EFFECT OF WORKING CAPITAL MANAGEMENT TECHNIQUES ON FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

BY:

BETTY KAWIRA MWITI

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE FINANCE DEGREE UNIVERSITY OF NAIROBI.

NOVEMBER 2022

DECLARATION

I hereby declare that this research project is my original work and has not been submitted for a degree or examination in any other University.

Signature _____ Date _____08/11/2022_____

Betty Kawira Mwiti

Reg. No: D63/39578/2021

This Research Project has been submitted for examination with my approval as the University Supervisor

Signature _____ Date 17/11/2022_____

Dr. Angela Kithinji

Senior Lecturer

University of Nairobi

ACKNOWLEDGEMENT

I would like to acknowledge and give my sincere gratitude to my supervisor Dr. Angela Kithinji for making this work possible. Her guidance and advice carried me through all the stages of writing my project.

I would like to give special thanks to my family for their continuous support and understanding when taking my research and writing my project. Your prayer for me is what sustained me this far. My friends who supported me and offered deep insight into the study.

Finally, I would like to thank the Almighty God, for letting me through all the stages, the. guidance day by day, energy, wisdom, academic intellect, and finances. I will keep on trusting you for my future.

DEDICATION

This work is dedicated to my family and many friends. I am especially grateful to my beloved parents, Mr and Mrs Silas Mwiti Kamundi for their prayers, encouragement, and push to tenacity. I also dedicate this work to those who have supported me in one way or another through my education. Thank you for watching this adventure through to the end.

 God bless you.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

AP   Accounts Payable

CCC   Cash Conversion Cycle

CMA   Capital Market Authority

GDP   Gross Domestic Product

MLR   Multi Linear Regression

NPV   Net Present Value

NSE   Nairobi Securities Exchange

OSL   Ordinary Least Squares

ROA   Return on Assets

VIF   Variation Inflation Factors

ABSTRACT

working capital management techniques is one critical area that influences liquidity of the firm while at the same time have other underlying effects on financial performance depending on the policy adopted by one firm over the other. Increasing liquidity of a firm implies that the firm reduces liquidity risks as well as bankruptcy risks. However, increasing liquidity beyond a certain point means that the management is not lucrative in identifying opportunities with positive NPVs and therefore increase the financial performance of the firm. Management therefore requires developing policies that will help to balance between the risk and the returns for each decision they make. The study sought to determine the effect of working capital management techniques on financial performance of manufacturing firms in Kenya. The study targeted manufacturing firms that are listed at NSE since it is easier to obtain data on them. The study therefore targeted a total of 10 firms and the study period consisted of the period 2017 to 2021. The variables that were found to be significant and could express working capital management techniques included accounts receivable management, accounts payable management, inventory management period as well as size of the firm. However, the study was not able to collect complete data from one of the manufacturing firm as it was delisted. The study was however able to get data from all the other nine manufacturing firms for the study period 2017 to 2021. This comprised of a response rate of 90% that was found to be adequate for data analysis. The study undertook descriptive statistics that described the data collected for each variable in form of mean standard deviation, minimum and maximum, skewness and kurtosis. In summary performance of manufacturing firms was in average poor as it recorded a loss of -3.17%. The variability of returns across the firms was high as depicted by standard deviation. Tis was also observed in working capital management techniques where it was observed that the firms in average adopted poor policies in regard to accounts receivable management, accounts payable management, inventory period management as well as cash management. The correlation that was undertaken indicated that only accounts receivable as well as size of the firm that had significant effect on financial performance. The working capital management technique indicated that there was negative Spearman's correlation between these working capital management techniques and financial performance. The regression analysis was used to determine the significance of the effect of liquidity management on financial performance of manufacturing firms. The regression model adopted by the model was only able to describe 22.8%. The adjusted R square on the other hand was smaller than R square that indicates that there were some elements in the model that did not help to improve the model. The study found that accounts receivable did not have significant effect on financial performance. The p-value of the F-test was less than 0.05 and therefore the study found statistically significant effect of working capital management on financial performance of manufacturing firms. The regression coefficients indicated that both accounts payable management and cash management had significant but negative impact on financial performance while size and inventory management had positive significant effect on performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Profit realized by a manufacturing firm is largely dependent on the level of efficiency undertaken by the firm in production, cost minimization and sales optimization. Manufacturing firms strive to use the available limited resources efficiently and for optimal results that enhances the financial performance of the firm. Every business therefore develops strategies to ensure maximum return on investment as well as utilization of fixed asset productivity which improves its financial performance (Njeri, 2014). To guarantee that their working capital is used as effectively as possible, businesses establish working capital management strategies. Current assets and current liabilities form most working capital that require dedicated monitoring. However, mismanagement of these components may severely incapacitate the firm's ability in meeting its short-term obligations due to shortage of cash and inadequate inventories may jeopardize the production process which in turn may lead to business failure (Nyabenge, 2014).

The trade-off theory, which is based on the literature research conducted by Modigliani and Miller (1958), will serve as one of the study's theoretical foundations. The trade-off theory of the manner by which they structure capital states that a company determines the amount of debt and equity financing implement in their business operations by gauging the advantages and disadvantages (Kraus & Litzenberger, 1973).The theory posits that the best capital structure achieves the balance between the cost of crisis that is financial in nature and interest tax protection. The Pecking Order Theory, which Donaldson initially proposed in 1961, is another theory upon which the study is predicated and was then later adapted by Myers and Majluf (1984) who postulated that the cost of financing an organisation is directly influenced by asymmetric information. There are three ways

to finance a business: internal equity, debt, and new equity. Many firms are drawn to internal financing first then may go to debt and finally raising equity is treated as the last option. Lastly, this study will also be underlain to cash conversion cycle theory which was first postulated by Richards and Laughlin (1980). The theory takes into account the duration a business to turn its asset input into cash and assesses how well a company manages its working capital.

Manufacturing firms, like many other corporate entities, exist to aggrandize the value of the shareholders' investment, and to attain this objective, financial strategy must be refined and responsive adoption procedures must be entrenched. Gitman et al (2008) claim that for an organisation to oversee fulfilling its immediate obligations as well as ensuring the continuous flow of the business, which is guaranteed by the profitable venture, when managing its everyday operations, a company should balance profitability and liquidity. Attaining this balance for most manufacturing firms in Kenya has been a challenge. The majority of Kenyan manufacturing companies invest significant amounts of money into their operations, so they must efficiently manage those investments in order to significantly increase firm profitability. According to Lazaridis and Tryfonidis (2006), inventory management prevents a business from tying up extra cash in unused stock at the expense of other worthwhile projects, preventing that capital from being effectively employed.

1.1.1 Working Capital Management

The control and coordination of current assets and current liabilities for effective business operation is referred to as working capital management. Working capital management techniques are effective business strategies that are designed to monitor the effective use of current assets and current liabilities to guarantee that business operations are performed efficiently. Nazir and Afza (2009) define working capital management techniques as basic principles and guidelines that are

carefully developed by a firm to control financial risks and improve overall performance by controlling working capital. The management of current assets, current liabilities, and their interaction for effective performance is defined as working capital management. According to Pandey (2010) there are appropriate means that a company can finance its current assets so a so as to ensure appropriate flow of cash to cover operational costs obligations of a short duration and ensuring business continuity through working capital management approaches.

The sign of strong business management is the ability to maintain a healthy balance between profitability, liquidity and growth (Garca Teruel & Martnez Solano, 2007). Working capital management's primary goal is to balance and maintain the working capital operation cycle, ensure its operations are ordered, minimize the value of resources used up on working capital and augment current asset investment and the returns accrued. If a business is unable to manage well its working capital leading to insufficient working capital, it fails meeting its obligation as they fall due, pays its employees and suppliers late as well as paying short term debts (Baños-Caballero, et al., 2010).

Organizations are guaranteed to perpetuate the appropriate extent of working capital by using five management strategies: cash or liquidity management, account receivable management, inventory management, account payable management techniques, and short-term loan management (Ross et al., 2010). Working capital is given through the subtraction of current asset and current liabilities. Liquid assets will be given by the summation of liquid cash, accounts receivable and inventories while current liabilities will be given by the summation of account payable, shot-term borrowing and accrued liabilities (Securities and Exchange Commission, 2007).

1.1.2 Financial Performance

The definition of financial performance according to Njeru (2016) as the monetary outcome of strategies implemented in a firm within a given period of time. Kimeu, et al (2016) as well define financial performance as the monetary outcome of the effort of the employees of a firm. There are common terms such as profitability, sales growth, earnings per share, growth of dividend, turnover among others, which are used to describe financial performance of a business. Financial performance measures the outcome of a company's activities and policies in terms of money.

There are various internal and external forces that affect the financial performance. Some internal forces affecting economic performance include corporate governance practices, ownership structure, capital structure, firm characteristics and policies, as well as risk management procedures. Some external factors affecting financial performance include government regulations and policies, market preference, and the country's economy (Nduta, 2015). Increase in efficiency enhances financial performance and is indicated by an increase in output when the input remains constant. Increase in efficiency minimizes the wastage of resources which include physical materials time and energy to accomplish a given output (Aggrey, Eliab & Joseph, 2010).

The accounting profitability of a firm is revealed by these outcomes which include the return on investment, return on common equity or return on asset. The subjective evaluation of the efficiency of a firm to generate revenue from the resources at its disposal and create value for its shareholders is referred to as financial performance (Alvarez, Sensini & Vazquez, 2021).

1.1.3 Working Capital Management and Financial Performance

Proper management of working capital ensures that operations within the firm are steady and efficient as well as all financial obligations are met. As per Ponsian et al. (2014) efficient working capital management assist a firm to maintain smooth operations and improve earnings and

profitability of a firm. An indicator of a company's productivity, liquidity, and overall health is working capital. It reflects various company activities such as the ability of a company to manage debt, collect revenue, manage inventory as well as pay the suppliers in time.

A firm with a high proportion of working capital could struggle to get the best return on its investment since money put in working capital typically earns a low or no return, which results in capital inefficiency. In such a case the firm does not maximise its performance by not fully utilizing the available opportunity (Akoto, Awunyo-Vitor & Angmor, 2013). However, lack of inadequate working capital to meet a firm's obligations can lead a firm to become financial insolvent. Late payment to employees and suppliers results in loss of loyalty, damaged credit rating and loss of supplier discount. Default in payment can lead a firm into legal troubles where its assets are compulsory liquidated to repay creditors (Ponsian et al., 2014).

