EFFECT OF COVID-19 MEASURES ON WORKING CAPITAL MANAGEMENT OF NSE-LISTED MANUFACTURING COMPANIES IN KENYA

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DECLARATION

I declare that this document and the research it describes are my original work and have not been presented at any other university for academic work.

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DEDICATION

My deepest gratitude goes to my mother, wife, children, siblings, and friends for their love, guidance, and support. I dedicate this project to my family, for I have often neglected them while working on this paper.

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I am very grateful for the unmerited favour, love, and grace God Almighty has shown me since the beginning of this proposal work. My sincere appreciation goes to my supervisors, Dr Moses Owino and Dr Lucy Kirima, for their tremendous direction, advice, support, and encouragement throughout my thesis writing. I would also like to thank the faculty and staff of Africa Nazarene University for providing a stimulating academic environment and resources that have enabled me to pursue my research interest.

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ABSTRACT

This study examined the impact of COVID-19 measures on the working capital management (WCM) of manufacturing companies listed on the Nairobi Securities Exchange (NSE) in Kenya. Adopting a longitudinal research design, the study was grounded in the cash conversion cycle theory, risk-return trade-off theory, agency theory, and liquidity preference theory. The target population comprised all eight NSE-listed manufacturing firms from 2017 to 2022. Secondary data were obtained from financial reports and the Kenya National Bureau of Statistics. Panel regression analysis was used to assess the impact of lockdowns (measured by period variations), fiscal policies (proxied by government spending), and monetary policies (represented by interest rates) on WCM. The findings indicate that company-specific factors predominantly influenced the Average Collection Period (ACP), with no significant impact from macroeconomic variables or the COVID-19 lockdown period ($p > 0.05$). However, the Average Payment Period (APP) and Inventory Conversion Period (ICP) exhibited statistically significant variations over time, with interaction effects between Company ID and period ($p < 0.05$), indicating that lockdown measures had an impact on these components. Similarly, the Quick Ratio (QR) was significantly influenced by inflation ($p = 0.023$) and company differences, with a marginally significant period-company interaction ($p = 0.052$), implying a possible impact of the COVID-19 lockdown. Conversely, the Cash Conversion Cycle (CCC) was primarily driven by GDP ($p = 0.024$) and company-specific factors, with no significant effect from the COVID-19 lockdown period or fiscal and monetary policies. The analysis of government spending on WCM revealed no significant relationship ($p > 0.05$), suggesting that fiscal interventions, including supplementary budgets and tax incentives, had a limited effect on the liquidity and operational efficiency of NSE-listed manufacturing firms. Similarly, monetary policies implemented by the Government of Kenya and the Central Bank of Kenya did not significantly influence WCM, highlighting the inadequacy of these interventions in mitigating economic shocks. The findings further suggest that while government spending on social protection primarily targeted households, it did not provide sufficient support for manufacturing firms. The study recommends that corporations establish contingency funds to navigate future economic crises and that the government implement more responsive fiscal and monetary policies, including targeted financial support for businesses. Further research is needed to evaluate the effectiveness of broader fiscal and monetary interventions and assess post-pandemic government preparedness in stabilizing the manufacturing sector.

DEFINITION OF TERMS

COVID-19:	Refers to the Coronavirus disease
Working Capital:	Refers to the difference between a firm's current assets and current liabilities.
Working Capital Management:	Refers to the management of short-term financing and investments of a firm
Average Collection Period:	Refers to the time taken to collect cash from customers.
Average Payment Period:	Refers to the time taken to pay the firm's suppliers.
Inventory Conversion Period:	Refers to the time taken to convert inventory held in the firm into sales.
Cash Conversion Cycle:	Refers to the length of time from the actual outlay of cash for purchases until the collection of receivables resulting from the sales of goods or services.
Gross Domestic Product:	Refers to the growth rate of the level of economic activity
Inflation:	Refers to the sustained increase in the general price level of goods/services in an economy.
Firm Size:	Refers to the natural logarithm of total assets.

LIST OF ABBREVIATIONS

ACP	-	Average Collection Period
APP	-	Average Payment Period
CBK	-	Central Bank of Kenya
CCC	-	Cash Conversion Cycle
COVID- 19	-	Coronavirus disease 2019
FS	-	Firm Size
GDP	-	Growth Domestic Product
GoK	-	Government of Kenya
ICP	-	Inventory Conversion Period
INF	-	Inflation
NSE	-	Nairobi Stock Exchange
WC	-	Working Capital
WCM	-	Working Capital Management
WHO	-	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter provides background information on the relationship between COVID-19 measures and the working capital management of manufacturing companies listed on the Nairobi Stock Exchange in Kenya. The chapter is structured into different sections, including the background of the study, statement of the problem, research objectives, study test hypothesis, significance of the study, scope of the study, theoretical framework, and conceptual framework.

1.1 Background of the Study

COVID-19 was first identified in Wuhan, China, in 2019 (Y. C. Wu et al., 2020). The virus rapidly spread to other regions, with early cases reported in Thailand, the Republic of Korea, Japan, the United States, and the Philippines (Y.-C. Wu et al., 2020). In Africa, the first confirmed case was reported in Egypt on February 14, 2020, according to the Africa Center for Disease Control and Prevention (Africa CDC) (Nkengasong, 2020). In Kenya, the first case was officially announced by the Ministry of Health on March 12, 2020, just a day after the World Health Organization (WHO) declared COVID-19 a global pandemic (Ouchetto et al., 2022). In response, the WHO and individual governments implemented a series of containment measures, which, while necessary for public health, triggered the most severe global economic crisis in over a century (World Bank, 2022c).

Effective working capital management (WCM) has been widely recognized as a crucial tool for navigating financial distress (Priem, 2021; Salehi et al., 2019; Sunday

et al., 2017). While definitions of WCM vary, it is commonly described as the management of short-term assets and liabilities to ensure a company meets its operational expenses (Sawarni et al., 2021, as cited in Ukaegbu, 2014; Lamichhane, 2019). Current assets include cash and cash equivalents, inventories, receivables, and tradable securities, while current liabilities encompass accounts payable, accruals, and short-term loans (Lamichhane, 2019).

WCM serves as a key indicator of a firm's operational and financial efficiency (Lamichhane, 2019). Its fundamental objective is to optimize revenue and enhance firm value by improving cash management, inventories, short-term assets, and short-term liabilities. A well-executed WCM strategy can significantly increase a firm's profitability. The cash conversion cycle (CCC) is widely used as a proxy for WCM (Lamichhane, 2019; Sawarni et al., 2021; Soda et al., 2022). Lamichhane (2019) defines the CCC as the duration between the outflow of cash for raw materials and the subsequent inflow from customer payments. Similarly, Soda et al. (2022) describe the CCC of manufacturing firms as the time required to convert raw materials into finished products and collect payment from customers.

1.1.1 COVID-19 Pandemic: An Overview

The World Health Organization (WHO) officially declared COVID-19 a global pandemic on March 11, 2020 (Ouchetto et al., 2022). This announcement prompted the worldwide implementation of unprecedented containment measures and non-pharmaceutical interventions aimed at curbing the spread of the virus and preventing healthcare systems from becoming overwhelmed (Deb et al., 2020). According to Ouchetto et al. (2022), these containment measures sought to reduce physical interactions between infected and healthy individuals to limit transmission. The primary intervention included partial or full lockdowns, which were widely adopted across

various countries (Deb et al., 2020; Jackson et al., 2020; Ouchetto et al., 2022; Quaife et al., 2020). While these measures were crucial in controlling the pandemic, they also triggered one of the most severe economic crises in nearly a century (Jackson et al., 2020; World Bank, 2022b).

