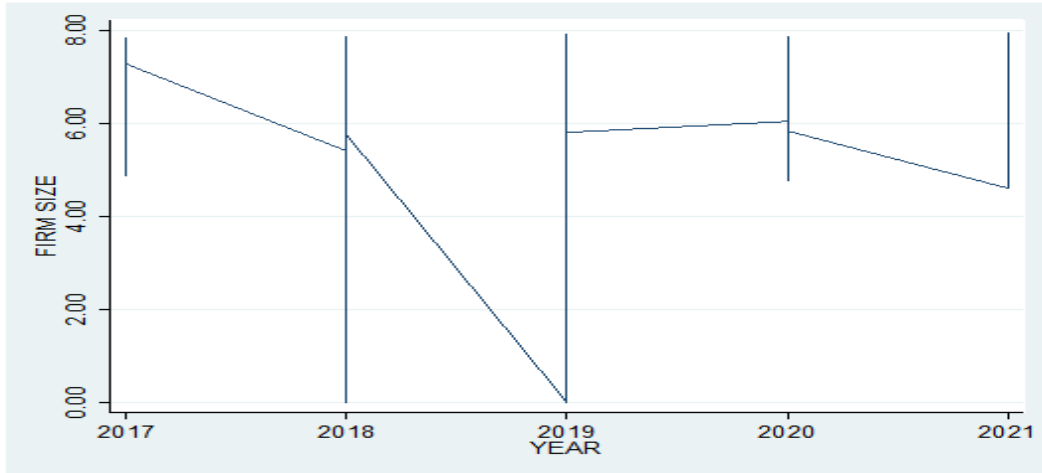


Figure 4. 2: Firm size

This trend shows a decline in the firm size between 2017 and 2018. Between 2018 and 2019 there was a further steady decline in firm size. There was a near constant level of firm size between 2019 and 2020 and between 2020 and 2021 there was a minor decrease in the firm's size, but the pace of decline slowed.

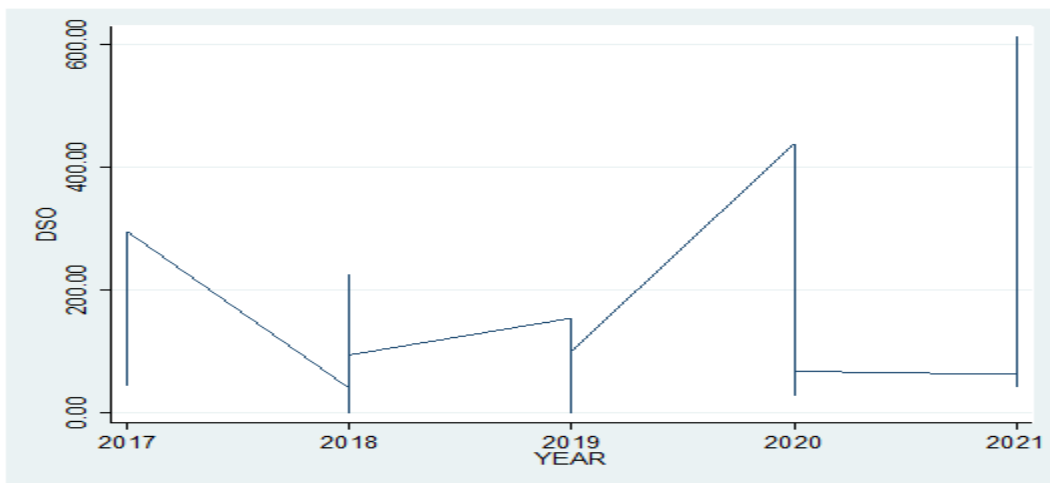


Figure 4. 3: Accounts Receivable Collection period

Between 2017 and 2018, the number of days it takes to collect past-due accounts decreases more sharply, followed by a less pronounced rise between 2018 and 2019.

Subsequently, during 2019 and 2020, it took longer for firms to collect past-due debts, perhaps as a result of the global economic downturn of that time, resulting in a sharp rise. Between the years 2020 and 2021, however, there was a notable improvement in the collection of past-due receivables, with the average receivable period remaining almost constant.