1.1.4 Manufacturing Firms in Kenya

The manufacturing sector being one of the main contributors of GDP in Kenya has being facing a number of challenges such as coronavirus pandemic and decrease in demand for the last six years which have contributed to the decline of its contribution to GDP. In the past decade the sector was stagnating with an average contribution of 11% of GDP. In 2016 the sector recorded 9.3%, 8.7 % in 2017, 8.4% in 2018, 7.9% in 2019 and 7.6% in 2020. The decline in 2020 and 2021 was attributed to coronavirus pandemic due to restrictions measures that were put in place limiting movement of personnel, goods and services which affected production networks. These measures as well affected local and international demand for manufactured products. High cost of production and inputs continued clipping the sector making it fail to achieve 15% of GDP by 2022 as targeted in the Big Four Agenda (Ngugi, 2021).

Manufacturing sector is not only a major contributor of to the economy, earning foreign exchange and attracting foreign direct investment but also has provided job opportunities to many people in Kenya and even the government of Kenya has designated it as one of the pillars of accomplishing vision 2030. There is need to ensure that profitability of manufacturing firms is enhanced in order to achieve the vision and continue leaping benefit from them. According to Kiptoo (2017) one way of ensuring that these firms are performing is through a proper management of working capital. These manufacturing firms in Kenya have huge investment of funds in working capital which substantially impact on the profitability depending on its management. Elements of working capital in an organisation are stock or inventory, account payable and account receivable. 20% to 30% of the overall investment in a manufacturing company is made up of inventory. Inventory management must be effective to support firm operations and prevent investing extra resources in idle inventory at the detriment of various profitable projects that could generate more revenue for the company (Kiptoo, 2017).

1.2 Research Problem

Manufacturing sector is a growing sector in Kenya attracting local and foreign investors able to significantly increase the nation's competitiveness and economic growth. However, most of manufacturing firms are in the growing stage facing paradoxical challenges where expenses increase leading to inadequate working capital while cash is needed most in this stage. These expenses strain the cash flow and offset the balance of working capital resulting to challenges in meeting the relatively brief debt obligations and overhead costs (Njeri, 2014). A firm struggling to manage its working capital can only survive but not thrive since thriving and surviving depend on profitability and liquidity. Businesses that perform better and have more liquidity prosper, while

those who face a decline in profits but are still able to have a reasonable level of liquidity for their operations can just get by (Lwiki et al., 2013).

The Kenyan manufacturing majorly contributes to the economic development of the country. According to Kenya Association of Manufacturers (2016) in 2016, the manufacturing sector was among the first three leading sector contributing 11% of the GDP in Kenya. However, due to varying financial conditions the manufacturing sector has undergone fluctuations over the years causing some firms to collapse and emerge accordingly. A sustained GDP growth rate of 10% was recognized in the Vision 2030 as one of the primary drivers as the economic backbone that would enable Kenya to become a middle-income country (Njoroge, 2015).

Many academics have been drawn to this subject to do research in various contexts on the implication of working capital management approaches on financial success. Research was done by Audax (2018) to determine the variables influencing the financial viability of listed manufacturing firms in Kenya. In 2017, Kiptoo conducted a study seeking to elaborate upon the working capital management procedures and financial results of Kenyan tea and processing companies. Another study done by Nduta (2015) established how the financial success of listed manufacturing firms was impacted by working capital management. These studies are essentially identical, however this one aim to determine how working capital management strategies affect the profitability of manufacturing enterprises in Kenya. As a basis, it will look into the following issue: How do working capital management strategies impact Kenyan manufacturer enterprises' financial performance?

1.3 Research Objective

The study's objective is to elaborate upon the consequences of working capital management techniques on financial performance of manufacturing firms in Kenya.

1.4 Value of the Study

The study serves to aid policy makers that are part of the top management for manufacturing firms in Kenya would find the study important as it would provide crucial information regarding working capital management and its implication on the financial performance of manufacturing firms. This study would therefore provide important insight onto the benefits accrued to efficient management of working capital that would improve the financial performance by enhancing efficiency of the allocation of investment fund in a company and would therefore enhance value creation to the shareholders and investors. However, the study informs on the challenges that a firm is likely to face if its working capital is not well managed.

The study is also significant to government and the regulators for example the Capital Markets Authority (CMA) who may come up with regulation on the minimum amount of funds that manufacturing firm is required maintain as working capital for its operation to avoid asset liquidation. The study provides insight on the optimum level that may give manufacturing firms the ideal working capital that each firm should maintain in order to realize maximum returns which enhances their performance.

The study is also of significance importance to academicians and future researchers. Future researchers and academicians have an opportunity to utilise this study's findings develop their literature review and it is also significant in identifying knowledge gaps that would help them advance and improve the findings. The study is therefore important in creating new knowledge,

developing theories, or providing necessary critiques for existing theories and ideologies that would therefore be vital in generating new knowledge.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter elaborates upon the theoretical review where it relates to relevant theories to ascertain the theoretical association the relationship link working capital management and financial performance. The chapter also reviews some empirical studies that are relevant to this study which provides a research gap for the current study. A conceptual framework of the variables was also outlined to show the pictorial relationship of the variables.

2.2 Theoretical Review

This section expounds on three theories which include trade-off theory, pecking order theory and cash conversion theory. This section outlines their theoretical relationship with the study's variables.

2.2.1 Trade - off Theory

This conjecture is based on the literature work written by Miller and Modigliani (1958). The trade-off theory of debt and equity proposes that a corporation picks out how much debt or equity finance to undertake by weighing the costs and advantages (Kraus & Litzenberger, 1973). The ideal capital structure, according to the concept, is a trade-off between interest tax shelters and the costs of financial distress. between working capital management and financing. According to the idea, the advantages of debt, such as tax savings, are weighed against the deadweight cost of insolvency, which includes agency charges.

The theory suggests that financing with debt has an advantage to the firm which is tax benefits of debt and at the same time there is a detriment of financing with debt, the cost of financing distress

which include insolvency costs of debt and other normal costs in the context of operations. A corporation that prioritizes trade-offs maximizes its overall value when selecting the extent to which debt and equity to use for the purpose of firm finances, where the negligible benefit of further increasing debt lowers with an upturn in debt while the negligible cost climbs (Ai, Frank & Sanati, 2021). The best capital structure is a trade-off model, which maximizes the firm's worth by weighing the cost and benefits of adding more debt.

This postulation is fundamental the findings of this study since it establishes the capital structure of a firm referring to the revenue's equity capital and debt the firm uses to finance growth and regular business-oriented operations. Working capital, which is obtained by subtracting current assets and current liabilities, is affected by the financing strategy a firm employ (Kraus & Litzenberger, 1973). The theory explains the differential that exists in capital structure between firms. High target debt ratios are typically found in firms with secure, measurable and plenty of tangible income. The amount of funds tied up in working capital is dependent upon the financial structure of an organsaition which require efficient management in order to save a firm from financial distress.

The trade-off theory's empirical validity has frequently been questioned due to its prediction of a pragmatic correlation connecting earnings and adequate financial leverage. Taxes are high and certain according to Miller (1997), while bankruptcy is uncommon and has less dead-weight costs. Thus, Miller contends that if the trade-off theory were accurate, firms would possess far larger extents of debt than they actually have. Welch (2007) goes on to criticize the trade-off theory further, contending that corporations do not reduce stock price shocks implications to the extent of their abilities, contrary to what the postulation predicts, by altering the mechanical asset values, which can be posited as the reason for the variety in capital structure.

2.2.2 Pecking Order Theory

Pecking Order Theory was first postulated by Donaldson in 1961 and was subsequently adapted by Myers and Majluf (1984) who postulated that the cost of financing a firm is directly influenced by asymmetric information. A firm can be financed from three derivations which include internal equity, debt and new equity. Many firms prefer internal financing first then may go to debt and finally raising equity is treated as the last option. Debt is only used when the internal finance is depleted and when using debt become less sensible equity is issued. According to this theory, businesses follow the hierarchy of financing sources demonstrating how the type of debt used to finance a firm may serve as an indicator that the firm requires external finance. The hierarchy in making financial decisions in a company as well as maximizing the value of a firm through a systematic and strategic decision made by the firm to finance new investment using the cheapest available source of fund forms the basis of this theory.

This hypothesis is agnated to our study in that the theory suggests that the cheapest source of finance for managers is the retained earnings. In this case managers are able to obtain increased retained earnings if they work on their liquidity management strategies. Good cash management practices increase the working capital of the firm, profitability is also enhanced by good working capital management that leads to increased earnings for the firm.

Pecking order theory has a number of criticisms which include the following: firstly, pecking order theory cannot make practical application because of its theoretical nature. It limits the type of funding and new types of funding cannot be included in the theory. The theory's lack of validity to high-and low-leverage firms is another shortcoming. When internal financing is unavailable,

firms with more debt prefer equity financing and high investment levels, while steady revenue firms prefer to borrow first (Yildırım & Çelik, 2021).

2.2.3 Cash Conversion Cycle Theory

Richards and Laughlin (1980) postulated the cash conversion cycle notion after discovering that executives allocate a sizable percentage of their undertaking to managing equity capital. This necessitates putting a lot of work into tasks like handling past-due sales, monitoring cash flow, negotiating credit terms, and finding short-term capital (Aminu & Zainudin, 2015). The proponent argues that when evaluating a firm's liquidity, businesses shouldn't rely on static measures of liquidity like the current asset and acid test ratios because they signal liquidation rather than the going concern approach. The use of inventory and receivable investments in routine business activities should be a firm's primary means of satisfying commitments rather than the through liquidation of assets. As a result, they developed the cash conversion cycle as an instrument for evaluating the effectiveness of working capital management.

One gauge for management efficiency is the cash conversion cycle (CCC). It gauges how quickly businesses can turn their resource inputs into cash. The lower the number, the better for the business, as it tracks how cash is converted from liquid cash to accounts payable (AP), inventory, sales, and debtors before returning to liquid cash. The firm with the lowest CCC typically has stronger management, therefore even while it should be used in conjunction to other measures. It theoretically can be especially helpful when comparing adjacent contenders for performance and customers (Deloof, 2003).