At the onset of the pandemic, Ozili and Arun (2020) conducted a study that was guided by two key questions: How did a health crisis evolve into an economic crisis? And why did the global economy collapse as a result of the COVID-19 pandemic? Their findings highlighted two critical factors. First, as the virus spread, governments enforced social isolation measures, which led to the closure of financial markets, corporate offices, businesses, and public events. Second, heightened uncertainty regarding the future prompted a "flight to safety" in both consumption and investment decisions, causing individuals, investors, and international trade partners to adopt a more risk-averse approach. This shift disrupted economic activity and further deepened the financial crisis.

1.1.2 Global Response to the COVID-19 Pandemic: Containment Measures

Countries implemented varying containment strategies in response to the COVID-19 pandemic, differing in both scale and strictness (Deb et al., 2022). For instance, Italy adopted stringent measures, including restrictions on internal movement, the mandatory closure of schools and workplaces, a total ban on social gatherings, and widespread lockdowns. In contrast, Sweden took a more lenient approach, allowing schools for younger children to remain open, permitting social gatherings of up to fifty people, and keeping entertainment venues operational.

In Europe, governments attempted a phased reopening of businesses during the summer of 2020 following a decline in infection rates (Jackson et al., 2020). However, by August 2020, economic recovery appeared to stall as new COVID-19 cases surged,

prompting several countries to reinstate quarantine measures and lockdowns. This trend continued into September and October 2020, with renewed restrictions implemented across the United Kingdom, the Czech Republic, France, the Netherlands, Spain, Poland, and Germany.

A similar containment approach was observed in North Africa. Ouchetto et al. (2022) examined the efficacy of COVID-19 measures in Morocco, Algeria, and Tunisia, finding that all three countries adopted nearly identical strategies. These strategies included the closure of entertainment venues, stay-at-home mandates, isolation of specific cities and regions, restrictions on mass gatherings, and the shutdown of land, air, and sea borders.

In Kenya, Wangari et al. (2021) reported that the government implemented a nationwide dawn-to-dusk curfew, restricted movement in high-risk areas, closed learning institutions and daycare centers, encouraged remote work for non-essential service providers, enforced social distancing in public spaces, and banned mass gatherings. Quaife et al. (2020) compared Kenya's response with those of developed nations, highlighting that Kenya imposed lockdowns on April 16, 2020, when the country had recorded only 158 cases and six deaths. In contrast, the United Kingdom waited until its case count had reached 6,650, with 335 fatalities, before enacting similar restrictions. Additional measures in Kenya included school closures on March 15, 2020, the suspension of international flights, mandatory quarantine for incoming travellers, and the closure of entertainment venues and public gatherings, all of which took effect on March 25, 2020.

1.1.3 Global Response to the COVID-19 Pandemic: Monetary and Fiscal Policies

Fiscal policy involves government decisions on taxation and public spending, with key considerations including government debt, deficits, and expenditure allocation (World Bank, 2022a). In contrast, monetary policy refers to central bank actions aimed at regulating the supply of credit, interest rates, and the overall circulation of money to achieve macroeconomic objectives (Hilbers, 2008).

International financial institutions responded to the COVID-19 crisis by providing financial aid to help countries mitigate its economic effects. Abideen (2020) reported that the World Bank allocated US$160 billion to support pandemic response efforts, while the International Finance Corporation (IFC) disbursed US$8 billion in relief aid to assist private companies and employees. Additionally, the International Monetary Fund (IMF) provided US$50 billion through emergency financing to help developing economies manage the crisis. In Africa, the African Development Bank Group (AfDB) launched a US$3 billion COVID-19 social bond to cushion African nations against economic disruptions.

Alongside this international assistance, individual countries adopted a blend of fiscal and monetary policies tailored to their unique socioeconomic conditions and resource availability (World Bank, 2022a). For example, the United States enacted the American Rescue Plan Act, allocating over US$5 trillion for pandemic-related economic relief (Romer, 2021). This fiscal stimulus significantly contributed to economic recovery, with employment benefits increasing between March 15 and April 25, 2020 (Roy, 2020). As a monetary policy measure, the Federal Reserve Bank of New York reduced interest rates by 0.5% following a G-7 meeting in March 2020, marking the largest rate cut since the 2008 financial crisis (Jackson et al., 2020). Furthermore, the Federal Reserve injected US$5 trillion through funding operations to stabilize the

banking system, ease trading in U.S. Treasury securities, and support short-term liquidity.

Similarly, the European Union implemented a €750 billion economic stimulus package to support member states (Jackson et al., 2020). In the United Kingdom, Abideen (2020) reported that the government injected £200 billion into the economy, providing 80% wage subsidies (up to £2,500) for employees who lost jobs due to the pandemic. Additional measures included reducing interest rates from 0.25% to 0.1%, launching a £350 billion loan and grant package, and injecting £30 billion into the money supply.

In India, the government deployed a fiscal stimulus package amounting to nearly 10% of GDP, including direct financial support to low-income households (World Bank, 2022b). The IMF policy tracker highlighted that India's specific fiscal interventions included cash transfers totaling 1.2% of GDP, wage support and employment provisions for low-wage workers amounting to 0.5% of GDP, and various tax relief measures such as delayed tax filing deadlines and reduced penalty interest rates.

The fiscal and monetary policies implemented in Nigeria and Kenya exhibited similar trends. In Nigeria, the Central Bank introduced several measures to support businesses and households. It granted loan moratoriums on principal repayments starting March 1, 2020, reduced interest rates from 9% to 5% on all loans, and deployed a NGN 50 billion targeted credit facility for businesses in the entertainment, airline, and healthcare sectors. Additionally, it provided credit support for healthcare expansion, permitted loan restructuring to improve credit accessibility, and strengthened loan-to-deposit policies, enabling banks to extend more credit to the economy (Ozili, 2020).

In Kenya, the government allocated KES 44.48 billion to strengthen healthcare services, COVID-19 monitoring, social protection programs, cash transfers, and food relief efforts (Nechifor et al., 2020). Additional fiscal policies included lowering the value-added tax (VAT) from 16% to 14%, granting a 100% tax waiver for individuals earning up to KES 24,000, reducing corporate tax by 5%, and lowering the turnover tax by 2%. These measures aimed to mitigate the economic downturn, stabilize businesses, and protect vulnerable households from the financial distress caused by the pandemic.

1.1.4 Working Capital Management

Working capital management refers to the decisions related to managing current assets and current liabilities, as well as the turnover rate, while ensuring sufficient profitability and liquidity (Czerwonka & Jaworski, 2023). In determining an ideal level of working capital requirements, managers make decisions regarding the levels of individual WC components, specifically receivables, payables, inventory, and cash. According to Braimah et al. (2021), the receivables collection period reflects a company's trade credit supply policy, the payables payment period represents the accounts payable policy, and inventory levels indicate the firm’s inventory management practices.

Zimon (2020) identified three primary working capital management (WCM) strategies based on varying accounts receivable, accounts payable, and inventory levels: the conservative working capital strategy, the aggressive working capital strategy, and the moderate working capital strategy.

1.1.4.1 Conservative Strategy

The conservative strategy involves maintaining high cash reserves while minimizing receivables and payables (Zimon, 2020). Firms that adopt this approach

tend to discourage credit sales and prioritize cash transactions, resulting in a shorter receivables collection period (Braimah et al., 2021). Additionally, these companies adhere to a strict accounts payable policy, ensuring timely payments to suppliers. This approach enhances liquidity and reduces financial risk but may limit profitability due to the restrictive credit policy.

