EFFECTS OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY OF LISTED MANUFACTURING COMPANIES AT THE NAIROBI SECURITIES EXCHANGE

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI

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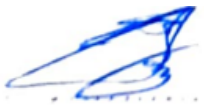
DECLARATION

I declare that this management research project is my original work and has not been submitted for an award at any university or institution of higher learning.

Signature…  …… Date …28th NOVEMBER 2022……

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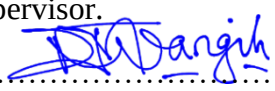
Signature……  …… Date 01 December 2022…….

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ABSTRACT

The study sought to examine WCM effect on profitability of NSE listed manufacturing firms for periods 2012 to 2021.The study was anchored on 3 theories; theory of working capital management, cash conversion cycle theory and rent theory of profitability. Secondary data utilized was sourced from annual reports from company's websites as well as from NSE and CMA websites. Panel data analysis was employed in the study on a population of eight NSE listed manufacturing firms as at 31st December 2021.

The analysis revealed a statistically significant positive correlation between Profitability and ICP, a significant negative relationship between profitability and ACP and lastly firm size and profitability were also established to be significantly and positively related. CCC and Debt ratio were established to be positively associated to profitability while PDP was established to relate negatively with profitability. However, the relationship was not statistically significantly.

Fixed effects (FE) model was the most appropriate model for analysis of data under investigation. Study findings established that firm size and debt ratio had a significant effect on profitability. However, all other variables were not statistically significant. Utilizing firm size and debt ratio as moderating variables study results indicated that ICP, ACP, PDP and CCC explained 22.11% of any change that may occur in profitability. When the independent variables interacted with firm size the predictive power of the model improved by 0.64% to 22.75%, further when debt ratio was introduced to the model the explanatory power rose by 0.57% to 22.68%.This findings indicate that firm size and debt ratio slightly moderated the relationship between WC and profitability.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACP - Average Collection Period

AR – Accounts receivable

AP – Accounts payable

APP - Average payment period

CA – Current Assets

CCC - Cash conversion cycle

COS- Cost of Sales

CR -Current Ratio

DR - Debt Ratio

EBIT-Earnings before interest and tax

GDP- Gross Domestic Product

ICP – Inventory Conversion Period

NSE -Nairobi Securities Exchange

PDP – Payable deferral period

ROA – Return on Assets

ROI – Return on Investments

ROCE - Return on capital employed

ROE - Return on equity

SME - Small and Medium Enterprises

SPSS - Statistical Package for Social Sciences

TA – Total Assets

WC - Working Capital

WCM - Working Capital Management

DEDICATION

I dedicate this research thesis to the Lord almighty for his grace and to all my family members for the moral, material and academic support rendered.

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I proudly acknowledge and forever thankful for the support accorded by my supervisor in undertaking this project, Prof. Cyrus Iraya for the guidance, encouragement, patience and vast knowledge. Thank you very much.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Working capital management (WCM) involves administration of both current assets and current liabilities (Yousaf and Bris, 2021; Pais and Gama, 2015;Akoto et al., 2013), which form key components of corporate finance affecting how liquid and profitable a firm is (Iqbal et al., 2017;Taleb et al., 2010).Construction and manufacturing firms are unique due to their current assets accounting for larger proportion in their large asset base hence WCM model becomes very important (Sumathi, 2021;Paul and Mitra, 2018).Unnecessarily high investment in liquid assets can result in low return on investment (Korent and Orsag, 2018). In contrast, firms holding few current assets may face out of stock and encounter disrupted business operations (Aldubhani et al., 2022) suggesting that there exists an optimal WC level that balances expected benefits and costs. The optimal WC level maximizes firm profitability (Korent and Orsag, 2018) and can create a competitive advantage (Sumathi, 2021).

The study was underpinned by three theories; cash conversion theory, WCM theory and rent seeking theory of profitability (Akoto et al., 2013).The theory of WCM supports the critical role played by current assets in promoting firm value. The rent seeking theory indicates that firms' earnings are determined just like land rent. Proponents of this model noted that as superior grade of land drew more rent than the inferior one, likewise superior entrepreneurs earn more profit than the inferior(Uremadu et al., 2012).However, according to cash conversion cycle (CCC) theory, there exist various dynamic liquidity measures of a firm's profitability and that CCC can be used as a liquidity measure thus making analysis less intuitive as opposed to static financial ratios use (Akoto et al., 2013).

Based on past studies, there are diverse views and findings with respect to the association between WCM and profitability. A number of studies identified positive relationship (Sumathi, 2021;Korent and Orsag ,2018; Hassan, 2017;Tahir & Anuar, 2016;),while others have established negative relationship (Wesley et al., 2013; Ray, 2012; Izadinia and Taki, 2010; Saad and Mohamad, 2010;). This indicates lack of consensus as pertains the exact association between

WCM and profitability. Consequently, this research sought to bridge that gap by investigating the effect WCM has on profitability of NSE listed manufacturing firms.

1.1.1 Working Capital Management

Iqbal et al., (2017) argument was that WCM relates to firms short-term financial analysis requiring firms to include net working capital, an indicator of its ability to meet short-term financial requirements (Paul and Mitra, 2018). Current liquidity depicts a firm's profitability and thus to optimize WC, management should tradeoff between profit maximization and liquidity (Nadeem et al., 2017). Additionally, it should be noted that WCM is the administration as well as management of both liquid assets as well as current liabilities (Hoque et al., 2017).WCM is a business tool that aids firms effectively optimize current assets while generating cash to satisfy short term objectives and obligations (Aldubhani et al., 2022).WC significantly affects firms' profitability (Nastiti et al., 2019) and therefore sound WCM is a requisite for a firm's survival (Mazumder, 2015) and its management can create competitive advantage (Sumathi, 2021;Paul and Mitra, 2018).

In theory, WCM models may be easy and uncomplicated, but in practice, it has set off key issues in companies with finance managers battling to identify basic WC drivers and optimal WC levels and its importance in influencing profitability ((Nastiti et al., 2019;Yameen et al., 2019). Lack of understanding on how working capital impacts profitability, the haziness about its drivers and leadership's inability to manage its components may result in bankruptcy. Additionally fewer current assets will expose the firm to difficulties in managing its operations, liquidity risk and thus reduce its capabilities to achieve short-term financial obligations (Aldubhani et al., 2022).

Different researchers as well as studies have operationalized working capital differently. Amponsah-Kwatiah and Asiamah, (2021) in their study noted that account receivables, current asset, inventory management, account payables, CCC and firm size impact ROA as well as ROE positively. Hoque et al., (2017) showed that CCC, Inventory conversion period, Days sales outstanding and current ratio are WCM elements influencing ROA and Net profit margin(NPM).Aldubhani et al., (2022) utilized inventory turnover, ACP, average payment

period and CCC as proxies for WCM. CCC, current ratio (CR), days sales outstanding (DSO), days inventory outstanding (DIO), days payable outstanding (DPO) and debt ratio (DR) were adopted as WCM proxies (Basyith et al., 2021).

According to Makori and Jagongo (2013) WCM is the proficiency to successfully control current assets as well as liabilities to enhance profit maximization through increasing ROA and reducing liabilities' payments. Wesley et al., (2013) conceptualized working capital elements as CCC and ACP. Akoto et al., (2013) found that, account receivables, inventory management, account payables, current ratio, CCC, current asset, and firm size positively affected firms' ROA and ROE. However, leverage had a negative influence on ROA and ROE.

1.1.2 Firm Profitability

The ability to generate income based on operation efficiency levels and available resources is a concept referred to as profitability (Napompech, 2012) and is an important pillar for any firm to survive for the future (Alarussi and Alhaderi, 2018).Profitability allows firms to gain profit from their investment opportunities(Akoto et al., 2013).A firm's profitability also depends on ROE, ROA as well as other ratios dealing with return on investment. ROE measures a firm's profits generated using shareholders' funds (Gibson, 2011).Profitability is a key factor if a firm is to remain competitive and refers to the likelihood that it will be financially successful (Munir, 2019).

Different researchers have operationalized profitability differently. ROA was utilized as proxy for firm profitability (Deari et al., 2022; Amponsah-Kwatiah and Asiamah, 2021;Basyith et al., 2021;Olaoye et al., 2019; Korent and Orsag, 2018) which was operationalized as profits realized in relation to assets .(Novak et al., 2021) studied WCM impact on manufacturing SMEs in Czech Republic used Earnings Before Interest Tax and depreciation (EBITDA) as profitability measure. Akoto et al., (2013) measured firm profitability based on ROA and ROE. Similarly, Makori and Jagongo(2013) measured firm profitability using ROA which was calculated as EBIT divided by total assets. ROE was utilized as the firms' profits realized in relation to shareholders' equity (Hongli et al., 2019;Nadeem et al., 2017;Wesley et al., 2013).

1.1.3 Working Capital Management and Profitability

From past studies on WCM and profitability, it is evident that WCM promotes a firm's profitability. Korent and Orsag, (2018) noted that WCM has significant effect on profitability of Croatian software enterprises with results implying that there exists a nonlinear, concave quadratic association between net WC and ROA suggesting existence of an optimal WC level that maximizes profits. Aldubhani et al., (2022) established that firms with shorter CCC and average collection periods are more profitable whilst longer average payment and days sales of inventory are associated with higher profitability levels.

Agustiyana, (2022) conducted a study on WCM impact on ROA in 39 listed consumer goods firms on the Indonesian Stock Exchange from 2015 – 2019. Multiple regression and correlation analysis were used with results indicating that extending both Days Payable and Days Sales Outstanding had a profitable impact on ROA. In contrast extending Days Sales of Inventory (DSI) and CCC adversely impacted ROA. Deari et al., (2022) conducted a study on WCM and firm profitability in eight European Union countries from 2006 - 2015. Sample technique was used and Panel regression model was utilized. Firm profitability was measured using ROA, whilst CCC, size, financial leverage, cash flow ratio and tangibility were used as explanatory variables. Study findings were WCM positively affects firm profitability where nonlinear, concave quadratic association exists between them.

Novak et al.,(2021) undertook a study on WCM impact on manufacturing SMEs in Czech Republic, considering 105 firms from 2014 - 2018 and utilizing quantitative methodology based on dynamic panel data. EBITDA was used a measure of profitability. Findings showed that longer credit periods extensions to customers has no impact profitability with the other variables indicating a negative association with profitability. Amponsah-Kwatiah and Asiamah,(2021) conducted a study on WCM effect on profitability of listed manufacturing firms in Ghana from 2015 – 2019.Quantitative research approach and balanced panel method was utilized. Study findings revealed that account payables, inventory management, account receivables, current asset, CCC, firm size and current ratio have positive impact on ROA and ROE whilst leverage indicated negative effect on them.

Panigrahi and Sharma, (2013) noted WCM role in determining an entity's financial health, being able to honour current financial needs and maintaining long term investment activities (Paul and Mitra, 2018) . Akoto et al., (2013) in their WCM and profitability study using Ghanaian listed manufacturing firms findings, established that with adequate WCM model, firms can manage and monitor their financial obligations. WC deprivation is mostly identified as a prime cause in the collapse of small firms in advanced and emerging economies. This means that an enterprise's success hinges on generating cash that exceeds its expenditure (Napompech, 2012).