Inventory management, debtor management, and payables management encompass the cash conversion cycle (Aminu & Zainudin, 2015). According to Deloof (2003), perpetuating an optimal

balance of liquidity maximizes shareholder value. In order to ensure profitability while maintaining adequate liquidity to meet short-term obligations, a company must determine the optimal time period from when money is invested in the acquisition of raw materials or finished goods to when resources are converted back serving as financial gain through collection from trade debtors.

2.3 Determinants of Financial Performance

Working capital management is comprised of various factors that requires any firm to make decisions on management of these factors as they may have effect on financial performance. Working capital is comprised of accounts receivables, inventory, accounts payable, and cash. The management of these components stand out individually as factors that require independent decisions in regard to their management. In this study therefore the superintendence of each of these factors will be undertaken independently to determine the bearing of these logistical decisions on profitability of firms involved in the manufacturing sector. This research will also study the effect of size as a critical firm characteristic factor that would determine financial performance in manufacturing firms.

2.3.1 Accounts Receivable Management

Accounts receivable refer to payment that is owed to a business from products already sold or services already rendered by the business. Account receivable management affects the relationship between customers and the business as well as affects the bottom line of the business (Deloof, 2003). Increasing accounts receivable period, means that the firm allows customers to stay longer before paying for products delivered and services rendered. This acts to cause an upturn in sales as more clients are willing to obtain a product if they are allowed enough time before they pay for

it. On the other hand, it increases risk of default and therefore increases provision of bad and doubtful debts, which is an increased expense. The firm must therefore make a decision between the extent to which they want to increase sales and balance with the extra cost they are ready to incur in form of increased provisions of doubtful and bad debts.

2.3.2 Inventory Management

Inventory refers to the goods or items that are traded by the business. In manufacturing firms, it refers to the goods and products manufactured by the firm, for the purpose of trading them at a profit. The management of inventories is crucial as critical decisions need to be undertaken in regard to the number of inventories produced or manufactured by the firm. Producing large quantities of inventories, help the firm to increase efficiency and cost saving measures as the unit cost of production decreases with the amount of goods produced. The element of fixed cost items such as rent of the premises, administrative costs among other fixed costs, decreases with marginal increase in production. Manufacturing large quantities of products also implies that the business organisation is able to meet its projected demand and any other unexpected demand, without the risk of running out of stock, which would reduce sales revenue. On the other hand, producing large quantities of goods, would mean that the firm ties large portion of its capital on inventory, which meaans that the firm would forego returns that would have been earned by the money used in production of these excess units of inventories if that money would have been placed in an interest earning account. The firm would also incur extra costs in form of storage costs that would influence performance (Prastacos, 1984).

2.3.3 Accounts Payable Management

Accounts payable refers to the amount the firm an organisation owes to suppliers of goods or raw materials for the goods supplied to the firm. Accounts payable should be well managed by the firm in order to optimize operations and performance of the company. The company must make a decision in regard to the benefit that would be accrued to the company, against the costs that would be incurred by the decision. Increasing accounts payable, means that the company would miss on the cash discount that is granted for paying in time. The company may also lose creditworthiness from its suppliers and therefore mean that they will not be able to enjoy credit facilities in future. On the other hand, a firm is afforded the ability to forgo current costa and payments and therefore enjoy interests earned on money that would otherwise be paid to the suppliers. The more the duration a firm takes before it pays its creditors, the more the interest the company would earn. This implies that the company must decide on a policy for dealing with accounts payable to influence their bottom line favourably (Prastacos, 1984).

2.3.4 Cash Management

Cash is vital in operating any firm and in particular manufacturing firm. The liquidity risks follow that reducing cash to a certain level increases the risk while at the same time the firm is unable to utilise the upper hand pertaining to any investments opportunity that would arise, with positive NPV. However, holding excess cash on the other hand would imply that the company would miss out on interest that would be earned, if the cash was held in interest-earning instruments. Cash management would therefore ensure that a policy is set out that would make it possible for the firm to reach on an optimal position that would further goals and objectives of the company (Aminu & Zainudin, 2015).

2.3.5 Size

16

Company and organisation size is crucial in defining performance since large firms can hedge on their size and enjoy economies of scale. This means that large firms can receive quantity discounts when ordering goods in bulk and therefore reduce their costs. However, diseconomies of scale may also arise if the firm is not able to well manage its growing size, that would lead to more losses.

2.4 Empirical Studies

Nduta (2015) used descriptive research design targeting ten manufacturing firms that are listed in NSE to look into how working capital management affects earnings reports. Secondary data of eight companies was extracted respective firms' websites and published financial records for a period of five years from 2010 to 2014. Multiple regression and correlation analyses were applied on the data to establish the relationship that exist among the various factors. Study findings revealed a positive relationship connecting current liabilities ratio over total liabilities and return on assets. Ratio of current asset and total asset and the current ratio as well had a positive correlation with improved financial performance. Nevertheless, the research study failed to consider other manufacturing firms that are not listed in the NSE which can affect the finding of a study. The current study considers all manufacturing firms and as well addresses the time gap by carrying a recent study.

Symekah (2017) did a similar study where he adapted descriptive research design and applied census on the ten manufacturing companies as listed in Nairobi Security Exchange. For the purpose of research as well was dependent on fata from secondary sources obtained from financial records of the respective firms regarding financial performance and working capital management. So as to determine the correlation connecting working capital management and financial success, regression and correlation analysis were applied to the data gathered. The results indicated a

substantial implication of working capital on financial performance. Additionally, it conveyed favourable correlation between Kenyan firms' profitability and cash conversion cycle. This study only considers listed manufacturing firms in NSE and fails to consider other manufacturing firms that are not listed.

A study based on a similar basis investigating the implication of working capital management on profitability was undertaken (Lalah, 2018). This study was done on seven manufacturing firms whose financial records were obtained from the respective firms' websites. The study applied explanatory research where descriptive and regression analysis were subjected on the collected data to establish the relation connecting the various factors. Through the tests researchers found a positive correlation connecting equity capital management and financial performance manufacturing organisations and companies. The study failed to consider other manufacturing firms that are not listed. The current study will adopt different methodology to carry out a similar study on all manufactured firms in Kenya.

So as to ascertain the implications of working capital management on either enhanced or unenhanced financial perfromance, Gakondi and Muturi (2019) used a multi-correlational research design. A record survey sheet was used to gather secondary data on the 311 private manufacturing firms in Kenya that were the study's target. Correlation and multiple regression analysis were performed on the data obtained to determine the relationship between the variables. Accounts receivable and the management of cash were found to have a favourable impact on financial viability and profitability. This study focussed only on the private manufacturing firms in Kenya and failed to consider other manufacturing firms in Kenya.

International studies as well have been done to elaborate upon the correlation connecting working capital management and profitability of manufacturing firms. Using panel data methods, Kasozi

(2017) conducted a study on 69 listed manufacturing companies on the Johannesburg Security Exchange to ascertain the implication pertaining to working capital on profitability. The data was subjected to regression analysis so as to give the correlation connecting variables. The findings indicate a negative and correlation connecting average period of collection, average payment period and economic viability in terms of accruing profit. The number of days in inventory and profitability were positively established. The study indicates a contextual gap where it was conducted in another country whereas the current study will be done in Kenya which may not establish similar findings.

Le et al. (2018) conducted a study in Vietnam on 69 publicly traded companies listed on the Ho Chi Minh Stock Exchange to determine the impact of working capital management on financial performance. The following conclusions were reached after the data was taken from secondary sources over a three-year period and put through descriptive and regression analyses. The results indicated the working capital management had pragmatic implications on the performance of the firms financially. Other variables which included growth, liquidity, risk, cash flow and leverage were established to have an antagonistic consequence on financial performance. This study failed to consider manufacturing firms which the current study will focus on.

Mansoori and Muhammad conducted a study in Singapore on the effect of working capital management on a company's profitability (2012). The study used panel data analysis, fixed effect estimation and pooled OSL on the data collected for a period of ten years. The findings indicated that working capital management had a positive impact on financial performance. The study as well revealed that receivable conversion period and inventory conversion period had a obstructive effect on profitability. This study reveals a contexture gap where it is done in another country and does not focus on manufacturing firms.

In Sri Lanka another study was done targeting listed manufacturing firms in the Colombo Stock Exchange (Jayarathne, 2014). This study gathered data over a period of five years, which was then analysed to reveal the relationship between profitability and working capital management. The study portrayed a negative effect connecting account receivable period, cash conversion cycle, inventory turnover period, leverage and profitability. Account payable period was found to have a pragmatic correlation with profitability. Therefore, the study came to the conclusion that performance of manufacturing firms that are listed in Sri Lanka can be improved by proper management of working capital. This study was done in another country different from the current study which will be done in Kenya.

2.5 Summary of the Literature Review

The theoretical review has indicated a theoretical correlation connecting working capital management and financial performance of firms. Trade-off theory encourages the use of leverages to finance a firm due to the benefits accrued interest tax shield at an expense of the cost of financial distress by suggesting that a firm must establish an optimum capital structure when financing a firm with debt to either trade-off interest tax shields or cost of financial distress.

Pecking order theory contrast trade-off theory by suggesting that a firm should first exhaust equity so as to use debt in the financing firms. Both theories affect working capital where more debt indicates less working capital and vice versa. Cash conversion cycle theory on the other hand evaluates how effective a company is managing its working capital. It indicates the time between cash outlay and cash recovery which affect the performance of a firm.

Literature on the empirical studies as well has shown that financial performance is affected by working capital management. All the studies reviewed both local and international indicated that

economic viability is positively affected by working capital management despite time, contextual and methodologies differences. Most of the studies focused on listed manufacturing companies which gives a research gap for the current study.

2.6 Conceptual Framework

Conceptual framework refers to the pictorial correlation connecting the independent and the dependent variables. It indicates how the independent variables, and the control variables influences the outcome variable as indicated in figure 2.1. The independent variables were comprised of factors of working capital management that include accounts receivable management, inventory management, accounts payable management and cash management. Size on the other hand was used as a control variable. Financial performance was the dependent variable of the study.