1.1.4.2 Aggressive Strategy

In contrast, an aggressive strategy focuses on having high levels of receivables and payables while keeping inventory low (Zimon, 2020). Nazir and Afza (2009) depict this method as one that substantially uses current liabilities to fund corporate activities. While this approach can boost profitability by minimizing idle working capital, it simultaneously raises financial risk. Low levels of current assets may result in liquidity issues and stock shortages, which can disrupt regular business operations. On the other hand, holding too many current assets can impede profitability by locking up resources that might be better used elsewhere.

1.1.4.3 Moderate Strategy

The moderate strategy is an intermediate approach between the conservative and aggressive strategies. According to Zimon (2020), the moderate strategy can take the form of either a moderate-conservative strategy or a moderate-aggressive strategy. The moderate-aggressive strategy is based on the principles of the aggressive strategy, while the moderate-conservative strategy aligns with the principles of the conservative strategy. The choice between these moderate approaches may vary depending on the specific industry context.

1.1.5 Stock Exchange Companies

Stock exchanges are pivotal institutions in global finance, facilitating the buying and selling of securities and serving as barometers of economic health. They provide companies with access to capital markets, enabling them to raise funds for expansion and development. For investors, stock exchanges offer opportunities to diversify portfolios and participate in the economic growth of various sectors. They are often organized as entities that oversee the trading of securities. These entities are responsible for establishing and enforcing trading rules, ensuring market integrity, and providing a platform for price discovery. In recent years, there has been a significant shift toward electronic trading platforms, enhancing the speed and efficiency of transactions. This evolution has led to increased competition among exchanges, prompting innovations in market design and trading technologies (M. Kalui & Musya, 2019).

1.1.6 Trading at the Nairobi Stock Exchange

The Nairobi Stock Exchange (NSE) is the leading stock exchange in Kenya. It plays a vital role in the Kenyan economy by providing a platform for companies to raise capital and for investors to trade securities. The NSE has undergone significant transformations in recent years, including the introduction of electronic trading systems and the demutualization process, which have enhanced its operational efficiency and governance structures (M. Kalui & Musya, 2019).

Recent studies on the NSE have examined various factors influencing its development and the performance of listed companies. M. Kalui & Musya (2019) established key elements such as market information, efficiency, transparency, openness, transaction processing systems, operating costs, and the legal and regulatory framework as critical to NSE growth. Moreover, the performance of companies listed on the NSE has been a subject of academic inquiry. Lucia (2022) emphasizes the

importance of sustainability and the sustainable development of stock exchange companies in ensuring the sustained support of all stakeholders.

Stock exchanges, including the Nairobi Securities Exchange, are integral to the functioning of financial markets. They facilitate capital formation, promote economic growth, and offer investment opportunities. Ongoing research continues to explore the dynamics of these institutions, providing insights into their evolution and impact on the broader economy.

1.2 Statement of the Problem

COVID-19 severely impacted the world's socioeconomic systems, prompting governments globally to implement unprecedented and strict mitigation measures to curb its rapid spread and alleviate its devastating impacts. In Kenya, manufacturing firms listed on the Nairobi Stock Exchange (NSE) encountered unique challenges due to COVID-19-related measures such as lockdowns, supply chain disruptions, reduced consumer demand, decreased investment, and government-imposed restrictions. To lessen the COVID-19 ramifications on the Kenyan economy, fiscal policies such as tax waivers, reductions, and deferrals, along with budget support and monetary policies in the form of liquidity injection, interest rate reductions, and eased lending conditions, were introduced through stimulus programs by the CBK and GoK.

Working capital management (WCM) serves as an effective tool for the survival and profitability of manufacturing firms by ensuring liquidity and operational efficiency. However, the measures taken during COVID-19 may have strained components of working capital—inventory management, accounts receivable, and accounts payable—impacting firms' cash flows, profitability, and financial stability.

Despite the significance of effective working capital management, there is limited empirical research on how COVID-19 measures influenced the liquidity and

financial performance of NSE-listed manufacturing firms. Understanding these effects is crucial for financial managers, investors, and policymakers to create resilient strategies for future economic shocks.

In this context, this study investigated the impact of COVID-19 lockdowns, fiscal policies (proxied by government spending), and monetary policies (represented by interest rates) on the working capital management (WCM) of NSE-listed manufacturing firms in Kenya. To the best of my knowledge, this is the first study to examine WCM practices among listed manufacturing firms before and during the COVID-19 pandemic within the Kenyan context.

1.3 Objectives of the Study

This study aimed to evaluate the effect of COVID-19 measures on the working capital management (WCM) of manufacturing companies listed on the Nairobi Stock Exchange, Kenya.

To achieve the general objective, the study was guided by the following three specific goals:

i) To assess the impact of government-imposed restrictions, decline in demand, and disruptions in the supply chain induced by the COVID-19 lockdowns on the WCM of manufacturing firms listed on the NSE.

ii) To examine the effect of government spending before and during the COVID-19 period on the WCM of manufacturing firms listed on the NSE.

iii) To evaluate the effects of interest rates during the pre-COVID-19 and COVID-19 periods on the WCM of manufacturing firms listed on the NSE.

1.4 Study test hypothesis.

To achieve the study's objectives, the research aimed to test the following hypotheses:

H_{01}: COVID-19 lockdowns do not have a statistically significant impact on the WCM of manufacturing companies listed on the NSE, Kenya.

H_{O2}: COVID-19 fiscal policies implemented by the GoK do not have a statistically significant effect on the WCM of manufacturing companies listed on the NSE, Kenya.

H_{03}: COVID-19 monetary policies instituted by the CBK do not have a statistically significant effect on the WCM of manufacturing companies listed on the NSE, Kenya.

1.5 Significance of the Study

Strong evidence suggests that the economic ramifications of the COVID-19 pandemic are distinct from those of past financial crises due to differences in their causes, scope, and severity (Ding et al., 2021; Steele et al., 2022; Zimon & Tarighi, 2021). Unlike the 2007–2009 financial crisis, which developed gradually over several years and led to financial imbalances, the COVID-19 pandemic was abrupt and had an immediate, severe impact on global economic activity.

The findings of this study are expected to provide valuable insights for policymakers, including the government, the Capital Markets Authority, and the Central Bank of Kenya. Specifically, the research may aid in assessing the effectiveness of the measures implemented to contain the spread of COVID-19, as well as the countermeasures designed to mitigate its economic impact on corporate financial performance.

Additionally, the study’s findings may assist corporate management in formulating strategies for financial crisis preparedness within the Kenyan context. By

analyzing the impact of COVID-19 on working capital management (WCM) among NSE-listed manufacturing firms, the study will also contribute to the existing body of literature, providing empirical evidence on WCM practices during economic shocks.

1.6 Scope of the Study

This study was conducted in Kenya, an emerging economy in sub-Saharan Africa, and focused on manufacturing companies listed on the Nairobi Securities Exchange (NSE) between 2017 and 2022. NSE-listed manufacturing firms were selected due to the availability of reliable financial data from published statements, as mandated by the Capital Markets Authority (CMA). Utilizing longitudinal data spanning this period enabled a comparative analysis of the pre-COVID-19 and COVID-19 periods.

The study aimed to examine the impact of COVID-19 measures on the working capital management (WCM) of manufacturing firms listed on the NSE. Specifically, the COVID-19 measures analyzed included lockdowns, assessed by variations in duration; fiscal policies, represented by government spending; and monetary policies, reflected by interest rates. WCM was evaluated using key indicators such as the cash conversion cycle, inventory turnover period, receivables collection period, payables deferral period, and quick ratio.