Effective ability to manage WC and optimize it, promotes cash flows and increases firms' profitability (Paul and Mitra, 2018).This is evident in almost all industries including manufacturing industry where WCM has been used to improve firms ROCE through cost containment actions, optimizing working capital and improving WC efficiency. This clearly indicates that proper WCM promotes firm profitability in terms of high CCC, optimal stock holding, both debtors and efficient creditors management (Wesley et al., 2013). Wanguu and Kipkirui, (2015) conducted a study on WCM effect on NSE listed cement manufacturing firms profitability in Kenya. Findings were that WC and leverage significantly impacted profitability negatively and positively respectively whereas firm size and liquidity had a positive insignificant association with profitability. This implies efficient management of WC will lead to improvement on financial performance of manufacturing firms (Madugba and Ogbonnaya, 2016).

1.1.4 Listed Manufacturing Companies at the NSE

The manufacturing industry is an important sector which acts as the main channel for the country's integration into both regional and world markets and holds forward and backward linkages to the wider economy. In Kenya, the manufacturing industry plays a significant role and its contribution to Gross Domestic Product (GDP) is approximately 10.0% of Kenya's GDP. There are over 1,000 companies in the manufacturing sector in Kenya with only 8 firms listed in the NSE (CMA, 2021) as at quarter 4 of 2021.In vision 2030 blue print by the Kenyan government, the manufacturing sector primary objective is to grow its GDP contribution by a minimum of 10% annually. This can be achieved with growth in profits with a key factor being identifying various variables that influence profits including WC management. WCM efficiency

is very important for enterprises involved in manufacturing, in which a substantial proportion of assets consist of liquid assets. Excessive levels can undoubtedly result to an entity realizing non-optimal return on investment and similarly too low liquid assets can result in out of stocks and operational challenges. Kenya's manufacturing industry is substantial as it serves both domestic and foreign markets, mainly Eastern African countries. In 2020 the manufacturing sector experienced a slow down primarily due to measures taken to contain COVID-19 and is estimated to have contracted by 0.1 per cent with the key deceleration driver being declining production in key subsectors (Kenya National Bureau of Statistics Economic Survey, 2021).The high need products manufactured locally is to some extent impacted by high manufacturing costs in comparison to cheaper imports.

1.2 Research Problem

In Kenya's economic development, the manufacturing sector plays an integral role, owing to its contribution to the national output and work creation. The sectors' contribution to the economy in Kenya has stagnated at about 10%. The sector contributed 9.4% to GDP in 2015, 9.3% in 2016, 8.7% in 2017, 8.4% in 2018, 7.9% in 2019, 7.6 in 2020, and 9.5% in 2021 (KNBS, 2022). World Bank showed that large scale manufacturing in Kenya recorded stagnation and accompanied by diminishing profits (World Bank, 2016a).Productivity levels in the Kenyan manufacturing sector are remarkably low, when compared to both regional and global markets. Some manufacturing firms in Kenya have ceased their business operations owing to poor performance while others have relocated their business operations to other markets. Manufacturing firms that have relocated or restructured their business operations have opted to serve the local market through an import model ideally from low-cost manufacturing countries for instance, Egypt, China, India and South Africa subsequently leading to job losses (GoK, 2017). Some firms have also reduced their manufacturing capacity adversely impacting their financial performance. This problem if not closely monitored has the potential to create difficulties in the Kenyan manufacturing industry.

There exist several studies in Kenya, with respect to WCM and firm performance. Nyangweso and Wepukhulu, (2019) revealed that WCM influences profitability of NSE listed commercial and services sector firms. Nyabwanga, et al., (2012) concluded that WCM execution influences

performance of SMEs in Kisii District, Kenya. Wainaina, (2010) revealed positive association between profitability and WC of SMEs in Kenya, a finding concurred with by Okungu, (2014) in his study on sugar producing firms in Kenya. Kiptoo et al., (2017) established that stock management policy related negatively with Kenya's tea processing firms' financial performance. Based on past studies, it is apparent that there are diverse views and findings regarding the association between WCM and profitability. A number of studies identified positive relationship while others confirmed negative association between WCM and profitability indicating lack of consensus. Therefore, this study sought to bridge that gap by conducting a study to determine the effects of WCM on profitability of NSE listed manufacturing firms.

1.3 Research Objective

To determine effects of WC management on profitability of listed manufacturing firms at the Nairobi Securities Exchange.

1.4 Value of the Study

Findings of the study will be of interest to various stakeholders. Manufacturing firm's management will utilize findings for effective financial decisions aimed at improving profitability and efficiently managing working capital. Policy makers may use study findings for formulation of policies that provide enabling environment for manufacturing firms particularly the macroeconomic and legislative factors affecting profitability of the manufacturing firms. Moreover, future scholars and academicians will use study findings and results as a reference point in their studies and grow their knowledge and experiences on matters associated with working capital management and how this relates to and/or affects profitability of firms.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A detailed account of reviewed literature on WC and profitability are advanced in this chapter. The chapter is structured as follows; Theoretical Review, Determinants of Profitability, Empirical Studies and Knowledge Gaps, Conceptual Framework and lastly Summary of literature review.

2.2 Theoretical Review

This investigation was directed by various theories associated with WCM and profitability. Specifically, this research was anchored on the theory of WC management, cash conversion cycle theory and rent theory of profitability.

2.2.1 The Theory of Working Capital Management

Founded by Walker, (1964),this theory indicates that working capital management should consider various factors such as liquidity ratio, solvency models, efficiency as well as profitability and shareholder wealth maximization systems (Wesley et al., 2013).WCM encompasses management of current assets as well as current liabilities it being a fundamental business requirement owing to its effect on liquidity and firm financial performance (Yousaf and Bris, 2021;Hoque et al., 2017). A key assumption is that WCM is critical in managing firm's profitability levels. This is because business performance and firm's needs for WC, vary over time driven by how fast money is generated and the amount of investment required for stocks and debtors (Iqbal et al., 2017).

The model also identified that if WC is managed appropriately, businesses would invest, finance and keep an eye on factors that influence WC. Thus, a firm will manage cash, receivables, stocks, payables, CCC effectively then evaluate and analyze performance to make certain that fixed assets are employed efficiently and effectively. The theory will aid the researcher establish WCM variables, how WC impacts and aids other finance decisions such as capital budgeting decisions, dividend and financing (Wanguu and Kipkirui, 2015). The theory identifies specific variables to be applied as WCM proxies including accounts receivable, CCC, stocks, accounts payable and current ratio (Nastiti et al., 2019) . However there are limitations on WC model in

that it considers only monetary items and thus disregards non-monetary ones for instance dissatisfied staff, government authorities and regulatory changes. Additionally, it's non situational for instance where disruption in business environment is disregarded since the basis for WCM is historical events and information.

2.2.2 Rent Theory of Profitability

Advanced by Walker (1894), this theory supports the view that organizations profit is derived just like the rent of land. Its Proponents argued that just as land of superior grade generated more rent than that of inferior grade, likewise superior entrepreneurs make more profit than inferior entrepreneurs. Profit is excluded in the cost of production and is something achieved through effective and proper WCM (Wesley et al., 2013).One key assumption is that profit does not only arise as a result of superior ability but many other factors are responsible for profit. The theory also indicated that profit can be achieved by managing capital and other factors of production. However, one limitation is that it fails to expound on the nature of profit and that profit is not always the reward of business ability but can as well arise due to monopoly and favorable changes in the market. In this study, managers can use the theory to manage and improve profits through effective working capital management framework adoption which mitigates losses and improves success and profitability.

2.2.3 Cash Conversion Cycle Theory

Founded by Richards and Laughlin, (1980),who argued about the various dynamic liquidity measures of a firm's profitability. The theory also indicated that CCC can be utilized as a liquidity measure, making liquidity analysis less intuitive than in the case of static financial ratios. The CCC initial step involves purchase of raw materials, followed by raw materials conversion to finished products through production process (Napompech, 2012) .The theory assumes that CCC is the time interval between raw materials purchase and/or services rendering and cash collection. Nadeem et al., (2017) defined CCC as the time period in which firms convert their resources into cash flows. In accordance with the model, how long the conversion period is, will determine how great the investment in WC will be, resulting in higher firm financing (Barine, 2012).Its proponents argue that interest expense will also be higher, leading to higher failure to pay risk and lower profitability in some instances. The theory will help the

researcher determine key cash conversion variables and how these will affect WC and profitability. Additionally the theory will aid the researcher to consider CCC as a key factor indicator of how efficiently a firm is at paying its bills, collecting payments and selling inventory (Hassan et al., 2017;Napompech, 2012).The theory has its shortcoming in that utilization within same industry is agreeable but becomes very difficult when comparing firms in different industries as their cycles differ greatly. Marisetty and Madasu, (2020) noted that CCC affects firms liquidity requirement of whatsoever nature, regardless of its size.

2.3 Determinants of Profitability

It has been argued that various factors for instance firm size, productivity levels, leverage levels, liquidity, cash management efficiency and firm asset structure influence profitability of firms.

2.3.1 Firm Size

Firm size impacts profitability positively because firms that are larger, profit from economies of scale and easily access low-cost capital than smaller firms do (Stierwald, 2009). Large firms characterized by high total assets base, are well governed resulting in increased profitability and perform better than smaller counterparts with their smaller total assets base (Ray, 2012).

Various studies have confirmed that indeed there is an association between firm size and firm profitability. Zawaira and Mutenheri, (2014) established that firm size influenced considerably business profitability because large entities generate more profits than smaller ones. Bisnis, (2018) conducted a study about effects of CCC, firm size and age on profitability of 101 listed manufacturing firms in Indonesia Stock Exchange (BEI) for periods 2012-2014. Quantitative approach was used with data collection techniques and purposive sampling method. Panel data regression was employed with findings indicating that the variable CCC, firm age and firm size positively affected variable ROA (Alarussi and Gao, 2021;Nadeem et al., 2017 ;Alarussi and Alhaderi, 2018).Conclusions from these studies indicate that large sized firms enjoy high profitability levels and that size of the firm is positively associated with organizational performance.

2.3.2 Productivity Levels

Firms that are more productive enjoy high profit levels and this reinforces with continuous increasingly high productivity levels (Ray, 2012).High total factor productivity levels lead to high profitability demonstrated in low average production costs, superior quality products or higher volumes produced using lower inputs, resulted in generally higher profit levels. According to Vural et al., (2012), productivity levels can be measured by considering total outputs to total inputs employed in the production process. To arrive at productivity growth, then growth in inputs is deducted from the growth in outputs (Oladipupo & Okafor, 2013). Efficiency levels differentiate firms as higher productivity levels offer competitive edge leading to profitability. A high degree of total factor productivity means a firm is more profitable (Salman and Yazdanfar, 2012)

2.3.3 Leverage Levels

The concept of leverage relates to total amounts of debts and liabilities employed in financing operations of an enterprise and this influences both profit and risk levels. Gharsalli, (2019) studied the association between firm leverage and its performance using SMEs data in France. Panel data set of manufacturing SMEs for years 2007-2015 was employed. Findings were that, firms with high leverage levels suffered from poor financial performance with, the variance in firm performance being higher where firms have high leverage levels. Rahman et al.,(2020) studied financial leverage impact on listed textile firm's financial performance in Bangladesh and established that there exists a significant negative association between firm leverage and profitability (Nadeem et al., 2017; Samo and Murad, 2019). Gachira et al., (2014) additionally noted that the level of debt calculated using debt to asset ratio depicts a substantial negative association from a profit level and value of a firm lens.