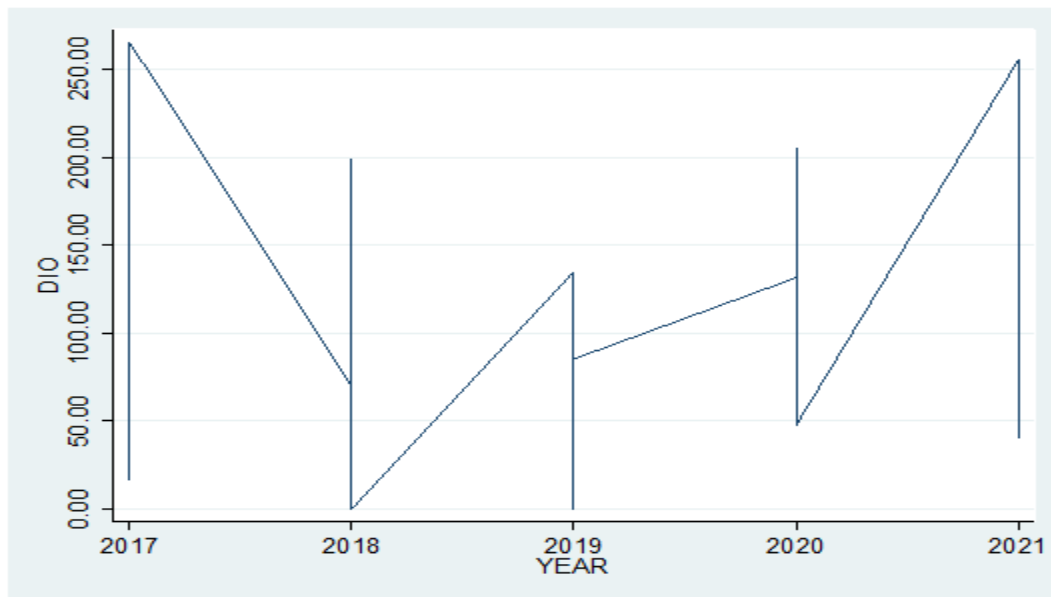


Figure 4. 4: Inventory Conversion Period

Between 2017 and 2018, this graph indicates a consistent drop in the number of days required to convert inventory into sales. However, between 2018 and 2019, there was a consistent rise in the number of days. The number of days increased further between 2019 and 2020, but at an accelerating rate. In addition, the number of days increases from 50 to 250 between 2020 and 2021. The performance of the latter two periods may have been poor owing to the economic downturn that existed at the time.

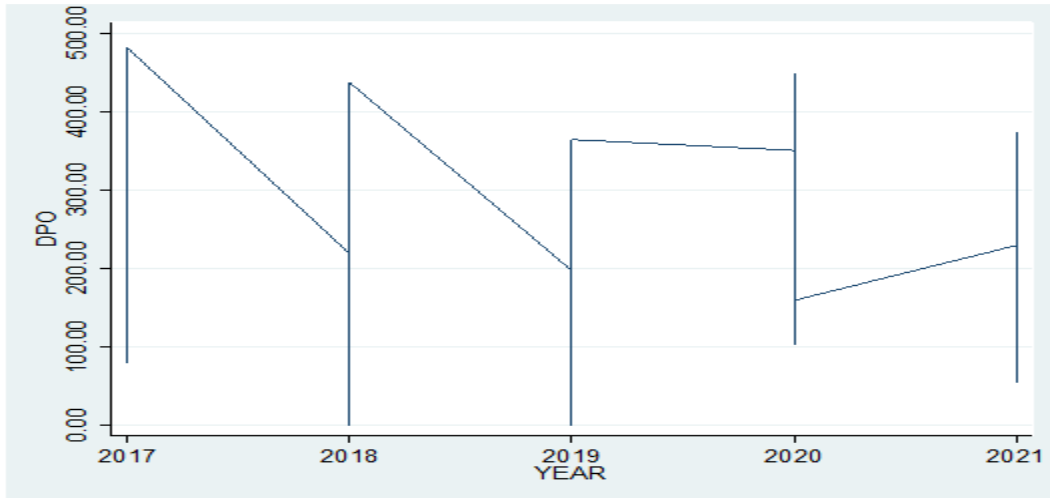


Figure 4. 5: Average Payment Period

In terms of paying their suppliers, the firms' average performance between 2017 and 2018 and also 2018 and 2019 declined steadily. However, this did not improve between 2019 and 2020, but their performance in paying their vendors remained almost consistent. Finally, between 2020 and 2021, they delayed longer to pay their suppliers, resulting in a modest increase in compensation. This might be explained by the global economic downturn at the time.

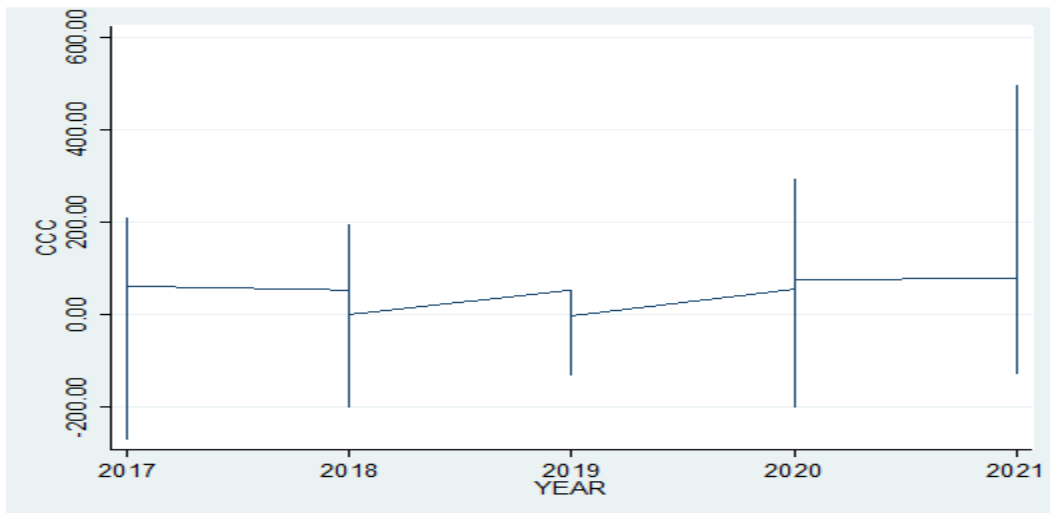


Figure 4. 6: Cash Conversion Cycle

The average number of days utilized by firms between making payments to creditors and collecting payments from debtors remained fairly consistent between 2017 and 2018. Slightly more days were added in 2019, and similarly more were added in 2020, but there was no change in the number of days from 2020 to 2021. The amount of days it takes for businesses to pay their suppliers and get payment from their credit customers has been decreasing.