To establish the relationship between WCM and the COVID-19 lockdowns, government spending, and interest rates, the study employed panel regression analysis. The findings are expected to contribute to the existing body of knowledge on financial management during economic crises and provide policymakers with insights for enhancing corporate resilience in Kenya's manufacturing sector.

1.7 Limitations of the study

While efforts were made to acquire reliable data, there was a potential risk of inaccuracies in financial statements due to possible manipulation by corporations to meet industry-specific norms. Financial information may have been adjusted to include or exclude details related to working capital to comply with company specifications or other regulatory requirements for publicly traded entities. This challenge could complicate generalizations, particularly regarding privately held and family-run businesses.

1.8 Delimitations of the Study

Companies in sectors other than manufacturing companies not listed on the NSE are excluded from the study sample. This exclusion may overlook valuable perspectives and experiences regarding their adoption of WCM strategies during the pre-COVID-19 and COVID-19 periods. Additionally, factors beyond the COVID-19 lockdowns and fiscal and monetary policies could have influenced the WCM of manufacturing firms listed on the NSE during the study period. These factors may have had the potential to impact the generalizability of the study results.

1.9 Assumptions of the Study

This study assumes that its findings will provide valuable insights to scholars aiming to address current research gaps in the field. Additionally, to ensure the accuracy and reliability of the analysis, it is assumed that the manufacturing companies included in the study sample have published financial statements that comply with the International Financial Reporting Standards (IFRS).

1.10 Theoretical Framework

A theory serves as an explanation of how and why specific relationships lead to particular outcomes. It can also be seen as an account of the connections observed in

the empirical world. This study is premised on the cash conversion cycle theory, risk-return trade-off theory, agency theory, and liquidity preference theory.

1.10.1 Cash Conversion Cycle Theory

The CCC theory was proposed by Richards & Laughlin (1980), who noted that while working capital management (WCM) constituted a significant part of a financial manager's responsibilities, it had often been overlooked. They advocated for a detailed examination of the components of WCM- namely receivables, inventories, and payables- to gain a comprehensive understanding of cash inflows and outflows.

The CCC theory complements WCM by providing a holistic perspective that encompasses the procurement of raw materials, the transformation into finished goods, and the collection of revenues from both cash sales and credit customers. By integrating both inflow and outflow components into WCM, the CCC offers financial managers clearer insights to ensure adequate funds are available at the right times to meet the firm's needs (Richards & Laughlin, 1980).

The concept of CCC has been widely applied in studying WCM and its impact on financial performance. Sensini & Vazquez (2021b) found a positive correlation between the CCC and profitability among Argentine manufacturing firms. Gakure et al. (2012) contended that an extended CCC negatively affects the net operating profit of manufacturing firms listed on the NSE.

This study has evaluated the relevance of the Cash Conversion Cycle (CCC) theory by utilizing it as a proxy for working capital. It has analysed the individual components of the CCC—receivables, payables, cash, and inventories—over the study period to examine their dynamics and implications for financial management.

1.10.2 Risk-Return Trade-off Theory

The origin of the risk-return theory is attributed to Harry Markowitz through an article published in 1952 that established the portfolio selection theory (Modigliani & Pogue, 1973). The fundamental principle of portfolio selection theory is not the risk of an asset individually but rather the contribution of each asset to the risk of the entire portfolio (Mangram, 2013). Fama & French (2004) credit William Sharpe (1964) and John Lintner (1965) with developing the Capital Asset Pricing Model (CAPM) based on the principles of portfolio selection theory. The CAPM measures the expected rate of return of a security and relates it to the expected risk. The model is based on the belief that investors will support higher risk only if there is a higher level of return (Nuir & Marwan, 2019).

This study has examined the risk-return trade-off theory by investigating how financial managers make decisions regarding optimal working capital levels during the COVID-19 pandemic. This involves balancing liquidity needs with profitability goals, reflecting the core trade-off outlined in the risk-return framework.

1.10.3 Agency Theory

The origin of the agency theory traces back to the 1960s and early 1970s when economists explored risk-sharing among individuals and groups (Eisenhardt, 1989). An agency relationship concerns the ubiquitous connection between one party (the principal), who delegates work to another (the agent). The agency theory assumes that two problems will always arise as a result of this relationship: (i) a conflict between the desires and goals of the agent and those of the principal, and (ii) the expense and difficulty for the principal to ascertain the behavior of the agent.

The relevance of the agency theory to this study is premised on the relationship between the managers (agents) and the shareholders (principals). During the COVID-

19 economic crisis, financial managers of the manufacturing firms listed on the NSE were exposed to challenging decision-making, which may have conflicted with the interests of the shareholders. For instance, managers may have prioritized cash preservations over profit maximization, which may have conflicted with the shareholders' expectations. Also, due to dilution in real income, managers may have introduced stricter credit policies, mitigating the risk of default but potentially constraining revenue growth.

1.10.4 Liquidity Preference Theory

The liquidity preference theory was proposed by John Maynard Keynes, who posits that people prefer holding cash over investing in treasury bonds or other financial instruments unless they are compensated with a higher yield (Bibow, 2005). Liquidity preference theory is closely associated with working capital management because both concepts deal with managing liquidity and ensuring that businesses have enough cash flow to operate efficiently while balancing profitability.

The COVID-19 pandemic significantly disrupted the financial stability of manufacturing companies due to heightened uncertainty, supply chain disruptions, and shifts in consumer demand. In response, financial managers adopted various working capital management (WCM) strategies to safeguard liquidity and sustain operations. These included increasing cash reserves, delaying creditor payments, shortening receivables collection periods, and scaling back investments.

The Liquidity Preference Theory provides a useful framework for understanding how NSE-listed manufacturing firms adjusted their WCM practices to mitigate financial risks during the crisis. By prioritizing liquidity over long-term investments, these firms aimed to safeguard their financial position against unpredictable market conditions, highlighting the theory’s relevance in times of crisis.