2.3.4 Liquidity Levels

Liquidity refers to matching assets and liabilities over time. The liquidity/profitability trade-off hypothesis suggests that when an organization pursues one theory, the other one is traded-off (Kamau et al., 2021;Yameen et al., 2019). The trade-off theory is premised on the assertion that for firms to juggle between advantages and costs associated with holding cash, an optimum level of liquidity must be met. Some of the costs associated with holding cash include low ROA

resulting from liquidity premiums and the potential of not enjoying tax advantage (Ray, 2012). The benefit of holding cash is that firm's assets need not be liquidated to settle payments hence firms save on transaction costs associated with raising funds (Sharma and Kumar, 2011).

Additionally, a firm's liquid assets can be utilized to finance business operations where other financing sources are unreasonably expensive. Therefore, firms will be persuaded to increase their liquidity levels to a point which optimizes profit (Umobong, 2015) and balances between the current assets and long term assets crucial for the firm (Nadeem et al., 2017).Two schools of thought exist relating to liquidity/profitability trade-off. The first school argues that WC does not contribute to a firm's profitability. This school of thought argues that even if WC were to be a factor, its relationship with profitability may be negative. Vieira, (2010) researched on liquidity effects on firms' profitability involving 48 major world airlines for the period 2005-2008. The study noted that liquidity was directly proportional to profitability in the short term. Kamau et al., (2021) studied firm attributes influence on profitability of insurance firms in Kenya from years 2010-2018.Study findings were that liquidity and leverage exhibited a significant negative impact on insurance firms' profitability. Alarussi and Gao, (2021) in their study on non-financial Chinese companies listed on the Shanghai stock exchange from 2017–2019 and (Yameen et al., 2019) in their 10 years study on pharmaceutical firms listed on Bombay Stock Exchange (BSE) for period 2008 – 2017 concurred that firm liquidity and leverage significantly influence profitability negatively.

2.3.5 Cash Management Efficiency

The interaction between various WC components and the flow of cash can be used to match cash needed to achieve a set sales level (Sharma and Kumar, 2011) and CCC therefore becomes a critical tool that influences short-term requirements of a firm (Marisetty and Madasu, 2020). The CCC is an operating cycle computed by summing ACP to inventory period, then deducting creditors' payment period from it. The shorter an entity's CCC is, the fewer the financial resources needed and converse is true. CCC shows the time interval from when cash expenditure occurs relating to raw materials purchase and revenues generated from sales of those finished products (Nadeem et al., 2017).The theory contends that liquidity is key to an entity's success in the short and long run (Goel et al., 2015).Lyngstadaas and Berg, (2016) in their study on WCM

effect on profitability of Norwegian SMEs covering periods 2010 – 2013 found that reducing CCC will increase profitability therefore supporting important role of CCC in firms survival.

2.4 Empirical Studies

The impact WCM has on firm profitability has attracted the attention of several scholars globally. Bagh et al., (2016) studied WCM impact on performance of listed manufacturing firms in Karachi Stock Exchange (KSE) from year 2005 – 2014 .Random samples of 50 non-financial firms was utilized. Secondary data and purposive sampling were used. Multiple regression results indicated that CCC, stock turnover ratio, and APP have significant negative impact on ROA while ACP had significant positive impact on ROA. APP impact on ROE was significant and negative.

Hongli et al., (2019) analyzed financial leverage and liquidity effect on manufacturing firm profitability listed on the Ghana Stock Exchange from 2007 - 2015. ROE and ROA were applied as proxies for firm performance. RE and FE models were utilized. Study findings established that leverage and liquidity had a significant positive impact on firm financial performance. Yameen et al., (2019) studied liquidity impact on profitability of Bombay Stock Exchange (BSE) listed pharmaceutical firms. 82 firms balanced panel data for 10 year period from 2008 – 2017 was utilized. Findings revealed that quick and current ratios have a significant positive impact on profitability as measured by ROA. Conversely, control variables firm size, age, leverage exhibited negative impact on profitability.

Rizky and Mayasari, (2018) studied CCC impact on financial performance of listed retail firms in the Indonesian Stock Exchange from 2012-2015.Purposive sampling and Panel data regression was used with results indicating that CCC has a negative effect on firm performance. Firm age and firm size as moderating variables have insignificant effect on profitability. Nadeem et al., (2017) studied WCM impact on textile firms performance in Pakistan utilizing five year period data from 2008-2012. Findings were that ACP, CCC and operating cycle depicted a positive association with performance. Afrifa and Padachi, (2016) studied the relationship between WC and SMEs performance. Panel data regression analysis was used.160 Alternative Investment Market listed SMEs from 2005 – 2010 were selected as the sample. Results findings

indicated existence of a concave relationship between WC level and firm performance and that there is an optimal WC level which maximizes firms' profitability with indication that deviation above or below the optimal level decreases profitability.

These findings correlate with other studies, and they concluded that finance managers could potentially improve profitability by reducing CCC and optimizing WC components. However, these investigations were done in other markets and in non-manufacturing industries and their conclusion cannot be generalized to the Kenyan manufacturing industry.

Local studies have been undertaken to establish the relationship WCM has on firm profitability. Kamau et al., (2021) undertook a study on how firm attributes influence financial performance of Kenyan insurance firms from years 2010-2018. Correlation research design was adopted with secondary data being utilized. Random and Fixed effect model was utilized to analyze unbalanced panel data. Study results revealed that liquidity and leverage have a significant negative effect on profitability of Kenyan insurance firms. Nyangweso and Wepukhulu, (2019) studied WCM effect on financial performance of 12 commercial and services sector listed firms at NSE from 2008-2017. Descriptive survey research was adopted and employing inferential statistics of correlation and regression analysis. Study findings indicated that both ACP and ICP had a significant negative influence on financial performance; APP was established to have a negative but not significant effect on profitability whilst CCC exhibited a positive but not significant effect on firm financial performance. Olambo and Aluoch, (2022) examined WCM impact on financial performance of energy and oil firms listed at the NSE for periods 2016 - 2020.191 employees were selected using stratified sampling method with controlled questionnaire being the primary source of information. Descriptive study procedure was employed. ROE monetary performance related data was collected and used as secondary information. Findings were that cash, inventory, payables and receivables impacted substantially financial performance of NSE registered oil and energy firms.

Kiptoo et al.,(2017) conducted a study to establish WC management practices impact on tea processing firms' financial performance managed by Kenya Tea Development Authority (KTDA). Cross-sectional descriptive research design was employed and stratified random

sampling method was utilized to select 48 tea processing enterprises. A questionnaire was utilized to gather primary data while record survey form was employed when collecting secondary data. Statistical Package for Social Sciences (SPSS) was employed to analyze data. Study findings established that inventory management exhibits significant negative relationship with tea processing firms' financial performance. Hassan et al., (2017) researched WCM effects on financial performance of Kenyan Companies supplying water covering the period 2011 to 2015.Descriptive survey of employees was adopted and findings were that effective WCM promoted financial performance. Water industry was the main focus of the study; hence its findings cannot be applied to the Manufacturing industry.

Wesley et al., (2013) investigated the association WCM has on NSE listed manufacturing entities business performance. 20 companies were sampled for a 5-year period from 2007 to 2011. Multiple regression and Principal Components Analysis (PCA) were utilized. Findings were that, WC proxies; CCC, ACP and controlled variables Net WC, Current Liabilities, Fixed Financial Ratio and Turnover Ratio were statistically significant to performance as measured by ROE.CCC and ACP were positively and negatively related to firm performance respectively.

From past studies, it is evident that empirical reviews indicate diverse views and findings with some studies indicating positive and others a negative relationship between WC and profitability indicating existence of a knowledge gap to be filled. This study, sought to fill that knowledge gap by determining WCM effects on NSE listed manufacturing firms' profitability.

2.5 Conceptual Framework

Conceptual framework refers to a diagrammatic illustration demonstrating relationships among variables and factors identified, relevant to the study (Muchemwa et al., 2016). A conceptual framework diagrammatically displays expected relationships between both the explanatory and response variables. This study conceptualized that WCM positively influences profitability of NSE listed manufacturing firms. Proxies for WC included ICP, ACP, PDP and CCC. Constant variables employed were debt ratio and firm size. Size of the firm was utilized as it influences profit levels whereas debt ratio is a proxy for leverage level.

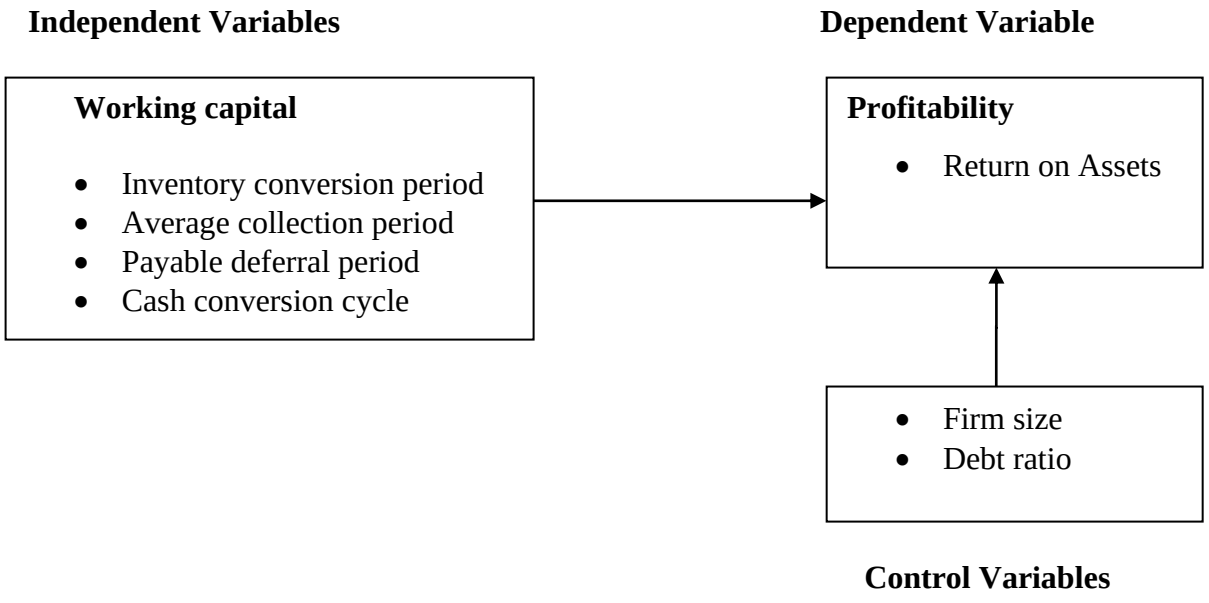

Figure 1.1: Conceptual Framework

Source: Researcher (2022)

2.6 Summary of Literature Review

The chapter started by discussing relevant theories that the study was anchored in; WCM theory, CCC theory and rent theory of profitability. These theories were discussed to enhance understanding of WCM and profitability. The chapter also included an empirical analysis of study objectives. Research gap was then identified. The chapter concluded by presenting conceptual framework diagrammatically.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlined and discussed in detail research design, sampling design, target population, in addition to data collection and data analysis techniques in pursuit of study objectives.