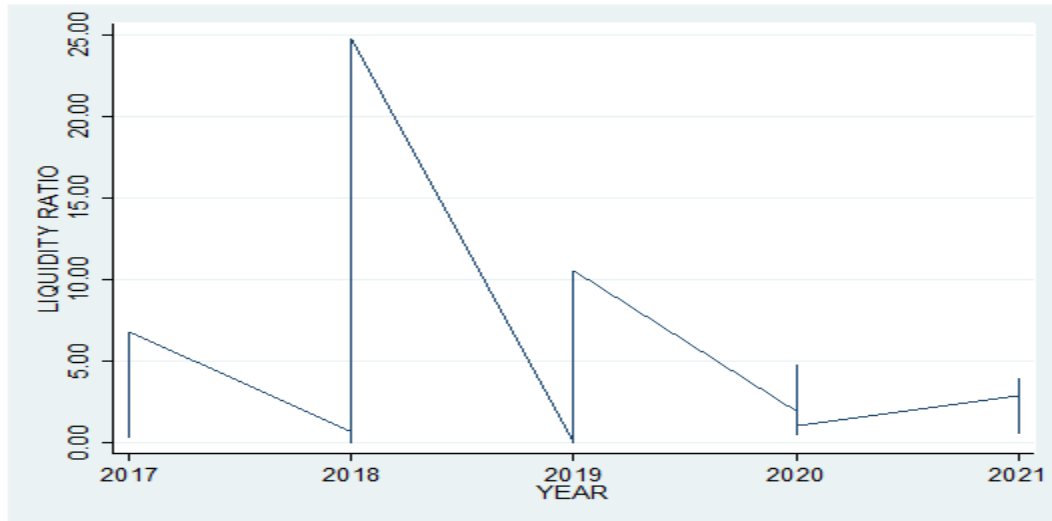


Figure 4. 7: Liquidity Ratio

From the trend analysis, firm's liquidity ratio between 2017 and 2018 and 2019 and 2020 declined. However, between 2018 and 2019, there was a sharp decrease in liquidity ratio of the firm while between 2020 and 2021, there was a slight increase in firm's liquidity ratio.

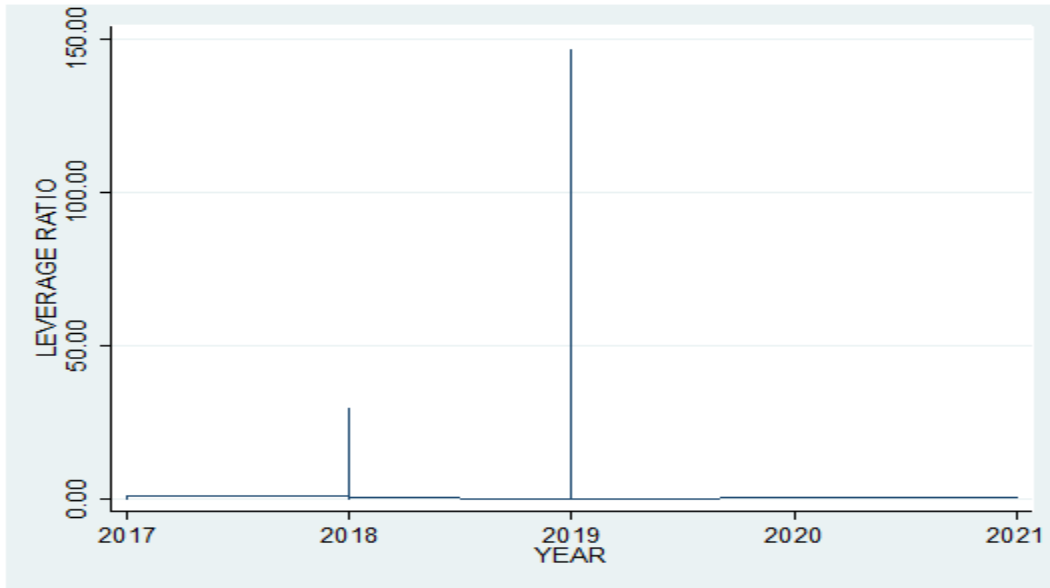


Figure 4. 8: Leverage Ratio

The trend indicates an overall constant in the leverage over the years (between the year 2017 and 2021). This is an indication of positive trend of borrowing was the same across the period the study.

4.2 Descriptive Statistics

The purpose of the descriptive statistics is to illustrate the manner in which the variables of interest are distributed. To illustrate this, the average, the maximum, the minimum, and the standard deviation for each of the variables is described. The findings are represented in Table 4.1.