1.11 Conceptual Framework

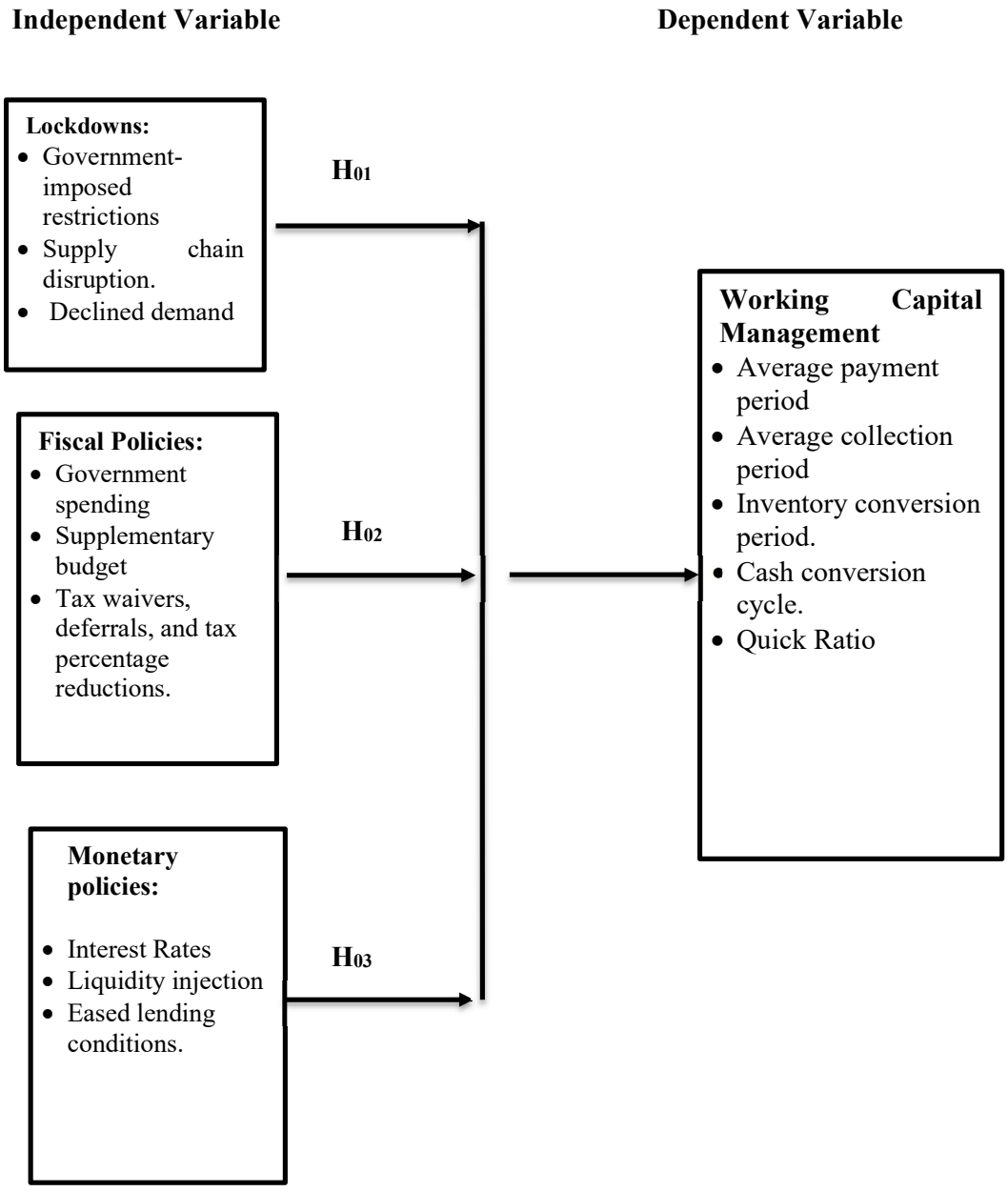


Figure 1.1 Conceptual Framework

Source (Author)

Figure 1.1 illustrates the relationship between the variables examined in this study. The independent variable, COVID-19 measures, includes lockdowns, fiscal stimulus, and monetary stimulus. In response to the COVID-19 outbreak in Kenya in March 2020, the government-imposed movement restrictions to curb the rapid transmission of the virus. These lockdowns, which extended to international and cross-border travel, severely disrupted supply chains, affecting the availability of raw materials and the distribution of finished goods for NSE-listed manufacturing firms.

The restrictions had widespread economic consequences, leading to business closures, downsizing, and income losses. Many firms struggled with liquidity constraints, operational disruptions, and reduced market demand due to declining household incomes and economic activity. To counter these effects, international financial institutions provided financial aid, which was supplemented by national governments through a combination of fiscal and monetary stimulus measures. In Kenya, the government's fiscal interventions included tax reductions, tax waivers, and targeted financial relief, alongside the enactment of supplementary budget laws to support vulnerable populations. Concurrently, the Central Bank of Kenya (CBK) implemented various monetary policies to counteract the economic downturn caused by the lockdowns. These measures included reductions in interest rates, the relaxation of lending conditions, and liquidity injections into the economy.

Working capital management has been recognized as a crucial tool for navigating financial crises. Financial managers of NSE-listed manufacturing firms adjusted their WCM strategies to maintain stability during the pandemic. This study investigates the impact of COVID-19 measures on WCM strategies before and during the pandemic, focusing on key WCM components such as the Average Collection

Period (ACP), Average Payment Period (APP), Inventory Conversion Period (ICP), Cash Conversion Cycle (CCC), and Quick Ratio (QR).

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

This chapter provides a comprehensive summary and critical analysis of the relationship between COVID-19 measures and WCM. It includes an assessment of key findings and research gaps identified in empirical studies to establish the connection between the COVID-19 pandemic and WCM.

2.1 Empirical Literature

The COVID-19 pandemic caused unprecedented disruptions in global supply chains and financial markets, directly affecting businesses' working capital management. This section presents an empirical review that examines the effects of COVID-19 measures on firms' liquidity, inventory management, accounts receivable, and accounts payable strategies.

2.1.1 COVID-19 Lockdowns and Working Capital Management

Hurley & Walker (2021) examined the impact of lockdown measures on business activity in the UK using a spatial regression discontinuity design. The study aimed to determine whether the decline in business activity was primarily driven by lockdown policies or by voluntary social distancing. The findings indicated that local lockdowns did lead to a reduction in business activity; however, business activity would have declined significantly even without these restrictions. On average, SME turnover growth during the lockdowns was approximately 20%, with firms located within two kilometres inside the lockdown boundaries experiencing 8 percentage points lower turnover growth than those just outside. The study further highlighted those local lockdowns accounted for at most two-fifths of the overall decline in business activity,

with the most significant effects observed in restaurants and non-food retail sectors, which were directly affected by restrictions. Additionally, while turnover declined sharply, costs decreased at a much slower rate, leading to cash flow constraints.

Li et al. (2022) examined the response of short sellers to the local COVID-19 pandemic in China, focusing on trading behavior amid negative shocks. The study found that an increase in newly confirmed COVID-19 cases in the headquarters' locations of listed firms was associated with a rise in short-selling of those firms. This relationship remained robust after accounting for other potential factors. Furthermore, the impact of the local pandemic on short-selling was more pronounced for firms with weaker financial conditions, those in vulnerable industries, and those at higher risk of a stock price crash. However, the effect diminished after the lockdown restrictions in Wuhan were lifted and became insignificant during later outbreaks. The findings highlight the informational role of short sellers in financial markets during the COVID-19 pandemic.

Tarighi et al. (2024) examined the effects of the COVID-19 crisis on WCM strategies among manufacturing firms listed on the Tehran Stock Exchange. The study analyzed data from 200 companies over six years (2016–2021) using ordinary least squares regression. The results revealed that the containment measures, which were primarily lockdowns, heightened firm risk, prompting companies to adopt more conservative WCM strategies to preserve liquidity. This shift often involved reducing inventory levels and extending payment terms with suppliers, reflecting a cautious approach to managing working capital during uncertain times.

Dzigbede & Pathak (2020) examined the fiscal challenges posed by the COVID-19 pandemic in African countries, using Ghana as a case study. The study analyzed Ghana's immediate monetary and fiscal responses and assessed the potential long-term

economic impacts of the pandemic. Using daily and monthly economic indicators, along with data from the Ghana Living Standards Survey (GLSS), the study simulated economic shocks and evaluated the effects of expanding a direct social assistance program. The findings indicated that the pandemic significantly increased poverty levels in Ghana. However, an expansion in government spending on cash transfer programs could partially offset the economic shocks and mitigate poverty and income inequality. The study recommended well-targeted revenue and expenditure policies to enhance economic resilience and long-term fiscal sustainability.

Wadesango et al. (2022) analyzed the impact of COVID-19 lockdown measures on working capital management and profitability of companies, focusing on challenges such as market losses, unchanged operational costs, and workforce reductions due to social distancing requirements. Using a quantitative descriptive research design, the study collected data from bakery employees through questionnaires. The findings revealed that lockdown measures, including curfews and travel bans, significantly affected firms' profitability. The study observed that firms faced delayed payments from credit customers, leading to increased accounts receivable and cash flow shortages, which hindered the ability to fund operations and settle liabilities. Effective working capital management strategies, such as reducing receivables, maintaining high inventory levels, and ensuring timely liability settlements, were necessary to sustain operations.