3.2 Research Design

Research design denotes how the conditions are arranged, data collected and analyzed aimed at incorporating relevance to research rationale with economy as the underlying principle. Kothari (2004) observed that research design is a blueprint facilitating smooth sailing of various research operations, therefore making the study to be more efficient and consequently yielding maximum information with least effort and resources. Descriptive survey design was used. Descriptive research describes the situation as it exists presently and notably the researcher has little or no influence over the variables; he merely reports what has occurred or what is currently happening. Descriptive research in this study was appropriate due to its low cost, reliability and convenience it offers for a large population.

3.3 Population

Population refers to the entire set of persons, elements, objects or things the researcher intends to investigate. Population in the study included all eight (8) NSE listed manufacturing companies trading as at 31st December 2021, however one company, Mumias Sugar was eliminated due to lack of data for years 2018 to 2021 (see Appendix, II). Listed manufacturing companies were most suitable as they are public entities in operation under strict code of conduct and set of laws, hence their financial and accounting disclosures are largely reliable. Secondly, Manufacturing entities have a greater proportion of their assets comprising working capital elements making them a more desirable target for the study. This study adopted a census on accessible population due to its small size.

3.4 Data Collection

Secondary data was extracted from financial statements of NSE listed manufacturing entities for utilization. Data was also gathered from websites and other online databases. Secondary data extracted included information such as company revenues, liquid assets, total assets, current

liabilities, total liabilities, inventories, costs of sales, accounts payable from the entity's websites. The study utilized panel data of 10 years (2012-2021).

3.5 Data Analysis

Data extracted was in Excel 2016 which was first cleansed and subjected to STATA version 13 for analysis. Panel regression models, pooled OLS, RE and FE models were then applied to establish the WCM impact on profitability of NSE listed manufacturing firms.

3.5.1 Diagnostic Tests

These tests are performed to ensure the study does not generate spurious results/findings. Diagnostic tests carried out included normality test, test for stationarity and Multicollinearity test. Different statistical techniques employed to analyze data usually formulate presumptions as regards data normality, incorporating regression, correlation, ***t***-tests and variance analysis. The central limit theorem postulates that where sample size constitutes 100 or more observations, contravention of normality is non-issue. Therefore, to arrive at worthwhile conclusions, normality assumption ought to be adhered to regardless of the size of the sample. This follows that if a continuous data follows normal distribution, therefore mean value should be used to present the data. Additionally, significance level (***P*** value) is calculated from the mean value when evaluating between/among groups. The resultant mean does not indicate value of the data in cases where the data is not normally distributed. Thus erroneous selection of data set's representative value and the subsequent calculated significance level may be misleading ultimately amount to misinterpretation. Therefore, the rationale for undertaking normality test for data and decision made as to whether the mean can be taken as a representative value or not. Where applicable, parametric tests are used to evaluate the means, if not applicable, nonparametric methods using the groups medians are utilized.

Data normality assessment is a precondition for a number of statistical tests since normal data is a fundamental supposition when applying parametric testing. The two tests recognized for normality are Shapiro–Wilk and Kolmogorov–Smirnov tests. For sample sizes (<50 samples) Shapiro–Wilk test is preferred although it has capacity to handle larger sample sizes whilst Kolmogorov–Smirnov test is suitable for sample sizes with $n \geq 50$.Even though there are various

normality testing methods for small sample size (n <50), Shapiro–Wilk test is recommended due to its potency to identify the non-normality and hence its popularity and wide usage. Null hypothesis tested presumes data is collected from a normal distributed population and that when $P > 0.05$, null hypothesis is accepted.

Stationarity is termed as a qualitative process where statistical parameter which includes standard deviation and mean do not change over time. An important characteristic of a stationary process is the auto-correlation function which relies on one lag alone and with no variation over time. Levin-Lin-Chu unit root test was performed to investigate the time series statistical features observed in the data. The Levin-Lin-Chu unit root test tests that the process is not stationary in an autoregressive model therefore establishing presence of a unit root. If data or variable is non-stationary, then the findings will be biased. Therefore, by ensuring that the data is stationary only the impact is tested purely. It is therefore necessary that data so obtained should be stripped of the effect of trends and seasonality.

Multicollinearity draws attention to explanatory variables which are highly correlated with one another. The challenge being that the regression model will be incapable of accurately associating variance outcome variable with the correct predictor variable, consequently giving rise to muddled results and erroneous inferences. Multicollinearity brings about two challenges; the coefficient estimates can vary wildly based on which other explanatory variables have been built into the model. The coefficients become too responsive to minor changes in the model. Therefore, multicollinearity minimizes precision of the projected coefficients thus weakening statistical power of the regression model.

To test multicollinearity, Variance Inflation Factor (VIF) and correlation matrix were produced. VIF looks at the degree to which an explanatory variable can be expounded by all the other explanatory variables in regression equation. Multicollinearity is said to be present when VIF is above 5 and tolerance value is below 0.2, meaning that one variable can determine the result of another variable. Pearson Correlation matrix is a simple technique of detecting collinearity amongst the predictor variables. Values that are greater than 0.9 indicates the presence of high correlation (Gujarati & Porter, 2010).

The study conducted autocorrelation analysis by utilizing Durbin-Watson and Wooldridge tests to identify autocorrelation in the residuals regression models. Gujarati and Porter, (2010) argued that Durbin-Watson statistic preferably needs to be within 1.50-2.50 indicating non-existence of autocorrelation, for a better prediction of the regression model. R squared is the square of the Durbin-Watson statistic and shows the percentage of variation which can be explained the regression line out of the total variation. Henseler et al., (2009) recommended as a rule of thumb that R squared should be 0.75 (substantial), 0.50 (moderate) and 0.25 (weak).

3.5.2 Analytical Panel data models

Panel data analysis encompasses utilization of three models: fixed effects model, pooled OLS method and RE model. The first step is to choose whether to apply the FE or RE model using Hausman test. If RE model is deemed appropriate then no further test are required. If FE model is chosen as the appropriate one, then testparm is performed to choose between the fixed effects model and the POLS model. If POLS regression model is preferred, then no further test is required.

POLS model does not consider time aspect and individual scopes, bringing about an assumption that the data behavior is the same across different time periods. Therefore, the POLS method can either use Ordinary Least Square (OLS) or least squares methods for panel data model estimation. The regression equation for panel data is comparable to OLS.

FE model anticipates that differences between objects or people (cross-section) can be matched from the various intercept. The model of FE varies from the standard impact, while utilizing the normal least square guideline. To evaluate the FE Model with various intercepts between people, the fake variable method known as the Least Squares Dummy Variable procedure or contracted LSDV is utilized.

The OLS and fixed effect models estimated are as follows;

$$\mathbf{Yi,t} = \alpha i,t+\beta_1 \mathbf{x_1\, i,t} + \beta_2 \mathbf{x_2\, i,t} + \beta_3 \mathbf{x_3\, i,t} + \beta_4 \mathbf{x_4\, i,t} + \beta_5 \mathbf{x_5\, i,t} + \beta_6 \mathbf{x_6\, i,t} + \varepsilon\, \mathbf{i,t}$$

Where; Yi, t= Profitability of company i at a given time, t

α i,t= Constant term β_1**,** $\beta 2_{\ldots}\beta_6$ =Regression Coefficients

X_1 i,t= Inventory conversion period in vector format

X_2**i,t** = Average collection period in vector format

X_3 **i,t** =Payables deferral period in vector format

X_4 **i,t** =Size of the firm in vector format

X_5 **i,t** =Debt ratio in vector format

X_6 **i,t** =Cash conversion cycle in vector format

ε i,t=vector of error term

RE model evaluates panel data where there is correlation amongst the variables over time and between objects / people. In the RE model, the variance between intercepts is assimilated by the error terms of each firm. The benefit of applying RE is that it eliminates heteroscedasticity completely.

The random effects model regression equation is as follows:

$$\mathbf{Yi,t} = \alpha i,t+\beta_1 \mathbf{x_1\, i,t} + \beta_2 \mathbf{x_2\, i,t} + \beta_3 \mathbf{x_3\, i,t} + \beta_4 \mathbf{x_4\, i,t} + \beta_5 \mathbf{x_5\, i,t} + \beta_6 \mathbf{x_6\, i,t} + \mu_i + \varepsilon\, \mathbf{i,t}$$

For i = 1,2, …, N and t = 1, 2, …, T where, N is the number of companies (7 Manufacturing firms), T is the number of time periods (Number of years = 10 years), ε_{it} is the residual of both time series and cross section, μ_i is the individual residual which is the random characteristic of unit observation.

Operationalization of variables in the study is as shown in table 3.1

Table 3.1: Operationalization of Variables

	Meaning	**Measurement**
Y	Profitability	Return on Assets
X_1	Inventory conversion period (ICP)	Inventory divided by costs of sales X 365
X_2	Average collection period (ACP)	Account receivables dividend by sales X 365
X_3	Payable deferral period (PDP)	(Average Accounts Payable / Cost of Sales) x Days in the Accounting Period
X_4	Firm size	Logarithm of total assets
X_5	Debt ratio	Total liabilities divided by total assets
X_6	Cash conversion cycle (CCC)	(Average collection period + Inventory holding period) – Average payments period
ε	Error Term	Variations in response variable unexplained by the explanatory variables.

3.5.3 Test of Significance

Student's t - test was employed to examine statistical significance of the explanatory variables whereas statistical significance of the regression model was tested using F- test and Analysis of Variance (ANOVA). 5% significance level was utilized for both the F and t-tests. Additionally, R-squared was utilized to establish how much of the variation was explained by the regression model.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter involves data analysis, results interpretation, discussion and research findings presentation. Data analysis included both descriptive and inferential methods. Descriptive statistics included means, standard deviations, minimum and maximum whose results were presented using charts and tables. Inferential analysis entailed establishment of significant relationships and effects between the explanatory and response variables. Correlation analysis and panel data analysis were performed. To ensure the study does not generate spurious results/findings diagnostics tests were carried out. Secondary data on WCM and profitability was utilized. Reviewed literature was utilized to bring to attention areas of concurrence or conflict with the study findings. This chapter has been organized as follows: General information, descriptive analysis, Diagnostic tests, research findings and chapter summary.

4.2 General information

This study utilized secondary data extracted from the manufacturing companies' annual reports accessible from firms, CMA / NSE websites. The data included Profitability, ICP, ACP, PDP, firm size, debt ratio (DR) and CCC. The data was for seven NSE listed manufacturing companies trading as at 31st December 2021 namely: East African Breweries Ltd, Flame Tree Group Holdings Ltd, British American Tobacco Ltd, Unga Group Ltd, Carbacid Investments Ltd, B.O.C Kenya Ltd and Kenya Orchards Ltd. One company, Mumias Sugar was eliminated from the study due to lack of data for years 2018 to 2021. The information was extracted over a ten year period for the seven NSE listed manufacturing totaling to 70 observations.

4.3 Descriptive Analysis

Descriptive statistics were performed for profitability (Y), ICP (X_1), ACP (X_2), PDP (X_3), firm size (X_4), debt ratio (X_5), Cash conversion cycle (X_6) and comprised of mean, standard deviation, minimum and maximum.

The results were presented in the table below.