Table 4. 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Return on Assets	40	.0476047	.2451655	-1.221476	.3502793
Firm size	40	6.11673	1.716321	0	7.934306
Account receivable Collection Period	40	109.8999	113.253	0	613.7384
Inventory Conversion Period	40	97.01244	59.17876	0	265.1773
Accounts Payable Period	40	195.1991	113.1465	0	481.2252
Cash Conversion Cycle	40	11.71325	134.1978	-269.1222	495.2308
Liquidity	40	2.447665	4.082572	0	24.71042
Leverage	40	4.951327	23.39814	0	146.3515

Source: Research Findings

To maintain symmetry with the other metrics, ROA has been employed. Average ROA is 0.0476%, with a standard deviation of 0.2452%. However, there is a mean of 6.1167 employees per firm, with a variation of 1.7163. It takes manufacturing companies an average of 109.8999 days to receive payments, 97.0124 days to clear inventory, and 195.1991 days to pay suppliers in cash. It also takes an average of 11.7133 days to get cash from consumers with open accounts. Since all businesses keep track of their accounts receivable, using a negative as the base number of days is unrealistic. For computational reasons, however, this is feasible when firms take more time to pay their suppliers than they do to collect from their debtors. The liquidity ratio shows a mean of 2.4477 and a variation of 4.0826 and the leverage ratio (total debt/total assets) shows the average of 4.9513 and a variation of 23.3981.

4.3 Correlation Analysis

Correlation analyses are performed to quantify the associations between the study's variables. The study's findings are addressed here.

Table 4. 2: Correlations Matrix

	Return on Assets	Firm size	Average receivable period	Inventory period	Average Payment Period	Cash Conversion Cycle	Liquidity	Leverage
Return on Assets	1.0000							
Firm size	0.2550	1.0000						
Average receivable period	-0.1286	-0.1983	1.0000					
Inventory period	0.2034	0.1948	0.5286*	1.0000				
Average Payment Period	-0.1870	0.0889	0.4676*	0.4646*	1.0000			
Cash Conversion Cycle	0.1389	-0.1565	0.6828*	0.4953*	-0.2436	1.0000		
Liquidity	0.0931	-0.0250	0.0403	-0.0957	-0.0432	0.0282	1.0000	
Leverage	-0.0199	0.0378	-0.0184	-0.0491	-0.1076	0.0536	-0.0646	1.000

Source: Research Findings

The correlation between the response and predictor variables is shown by the correlation matrix's findings. There is a positive link of 0.2550 between the size of the firm and the ROA. Average receivables periods have a negative coefficient of -0.1236 according to the findings. This suggests that a unit increase in accounts receivable days decreases return on assets by a factor of 0.1286. A positive correlation of 0.2034 between inventory period and ROA suggests that a one-unit increase in inventory period increases ROA by a factor of 0.1286. Payable days have a -0.1870 negative correlation with the response variable. ROA and cash conversion cycle had a correlation of 0.1389, revealing a positive association between the two variables. A unit rise in liquidity ratio leads to a 0.0931-unit increase in return on assets, while leverage ratio had a negative correlation with the dependent variable (ROA) of -0.0199, indicating that a unit increase in ROA leads to a -0.0199-unit decrease in leverage ratio.

4.4. Diagnostics Tests

4.4.1. Multicollinearity test

Since the correlation matrix showed which variables to retain or to drop due to collinearity, the study conducted VIF test after pre-estimation tests to establish the specific variables which led to high collinearity among the pairs of profitability and independent variables. The VIF findings are as shown below. Table 4.3 tabulate the findings of the VIF.

Table 4. 3: Variance Inflation Factor

Variable	VIF	1/VIF
Firm size	1.22	0.818980
Inventory period	3.10	0.322868
Average Payment Period	2.20	0.454300
Cash conversion cycle	2.54	0.393815
Liquidity	1.03	0.970977
Leverage	1.02	0.976350
Mean VIF	1.85	

From table 4.3, all VIFs and 1/VIFs were far below 10 and above 0.1 respectively implying absence of Multicollinearity (Senaviratna & Cooray, 2019).

4.4.2 Normality test

To ascertain whether or not the data included in this study had a normal distribution, the current study employed the Shapiro-Wilk test for normality. The assumption that residuals follow a normal distribution is known as the null hypothesis. Table 4.4 tabulate the results of the normality test.

Table 4. 4: Shapiro-Wilk W test for normal data

Variable	Observations	W	V	z	Prob>z
Return on Assets/Profitability	40	0.63506	14.425	5.617	0.00000
Firm size	40	0.76049	9.467	4.730	0.00000
Accounts receivable period	40	0.65050	13.815	5.526	0.00000
Inventory period	40	0.90065	3.927	2.879	0.00200
Accounts payable days	40	0.93668	2.503	1.931	0.02675
Cash conversion cycle	40	0.91407	3.396	2.573	0.00504
Liquidity	40	0.46014	21.339	6.441	0.00000
Leverage	40	0.20280	31.511	7.261	0.00000

From table 4.4 the probability values of all the variables are significance ($p < 0.050$) resulting to rejection of the null hypothesis of normal distribution. Thus, the residual was not normally distributed. To correct this a robust standard error was used.