2.1.2 COVID-19 Fiscal Policies and Working Capital Management

Bianchi et al. (2022) examined the macroeconomic impact of the initial emergency fiscal measures introduced in Italy during the COVID-19 crisis, leveraging microdata and detailed policy information from the Italian Ministry of Economy and Finance. As the first Western country to face the pandemic, Italy provided a natural

case study for assessing the economic effects of lockdown measures and government interventions. The study found that emergency fiscal measures helped prevent an additional 4.4% decline in GDP in 2020. Furthermore, public interventions had a particularly significant impact on investment dynamics, highlighting the crucial role of fiscal policies in mitigating economic downturns during crises.

Alberola et al. (2021) analyzed the factors driving the differences in fiscal policy responses between advanced economies (AEs) and emerging market economies (EMEs) during the initial months of the COVID-19 pandemic. The study found that AEs implemented significantly larger fiscal measures compared to EMEs, partly because EMEs entered the crisis later and faced tighter financing conditions. Additionally, the narrower fiscal policy space in EMEs limited their ability to respond effectively. Structural factors, including income levels, the strength of social safety nets, and the presence of automatic stabilizers, also influenced the size and composition of fiscal interventions. The findings highlight the constraints faced by EMEs in deploying robust fiscal measures during economic crises.

A study by the International Monetary Fund (2021) analyzed fiscal policy responses across 197 economies during the COVID-19 pandemic. The policy tracker summarized key economic responses, highlighting that many governments implemented substantial fiscal programs to support businesses. These programs aimed to provide immediate liquidity to firms, thereby supporting their working capital during periods of reduced revenue.

2.1.3 COVID-19 Monetary Policies and Working Capital Management

Johnson et al. (2021) examined the effectiveness of the US Federal Reserve's expansionary monetary policy in mitigating the economic downturn caused by the

COVID-19 recession. Utilizing a mixed-frequency vector autoregressive (MF-VAR) model, the study integrated both high-frequency financial data and macroeconomic indicators such as industrial production, unemployment rates, and inflation. The findings indicated that monetary stimulus contributed to higher output growth, improved stock market returns, more favorable long-term financing conditions, and a depreciation of the US dollar compared to a no-policy scenario. These results highlight the crucial role of monetary policy in stabilizing financial markets and supporting economic recovery during crises.

Pinishi (2020) analyzed the impact of COVID-19 uncertainty on the economy and monetary policy in the Democratic Republic of Congo using a Bayesian VAR (BVAR) framework. The study found that the uncertainty shock led to an unprecedented decline in aggregate demand, posing challenges for monetary policy in stabilizing the economy. Additionally, the exchange rate effect influenced inflation dynamics, further complicating policy responses.

Amutabi (2022) analyzed the impact of COVID-19 on price stability in the East African Community (EAC) region using monthly panel data from March 2020 to April 2021. Employing the Pooled Mean Group (PMG) model, the study found a long-run relationship between the pandemic and the Consumer Price Index (CPI), with COVID-19 significantly increasing CPI levels across the region. In the short run, the impact varied by country, being positive for Kenya but negative for Rwanda and South Sudan. The study highlighted a policy dilemma where governments aimed to support businesses and households through relief measures while also managing inflation risks arising from increased money supply. The researchers recommended that governments prioritize vaccination drives to facilitate economic recovery and develop well-managed food reserves to cushion against price fluctuations caused by economic shocks

2.2 Impact of the COVID-19 Pandemic on Working Capital Management

Numerous studies published in high-impact journals have examined the effects of the COVID-19 pandemic on Working Capital Management (WCM) across different countries. For instance, Zimon and Tarighi (2021) investigated the impact of the global crisis on WCM practices among small and medium enterprises (SMEs) in Poland. Their findings revealed that most firms adopted a moderate-conservative policy throughout the study period. In contrast, Habib and Kayani (2023) reported that firms responded to the crisis by increasing inventory levels and reducing receivables. Similarly, Habib and Mourad (2022) found that firms with high liquidity and shorter Cash Conversion Cycles sought to maintain their customer base by extending receivables due dates while reducing payables turnover periods.

The impact of COVID-19 on WCM has varied across different economies. For example, Hamshari et al. (2022) analyzed 101 financial companies listed on the Amman Stock Exchange (ASE) from 2012 to 2021. Their study, employing a multiple regression model, found significant effects of WCM components such as the quick ratio, financial liquidity, short-term liability turnover ratio, and inventory turnover ratio. However, other scholars have presented differing perspectives. Faria-e-Castro (2021) linked financial company performance to financial liquidity and reductions in short-term payables turnover. Similarly, Li et al. (2021) observed that firms in Asian countries with longer CCC and primary assets consisting of short-term receivables outperformed other WCM strategies.

Several studies in Asia and the United States have produced divergent findings. Ahmad et al. (2022) compared the effects of the 2008 financial crisis with the COVID-19 pandemic on WCM and financial performance in three developing Asian economies. Analyzing data from 577 firms between 2004 and 2020, they concluded that the

COVID-19 crisis had a more severe impact on WCM than the 2008 financial crisis. However, their study did not consider crucial elements such as liabilities and financial dependencies. Addressing this gap, Habib and Kayani (2022) found that firms sought to mitigate financial strain by reducing their reliance on short-term liabilities. In the U.S., Tarkom (2022) employed a fixed-effects model to analyze how COVID-19 exposure influenced the WCM of 2,542 publicly traded firms between 2019 and 2020. The study revealed that firms directly affected by the pandemic operated with higher CCC levels, while those receiving government subsidies, such as tax postponements and investment tax credits, maintained lower CCC levels.

Despite the growing body of literature, studies assessing the impact of COVID-19 on WCM in Africa remain limited. However, a few country-specific studies, particularly in Nigeria, provide insights. Aladejebi (2020) found that SMEs in Nigeria experienced liquidity challenges due to the pandemic, which affected their ability to pay full staff salaries. Government interventions, such as low interest rates, loan restructuring, and moratoriums, were identified as the most preferred measures. However, this study did not comprehensively explore the interplay between liquidity and profitability. Similarly, Omaliko et al. (2021) examined the pandemic's effect on liquidity and profitability in Uganda. Their findings indicated that COVID-19-related lockdowns disrupted firms' access to local market inputs and exacerbated export-import bottlenecks, negatively impacting overall business liquidity and profitability.

Studies conducted in other African nations, such as Zimbabwe and Kenya, have yielded further insights. Chinjova and Ncube (2022) analyzed data from 78 respondents across four telecommunications companies in Zimbabwe using SPSS 22.0. Their regression model identified a statistically significant relationship between COVID-19-related WCM practices and various WC elements, particularly inventory management.

However, their study did not fully account for industry-specific variations in WCM strategies. Addressing this gap, Chinjova and Ncube (2022) found that COVID-19-related disruptions contributed to approximately an 11% variance in accounts receivable and a 10.1% variance in cash management across most African firms.

In Kenya, there is a notable lack of empirical studies specifically examining the impact of COVID-19 on WCM. A longitudinal study conducted by Cipe et al. (2020) in collaboration with the Centre for International Private Enterprise (CIPE) and the Kenya National Chamber of Commerce and Industry (KNCCI) assessed the pandemic's effects on businesses. The study highlighted declining sales as the primary challenge faced by enterprises before and during the crisis. However, it did not explore liquidity and resource constraints in depth. Huppertz (2022) addressed these gaps by investigating the financial performance of firms during the pandemic, focusing on liquidity management. His findings indicated that African businesses faced significant liquidity shortages, leading to salary payment difficulties and workforce redundancies. Furthermore, most firms struggled to access financial resources, underscoring the need for targeted government interventions to support corporate liquidity during economic downturns.