Table 4.1: Descriptive analysis

Variable		Mean	Std. Dev.	Min	Max	Observations	
Y	overall	0.17633	0.12047	0.00683	0.46057	N =	70
	between		0.11649	0.05795	0.38769	n =	7
	within		0.05209	0.07005	0.31204	T =	10
X_1	overall	92.5289	56.1242	7.30891	255.078	N =	70
	between		42.7784	50.0186	177.626	n =	7
	within		39.4794	2.28607	250.055	T =	10
X_2	overall	94.6548	95.3601	21.7938	501.937	N =	70
	between		86.5254	30.8248	282.14	n =	7
	within		50.8274	-67.161	314.452	T =	10
X_3	overall	130.205	115.506	4.67551	441.185	N =	70
	between		112.465	19.0536	340.601	n =	7
	within		48.4058	-17.688	326.02	T =	10
X_4	overall	9.57787	0.86252	7.70073	11.0005	N =	70
	between		0.91792	7.96667	10.8472	n =	7
	within		0.10613	9.24413	9.85267	T =	10
X_5	overall	0.52257	0.28512	0.097	1.45483	N =	70
	between		0.29109	0.12858	0.92931	n =	7
	within		0.08724	0.33132	1.0481	T =	10
X_6	overall	104.022	73.065	-2.5578	416.704	N =	70
	between		57.4386	39.3456	208.528	n =	7
	within		49.6955	-18.593	312.197	T =	10

4.4 Diagnostic Tests

Prior to undertaking a regression analysis, diagnostics tests are carried out on collected data. Diagnostics tests carried out included; normality, multicollinearity and autocorrelation tests. VIF was utilized to test for multicollinearity whilst Durbin-Watson and Wooldridge statistics tested for autocorrelation. Levin-Lin-Chu unit root test was used to check for unit root. Hausman test was applied to determine whether FE or RE model should be performed. The study also tested for time fixed effects helping one determine whether to consider a FE model or a pooled OLS regression model. Hausman and testparm for FE model was performed in the sections below.

4.4.1 Test of Normality

Normality was tested by employing Shapiro-Wilk. Shapiro states its hypothesis as:

H0: Data exhibits normal distribution

Ha: Data does not exhibit normal distribution

Normality test results are presented in table 4.2

Table 4.2: Shapiro-Wilk normality test

Variable	Obs	W	V	z	Prob>z
Y	70	0.90462	5.871	3.849	0.000
X_1	70	0.90438	5.886	3.855	0.000
X_2	70	0.63061	22.737	6.794	0.000
X_3	70	0.84817	9.345	4.86	0.000
X_4	70	0.93789	3.823	2.916	0.002
X_5	70	0.94562	3.348	2.627	0.004
X_6	70	0.79998	12.312	5.46	0.000

Source: Author (2022)

Results indicate that the null hypothesis should be rejected ($p<0.05$), hence the data is not normally distributed. Panel data does not necessarily follow normal data and doesn't affect the results.

The normality plots are as shown below;