4.4.3 Heteroscedasticity test

Heteroscedasticity is required in order to determine whether or not there is fluctuation of the error terms across observations or whether or not there is a lack of consistent variance caused by the research variables. The plotted a scatterplot in order to examine the heteroscedasticity of the data. Figure 4.8 shows the outcome of the scatterplot.

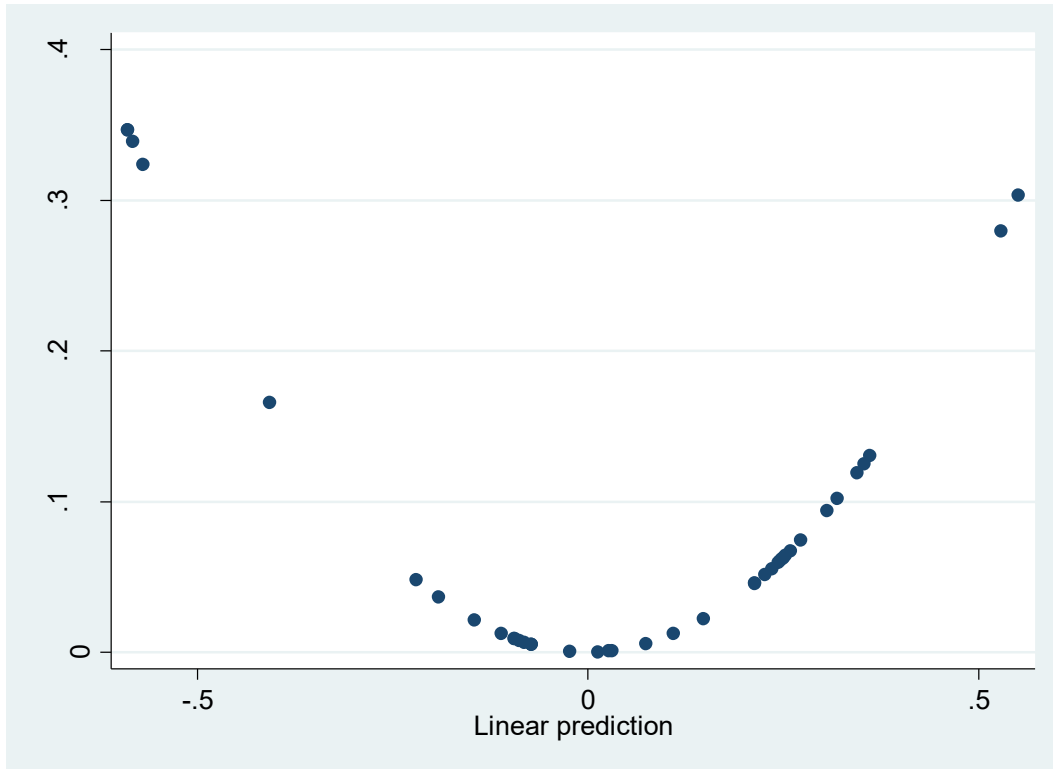


Figure 4. 9: Heteroscedasticity

The results of figure 4.8 indicate a pattern which has the residual error not concentrated around a region, revealing the present of Heteroscedasticity. To correct this, robust error term was applied on the model.

4.5 Multiple Regression

Random-effects GLS regression

Number of obs = 40

Group variable: CODE

Number of groups = 8

R-sq:

within = 0.2755

between = 0.1731

overall = 0.1953

Obs per group:

min = 5

avg = 5.0

max = 5

Wald chi2(6) = 326.51
 Prob > chi2 = 0.0000

Return on Assets	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
			2.15			
Firm size	.0439556	.0204898	-1.28	0.032	.0037963	.0841149
Account receivable collection perios	-.00084	.0006551	1.69	0.200	-.0021239	.000444
Inventory conversion period	.0023572	.0013964	1.69	0.091	-.0003796	.0050941
Accounts payable period	- .0006038	.0002232	-2.71	0.007	-.0010413	- .0001663
Cash conversion cycle	0	(omitted)				
Liquidity ratio	.0035264	.0020788	1.70	0.090	-.000548	.0076007
Leverage ratio	.0002517	.0002362		1.07 0.287	-.0002113	.0007146
_cons	- .2496478	.2157716	-1.16	0.247	-.6725524	.1732567

4.6 Interpretation of the Findings

Similar to regression analysis, multiple regression analysis assesses the correlation between dependent and independent variables. R squared indicates what percentage of variation in the reference index may be accounted for by unexplained variance. The value of R square might range from 0% to 100%. Hundred percent R square indicates that the variable in question fully explains the index.

This study's R-squared score of 0.1953 indicates that the predictor variables account for 19.53% of the variance in profitability (the response variable). If the p-value is less than 0.05, it is generally accepted that the link between the independent and dependent

variables is statistically significant. An insignificant correlation is assumed when the value is greater than 0.05.

In this situation, the results indicate a p-value of 0.000, which is less than the generally recognized levels of 0.05 and 0.01. As a result, we accept the alternative hypothesis, which asserts that the predictor variables have an effect on the profitability of the enterprises, and reject the null hypothesis.