Figure 2. 1: Conceptual Framework

INDEPENDENT VARIABLES

Accounts Receivable Management

Turnover of Accounts Receivable

DEPENDENT VARIABLE

Accounts Payable

Accounts Payable Ratio

Financial Performance

- ROA

Inventory Management

Inventory Turnover Ratio

Cash Management

Cash Conversion Cycle

21
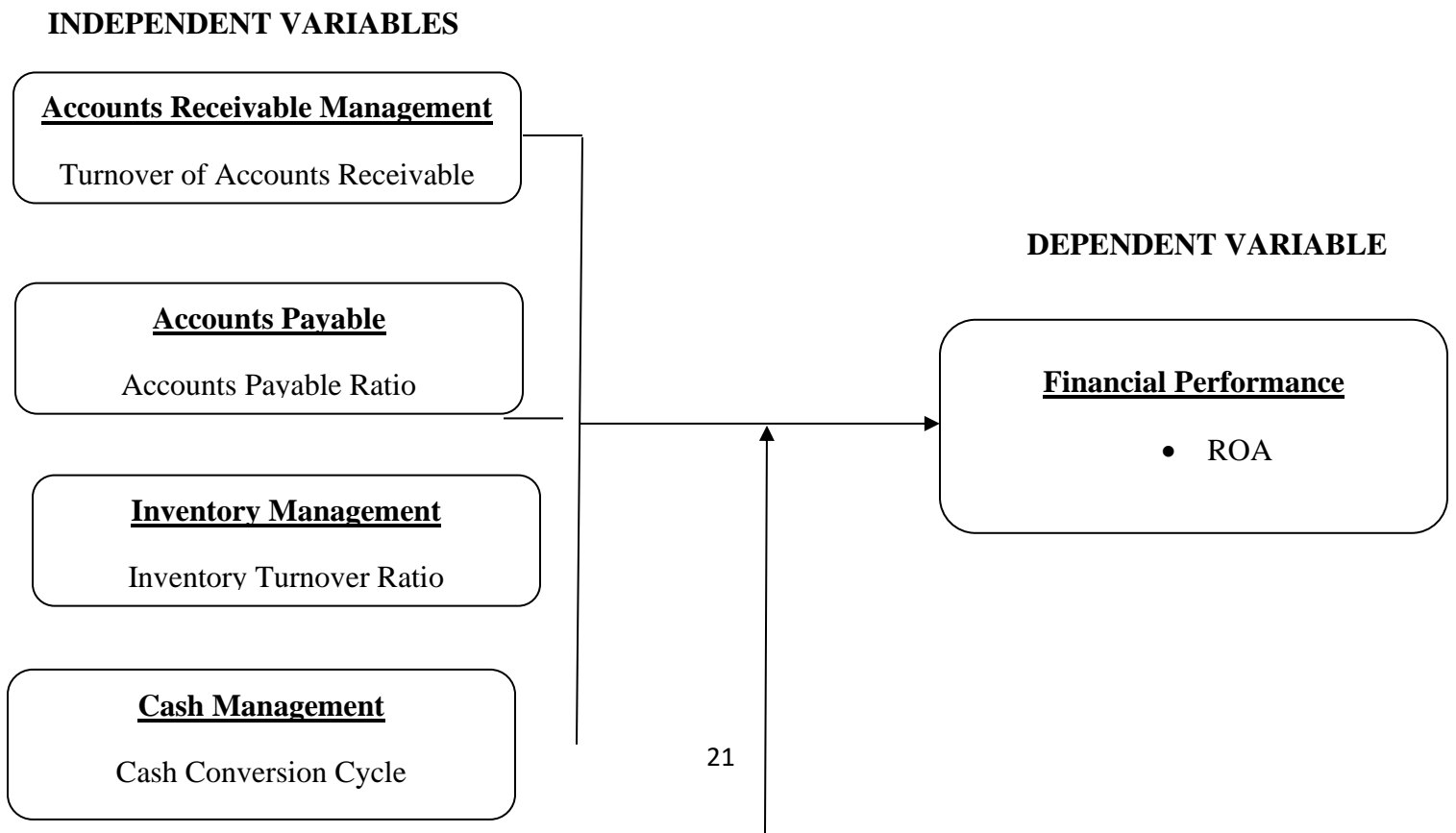
CONTROL VARIABLE

<u>Size</u>

Total Assets

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter entails the research design, population targeted by the study, sampling techniques, data collection and analysis methods, analytic model that was used as well as diagnostic tests consucted to test the robust of the regression model.

3.2 Research Design

Lavrakas (2008) defines research design as a well-defined strategic plan that a researcher follows when conducting a study to get to the research findings which answers a research question. In other words, can be described as a conceptual structure that outlines how a research is conducted. This study employed a descriptive research design which would assist to establish the correlation between financial performance and working capital management.

3.3 Population

A large collection of things or people that share traits that set them apart from other things or people is referred to as a study population (Cooper and Schindler, 2003). The study population will include the licensed manufacturing firms in Kenya, that totals to 501 as per 2021. However, there are only 10 listed manufacturing firms at Nairobi Securities Exchange (NSE). Listed manufacturing firms are required by law to publish their audited annual financial reports and

therefore it is convenient to collect data for listed manufacturing firms. This study therefore undertakes a census study of 5 years from 2017-2021.

3.4 Data Collection

To extract the financial information of Kenyan industrial companies, secondary data was employed. It was gathered through public annual reports, websites of the relevant companies, published manuals, and any other trustworthy sources of information. This information on research variables was gathered over a five-year period, from 2017

3.5 Data Analytics

This research used SPSS version 29 to examine the data collected to give descriptive and inferential statistics. The relationship between independent and dependent variables was undertaken by use of multiple linear regression (MLR) analysis and correlation analysis. MLR analysis is technique that analyses the relationship between dependent variable and several independent variables. The following diagnostic tests were undertaken before applying multiple linear regression analysis to test the magnitude of the regression model.

3.6 Diagnostic Tests

The following diagnostic tests were undertaken before regression analysis: linearity test, normality test, multicollinearity test, autocorrelation test and heteroskedasticity test.

3.6.1 Normality Test

To draw reliable conclusions from a regression, the residual should have a normal distribution. The error term in this situation is the discrepancy between the estimated and observed values of the dependent variable. This study used a non-graphical test by Shapiro Wilk to determine the

normality of the residual. The test is undertaken in that the null hypothesis is rejected if the P-value is less than 0.05 at 95% confident level. In the p-value is greater than 0.05 the study rejects the null hypothesis and therefore concludes that the residual is normally distributed (Royston, 1991).

3.6.2 Linearity Test

If an increase in one unit of the independent variable causes a fixed rise in the dependent variable, the variables are said to be linear. The study tested for linearity using the Pearson correlation coefficient, which also displays the strength and direction of the linear relationship between the independent variables and the dependent variable. A direct proportional relationship is indicated by a positive correlation, and an inverse proportional relationship is indicated by a negative correlation (Field, 2009).

3.6.3 Autocorrelation Test.

Autocorrelation across the period or serial correlation is normally brought by disturbances in time series data. It causes biasness of the standard errors and inefficiency of consistent estimated regression coefficients when presented in a linear panel data model. This study used Durbin-Watson test to test for autocorrelations. The null hypothesis was: There is no serial correlation. The study failed to reject the null hypothesis at 95% confident level if d-statistic is more than 0.05 and concludes that there is no correlation among the error in different observations (Bartels & Goodhew, 1981).

3.6.4 Heteroscedasticity Test

Observations may have regression disturbances which do not have constant variances. This problem is referred to as heteroskedasticity. It may arise in cross-section data as well as time series data. Its presence causes a problem of inefficiency of the estimation results. Trevor Breusch and Adrian Pagan (1979) came up with modified Wald test for heteroskedasticity. This study used Breush-Pagan test in testing for heteroscedasticity.

3.6. 5 Multicollinearity Test

The objective of this test is to ascertain if the independent variables are still independent or whether they interact. Regression analysis makes the assumption that independent variables stay independent and do not interact. Using variation inflation factors (VIF) or tolerance levels, a multi-collinearity test is carried out to ascertain whether or not there is multi-collinearity between the variables. Multicollinearity exists when the VIF values are more than 10. In this instance, the multicollinear variables are not included in the model (Daoud, 2017).

3.7 Analytic Model

This study applied linear regression model to determine the relationship between liquidity management on efficiency. To determine the dispersion and distribution of the data, the study used descriptive statistic. This study conducted correlation analysis to identify the association between the independent variables and the dependent variable

The regression model depicted below was used in the study

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

Y = Financial Performance measured by ROA

X_1 = Accounts receivable management measured by turnover of accounts receivable (Av. Accounts Receivable/Credit Sales *365)

X_2 = Inventory management measured by inventory turnover ratio (Av. Inventory/COS *365)

X_3 = Accounts payable management measured by accounts payable ratio (Av. Accounts Payable/Credit Purchases*365)

X_4 = Cash management measured by cash conversion cycle (CCC) (Inventory Period + Ac Receivable Period – Ac Payable Period)

X_5 = Size of the firm measured by total assets (Ln total Assets)

3.8 Significance Tests

The F-test model was used to assess the study's significance. The model can find the significance level in this study's sample and is simple to run and interpret. The statistical significance level that was used in this study is 0.05, which means that the confidence level will be 95% because the study is statistically significant.

CHAPTER FOUR: DATA ANALYSIS

4.1 Introduction

The chapter undertakes the analysis of data collected where the response rate is highlighted, the descriptive analysis is then undertaken to describe each study variable. Correlation analysis is then undertaken after which diagnostic tests are conducted in the study. Regression analysis is carried out to test the study hypothesis. The chapter then concludes with the summary and interpretation of the study findings.

4.2 Response Rate

The population that was targeted was comprised of manufacturing firms listed at NSE. The study sought to undertake a census study where data from all the manufacturing firms listed at the NSE was collected for 5 years (2017-2021). The study identified 10 manufacturing firms listed at the NSE. However, data from 1 company (A. Baumann Co. Ltd) was not available for all the five years under study. The data from the company was therefore forfeited, and the study obtained data from the remaining 9 listed manufacturing firms for a period of 5 years. This represents a response rate of 90% and adequate for undertaking data analysis (Mugenda & Mugenda, 2003). The response rate above 60% is considered adequate for data analysis and conclusion.

4.3 Descriptive Analysis

The study variables included the dependent variable (ROA-measured performance), as well as the independent variables Accounts receivable management, inventory management, accounts

payable management, cash management, and size. To identify the data obtained for each of the study variables, the variables are defined in terms of mean, standard deviation, minimum and maximum values. It also expresses the data distribution through kurtosis, which assesses the flatness or sharpness of the acquired data, or skewness, which decides whether data is positively, negatively, or not skewed at all.