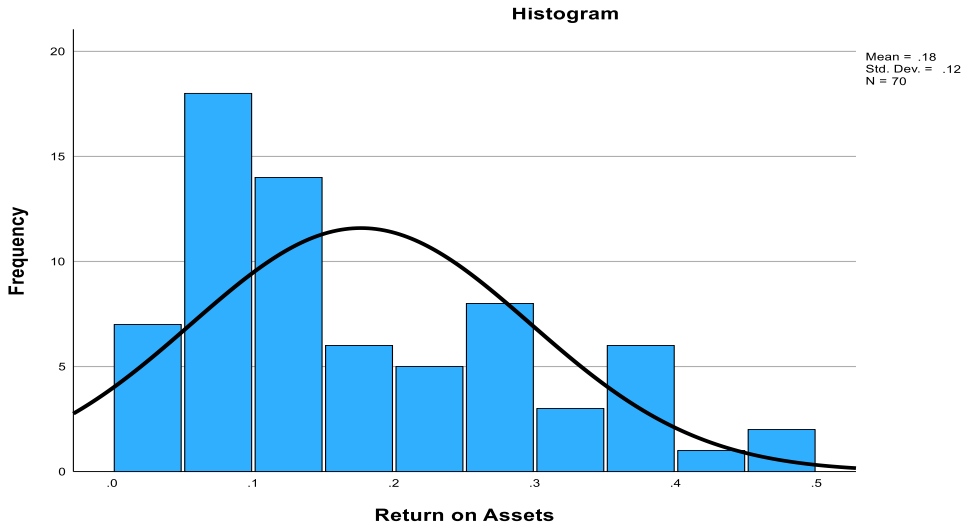

Figure 4.1: ROA normality plots

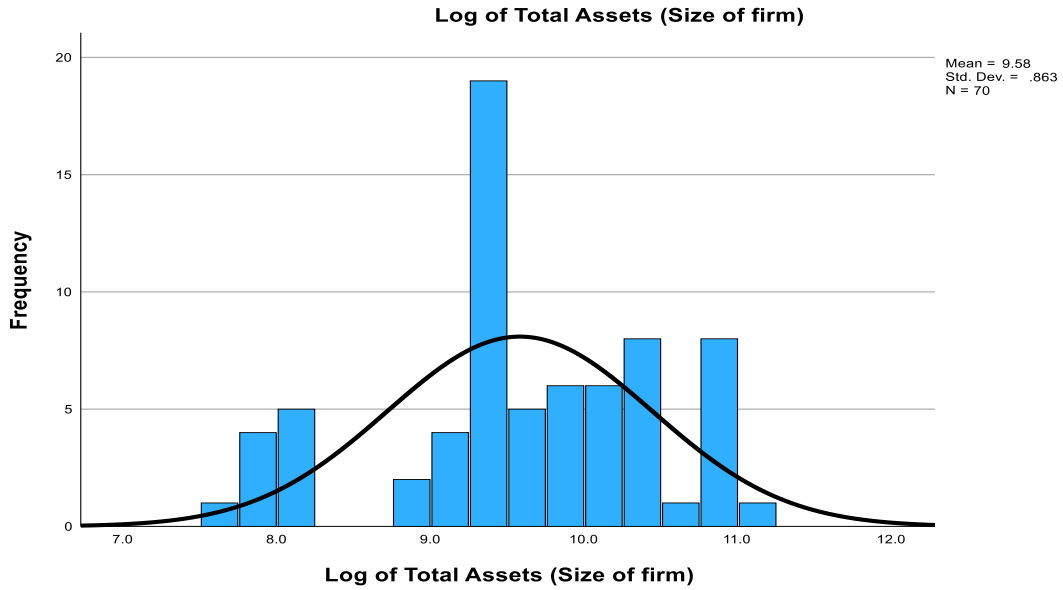

Figure 4.2: Log of Total Assets (Size of firm) normality plots

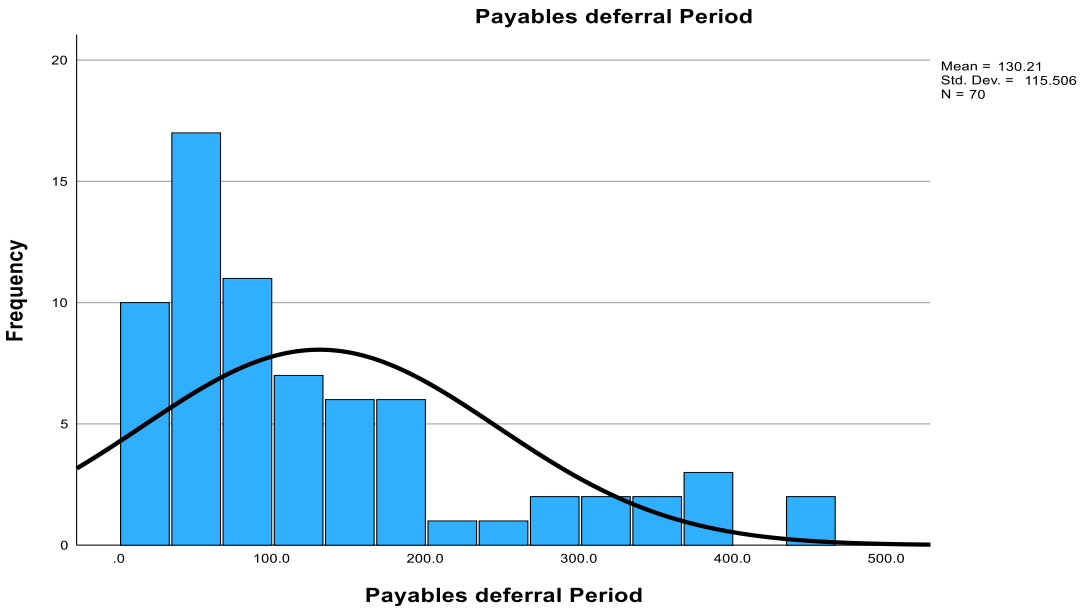

Figure 4.3: Payables deferral period normality plots

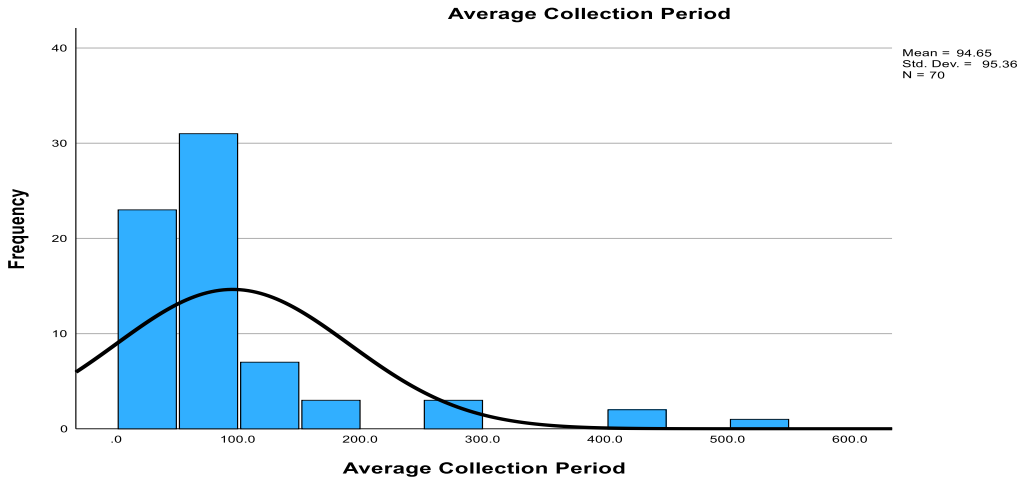

Figure 4.4: Average Collection Period normality plots

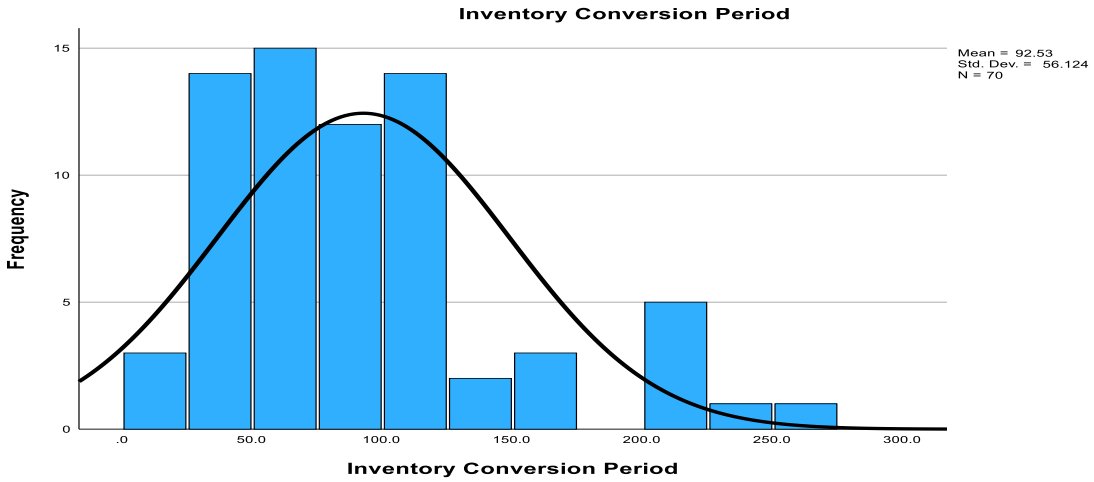

Figure 4.5: Inventory Conversion period normality plots

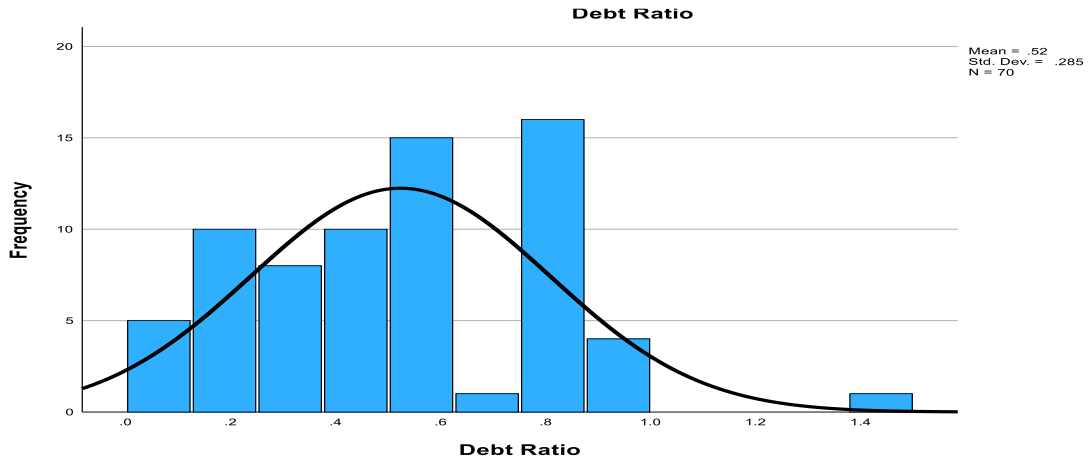

Figure 4.6: Debt Ratio normality plots

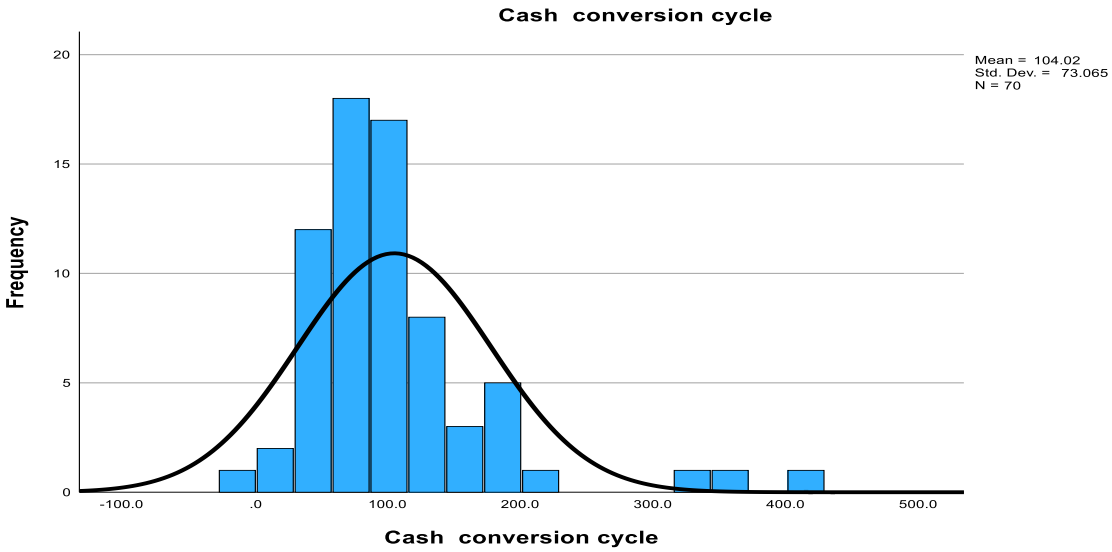

Figure 4.7: Cash conversion cycle normality plots

Source: Author (2022)

4.4.2 Multi-Collinearity Test

Multicollinearity indicates presence of high correlation amongst explanatory variables. Variance Inflation Factor (VIF) test was utilized to test for multicollinearity.

Table 4.3: Multicollinearity test

Variable	VIF	1/VIF
X_1	3.05	0.3279
X_2	2.88	0.3472
X_3	1.329	0.752
X_4	3.15	0.3179
X_5	1.335	0.7493
X_6	2.39	0.4184
Mean VIF	2.36	

Source: Author (2022)

In statistics, Variance Inflation Factor values that are smaller than 5 or 1/VIF values that are above 0.2 indicates that the predictor variables are not highly correlated. If 1/VIF value is more than 0.2 indicates presence of low multicollinearity, and subsequently value close to 0 suggests existence of multicollinearity. Therefore, multi-collinearity was absent.

4.4.3 Autocorrelation

Autocorrelation suggests existence of a relationship in at least two unique factors, but also amongst progressive estimations of a similar variable. Auto correlation was investigated utilizing Durbin-Watson (D-W) and Wooldridge test. Gujarati and Porter, (2010) noted that if the Durbin-Watson value is less than 1.0 or greater than 3.0, there is need to be concerned. The D-W statistic is considered to be acceptable if it is closer to 2. The study's Durbin Watson (D-W) statistic was found to be 1.992 hence within the acceptable limits (Gujarati and Porter, 2010) for Pooled OLS as per results in table 4.4 . Panel data in the study was subjected to Wooldridge test with the hypothesis stating that there was no autocorrelation while the alternative stated that there was autocorrelation. Results were given as per table 4.5

Table 4.4: Durbin - Watson Tests

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.771[a]	.594	.556	.080299120082122	1.992

a. Predictors: (Constant), X6, X3, X5, X4, X1, X2

b. Dependent Variable: Y

Table 4.5: Wooldridge test

H0: no first-order autocorrelation
F(1, 6) = 4.043
Prob> F = 0.0911

The results indicated that the null hypothesis is accepted with no serial correlation at 5% significance level. Therefore, the model has no serial correlation problems.

4.4.4 Stationarity / Unit root test

Levin-Lin-Chu unit root test was undertaken to establish presence of time series statistical features in the data used so as to ensure that the data was stationary. The hypotheses of the tests are as follows:

H0: Unit root is present in the data

H1: Unit root is not present in the data.

If the test-statistic is significant $p<0.05$, then null hypothesis is rejected. Alternatively if null hypothesis is accepted then assumption made is that the data contains a unit root hence not stationary.

Table 4.6: Levin-Lin-Chu unit root test

Variable	Test Statistic (t)	p-value
Y	-6.802	0.000
X_1	-3.074	0.009
X_2	-4.308	0.009
X_3	-3.882	0.007
X_4	-3.659	0.008
X_5	-9.523	0.000
X_6	-4.586	0.007

Source: Author (2022)

From the results, the null hypothesis was rejected with the presumption that the factors were stationary.

4.5 Correlation Analysis

Correlation analysis was performed to show a relationship exists between two variables. The correlation value ranges from –ve 1 to +ve 1. The response variable in this study was profitability while the predictor variables were: ICP (X_1), ACP (X_2), PDP (X_3), firm size (X_4), debt ratio (X_5) and CCC (X_6). To achieve this, Pearson's correlation analysis was performed. Absolute Pearson's correlation value if greater than 0.05 suggests a strong linear relationship

whilst value less than 0.05 show a weak linear relationship. The correlation coefficient signage indicates the relationship direction and the resultant p-value indicates whether the relationship is statistically significant. Correlation analysis outputs are presented in table 4.7.

Table 4.7: Correlation Analysis

	Y	X_1	X_2	X_3	X_4	X_5	X_6
Y (Profitability)	1						
X_1 (Inventory conversion period)	0.3643*	1					
X_2 (Average collection period)	-0.4537*	0.2199	1				
X_3 (Payable deferral period)	-0.1924	0.5124*	0.4892*	1			
X_4 (Firm size)	0.6239*	0.1785	-0.7303*	-0.3302*	1		
X_5 (Debt ratio)	0.0445	0.0798	0.2763*	-0.0727	-0.1633	1	
X_6 (Cash conversion cycle)	0.0166	0.5423*	0.7338*	0.1288	-0.3073*	0.2872*	1

Note: * indicates significance at 5 percent level

Source: Author (2022)

The results show presence of a statistically significant positive correlation between Profitability and Inventory conversion period, (r=0.3643, p<0.05), a significant negative relationship between profitability and ACP (r=-0.4537, p<0.05). Firm size and profitability were also found to be significantly related (r=0.6239, p<0.05). However, Payable deferral period was not significantly related with profitability (r=-0.1924, p>0.05). Debt ratio was found to be positively related to profitability, however, they were not significantly related (p>0.05). Lastly, there was no significant relationship between profitability and CCC.

4.6 Panel Regression analysis

The study aimed at examining the effect of WCM on profitability of listed manufacturing firms at NSE. Data was analyzed using panel data analysis since the behavior of listed manufacturing companies at NSE was observed across time from 2012 to 2021.

Panel data allows in controlling for variables that cannot be measured or observed for instance socio-cultural factors, varying business practices across businesses; or variables that vary over

time period but not across firms. It takes into account for individual firm's heterogeneity. Data in this study was balanced. This refers to the fact that the listed manufacturing companies had data for different years from the year 2012 to 2021.

Under Panel data analysis, three methods exist that can be performed: fixed effects (FE) model, pooled OLS (POLS) method and random effect (RE) model. First, the study performed a FE model then a RE model. A hausman test is then conducted to determine the appropriate model to apply. Hausman test is performed to determine the most appropriate model between RE and FE model. Hausman test examines correlation effect between errors and repressors. The Hypothesis is stated as follows:

Null hypothesis (H0): RE model is appropriate
Alternative hypothesis (HA): FE model is appropriate

In decision making, the null hypothesis is rejected if $P<0.05$ and accepted if $P>0.05$.

If FE model is established as the most ideal, then a further analysis is performed to determine the best model between FE model and POLS regression model. A FE model testparm test is performed, which is a joint test to determine whether the dummies for all years were equal to 0, if they are, then no time FE is required. This test helps establish whether to utilize a POLS model or a FE model. If the RE model is the most appropriate, then no additional test is required. The three models were performed, and the best choice was chosen. Each has been discussed below.