The regression equation demonstrates that, regardless of the presence of additional profit factors, ROA will always rely on a constant factor of 0.2496. For the remaining independent variables, an increase in receivable days outcomes in a decrease in ROA of 0.00236 for every unit increase, while an increase in payment days results in a decrease of 0.0006038 for every unit increase. ROA, on the other hand, rises by 0.0023572 per unit increase in inventory holding days and 0.0035264 per unit rise in liquidity ratio. The ROA falls by 0.0002517 percentage points for every rise of one in the leverage ratio. According to the firm's size, as shown by the logarithm of sales, the ROA grows by 0.0439556 for every unit increase in sales.

There is a significant link between firm size, inventory days, payment days, liquidity ratio, and return on assets, as seen in the correlation table. There is a statistically significant difference, with a p-value of 0.000 being lower than the more common levels of 0.05 and 0.01. But other factors demonstrate that the independent variables and the dependent ones are not statistically related. From this, one can conclude that only firm size, inventory days, payment days, and liquidity ratio had a substantial influence on return on assets, whereas the other factors evaluated had no effect at all.

The results are consistent with the research carried out by Mathuva (2010) in Kenya and are consistent with those of previous researches. The research found that day's payment and inventory were positively connected to profitability, but days receivable were negatively related. The impact of WCM methods on the financial performance of small and medium-sized enterprises (SSEs) in Kenya's Kisii South District was analyzed by

Nyabwanga et al. (2012). The majority of SSEs surveyed had not implemented any systematic WCM protocols, leading researchers to conclude that these firms usually had poor financial performance. There were a total of 75 firm-year observations included in Gakure et al. (2012) study of the correlation between WCM and performance at 15 manufacturing businesses listed on the Nairobi NSE, Kenya, from 2006 to 2010. Company performance was shown to significantly correlate negatively with liquidity. Profitability was shown to be positively correlated with the CCC but negatively correlated with the accounts collection period, the average payment period, and the inventory holding duration. Although the model was statistically significant, only the average payment term had a statistically significant effect. WCM and Corporate Performance in Nairobi Security Exchange-Listed Manufacturing Firms was studied by Omesa et al. (2013).

CHAPTER FIVE:

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the data studied in the chapter 4 utilizing the appropriate statistical procedures. In addition, it discusses the limitations and suggests future study areas. It also provides policy suggestions and results' conclusions.

5.2 Summary

The objective of the research was to determine the impact of WCM on the profitability of manufacturing firms listed on the Nairobi security exchange. During the study's five-year timeframe, from 2017 and 2021, all publicly-traded manufacturing companies were considered. The relevant information was acquired from the 2017 to 2021 published annual financial reports of the firms. The research discovered a negative correlation between average receivables period, average payment time, and leverage ratio for manufacturing firms listed on the Nairobi security exchange. This indicates that a reduction in the accounts receivable time will increase profitability and vice versa. This suggested that firms who collect their debts early generate more profits than those that collect their receivables late. When running a business, working capital should have a negative link with profits.

The research demonstrates that firm size has a substantial beneficial influence on profitability, as assessed by ROA, with a p-value of 0.032 compared to the conventional significance values of 0.05 and 0.01. However, the other components (average receivable period, inventory period, liquidity ratio, and leverage ratio) are less significant than the traditional significance levels of 0.05 and 0.01 while establishing the theoretical connection with the response variable. In consequence, the cash conversion cycle slowed as businesses, on average, delayed longer to pay their suppliers. Because of this, the CCC

has a positive impact on company profits. The graphs of the trend analysis show that manufacturing companies' production has increased over time. This is shown by an upward trend in firm size, inventory period, cash conversion cycle, and liquidity ratio, but a downward trend in average receivables period, average payment period, and leverage ratio.

5.3 Conclusion

WCM is significant since it influences a company's profitability and liquidity, and hence its value. Effectively managing working capital will improve managerial performance. Using panel data analysis, a pooled OLS regression and fixed effect estimates, the study shows that average receivable period, average payment duration, and leverage ratio have a negative association with ROA. The findings indicate that managers may increase their performance by effectively WCM. The link between profitability and the average receivables period, average payment period, and leverage ratio is negative. The profitability of a business is positively correlated with company size, inventory period, cash conversion cycle, and liquidity ratio. These statistics show that reducing the duration of accounts receivable and the average payment time would increase a company's profitability. Owing to the possibility that increased control over the accounts payables period might impair the firm's image and, as a consequence, diminish profitability, the accounts payables period remains a subject of worry for finance managers.

Generally, the percentage of working capital to total assets employed is disproportionately large; thus, it is essential that these funds be utilized effectively and efficiently. A firm's ability to convert its earnings into cash from operations within the same operating cycle is a key factor in determining whether or not it will need to borrow money to fulfill its daily working capital requirements, even if the firm is very successful. As a result, one must lower our standards for both profitability and liquidity. In order to provide a continuous flow of products and services to target consumers, investments in current assets must be managed such that they generate the required return or do not negatively influence liquidity.

The cash operating cycle will be extended if resources are halted anywhere along the supply chain. Even if sales go up as a result of this, the company's bottom line might take a hit if the cost of maintaining a larger inventory and providing more trade credit to consumers is more than the revenue gained from doing so. According to the findings of this study, businesses with well-managed working capital tend to be more profitable overall. According to the results of this research, when excellent management of working capital results in superior financial results, a negative association between financial performance and working capital indicators may be predicted.