Table 4. 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
							Std.	Statistic	Std.
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	c	Error
Y_ROA	45	-122.14	33.99	-3.17	30.83	-2.48	.354	6.697	.695
X1_AccsRec	45	27.81	503.81	129.64	111.11	1.76	.354	3.102	.695
X2_InvMgt	45	11.71	272.31	103.95	59.05	1.44	.354	1.797	.695
X3_AccPay	45	16.23	636.10	201.90	129.55	1.07	.354	1.798	.695
X4_CashMgt	45	-322.17	360.56	31.69	138.24	-.031	.354	.538	.695
X5_Size	45	7.43	18.73	12.87	4.23	.098	.354	-1.629	.695
Valid N (listwise)	45								

Researcher, (2022)

Table 4.1 indicates that the total number for each variable was 45. This represents data for a total of 9 manufacturing firms for a period of 5 years. The dependent variable that was determined by calculating the percentage of ROA was used to measure performance. It indicates that the mean performance for these firms were -3.17% indicates that in average manufacturing firms were operating on loss basis in the last five years. The standard deviation that measures the extent to

which the values deviate from the mean indicates a high of 30.83%. This would mean that despite that the average for all the firms was a meagre of -3.17%, the firms had varied performances, with performance of some manufacturing firms being away from the mean in average by 30.83%. It indicates that performance of these firms was not uniform and varied significantly from one firm to the other. The firm that recorded the highest performance recorded ROA of 33.99% while the firm that recorded the least performance recorded ROA of -122.14%. The data is negatively skewed with a skewness of -2.48 and high kurtosis of 6.70.

Accounts receivable management is a working capital management technique that was determined by the study. This variable is one of the independent variables of the study that indicates one area where firms manage their working capital. The study sought to determine the number of days that manufacturing firms allowed their customers before they settled their accounts. The best working capital technique that would be adopted by any firm is to ensure that they collect from their customers as soon as possible. However. Having a very aggressive approach towards accounts receivable would compromise on revenue by the firm and therefore negatively affect performance. On the other hand, relaxing this variable would increase sales on one hand, but would increase provision of bad and doubtful debt, as well as bad debt. This would also affect performance of the firm. Therefore, firms are required to balance between the two extremes and adopt a policy that would help them achieve their objectives (Deloof, 2003).

The accounts receivable variable had a mean of 129.64 days. This indicates that the firms in average allowed debtors to stay with the accounts receivable for a total of 130 days, which is far much beyond the standard practice of 30-45 days. The standard deviation on the other hand was also huge at 111 days, indicating that the variation from the mean from one firm to the other could change to an extent of 111 days. The firm that had the highest number of accounts receivable days

recorded 504 days while the firm that recorded the least indicated only 27.8 days. The data has positive low skewness of 1.76 and a high positive kurtosis of 3.10.

Inventory Management was also another independent variable that measured the number of days it took from the day that order for raw materials was made, the materials were processed into final products and the final products were sold to clients. Firms seek to ensure that they reduce the number of days it takes to process raw materials as well as the number of days final products remain in the firm's warehouses before they are sold to customers. The lower the number of days the better. However, technical capacity as well as market size sometimes limit this target, increasing the number of days. In average, the number of days were 104 days, which were quite high and a standard deviation of 59 days. The firm that recorded the highest number of days, and therefore was performing poor on inventory management, recorded 272 days while the firm that was best performing recorded only 12 days. The data had positive and low skewness and kurtosis.

Accounts payable management on the other hand indicates the number of days a firm takes before paying their suppliers. It is the period from the day the firm receives the goods, to the period that the firm pays for those goods. Liquidity management indicates that the firm should pay as late as possible to ensure that the firm obtains high liquidity, however, the firm should be careful not to lose credit worthiness of the suppliers, and therefore suppliers become unwilling to supply the firm on credit. This calls for the firms to ensure that they balance between the two ends as they put across their policies in regard to accounts payable management. In this study, the average accounts payable for all the listed manufacturing firms was high at 201.90 days with an equally high standard deviation of 129.55 days. The firm that took the longest before paying suppliers recorded a total of 636 days while the firm that recorded the shortest period was only 16 days. The variable had low and positive skewness and kurtosis of 1.07 and 1.80 respectively.

Cash management on the other hand indicates the extent to which a firm is able to manage the number of days it takes for the firm, from the day the firm pays for raw materials for the goods to the day the firm receives payment from the sale of the final products (CCC – Cash conversion cycle). The shorter the days the better for the firm, however, care should be undertaken to ensure that the firm does not pay the suppliers very late to lose creditworthiness and at the same time the firm does not allow customers enough time to pay for goods which decreases sales. The mean for cash management was low at only 37 days with high standard deviation of 138 days. The firm that recorded the highest number of days indicated a total of 361 days and the firm with the least number of days indicated -322 days. A negative in this case would indicate that the firm usually receives payment for goods sold to customers before it has paid suppliers for the raw materials it purchased to make those goods. The data has almost zero skewness and kurtosis at -0.031 and 0.538 respectively.

The study's third variable was size, which represented the total assets owned by the firm. The greater the firm's assets, the greater the firm's size, and vice versa. The natural log of total assets was utilized to calculate the firm's size. The firm size average was 12.87, with a standard deviation of 4.23. The largest enterprise recorded 18.73, while the smallest firm recorded 7.43. Skewness was practically nil, with a negative kurtosis of 0.098 and -1.629.

4.4 Correlation Analysis

The analysis is usually undertaken to determine the extent to which one variable is correlated against one another. A variable correlated against itself gives a correlation of 1, while a variable correlated against a direct opposite variable has a correlation of -1. Variables that have absolutely no correlation have a correlation of 0. The study is interested in the correlation of independent variables against the dependent variable.

Table 4. 2: Correlations Table

Correlations

			Y_ROA	X1_AccsRec	X2_Inv Mgt	X3_AccPa y	X4_Cash Mgt	X5_Size
Spearm an's rho	Y_ROA	Correlation Coefficient	1.000					
		Sig. (2-tailed)	.					
		N	45					
	X1_AccsRe c	Correlation Coefficient	-.497**	1.000				
		Sig. (2-tailed)	<.001	.				
		N	45	45				
	X2_InvMgt	Correlation Coefficient	-.061	.258	1.000			
		Sig. (2-tailed)	.689	.087	.			
		N	45	45	45			
	X3_AccPay	Correlation Coefficient	-.068	.490**	.598**	1.000		
		Sig. (2-tailed)	.657	<.001	<.001	.		
		N	45	45	45	45		
	X4_CashMg t	Correlation Coefficient	-.210	.419**	.111	-.327*	1.000	
		Sig. (2-tailed)	.167	.004	.466	.028	.	
		N	45	45	45	45	45	
	X5_Size	Correlation Coefficient	.455**	-.038	.109	.259	.107	1.000
		Sig. (2-tailed)	.002	.804	.475	.086	.483	.
		N	45	45	45	45	45	45

The study deployed Spearman's Correlation instead of Pearson's correlation, because Spearman's Correlation is a non-parametric test and therefore does not require the data to be normally distributed unlike Spearman's correlation that requires data to be normally distributed.

Table 4.2 indicates that there is almost no correlation (zero correlation) between inventory management and performance, together with accounts payable management with performance. They had correlation of -0.061 and -0.068 respectively. Cash management variable had a negative insignificant correlation of -0.21. However, accounts receivable management had significant negative correlation of -0.497 that indicates that the increasing the number of days for accounts receivable led to significant decrease in performance of the manufacturing firms. Manufacturing firms are therefore required to ensure that as part of their strategic policies, ensure that they put in place accounts receivable management policies, to ensure that they allow their customers just enough period to pay their outstanding balances, since increasing the balances lead to decrease in performance, this would be probably as a result of increase in bad debts and provisions of doubtful debts.

Size on the other hand had a significant positive correlation against performance at 0.455. This indicates that increasing the size of the firm, leads to increase in performance. This could be explained by the fact that increasing the size of the firm leads to economies of scale, where large firms are able to enjoy from quantity discounts, that increases their performance, as well as the ability to reach more customers through advertising, marketing and brand promotion.

4.5 Diagnostic Tests

Diagnostic tests are considered in a study to ensure that the data collected aligns with the requirements of the model adopted in the study analysis. The study adopts multiple linear regression model and therefore the data collected should align with the assumptions made in carrying out regression analysis. The study therefore carried out normality test, linearity test, test for autocorrelations, heteroscedasticity and multicollinearity test.

4.5.1 Normality Test

To draw reliable conclusions from a regression, the residual should have a normal distribution. The error term in this situation is the discrepancy between the estimated and observed values of the dependent variable. This study used Shapiro Wilk test to determine the normality of the residual. The test is undertaken in that the null hypothesis is rejected if the P- value is less than 0.05 at 95% confident level. In the p-value is greater than 0.05 the study rejects the null hypothesis and therefore concludes that the residual is normally distributed (Royston, 1991).

Table 4. 3: Normality Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X1_AccsRec	.187	45	<.001	.805	45	<.001
X2_InvMgt	.201	45	<.001	.852	45	<.001
X3_AccPay	.123	45	.084	.928	45	.008
X4_CashMgt	.112	45	.193	.980	45	.631
X5_Size	.180	45	<.001	.870	45	<.001
Y_ROA	.325	45	<.001	.696	45	<.001

a. Lilliefors Significance Correction

Table 4.3 indicates that all variables under Shapiro-Wil test have p-value less than 0.05 apart from cash management variable that has a p-value of 0.631. This therefore concludes that the variables are not normally distributed apart from cash management variable that is normally distributed. The variables that failed the test imply that they should be transformed to ensure that they form a bell-shaped curve, and this may be undertaken through standardization, through square root of reciprocals among other methods. This study therefore preferred to standardize the variables that were not normally distributed.

4.5.2 Linearity Test

Variables are said to be linear if an increase in one unit of independent variable results to a fixed increased in the dependent variable (Field, 2009). The study adopted the use of distribution plots of the variables to observe whether the distribution of variables has any linear tendency. Variables that do not have linear tendency in their distributions are therefore transformed or standardized. The normal Q-Q plot for cash management variable is as indicated in the figure 4.1. All the other variables have Q-Q plots that follow the diagonal line that indicates that the variables are linear in nature.