4.6.1 Models with independent variables only

The three models were summarized as in Table 4.6 below. Profitability (Y) was used as the response variable and predicator variables were ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6).

Table 4.8: **Models with independent variables only**

Variable	Pooled OLS Model	RE Model	FE Model
X_1	0.0002	-0.0002	0.0002
	0.739	0.741	0.739
X_2	0.0007	-0.0006	0.0007
	0.186	0.212	0.186
X_3	-0.0004	0.0001	-0.0004
	0.204	0.81	0.204
X_6	-0.0006	0.0006	-0.0006
	0.312	0.382	0.312
C	0.1869*	0.1853*	0.2167*
	0.003	0.000	0.000
R-squared	0.8278	0.4358	0.2211
Adj. R2	0.7987		
F (10, 59)	28.37		16.62
Prob> F	0.000		0.000

Source: Author (2022)

The results of the pooled OLS model show that ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6) explained 79.87% of any change that occurs in profitability (R^2= 0.7987). Coefficient of determination (R^2) is a measure of the goodness of fit for the distinct mean de-trended data and disregards all the evidence between groups. POLS model was found to significantly predict the response variable (F = 28.37, p = 0.000). From the model coefficients of the fitted POLS regression model, none of the WCM variables was identified to be statistically significant (F = 16.62, p = 0.000). All the *p*-values were established to be greater than the significance level (α= 0.05) meaning all the predictor variables had insignificant effect on profitability.

From the RE model, R-squared value was observed as (R^2= 0.4358) meaning that the explanatory factors explained 43.58% of any change occurring in profitability. Under the FE model, the explanatory variables explained 22.11% of any change that may occur in profitability as the coefficient of determination was observed to be (R^2= 0.2211). Just like in the POLS model, the variables were found to be statistically insignificant at a 5% level of significance.
Both Hausman and testparm confirmed fixed effects as the most appropriate and was therefore adopted.

In this model which included all four predictor variables both ICP and ACP were established to have an insignificant positive impact on profitability. PDP and CCC were established to have negative relationship which was insignificant to profitability. These results findings concurs with Rizky and Mayasari, (2018) that CCC has a negative effect on firm performance and with Nadeem et al., (2017) on positive association between ACP and profitability though insignificant but contradicts it on CCC which has negative insignificant relationship with profitability.

Additionally results contradicts Nyangweso and Wepukhulu, (2019) whose study findings indicated that both ACP and ICP had a significant negative influence on financial performance but concurs with the findings though insignificantly when firm size is used as a moderating variable. CCC exhibited a positive but insignificant effect on firm financial performance which contradicts current study findings of an insignificant negative relationship with profitability.

4.6.2 Model with all variables (Treating Firm size and Debt ratio as independent variables)

Regression model was fitted using profitability (Y) as the response variable and the predictor variables were ICP (X_1), ACP (X_2), PDP (X_3), firm size (X_4), debt ratio (X_5), CCC (X_6). Both Hausman and testparm confirmed FE model as the most appropriate and was therefore adopted.

A summary of the model coefficients was then presented in the Table below. The table presented model coefficients from POLS, RE and FE models. However, the FE model was reported as it was deemed appropriate following the tests performed above.

Table 4.9: **Model with all variables (Treating Firm size and Debt ratio as independent variables)**

Variable	Pooled OLS Model	RE Model	FE Model
X_1	0.0004 0.417	-0.0009 0.120	0.0004 0.417
X_2	0.0006 0.220	-0.0020* 0.000	0.0006 0.220
X_3	-0.0004 0.247	0.0008* 0.012	-0.0004 0.247
X_4	-0.3167* 0.000	0.0332 0.095	-0.3167* 0.000
X_5	-0.2206* 0.013	0.0958* 0.014	-0.2206* 0.013
X_6	-0.0005 0.318	0.0022* 0.001	-0.0005 0.318
C	3.159* 0.000	-0.242 0.215	3.339* 0.000
R-squared	0.8745	0.5944	0.4292
Adj. R2	0.8481		
F Statistic	33.11		21.22
Prob> F	0.000		0.000

Source: Author (2022)

The results of FE model show that ICP (X_1) and ACP (X_2) had positive coefficients indicating that their increase would result to an increase in profitability. The other variables, PDP (X_3), Firm size (X_4), Debt ratio (X_5) and CCC (X_6) had negative coefficients meaning that when they increase, profitability reduces. These variables were also found to explain 42.92% of any change that occurs in profitability (R^2= 0.4292). Additionally, this model was established to statistically significantly predict the response variable (F = 21.22, p = 0.000).

It was observed that Firm size (-0.3167, $p<0.05$) and Debt ratio (-0.2206, $p<0.05$) were statistically significant predictors of profitability. This meant that they had a negative effect on profitability, the higher the debt ratio and the bigger the firm, the higher the profitability. However, ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6) were found to have weak prediction

power as they were statistically insignificant. Their p-values were found to be larger than the significance level (α= 0.05) implying insignificant effect on profitability.

In this model moderating variables debt ratio and firm size were treated as independent variables where ICP and ACP were established to have insignificant positive impact on profitability. PDP and CCC were established to have negative relationship which was insignificant to profitability. Additionally firm size and debt ratio results showed that both had a negative significant association with profitability. These variables were found to statistically significantly predict (F = 21.22, p = 0.000) any changes in profitability at 42.92% (R^2= 0.4292)

These findings concur with Yameen et al., (2019) who in their study on liquidity impact on profitability of Bombay Stock Exchange (BSE) listed pharmaceutical firms revealed that control variables firm size, age, leverage exhibited negative impact on profitability. Kamau et al., (2021) conducted a study on how firm attributes influence financial performance of Kenyan insurance firms from years 2010-2018, whose findings indicated liquidity and leverage having a significant negative effect on profitability of Kenyan insurance firms which is corroborated by the results of this study.

4.6.3 Moderated model – Firm size

The study went ahead to examine the moderating effect firm size has on the relationship between Profitability (Y) and ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6). Three models were fitted namely pooled OLS, random effect and fixed effect models. Both Hausman and testparm confirmed fixed effects as the most appropriate and was therefore adopted.

A summary of the model coefficients was then presented in the Table below. The table presented model coefficients from POLS, RE and FE models. However, the FE model was reported as it was deemed appropriate following the tests performed above.

Table 4.10: Moderated model – Firm size

Variable	Pooled OLS Model	RE Model	FE Model
X_1	-0.0003 0.973	0.0190* 0.008	-0.0003 0.973
X_2	0.008 0.405	0.0242* 0.000	0.008 0.405
X_3	0.0029 0.725	-0.021 0.000	0.0029 0.725
X_6	-0.0038 0.654	-0.0236 0.001	-0.0038 0.654
X_1*Firm size	-0.00003 0.976	-0.002 0.008	-0.00003 0.976
X_2*Firm size	-0.0009 0.395	-0.0026 0.000	-0.0009 0.395
X_3*Firm size	-0.0004 0.684	0.0022 0.000	-0.0004 0.684
X_6*Firm size	0.0004 0.688	0.0025 0.000	0.0004 0.688
C	0.2735* 0.000	-0.137 0.000	0.2628* 0.000
R-squared	0.8431	0.7033	0.2275
Adj. R2	0.8032		
F Statistic	21.12		8.17
Prob> F	0.000		0.000

Source: Author (2022)

The results of FE model indicates that R-squared (R^2= 0.2275) explained 22.75% of any change that occurs in profitability. This was an increase of 0.64% from 22.11%. Therefore, it means that the moderating factor, firm size caused an improvement in the coefficient of determination.

It was also noted that ICP (X_1) and CCC (X_6) had negative coefficients meaning that when they increase, profitability reduces while ACP (X_2) and PDP (X_3) had positive coefficients meaning that when they increase, profitability increases. However when moderated by the firm size, the interaction coefficient of CCC (X_6) changes to positive, ACP (X_2) changes to negative and the coefficient of PDP (X_3) changes to negative. Again this is an indication of a moderating effect caused by firm size. Even though the variables were established to be statistically insignificant, we can conclude that Firm size slightly moderated the relationship between WCM and profitability.

In this model when firm size was introduced as a moderating variable ICP, ACP and PDP were established to be negatively related to profitability and with an insignificant impact on profitability. CCC was established to have a positive insignificant relationship to profitability.

This finding collaborates Bisnis, (2018) in a study about effects of CCC, firm age and size on profitability of 101 Indonesia Stock Exchange listed manufacturing firms for periods 2012-2014. Panel data regression employed revealed that variable CCC, firm age and firm size positively affected variable ROA (Alarussi and Gao, 2021;Nadeem et al., 2017 ;Alarussi and Alhaderi, 2018). Conversely study findings contradict Rizky and Mayasari, (2018) in their study on CCC impact on financial performance of listed retail firms in the Indonesian Stock Exchange from 2012-2015,who established firm age and firm size as moderating variables have insignificant effect on profitability.

4.6.4 Moderated model – Debt ratio

The study went ahead to investigate the moderating effect of firm size on the relationship between Profitability (Y) and ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6). Three models were fitted namely pooled OLS, random effect and fixed effect models. Both Hausman and testparm confirmed fixed effects as the most appropriate and was therefore adopted.

A summary of the model coefficients was then presented in the Table below. The table presented model coefficients from POLS, RE and FE models. However, FE model was adopted as it was deemed appropriate following the tests performed above.

Table 4.11: Moderated model – Debt ratio

Variable	Pooled OLS Model	RE Model	FE Model
X_1	-0.0005 0.693	0.0002 0.870	-0.0005 0.693
X_2	0.00004 0.971	-0.0008 0.574	0.00004 0.971
X_3	0.0002 0.743	-0.0003 0.748	0.0002 0.743
X_6	-0.0005 0.682	0.0005 0.704	-0.0005 0.682
X_1*Debt ratio	0.002 0.347	-0.0032 0.225	0.002 0.347
X_2* Debt ratio	0.0018 0.392	-0.0036 0.181	0.0018 0.392
X_3* Debt ratio	-0.0022 0.180	0.0029 0.141	-0.0022 0.180
X_6* Debt ratio	-0.0008 0.727	0.004 0.123	-0.0008 0.727
C	0.1886* 0.000	0.139* 0.000	0.2320* 0.000
R-squared	0.8376	0.5898	0.2268
Adj. R2	0.7963		
F Statistic	20.27		13.99
Prob> F	0.000		0.000

Source: Author (2022)

The findings of FE model indicate that R-squared (R^2= 0.2268) explained 22.68% of any change that occurs in profitability. This was an increase of 0.57% from 22.11%. Therefore, it means that the moderating factor, debt ratio caused an improvement in the coefficient of determination. There was a greater explanation power of any change occurring in the dependent variable, profitability.

It was observed that ICP (X_1) and CCC (X_6) had negative coefficients meaning that when they increase, profitability reduces while the ACP (X_2) and PDP (X_3) had positive coefficients meaning that when they increase, profitability increases. When moderated by the debt ratio, the interaction coefficient of Inventory conversion period (X_1) changed to positive, while the sign of payable deferral period (X_3) changed to negative. Again this is an indication of a moderating

effect caused by debt ratio. The study therefore concludes that debt ratio slightly moderated the relationship between WCM and profitability.