The study reveals that manufacturing firms' success is based upon good working capital management. ROA is positively correlated with many indicators including total asset period, inventory period, and cash conversion cycle. It is thus beneficial to raise the size of the company, invest the money in several successful ventures/areas, and accelerate the cash conversion cycle. This enhances a company's profitability. On the other side, return on assets is negatively connected to average receivables period, average payment time, and leverage ratio. Therefore, the findings imply a link between working capital elements, indicating that efficient WCM has a major effect on profitability.

5.4 Recommendation for Policy

The research determined that effective WCM increases the profitability of Nairobi Security Exchange-listed manufacturing firms. It is anticipated that finance managers will get a comprehensive understanding of the link between the various components of WCM and profitability. Based on the findings, the following recommendations are provided for each element of working capital.

The average accounts receivable age has a negative impact on a firm's bottom line. Firms would be well to reduce the time it takes to recover receivables from customers as much as possible since doing so increases profits. Businesses, however, need to watch out that this doesn't cut down on the number of credit purchases made, since it might cut into their profits. Receiving money quickly helps shorten the lag time between making a

transaction and having enough money on hand to pay for materials and labor. However, due to their trade credit policy or competitive pressure, businesses find it challenging to insist on cash payments for all purchases. Almost every business includes daily receivables in its daily operations. Lower receivables result in reduced bad debts through accelerated collections, which is a positive.

The firms might shorten the cash conversion cycle period in order to increase corporate liquidity. A manufacturer's liquidity may be improved by taking measures to shorten the cash conversion cycle time, and any excess funds can be put back into the business. Recovering the accounts receivable quickly and extending payment terms will improve the company's liquidity. In order to maintain enough working capital, manufacturing firms should shorten the payment terms for their creditors and increase the collection periods for their debtors.

According to studies, a firm's bottom line would improve if it reduced the time it took to turn over its shares. The inventory period time is the number of days it takes to purchase raw materials, manufacture the product, and sell it. This makes it dependent on output and revenue. Production times are also affected by factors including the product's complexity, the amount of automation involved, and the technology used. Therefore, businesses have to balance the costs and benefits of innovation with the speed and quality of their production processes. In other contexts, the success of a sale depends on the product's flexibility to adapt to changing customer needs. Having less inventory is beneficial for businesses since it requires less room for storage, fewer products to go bad, less money lost to depreciation and deadweight costs (such as cash stuck in raw materials or work in progress that may be put to better use elsewhere).

According to the study, profitability improves when accounts payable period increases. Possible causes include the positive impression made on suppliers, which encourages them to keep supplying the firm without interruption, and the positive financial results that result from year-round business continuity. Given the inverse correlation between the average payables time and the profitability of the business, a decrease in the average

payables period is likely to have a positive impact on the bottom line. A company's average payables period is the number of days it may go without paying its suppliers. A company may save money on interest payments for things like bank loans by delaying payments, which is considered internal finance. However, it is important to strike a balance between the duration of the delay and the possible damage to long-term connection with suppliers. Companies must maintain enough levels of current assets to meet their immediate liabilities. In order to increase their liquidity, firms may either speed up the time it takes to collect from debtors and convert that cash into useable assets, or slow down the time it takes for creditors to make payments, depending on the strategy they choose.

Profitability suffers when working capital is mismanaged and money is locked in liquidity rather than productive ones like machinery and buildings. Companies in the industrial sector that are publicly traded may benefit from establishing credit control systems, ideally with a dedicated credit officer, and adhering to credit control policy processes in order to better manage their working capital. In addition, organizations should implement collection procedures for any overdue payments to be received as soon as possible. When it came to inventory conversion cycle, order management, and stock levels, the studied firms fell short. In order to avoid stock-outs and surpluses, the study recommends using an efficient inventory management system. Orders, buffer inventories, and reorder points all need to be calculated according to a predetermined model. Suppliers and customers that provide longer credit terms and shorter payment terms, respectively, should be prioritized by businesses.

5.5 Limitations of the Study

This research ran across a number of barriers. There are so many studies on the subject, however various studies on relevant concerns conducted inside and outside the nation have found conflicting results. Kenya's main regulatory authorities, the Nairobi Securities Exchange and the Capital Markets Authority, are responsible for ensuring the accuracy of the financial data, although only a small number of manufacturing companies are

registered with them. Most other companies are privately owned and operate in a decentralized fashion throughout the country. Competition and other legal reasons add to the unease about sharing information with other parties. For these reasons, obtaining reliable information from corporations is a laborious, expensive, and time-consuming process.

The five-year duration of the study was inadequate for evaluating changes in variables over time. Several of the changes were not observable at the time. The indicator choices provided for each objective area to evaluate the firms' working capital management methods may not be exhaustive. Thus, there is a tendency for variables under research to be under measured.

Due to technology advancements affecting the operational efficiency of firms listed, the conclusions acquired may no longer be applicable to the present state of affairs, necessitating the necessity for further research to follow the development.

5.6 Suggestions for Further Research

In order to generalize the findings, studies on the management of WCM in various sectors is required. Other kinds of listed institutions also feature a section on working capital management, and based on the results of this research, a research on the effects of WCM on their profitability should be done.