Figure 4. 1: Normal Q-Q Plot for Cash Management
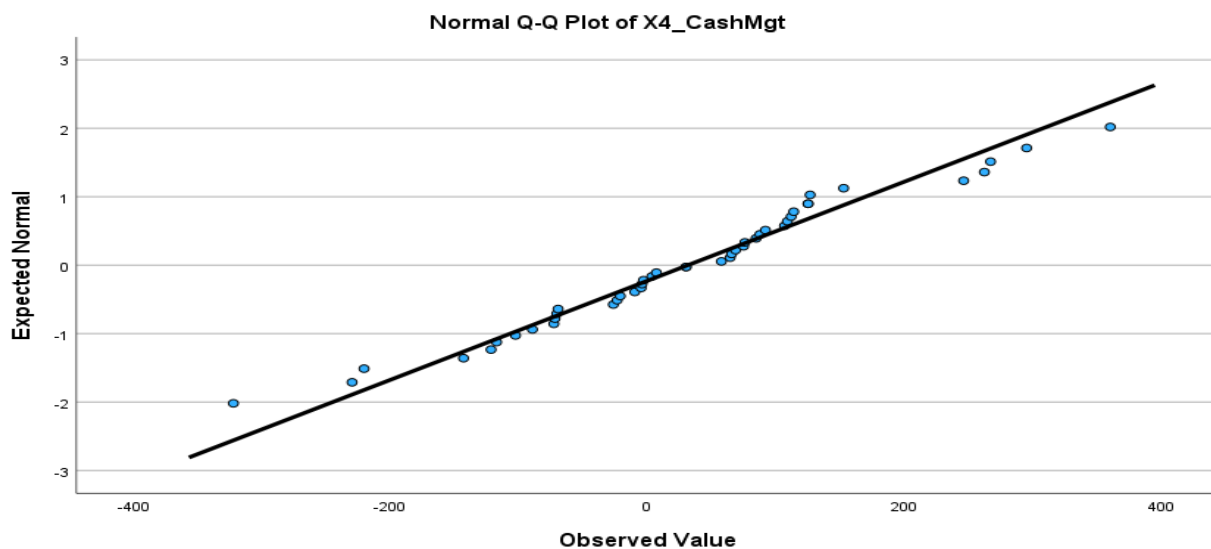
4.5.3 Autocorrelation Test.

Autocorrelation across the period or serial correlation is normally brought by disturbances in time series data. It causes biasness of the standard errors and inefficiency of consistent estimated regression coefficients when presented in a linear panel data model. This study used Durbin-Watson test to test for autocorrelations (Bartels & Goodhew, 1981). The Durbin Watson test ranges

from 0 to 4 with both of these values representing both extremes where there are presence of autocorrelations (either positive or negative). The closer the score to the mid-point (a range from 1.5 to 2.5 indicates that there are no autocorrelations that would have significant effect on the model.

Table 4. 4: Test of Autocorrelation

Model	Durbin-Watson
1	1.308

Table 4.4 indicates that the Durbin-Watson is 1.308 which although it is close to 1.5 indicates that there are significant autocorrelations errors that would affect the regression analysis. This is therefore corrected by undertaking regression analysis by use of standardized values.

4.5.4 Heteroscedasticity Test

Observations may have regression disturbances which do not have constant variances. This problem is referred to as heteroskedasticity. It may arise in cross-section data as well as time series data. Its presence causes a problem of inefficiency of the estimation results. Trevor Breusch and Adrian Pagan (1979) came up with modified Wald test for heteroskedasticity. This study used Modified Breush-Pagan test in testing for heteroscedasticity. The test results are as indicated in the table 4.5 below.

Table 4. 5: Modified Breusch-Pagan Test for Heteroskedasticity[a,b,c]

Chi-Square	df	Sig.
3.182	1	.074

a. Dependent variable: Y_ROA

b. H0 Variance of the errors does not depend on the values of the independent variables.

c. Predicted values from design: Intercept + X1_AccsRec + X2_InvMgt + X3_AccPay + X4_CashMgt + X5_Size

The third variable in the study was size, which reflected the total assets owned by the firm. The larger the firm's assets, the larger the firm, and vice versa. The firm's size was calculated using the natural log of total assets. The average firm size was 12.87, with a standard deviation of 4.23. The largest company scored 18.73, while the smallest company scored 7.43. Skewness was almost non-existent, with negative kurtosis of 0.098 and -1.629.

4.5.5 Multicollinearity Test

This test is used to determine whether the independent variables remain independent or whether they influence each other. Regression analysis assumes that independent variables remain independent and thus do not influence each other. To determine whether or not there is multi-collinearity between variables, a multi-collinearity test is performed using variation inflation factors (VIF) or tolerance levels. When the VIF values exceed 10, multi-collinearity exists. The variables with multicollinearity are excluded from the model in this case (Daoud, 2017).

Table 4. 6: Multi-Collinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	X1_AccRec	.624	2.158
	X2_InvMgt	.437	2.289

X3_AccPay	.420	2.381
X4_CashMgt	.456	2.193
X5_Size	.927	1.079

Table 4.5 indicates that all VIF factors are below 10 and therefore there no problem of multi-collinearity in the data.

4.6 Regression Analysis

Regression analysis is undertaken where the regression model adopted by the study takes the form:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$$

Table 4. 7: Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.477^a	.228	.151	28.41380

a. Predictors: (Constant), X5, X4, X3, X2, X1)
b. Dependent Variable: Y_ROA

The model summary indicated in table 4.7 shows that the co-efficient of determination that is measured by R square is 0.228. It shows that 22.8% of the changes in the dependent variable are predicted by the changes in the variables according to the model. The model can therefore predict 22.8% of the changes in performance of manufacturing firms while other factors outside the model are responsible for predicting the remaining 77.72%. The adjusted R square on the other hand is less than R squared that shows that there are factors in the model that do not act to increase the ability of the model to predict performance of manufacturing firms.

4.6.1 Significance Testing

Testing the significance of the relationship between working capital management techniques and performance, the study adopted the use of F test, where the p-value below 0.05 indicated that the null hypothesis is rejected and therefore there is significant effect of liquidity management techniques on performance of manufacturing firms.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9524.950	4	2381.237	2.949	.032[b]
	Residual	32293.757	40	807.344		
	Total	41818.706	44			

a. Dependent Variable: Y_ROA
b. Predictors: (Constant), Z(X5_Size), Z(X3_AccPay), Z(X4_CashMgt), Z(X2_InvMgt)

The variable X1 (accounts receivable) was found insignificant in the model and therefore only 4 independent variables were tested in the model. The p-value was 0.032 that indicated that it was less than 0.05 and therefore there was statistically significant effect of working capital management on performance of manufacturing firms listed at the NSE.

4.6.2 Regression Coefficients

The co-efficient are indicators of the extent to which each independent variable influences the dependent variable if all other variables are held constant and the variable is increased by one unit.

Table 4. 8: Regression Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-3.174	4.236		-.749	.458
	Zscore(X2_InvMgt)	11.420	6.480	.370	1.762	.086

Zscore(X3_AccPay)	-17.728	6.610	-.575	-2.682	.011
Zscore(X4_CashMgt)	-14.275	6.344	-.463	-2.250	.030
Zscore(X5_Size)	10.985	4.450	.356	2.468	.018

a. Dependent Variable: Y_ROA

The coefficient regressions according to table 4.8 have p -values of less than 0.05 apart from inventory management which is slightly above 0.05 at 0.086. The variables in regard to accounts payable management, cash management as well as size have significant impact on the dependent variable.

The regression equation is therefore transformed into:

$$Y = -3.174 + 11.42X_2 - 17.73X_3 - 14.28X_4 + 10.99X_5 + 4.24$$

This indicates that if inventory management is increased by one day, while holding all other factors constant, then the performance of manufacturing firms would increase by 11.42%. This indicates that increasing inventory management has positive influence on performance. It signals that inventory period by these firms is so short that the firms run risks of undergoing stock outs sessions, mostly when there is spiked demand.

Increasing accounts payable by one day would lead to reduction in performance by 17.73% and therefore an indication that increasing the accounts payable, the firms are likely to lose the credit worthiness from suppliers and therefore undergo losses. Similarly, increasing cash conversion cycle by one day would mean reducing performance by 14.28%. Size on the other hand has a co-efficient of 10.99 indicating that an increase in size by one unit would lead to increase in performance. This would likely emanate from economies of scale enjoyed by larger firms.

4.7 Summary and Interpretation of Findings

The study sought to determine the effect of working capital management techniques on financial performance of manufacturing firms in Kenya. The study targeted manufacturing firms that are listed at NSE since it is easier to obtain data on them. The study therefore targeted a total of 10 firms and the study period consisted of the period 2017 to 2021. The variables that were found to be significant and could express working capital management techniques included accounts receivable management, accounts payable management, inventory management period as well as size of the firm. However, the study was not able to collect complete data from one of the manufacturing firm as it was delisted. The study was however able to get data from all the other nine manufacturing firms for the study period 2017 to 2021. This comprised of a response rate of 90% that was found to be adequate for data analysis.

The study undertook descriptive statistics that described the data collected for each variable in form of mean standard deviation, minimum and maximum, skewness and kurtosis. In summary performance of manufacturing firms was in average poor as it recorded a loss of -3.17%. The variability of returns across the firms was high as depicted by standard deviation. This was also observed in working capital management techniques where it was observed that the firms in average adopted poor policies in regard to accounts receivable management, accounts payable management, inventory period management as well as cash management. The correlation that was undertaken indicated that only accounts receivable as well as size of the firm that had significant effect on financial performance. The working capital management technique indicated that there was negative Spearman's correlation between these working capital management techniques and financial performance.

The regression analysis was used to determine the significance of the effect of working capital management on financial performance of manufacturing firms. The regression model adopted by the model was only able to describe 22.8%. The adjusted R square on the other hand was smaller than R square that indicates that there were some elements in the model that did not help to improve the model. The study found that accounts receivable did not have significant effect on financial performance. The p-value of the F-test was less than 0.05 and therefore the study found statistically significant effect of working capital management on financial performance of manufacturing firms. The regression coefficients indicated that both accounts payable management and cash management had significant but negative impact on financial performance while size and inventory management had positive significant effect on performance.