2.3 Summary and Research Gaps

The COVID-19 pandemic significantly impacted working capital management across global businesses, with variations in effects largely driven by firms' financial resilience, geographical context, and sector-specific conditions. The pandemic prompted widespread lockdowns, fiscal interventions, and monetary policy adjustments, each influencing business operations and working capital strategies in distinct ways.

Lockdowns, as emergency measures, had diverse consequences for businesses, particularly SMEs. Firms with substantial working capital reserves, especially those able to pivot to online operations, experienced growth, while others faced significant downturns. Studies like Hurley and Walker (2021) and Olowookere et al. (2022) highlighted how the availability of working capital could buffer against reduced business activity during lockdowns, whereas firms in areas with stricter lockdowns, such as SMEs in Uganda, suffered from severe liquidity constraints and lost revenue opportunities.

Fiscal policies played a critical role in mitigating the pandemic's economic impact, particularly through interventions like tax relief, direct transfers, and social benefits. However, the effectiveness of these measures was contingent on both the timeliness and scope of the response. Research by the World Bank (2022b) and others showed that fiscal interventions were more successful in high-income countries, while delays in low-income regions led to less effective outcomes. The challenges posed by delayed cash transfers and limited fiscal space further compounded the financial difficulties faced by businesses.

Monetary policies, including interest rate cuts and liquidity-enhancing measures, were key in stabilizing economies. The U.S. Federal Reserve and Kenyan Central Bank’s policies provided relief to businesses, especially those facing liquidity issues, as shown by studies like Siringi (2021). However, the overall effectiveness of monetary policy in managing working capital during the pandemic was debated, with some countries experiencing limited success in curbing inflation and stabilizing exchange rates.

Working Capital Management (WCM) during the pandemic required businesses to adopt varied strategies to manage their financial health. Firms in different regions

and sectors responded by adjusting inventory levels, prolonging receivables, or reducing payables to maintain liquidity. Studies such as those by Habib and Kayani (2022) and Ahmad et al. (2022) showed that firms in Asia and the U.S. adjusted WCM practices to weather the crisis, but challenges persisted in regions like Africa, where liquidity shortages and resource constraints were more pronounced.

Despite the growing body of research, notable gaps remain in understanding the full impact of COVID-19 on WCM across regions, particularly in Africa. While studies in Nigeria, Uganda, and Zimbabwe provide insights into the financial challenges faced by SMEs, there is a significant lack of empirical research in countries like Kenya, where firms struggle with liquidity and operational disruptions. Furthermore, existing literature has not adequately examined the industry-specific variations in WCM responses, which could provide more granular insights into the pandemic's effects across different sectors.

In addition, comparative studies of the COVID-19 crisis and previous economic disruptions, such as the 2008 financial crisis, often overlook how the unique nature of each crisis shaped working capital strategies. Future research could also benefit from exploring the long-term effects of the pandemic on business financial health, particularly for firms that faced severe liquidity constraints during the crisis. Additionally, the interplay between liquidity management and profitability remains underexplored, particularly in the context of firms' ability to maintain solvency and profitability during times of crisis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the strategy applied to achieve the general and specific objectives of the study. The section covers the research design, target population, study sample, data collection method, diagnostic tests, data analysis and processing, and ethical considerations.

3.1 Research Design

A research design serves as the fundamental framework that guides a researcher in systematically conducting a study. It outlines the methods, procedures, and techniques employed for data collection, analysis, and interpretation, ensuring that the research objectives are met in a structured and scientific manner. An effective research design enhances the reliability, validity, and accuracy of findings while minimizing bias and errors. It encompasses key elements such as the research approach (qualitative, quantitative, or mixed methods), data collection techniques (surveys, experiments, case studies, etc.), sampling strategies, and data analysis methods.

This study adopted a longitudinal research design, which involves tracking data over an extended period. Longitudinal research is a method used in various fields, including psychology, medicine, and social sciences, to study changes over time within the same group of subjects. Unlike cross-sectional studies, which provide a snapshot at a single point in time, longitudinal studies track individuals or groups over extended periods, allowing researchers to observe trends, developments, and causal relationships.

Spanning from 2017 to 2022, this study opted for a longitudinal approach for several reasons: it provides a comprehensive understanding of changes and trends in

variables of interest over time, allows control of unrelated variables that could affect results, and offers insights into causal relationships among the variables under investigation.

3.2 Target Population

A target population refers to a specific group of individuals or elements that a researcher aims to examine or draw conclusions about (Willie, 2023). This population shares common characteristics relevant to the research objectives, thereby ensuring the validity and generalizability of the study's findings.

The target population for this study comprised all NSE-listed firms from 2017 to 2022. As of January 2022, there were 62 listed companies categorized under the following sectors: agricultural; automobile and accessories; banking; commercial and services; construction and allied; energy and petroleum; insurance; investment services; manufacturing and allied; telecommunication; real investment trust; and exchange-traded funds (Annex I).

The selection of manufacturing companies listed on the Nairobi Stock Exchange (NSE) is because they are regulated by a strict regulatory framework that ensures their financial statements are accurate, transparent, and free from misrepresentation. Additionally, NSE-listed companies are required to publish their financial reports, providing reliable and accessible secondary data for analysis. This transparency enhances the credibility of the study and facilitates an in-depth assessment of working capital management within the manufacturing sector.

3.3 Study Sample

According to Martínez-Mesa et al. (2016), a study sample is a subset of individuals selected from the target population. This study employed a census sampling

technique, which included all manufacturing and allied companies listed on the Nairobi Securities Exchange (NSE). As Asiamah et al. (2019) explain, a census survey collects data from every member of the target population, making it suitable for obtaining accurate and comprehensive insights when it is feasible to survey the entire population.

Accordingly, this study included all eight manufacturing companies listed on the NSE (see ANNEX II). Secondary data were collected from published financial statements and the Kenya Bureau of Statistics for the period from 2017 to 2022.

3.4 Data Collection Method

Data is defined as raw, unorganized facts that require systematization to become meaningful (Bhome et al., 2013). This study relies on secondary data, which was obtained from published and audited financial statements of NSE-listed manufacturing and allied firms from 2017 to 2022.

The first step in data collection involves identifying relevant data sets to address the research questions (Johnston, 2014). This study focused on the WC components of ACP, APP, ICP, CCC, and QR. Additionally, the study incorporates control variables such as inflation (INF), firm size (FS), and gross domestic product (GDP) to account for external influences.

The inclusion of firm size is justified because larger firms generally have more efficient working capital management practices compared to smaller firms**.** Inflation is considered relevant as it affects the real value of investments and purchasing power, which can impact working capital decisions. GDP is included since firms with significant fixed assets often have higher collateral values, influencing their ability to access credit and manage debt effectively.

3.5 Variable Measurements and Data Sources

This section outlines the variables examined in the study, along with their measurements and data sources. The selection of these variables is grounded in both theoretical and empirical frameworks.

Cash Conversion Cycle (CCC): Measures the time taken to convert raw materials into finished goods and, subsequently, into cash or credit sales.

Accounts Collection Period (ACP): This represents the average number of days a firm takes to collect payments from customers, including credit sales.

Accounts Payment Period (APP): Indicates the average number of days a firm takes to settle payments with suppliers.