In this model when debt ratio was introduced as a moderating variable both ICP and ACP were established to be positively associated to profitability and with an insignificant impact on profitability. PDP and CCC were established to have a negative relationship which was insignificant to profitability. This findings concurs with Yameen et al., (2019) who conducted a study on liquidity impact on profitability of Bombay Stock Exchange (BSE) listed pharmaceutical firms where study findings revealed that control variables firm size, age, leverage exhibited negative impact on profitability.

4.7 Chapter Summary

This study examined the impact of WCM on profitability. To be more specific, the study investigated how ICP, ACP, PDP and CCC related and affected profitability which was indicated by ROA. In addition, firm size and debt ratio were also examined how they related to profitability and also how they moderated the relationship between WC and profitability.

First, descriptive statistics were performed where mean, standard deviation, minimum and maximum values were obtained which gave summary information about the variables under study. The study went ahead and performed correlation analysis to see how the independent variables related with profitability. Results findings indicate a statistically significant positive correlation between Profitability and ICP, a significant negative relationship between profitability and ACP and lastly firm size and profitability were also established to be significantly and positively related. CCC and Debt ratio were established to be positively related to profitability while PDP was found to relate negatively with profitability. However, the relationship was not statistically significantly ($p>0.05$).

Panel data analysis was utilized to establish the effect of WCM on profitability and also the moderating effect of firm size and debt ratio on profitability. A hausman test showed that FE model was the most appropriate to use between random and fixed effect models. Further, a time fixed effect test established that a fixed effect model was the most appropriate compared to a

POLS regression model. The results of FE model established that firm size and debt ratio had a significant effect on profitability. However, all other variables were not statistically significant.

A moderated model was also produced where firm size and debt ratio were applied as moderating variables. Research findings indicated that the independent variables ICP (X_1), ACP (X_2), PDP (X_3), and CCC (X_6) explained 22.11% of any change that may occur in profitability. When the variables interacted with firm size, the explanatory power rose by 0.64% to 22.75%. Again, when they interacted with debt ratio, the explanatory power rose by 0.57% to 22.68%. This was an indication that firm size and debt ratio brought some change and therefore slightly moderated the relationship between WC and profitability. The study concluded that firm size and debt ratio are important factors to be considered when concerned with the profitability of any company. These findings follows Bisnis, (2018) study that concluded that large sized firms enjoy high profitability levels and that size of the firm is positively related with organizational performance.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes research results of the relationship between WCM and firms' profitability, draws conclusions and gives recommendations informed by the findings. Study limitations are highlighted and suggestions for future and further research made.

5.2 Summary of findings

Correlation analysis revealed a statistically significant positive correlation between Profitability and ICP, a negative significant relationship between profitability and ACP and lastly firm size and profitability were also established to be significantly and positively related. CCC and Debt ratio were found to be positively associated with profitability while PDP was found to relate negatively with profitability. However, the relationship was not statistically significantly ($p>0.05$).

Panel data analysis indicated that FE model as the most appropriate model for analysis of data under investigation. Further findings established that firm size and debt ratio had a significant effect on profitability. However, all other variables were not statistically significant. Utilizing firm size and debt ratio as moderating variables study results indicated that ICP (X_1), ACP (X_2), PDP (X_3) and CCC (X_6) explained 22.11% of any change that may occur in profitability. When the independent variables interacted with firm size the predictive power of the model improved by 0.64% to 22.75%, further when debt ratio was introduced to the model the explanatory power rose by 0.57% to 22.68%.This findings indicate that firm size and debt ratio slightly moderated the relationship between WC and profitability

5.3 Conclusions of the study

Based on the key findings of this study, it is concluded that a statistically significant positive correlation exists between profitability and ICP, a significant negative relationship between profitability and ACP and lastly firm size and profitability were also found to be significantly and positively related. CCC and debt ratio were established to be positively related to profitability while PDP was established to relate negatively with profitability.

Therefore management of manufacturing firms can enhance performance by collecting credit sales sooner or earlier to reinvest the funds and maintain business operations as this will improve profitability. To further enhance profitability management can reduce time taken to settle supplier dues as firms will benefit from discounts offered hence reducing the cost of credit and improve relationship with suppliers. This conclusion is supported further by debt improving profitability, in that for a firm to shorten their payable deferral period they need to source for funds through debt this has consequence of reducing overall cost of capital for the business.
Larger firms make more profits and thus management should endeavor to grow their businesses.

When firm size and debt ratio were introduced into the analytical model as moderating factors, they slightly improved the explanatory power of the WC elements; ICP, ACP, PDP and CCC to profitability by 0.64% and 0.57% to 22.75% and 22.68% respectively. The study concluded that firm size and debt ratio are important factors to be considered when concerned with the profitability of any company. This conclusions follows Bisnis, (2018) study that concluded that large sized firms enjoy high profitability levels and that size of the firm is positively associated with organizational performance.

Owing to the weak prediction power of the analytical models the study concludes that there are other variables which have not been included in this study responsible for a better explanation of the overall profitability of NSE listed manufacturing firms in Kenya. Despite the model being weak in terms of its explanatory power, results indicate that the model has a very strong predictive power as depicted by the analysis of variance where the F- test was significant

($F=8.17$, $p<0.05$) and ($F=13.99$, $p<0.05$) for firm size and debt ratio moderated models respectively.

Although WCM elements account for a big proportion of assets of NSE listed manufacturing firms, WCM does not influence significantly their profitability as its just one of the many factors that influences financial performance.

5.4 Limitations of the study

The study focused on NSE listed manufacturing firms for ten year period 2012 to 2021, all information used was extracted from annual financial reports. The analysis only covered listed NSE manufacturing firms in Kenya. Additionally, majority of these firms are large and mature which may limit generalization of findings that could have been established if the non- listed firms including SMEs were incorporated. The financial measures of firm's performance and WCM employed in the study are historical in nature therefore may not give insights to finance managers and executives who are focused more on how to influence current and future decisions.

The study depends solely on published financial information hence subject to inherent limitations that are present in those annual statements. Consequently, the study quality is dependent purely on completeness, accuracy and quality of the secondary data. There are numerous other factors that influence firm's performance other than WCM which were not employed in the study for instance managerial experience, policy execution, strategy being pursued, environment, sector and industry a firm is operating in.

5.5. Recommendations

In consideration of the study findings, the researcher makes the following recommendations;

5.5.1 Recommendations for policy and practice

To further enhance profitability management can reduce time taken to settle supplier dues as firms will benefit from discounts offered hence reducing the cost of credit and improve relationship with suppliers. Firms can shorten their payable deferral period by sourcing for funds through debt which has consequence of reducing overall cost of capital for the business.

It is imperative for manufacturing firms to undertake a preliminary cost-benefit analysis of the various WCM decisions before firms' resources are committed in a decision. Trade and credit policies that involve collection and payments with customers and suppliers that enhance partnering relationships should be carefully crafted to safeguard future business for revenue generation and ensure undisrupted supplies.

Finance managers of NSE listed manufacturing firms should view profitability wholistically and determine all factors that influence overall profitability.

5.5.2 Recommendations for further study

Based on the scope and limitations of this study, the researcher puts forth a number of areas for further study. This study focused on NSE listed manufacturing firms in Kenya and therefore further studies in the field may look into areas like banking sector, communication industry, commercial and services sector. Additionally a similar study can be undertaken in non-listed manufacturing firms. A similar study on WCM effect on firm performance can be done by grouping firms into small, medium and large firms based on measures such as total revenues, long-term borrowings, total assets, firm value and capital employed and the results compared.

There are numerous factors that influence firm performance and therefore further studies incorporating factors such as managerial experience, firm strategy, geographical location, political risk, employee skill pool, firm age should be undertaken. A study should be undertaken on WCM policies and practices of both NSE listed and Non-listed manufacturing firms and the effects of these policies on financial performance compared.

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APPENDICES

Appendix I: Listed Companies at the Nairobi Securities Exchange as at 31st December 2021

AGRICULTURAL SECTOR	**TELECOMMUNICATION AND TECHNOLOGY SECTOR**
Eaagads Ltd	Safaricom Ltd
Kapchorua Tea Company Co. Ltd	
Kakuzi Ltd	**AUTOMOBILES AND ACCESSORIES SECTOR**
Limuru Tea Co. Ltd	Car and General (K) Ltd
Sasini Ltd	
Williamson Tea Kenya	**COMMERCIAL AND SERVICES SECTOR**
	Express Kenya Ltd
BANKING SECTOR	Kenya Airways Ltd
ABSA Bank Kenya Ltd	Nation Media Group
Stanbic Holdings plc.	Standard Group Ltd
Equity Group Holding Ltd	TPS Eastern Africa (Serena)
Housing Finance Co. Kenya	WPP Scangroup Ltd
Diamond Trust Bank Kenya	Uchumi Supermarket Ltd
I&M Group Holdings Ltd	Longhorn Publishers
Kenya Commercial Bank Ltd	Deacons (East Africa) Ltd
NCBA Group Ltd	Eveready East Africa Ltd
Standard Chartered Bank Kenya	Homeboyz Entertainment Ltd
The Co-operative Bank of Kenya	Nairobi Business Ventures Ltd
Bank of Kigali	Sameer Africa Ltd
CONSTRUCTION AND ALLIED SECTOR	**ENERGY AND PETROLEUM SECTOR**
Athi River Mining Cement Ltd	KenGen Company Ltd
Bamburi Cement Ltd	Total Energies Marketing Kenya Ltd
Crown Paints Kenya Ltd	Kenya Power & Lighting Co Ltd
East African Cables Ltd	Umeme Ltd
East African Portland Cement Ltd	
	INSURANCE SECTOR
INVESTMENT SECTOR	Jubilee Holdings Ltd
Centum Investment Co Ltd	Sanlam Kenya Plc
Olympia Capital Holdings	Kenya Re-Insurance Corporation Ltd
Trans-Century Ltd	Liberty Kenya Holdings Ltd
Home Afrika Ltd	Britam Holdings Ltd
Kurwitu Ventures Ltd	CIC Insurance Group Ltd
MANUFACTURING AND ALLIED SECTOR	**INVESTMENT SERVICES SECTOR**
B.O.C Kenya Ltd	Nairobi Securities Exchange Ltd
British American Tobacco Kenya	
Carbacid Investments Ltd	**EXCHANGE TRADED FUND**
East African Breweries Ltd	New Gold ETF
Mumias Sugar Company Ltd	
Unga Group Ltd	**REAL ESTATE INVESTMENT TRUSTS (REITS) SECTOR**
Flame Tree Group Holdings Ltd	Stanlib Fahari I-REIT
Kenya Orchards Ltd	

Source (CMA Statistical bulletin Q4, 2021)

Appendix II: Listed Manufacturing Companies at the Nairobi Securities Exchange as At 31st December 2021

British American Tobacco Ltd	Tobacco products and production.
Carbacid Investments Ltd	Manufactures and sells carbon dioxide products.
East African Breweries Ltd	Manufactures and sells beer and alcoholic spirits.
B.O.C Kenya Ltd	Industrial gases manufacturing.
Kenya Orchards Ltd	Processed fruits, vegetables distribution.
Mumias Sugar Company Ltd	Sugar cane manufacturing and marketing.
Unga Group Ltd	Flour milling, human nutrition and animal feed products.
Flame Tree Group Holdings Ltd	Manufactures and sells beauty care products.

Source (CMA Statistical bulletin Q4, 2021)