The findings of the study were similar to the findings as indicated by Symekah (2017) that found a significant impact of working capital on financial performance. Similar findings were indicated by Kasozi (2017) as well as Jayarathne (2014) who had found significant but negative effects of working capital management techniques on financial performance.

The findings were contrary to findings indicated by Nduta (2015) whose findings of the study revealed a positive relationship between the ratio of current liabilities and total liabilities and return on assets. This study indicated a significant but negative effect of working capital management and financial performance. The study by Lalah (2018) also indicated that there was a positive correlation between working capital management and financial performance of listed manufacturing firms. Mansoori and Muhammad (2012) used fixed effect estimation and pooled OSL on the data collected for a period of ten years. The findings indicated that working capital management had a positive impact on profitability.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The effect of working capital management techniques on financial performance was sought to be determined in this study. The chapter therefore undertakes a summary of the study findings, the conclusion arrived at by the study as well as recommendations. The limitations encountered by the study are also highlighted while areas for future research are elaborated.

5.2 Summary of the Study

The study was undertaken in the understanding that working capital management techniques is one critical area that influences liquidity of the firm while at the same time have other underlying effects on financial performance depending on the policy adopted by one firm over the other. Increasing liquidity of a firm implies that the firm reduces liquidity risks as well as bankruptcy risks. However, increasing liquidity beyond a certain point means that the management is not lucrative in identifying opportunities with positive NPVs and therefore increase the financial performance of the firm. Management therefore requires developing policies that will help to balance between the risk and the returns for each decision they make.

The study sought to determine the effect of working capital management techniques on financial performance of manufacturing firms in Kenya. The study targeted manufacturing firms that are listed at NSE since it is easier to obtain data on them. The study therefore targeted a total of 10 firms and the study period consisted of the period 2017 to 2021. The variables that were found to be significant and could express working capital management techniques included accounts receivable management, accounts payable management, inventory management period as well as

size of the firm. However, the study was not able to collect complete data from one of the manufacturing firm as it was delisted. The study was however able to get data from all the other nine manufacturing firms for the study period 2017 to 2021. This comprised of a response rate of 90% that was found to be adequate for data analysis.

The study undertook descriptive statistics that described the data collected for each variable in form of mean standard deviation, minimum and maximum, skewness and kurtosis. In summary performance of manufacturing firms was in average poor as it recorded a loss of -3.17%. The variability of returns across the firms was high as depicted by standard deviation. This was also observed in working capital management techniques where it was observed that the firms in average adopted poor policies in regard to accounts receivable management, accounts payable management, inventory period management as well as cash management. The correlation that was undertaken indicated that only accounts receivable as well as size of the firm that had significant effect on financial performance. The working capital management technique indicated that there was negative Spearman's correlation between these working capital management techniques and financial performance.

The regression analysis was used to determine the significance of the effect of working capital management on financial performance of manufacturing firms. The regression model adopted by the model was only able to describe 22.8%. The adjusted R square on the other hand was smaller than R square that indicates that there were some elements in the model that did not help to improve the model. The study found that accounts receivable did not have significant effect on financial performance. The p-value of the F-test was less than 0.05 and therefore the study found statistically significant effect of working capital management on financial performance of manufacturing firms. The regression coefficients indicated that both accounts payable management and cash

management had significant but negative impact on financial performance while size and inventory management had positive significant effect on performance.

5.3 Conclusion of the Study

From the study findings, the study undertakes different conclusion which may be classified per each study variable.

5.3.1 Accounts Receivable Management Technique

Accounts receivable was noted as an important factor that can be used by managers in a firm to ensure that they manage working capital of the firm. The firm is considered to be operating optimally if it is able to collect accounts receivable as quickly as possible to the extent that the pressure in collecting the receivable does not significantly affect revenue for the firm. However, the study indicated that in average, manufacturing firms collected receivables after 130 days, far much beyond the recommended period of 30-45 days. The variability ascertained by huge standard deviation indicated that different firms adopted different policies in regard to accounts receivable management technique. The correlation between accounts receivable and financial performance was significant and negative. It indicated that increasing accounts receivable days would lead to decrease in financial performance. It was considered that the decrease would be as a result of increase in bad and doubtful debts that would significantly affect financial performance. The variable, however, did not contribute significantly towards strengthening the predictability of the regression model.

5.3.2 Inventory Management Technique

The technique involves ensuring that the inventory is turned over as quickly as possible so as to avoid incurring extra stock handling costs as well as storage costs. Despite the fact that the variable had negative correlation with financial performance (-0.061) the value was insignificant and close

to zero indicating a weak correlation. It was therefore not the best variable for management to consider when undertaking capital management decisions and financial performance. Similarly, the regression model indicated that the variable did not contribute significantly towards, predicting financial performance for manufacturing firms.

5.3.3 Accounts Payable Management Technique

The technique seeks to ensure that the firms pay their suppliers as late as possible (to improve liquidity) but at the same time being cautious that the firm do not lose creditworthiness and the suppliers refuses to extend credit facilities to the firm. In average the accounts payable days exercised by the firms were 202 days which was extremely high. This shows that competitive suppliers would not be willing to supply these firms except in the situation were they supply at very high prices or in situations where suppliers do not have alternative markets to take their goods.

Despite the fact that accounts payable did not have significant or strong correlation against financial performance. It had significant effect on financial performance as an increase in one more day would lead to decrease in financial performance by 17%. The study therefore concludes that the firms should consider their accounts payable management techniques as the current practices are adversely affecting financial performance.

5.3.4 Cash Management

The management of cash means that managers should ensure that they have enough cash to meet their cash demands and reduce liquidity risks but having so much cash would mean that they would lose on opportunities with positive NPV. Cash management had a negative impact on financial performance. This means that increasing cash conversion cycle would lead to decrease in financial performance. The study therefore concludes that firms should ensure that they reduce the number

of days it takes them to convert inventory to cash as it would lead to improved performance. Increasing cash conversion cycle would mean that the period from the day the firm pays suppliers for goods delivered to the day the firm receives cash from its customers is increased. The study concludes that decreasing the CCC in these firms would improve performance.

5.3.5 Size

The study finds significant positive effect of size on financial performance. It means that large firms are able to enjoy from buying in bulk and they could easily enjoy quantity discounts. Other benefits would include increased revenue as it is easy for them to undertake targeted marketing, sales and promotion. Large firms are also trusted by clients as able to deliver quality products and can confidently sell their products at higher margins than their smaller counterparts. The study therefore concludes that the larger the size of the firm the better the financial performance.

5.4 Recommendations

From the study conclusion, there are different recommendations that are undertaken. The study recommends that accounts receivable management technique should be deployed by manufacturing firms to ensure that they collect receivables as soon as possible without affecting sales in a significant way. The firms should reduce the number of days they take to collect receivables. The study also recommends that managers in manufacturing firms should not bother working on inventory management technique as it does not have significant effect on financial performance. The correlation is also almost zero.

The study also recommends that accounts payable should be reduced as increasing the number of days for paying accounts payable, lead to reduce credit worthiness of the firm. The firm is only therefore able to access highly priced goods, low quality and non-competitive products that affects their final products in the market. Similarly, the manufacturing firms are better reducing the cash

conversion period as it helps them to generate cash as fast as possible and deal with liquidity risks among other risks. The study also recommends firm to ensure that they build their capacity to increase their size as larger firms have better financial performance than smaller firms.

5.5 Limitations of the Study

There are several limitations that might have effect on the findings of the study. Despite the fact that due diligence and sensible assumptions were made in regard to the study, there still exists limitations that would potentially affect the findings of the study. The study made an assumption that all sales that were made by each manufacturing firm were made on credit terms. This may not be very accurate as some of the sales are made on cash basis. The research did not get a way to ascertain the portion of sales made by cash or those made on credit. The same case also applied to the total purchases.

The study ignored the aspect of inflation and therefore absolute figures were considered without consideration of the impact of consumer price indices. The value of the shilling 5 years ago, would not be the same as the value today considering the difference in inflation between the two periods.

The study collected secondary data, which may be subject to errors of original entry, or errors in presentation of data. The researcher however, only relied on audited financial statements that are considered to be more accurate although this may not take away the inaccuracies that may have been undertaken. The study was only limited to five years, and only listed manufacturing firms were considered.

5.6 Areas for Further Research

Future research should be considered where the exact amount of good purchased on credit should be ascertained. The sales made on credit should also be well ascertained and therefore the assumption that all the sales were made on credit should not be made in future research.

The study also recommends the undertaking of a similar study where primary data is considered. Primary data will address the inadequacies of secondary data and the results of such a study should be compared to the findings of this study.

A similar study could also be undertaken by future researcher where real variables are adopted by the study and therefore the element of inflation is considered in the study. This would ensure that the real value is considered rather than the absolute values of variables.

REFERENCES

Aggrey, N., Eliab, L., & Joseph, S. (2010). The relationship between firm size and technical efficiency in East Africa manufacturing firms. *Journal of Sustainable development in Africa*, *12*(4), 226-236.

Ai, H., Frank, M. & Sanati, A. (2021). The Trade-Off Theory of Corporate Capital Structure. *Oxford Research Encyclopedia of Economics and Finance*.

Akoto, R. K., Awunyo-Vitor, D., & Angmor, P. L. (2013). Working Capital Management and Profitability: Evidence from Ghanaian Listed Manufacturing Firms. *Journal of economics and international finance*, *5*(9), 373-379.

Alvarez, T., Sensini, L., & Vazquez, M. (2021). Working Capital Management and Profitability: Evidence from an Emergent Economy. *International Journal of Advances in Management and Economics*, *11*(1), 32-39.

Aminu, Y., & Zainudin, N. (2015). A review of anatomy of working capital management theories and the relevant linkages to working capital components: A theoretical building approach. *European Journal of Business and Management*, *7*(2), 10-18.

Audax, A. (2018). Factors affecting financial performance of manufacturing firms listed in Nairobi Securities Exchange Kenya. *Unpublished Doctoral dissertation*, United States International University-Africa.

Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2010). Working Capital Management in SMEs. *Accounting & Finance*, *50*(3), 511-527.

Bartels, R., & Goodhew, J. (1981). The Robustness of the Durbin-Watson Test. *The Review of Economics and Statistics*, 136-139.

Breusch, T. S., & Pagan, A. R. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica: Journal of the econometric society*, 1287-1294.

Cooper, D. R., & Schindler, P. S. (2003). Research methods. *Boston, MA: Irwin*.