There is need to do further research on the effect of WCM on profitability with other companies, including those not listed, across all industries, and over a longer time period. Finally, it is suggested that future research use other sets of WCM indicators to study the influence of certain strategies on the financial performance of businesses. This will significantly contribute to the building of a scholarly consensus on changes to corporate finances and working capital management.

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Appendix 1: Manufacturing Firms Listed at the NSE

1. B.O.C Kenya Ltd - **Trading**
2. British American Tobacco Ltd - **Trading**
3. Carbacid Investment Ltd - **Trading**
4. East African Breweries Ltd - **Trading**
5. Mumias Sugar Company limited – **Not trading**
6. Unga Group Plc - **Trading**
7. Eveready East Africa Limited - **Trading**
8. Kenya Orchards Ltd - **Trading**
9. Flame Tree Group Holdings Ltd -**Trading**

Appendix 2: Data

YEAR	MANUFACTURING FIRM	CODE	FIRM SIZE	DSO	DIO	DPO	CCC	LIQUIDITY	LEVERAGE RATIO	ROA	
2017	BOC KENYA		1	5.986	98	114	481	-269	2	0.28	0.02
2018	BOC KENYA		1	5.985	116	122	437	-199	1.07	0.27	0.03
2019	BOC KENYA		1	5.989	140	103	364	-121	1.00	0.28	0.03
2020	BOC KENYA		1	6.041	152	95	279	-32	2.51	0.23	0.08
2021	BOC KENYA		1	6.140	92	92	176	8	2.88	0.20	0.05
2017	BRITISH AMERICA TOBACCO		2	7.271	55	193	162	86	0.32	0.89	0.30
2018	BRITISH AMERICA TOBACCO		2	7.317	50	199	175	74	0.67	0.65	0.33
2019	BRITISH AMERICA TOBACCO		2	7.381	55	135	197	-7	0.34	0.75	0.34
2020	BRITISH AMERICA TOBACCO		2	7.404	68	93	156	5	1.30	0.45	0.25
2021	BRITISH AMERICA TOBACCO		2	7.405	63	108	162	9	1.64	0.38	0.27
2017	CARBACID INVESTMENT		3	5.770	91	100	231	-40	6.80	0.12	0.11
2018	CARBACID INVESTMENT		3	5.752	95	66	153	7	24.71	0.02	0.16
2019	CARBACID INVESTMENT		3	5.800	101	65	169	-2	10.55	0.04	0.13
2020	CARBACID INVESTMENT		3	5.834	104	48	159	-7	4.76	0.11	0.09
2021	CARBACID INVESTMENT		3	5.957	86	40	177	-51	3.98	0.12	0.11
2017	EAST AFRICA BREWERIES		4	7.847	52	70	194	-73	1.01	0.81	0.15
2018	EAST AFRICA BREWERIES		4	7.866	39	70	219	-109	0.83	0.84	0.10
2019	EAST AFRICA BREWERIES		4	7.917	36	61	229	-132	0.88	0.91	0.13
2020	EAST AFRICA BREWERIES		4	7.875	28	95	189	-67	0.45	0.35	0.11
2021	EAST AFRICA BREWERIES		4	7.934	55	88	230	-86	0.56	0.40	0.03
2017	UNGA GROUP		6	7.291	46	49	80	14	1.56	1.19	0.00
2018	UNGA GROUP		6	7.301	51	59	57	53	2.27	2.30	0.18
2019	UNGA GROUP		6	7.253	62	65	74	53	1.96	2.32	0.12
2020	UNGA GROUP		6	7.202	58	106	109	55	1.58	0.49	0.01
2021	UNGA GROUP		6	7.251	42	56	54	44	2.26	0.36	0.03
2017	EVERADY EAST AFRICA		7	5.530	161	265	217	209	2.69	0.29	0.35
2018	EVERADY EAST AFRICA		7	5.401	225	129	158	196	2.53	0.24	-0.19
2019	EVERADY EAST AFRICA		7	5.280	154	85	265	-25	1.50	0.55	-1.22
2020	EVERADY EAST AFRICA		7	5.126	115	131	448	-202	1.04	0.82	-0.26
2021	EVERADY EAST AFRICA		7	5.175	93	46	268	-129	0.76	0.99	-0.24
2017	KENYA ORCHARD LIMITED		8	4.867	295	17	189	122	1.71	0.86	0.05
2018	KENYA ORCHARD LIMITED		8	0.000	0	0	0	0	0.00	0.00	0.00
2019	KENYA ORCHARD LIMITED		8	0.000	0	0	0	0	0.00	0.00	0.00
2020	KENYA ORCHARD LIMITED		8	4.756	438	206	350	294	1.93	0.84	0.10
2021	KENYA ORCHARD LIMITED		8	4.606	614	255	374	495	2.08	0.81	0.03
2017	FRAME TREE GROUP		9	6.385	118	61	118	61	1.29	0.56	0.02
2018	FRAME TREE GROUP		9	6.396	108	101	177	31	1.14	29.85	0.03
2019	FRAME TREE GROUP		9	6.385	97	78	124	50	1.21	146.35	0.02
2020	FRAME TREE GROUP		9	6.464	73	103	102	74	1.11	0.56	0.03
2021	FRAME TREE GROUP		9	6.529	71	112	103	79	1.05	0.59	0.04