Daoud, J. I. (2017). Multicollinearity and Regression Analysis. In *Journal of Physics: Conference Series* (Vol. 949, No. 1, p. 012009). IOP Publishing.

Deloof, M. (2003). Does working capital management affect profitability of Belgian firms?. *Journal of business finance & Accounting*, *30*(3-4), 573-588.

Field, A. (2009). Discopering Statistics Using SPSS, thrid edition.

Gakondi, E. W., & Muturi, W. (2019). Effects of Working Capital Management on Financial Performance of Private Manufacturing Firms in Kenya. *International Journal of Social Science and Information Technology*.JKUAT.

García-Teruel, P. J., & Martínez-Solano, P. (2007). Effects of Working Capital Management on SME Profitability. *International Journal of managerial finance*.

Gitman, L., Megginson, W. L., & Smart, S. B. (2008). Corporate Finance. *London: Thompson*.

Jayarathne, T. A. N. R. (2014). Impact of working capital management on profitability: Evidence from listed companies in Sri Lanka. In *Proceedings of the 3rd International Conference on Management and Economics* (Vol. 26, No. 1, pp. 269-274).

KAM (2016), Kenya Association of Manufacturers (2015/2016). Edition Directory.

Kasozi, J. (2017). The effect of working capital management on profitability: A case of listed manufacturing firms in South Africa. *Investment management and financial innovations*, *14*(2), 336-346.

Kiptoo, I. K. (2017). Working capital management practices and financial performance of tea processing firms in Kenya. *Unpublished Doctoral dissertation*, University of Embu.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The journal of finance*, *28*(4), 911-922.

Lalah, A. A. (2018). Effects of working capital management on financial performance of manufacturing companies listed at the Nairobi securities exchange, Kenya. *Unpublished MBA Project*.

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. Sage publications.

Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in the Athens stock exchange. *Journal of financial management and analysis*, *19*(1).

Le, H. L., Vu, K. T., Du, N. K., & Tran, M. D. (2018). Impact of working capital management on financial performance: The case of Vietnam. *International Journal of Applied Economics, Finance and Accounting*, *3*(1), 15-20.

Lwiki, T., Ojera, P. B., Mugenda, N. G., & Wachira, V. K. (2013). The impact of inventory management practices on financial performance of sugar manufacturing firms in Kenya. *International Journal of Business, Humanities and Technology*, *3*(5), 75-85.

Mansoori, D. E., & Muhammad, D. (2012). The effect of working capital management on firm's profitability: Evidence from Singapore. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(5).

Miller, M. H. (1977). Debt and Taxes. *the Journal of Finance*, *32*(2), 261-275.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, *48*(3), 261-297.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, *13*(2), 187-221.

Nazir, M. S., & Afza, T. (2009). Impact of Aggressive Working Capital Management Policy on Firms' Profitability. *IUP Journal of Applied Finance*, *15*(8).

Nduta, M. W. (2015). The effect of working capital management on financial performance of manufacturing firms listed in Nairobi security exchange. *Unpublished Doctoral dissertation*, University of Nairobi.

Ngugi B. (2021). Manufacturing in Fifth Year GDP Contribution Dip. *Business Daily*. Manufacturing in fifth year GDP contribution dip - Business Daily (businessdailyafrica.com)

Njeri, K. C. (2014). Effect of internal controls on the financial performance of manufacturing firms in Kenya. *unpublished thesis*.

Njoroge, I. M. (2015). The effect of liquidity on the financial performance of construction and allied companies listed at the Nairobi Securities Exchange. *Unpublished Doctoral dissertation*, University of Nairobi.

Nyabenge, V. O. (2014). Effect of working capital management on financial performance of manufacturing firms in Kenya. *Unpublished Doctoral dissertation,* University of Nairobi.

Ponsian, N., Chrispina, K., Tago, G., & Mkiibi, H. (2014). The Effect of Working Capital Management on Profitability. *International Journal of Economics, Finance and Management Sciences*, *2*(6), 347-355.

Prastacos, G. P. (1984). Blood inventory management: an overview of theory and practice. *Management science*, *30*(7), 777-800.

Richards, V. D., & Laughlin, E. J. (1980). A cash conversion cycle approach to liquidity analysis. *Financial management*, 32-38.

Royston, P. (1991). Estimating Departure from Normality. *Statistics in medicine*, *10*(8), 1283-1293.

Securities, U. S., & Exchange Commission. (2007). Beginners' Guide to Financial Statements. [On-line].

Symekah, P. N. (2017). The effect of working capital management on financial performance of manufacturing companies listed at the Nairobi Stock Exchange. *Unpublished Doctoral Dissertation,* University of Nairobi.

Welch, I. (2004). Capital Structure and Stock Returns. *Journal of Political Economy*, *112*(1), 106-131.

Yamane, Taro. 1967. *Statistics, An Introductory Analysis*, 2nd Ed., New York: Harper and Row.

Yıldırım, D., & Çelik, A. K. (2021). Testing the pecking order theory of capital structure: Evidence from Turkey using panel quantile regression approach. *Borsa Istanbul Review*, *21*(4), 317-331.

APPENDICES

Appendix 1: List of Manufacturing Firms Listed at NSE

1	B.O.C Kenya Ltd Ord 5.00
2	British American Tobacco Kenya Ltd Ord 10.00
3	Carbacid Investments Ltd Ord 5.00
4	East African Breweries Ltd Ord 2.00
5	Mumias Sugar Co. Ltd Ord 2.00
6	Unga Group Ltd Ord 5.00
7	Eveready East Africa Ltd Ord.1.00
8	Kenya Orchards Ltd Ord 5.00
9	A.Baumann CO Ltd Ord 5.00
10	Flame Tree Group Holdings Ltd Ord 0.825

Source: NSE website

Appendix 2: Data Collection Form

Company Name	Year	Net profit/(loss)	Total Assets	Total Revenue	Accounts Receivable	Accounts Payable	Free Cash Flow	Inventory
	2016							
	2017							
	2018							
	2019							
	2020							
	2021							

DATA USED

Company	Year	Y_ROA	X1_AccsRec	X2_InvMgt	X3_AccPay	X4_CashMgt	X5_Size
BOC	2017	1.766929	109.3703	114.6393	453.7805	-229.771	7.70916
BOC	2018	3.061846	106.839	113.8899	441.1854	-220.457	7.669377
BOC	2019	2.805375	127.2791	105.9978	376.2624	-142.986	7.597215
BOC	2020	4.865651	138.3383	93.1932	300.9146	-69.3831	7.644564
BOC	2021	5.425295	106.5437	81.43136	192.7082	-4.73319	7.599455
BAT	2017	29.70948	27.81409	209.2251	162.0706	74.96863	16.23399
BAT	2018	22.27323	28.29912	197.8008	168.3234	57.77651	16.7245
BAT	2019	17.71328	29.54627	149.316	171.6998	7.16252	16.90366
BAT	2020	25.41938	39.18019	113.7055	176.3147	-23.429	16.89309
BAT	2021	26.88101	41.39102	106.2153	168.6026	-20.9963	16.9985
Mumias	2017	-28.1184	165.4015	81.83079	121.9708	125.2616	10.08959
Mumias	2018	-93.9559	178.1327	88.90403	236.7808	30.25593	9.687506
Mumias	2019	-17.7493	30.42634	36.10377	70.61741	-4.0873	10.19619
Mumias	2020	-28.1184	165.4015	81.83079	121.9708	125.2616	10.08959
Mumias	2021	-93.9559	178.1327	88.90403	236.7808	30.25593	9.687506
Flame T	2017	2.379536	118.3052	60.40738	86.66136	92.05118	7.427144
Flame T	2018	1.848831	111.4504	66.42303	93.10113	84.77228	7.516977
Flame T	2019	1.972819	101.6732	78.61006	111.5085	68.77471	7.732369
Flame T	2020	3.013258	73.163	86.96863	94.39655	65.73508	7.819636
Flame T	2021	3.547826	65.16701	96.79513	85.86796	76.09418	7.963808
Carbacid	2017	10.65324	100.915	77.08466	250.6856	-72.686	15.01154
Carbacid	2018	15.26054	94.97159	80.31196	184.9532	-9.66963	14.48651
Carbacid	2019	12.72895	93.01479	62.04799	151.4277	3.635127	14.54722
Carbacid	2020	8.948984	98.93481	52.98537	154.7984	-2.87819	15.10415
Carbacid	2021	10.59136	82.2831	38.1406	146.7943	-26.3706	15.1814
Unga Grp	2017	1.649921	43.31443	51.6743	30.43959	64.54914	9.154299
Unga Grp	2018	5.124333	49.14586	54.86713	16.23463	87.77836	9.203618
Unga Grp	2019	3.212474	60.17727	64.64655	17.90194	106.9219	9.27294
Unga Grp	2020	0.506182	59.40339	84.42115	16.98047	126.8441	9.396903
Unga Grp	2021	1.920589	48.15303	81.11875	20.10205	109.1697	9.215228
Eveready	2017	33.98999	235.2866	272.3109	261.2236	246.3739	13.88668
Eveready	2018	-19.4633	269.5805	267.2189	269.465	267.3343	13.25998
Eveready	2019	-122.138	225.6088	147.9606	261.5028	112.0667	12.4233
Eveready	2020	-34.3188	167.4699	127.9409	416.9906	-121.58	12.21148
Eveready	2021	-21.7918	162.7252	151.1996	636.096	-322.171	11.97787
EABL	2017	11.589	55.85681	72.80236	199.0394	-70.3802	18.01521
EABL	2018	8.685971	44.4083	68.26501	202.0219	-89.3486	18.24074

EABL	2019	12.1577	35.7501	62.64885	215.6409	-117.242	18.36638
EABL	2020	7.919063	33.87195	79.64721	216.0382	-102.519	18.3003
EABL	2021	6.953803	39.70995	84.97417	196.5097	-71.8255	18.42185
KOL	2017	5.296215	260.049	11.71014	157.6888	114.0704	18.50021
KOL	2018	7.756347	291.9225	63.08612	202.0725	152.9361	18.55666
KOL	2019	6.201244	387.5413	138.7777	263.7975	262.5215	18.72819
KOL	2020	-9.9353	447.9959	182.7195	335.2817	295.4338	18.65375
KOL	2021	2.906947	503.8106	246.8745	390.1295	360.5556	18.6593