Inventory Conversion Period (ICP): Refers to the time required to convert inventory into sales.

Inflation Rate (INF): This represents the general increase in price levels over time, affecting purchasing power and cost structures.

Firm Size (FS): Measured using total assets or the logarithm of total revenue. In this study, the natural logarithm of total assets is used.

Gross Domestic Product (GDP): Captures overall economic growth, which can influence corporate sales and liquidity**.**

Table 3.1 below summarizes the operationalization and source of the secondary data.

Table 3.1: Variable Measurement and Data Source

Variable	Measure	Data Type	Data Source
Average collection period (ACP)	Receivables/ total sales * 365	Secondary	Financial reports
Average payment period (APP)	Accounts payable/cost of sales * 365	Secondary	Financial reports
Inventory Conversion Period (ICP)	Inventories/ cost of sales * 365	Secondary	Financial reports
Cash Conversion Cycle (CCC)	(ACP + ICP) less (APP)	Secondary	Financial reports
Quick Ratio	Current assets/current liabilities	Secondary	Financial reports
Inflation (INF)	Change in consumer price index	Secondary	Kenya National Bureau of Statistics
Firm size (FS)	Natural logarithm of firms' assets value	Secondary	Financial reports
Gross Domestic Product (GDP)	Change in GDP	Secondary	Kenya National Bureau of Statistics

Source: Researcher

3.5 Diagnostic Tests

Diagnostic tests refer to the examination of the significant variables in the study. Hamshari et al. (2022) observe that diagnostic tests are crucial because they offer empirical data about the research. The diagnostic tests begin with a normalcy test, then move to a heteroskedasticity test, and conclude with a multicollinearity test.

3.5.1 Normality Test

Normality tests are tests conducted to determine whether a sample population follows a normal (Gaussian) distribution. The test assumes that the population from which the samples are drawn is normally distributed. Khatun (2021) notes that normality tests assess whether residuals from a linear regression exhibit a normal distribution. An abnormal distribution of residuals suggests that the dependent variable or at least one explanatory variable may have a wrong functional form (Khatun, 2021).

3.5.2 Heteroskedasticity Test

Heteroskedasticity refers to an inconsistent covariance matrix in a linear model, which can result in unreliable inferences when testing statistical hypotheses (White, 1980). In this study, the Breusch-Pagan-Godfrey test has been employed to assess the presence of heteroskedasticity in the regression model and to detect potential outliers.

3.5.3 Multicollinearity Test

According to Chan et al. (2022), multicollinearity occurs when there is a linear relationship between two or more explanatory variables. Multicollinearity is typically indicated by large standard errors of coefficients, discrepancies in variable coefficients from theoretical expectations, ambiguous interpretations of variable effects on the outcome, high correlations between predictor variables and the outcome, and significant correlation coefficients among predictor variables.

In linear regression, multicollinearity results in unstable estimates due to the interdependence of variables and inflated standard errors of regression coefficients. This instability leads to inaccurate estimates, reduced precision, and ultimately diminishes the model's ability to generalize findings. To assess the presence of multicollinearity among the independent variables, this study has used the variance Inflation Factor (VIF).

3.6 Data Processing and Analysis

Data analysis, as defined by Bhome et al. (2013), involves the systematic examination of collected and organized data to explore the characteristics of the subject under study and identify patterns and relationships among relevant variables. According to Kothari (2004), during the analysis phase, identified relationships or patterns should be subjected to statistical significance tests to determine the reliability of the data in supporting conclusions.

In this study, descriptive and inferential statistical analyses, along with Pearson correlation analysis, were applied to examine the relationships among the variables. These methods facilitated the development of a statistical model that clarified the interconnections between the study variables.

3.6.1 Descriptive Analysis

Descriptive analysis is a fundamental component of quantitative research, involving summarizing and organizing the characteristics of a dataset to facilitate understanding and interpretation. Vetter (2017) posits that this approach encompasses measures of central tendency- such as mean, median, and mode; variability- including range, variance and standard deviation, and the distribution of data. By employing these

techniques, the researcher can effectively present complex data in a more comprehensible form, enabling the identification of patterns and trends.

3.6.2 Inferential Statistical Analysis

An essential aspect of quantitative research is inferential statistical analysis, which enables researchers to make inferences and draw conclusions about a population based on a sample of data. This method assists in calculating the probability that observed results are due to chance and in estimating the degree of error in the data (Gujarati, 2003). Moreover, by employing statistical models, researchers can evaluate theories and forecast population trends.

In this study, techniques such as panel regression modeling (including fixed effects model and random effects model) and Pearson correlation analysis have been employed. These methods are chosen to analyze relationships among variables and assess the impact of various factors on the outcomes of interest.

3.6.3 Correlation Analysis

Schober et al. (2018) defined correlation as a measure of a monotonic relationship between two variables, where an increase in one variable results in a consistent increase or decrease in the other. When two variables are correlated, changes in the magnitude of one variable are associated with corresponding changes in the other, either positively or negatively.

In this study, the Pearson correlation coefficient was used to examine the relationship between the observed variables. As described by Schober et al. (2018), this coefficient is a dimensionless measure of covariance, scaled between -1 and +1, indicating both the strength and direction of the linear relationship between two variables.

A coefficient of r = 0 indicated no linear relationship between the variables. A perfect correlation, represented by r = -1 or r = +1, suggested that an increase or decrease in one variable resulted in a proportionate change in the other. Values between -1 and +1 indicated varying levels of correlation, which were classified as negligible, weak, moderate, strong, or very strong (Schober et al., 2018).

3.7 Panel Regression Analyses Techniques

Hamshari et al. (2022) defined panel data as a combination of cross-sectional units (such as firms, industries, or countries) and time series observations (such as years, quarters, or months), where each cross-sectional unit is observed repeatedly over time. This structure allows for comparisons across sectors while capturing both individual and temporal variations.

This study investigated the effect of COVID-19 measures on the working capital management of manufacturing firms listed on the Nairobi Securities Exchange. Given the six-year data collection period (2017–2022), panel regression techniques were employed to analyze the data.

Yaffe (2003) discussed various panel regression techniques suitable for analyzing panel data, including the constant coefficients model, fixed effects model, random effects model, dynamic panel models, and robust panel models. However, Zulfikar (2018) identified the common effects model (pooled least squares), fixed effects model, and random effects model as the most widely used approaches.

In the common effects model, only the time series and cross-sectional data are combined, assuming that corporate data remain unchanged over time. Ordinary least squares (OLS) (or least squares technique) are typically used to estimate this regression model. The fixed-effect model assumes that differences between individuals (cross-section) can be accounted for by different intercepts. To estimate the fixed effect model

with different intercepts across cross-sectional units, dummy variables are introduced. In the random-effect model, differences in intercepts are accommodated by the error terms of each company. The Hausman test was used to test the best analysis model.

3.8 The Estimation Model

The primary objective of this study was to evaluate the effect of COVID-19 measures on the working capital management (WCM) of manufacturing firms listed on the Nairobi Securities Exchange (NSE). Data was collected from seven out of the eight manufacturing companies listed on the NSE for the period 2017–2022. The following models were estimated to determine the relationship between COVID-19 measures and WCM in manufacturing firms:

$WCM_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model I

$CCC_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model II

$ACP_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model III

$APP_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model IV

$ICP_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model V

$QR_{it} = \beta_0 + \beta_1 Covid19_{it} + \beta_2 GDP_{it} + \beta_3 INF_{it} + \beta_4 FS_{it} + \beta_5$ Interest Rate $+ \beta_6$ Government Spending $+ \varepsilon_{it}$ Model VI

Where:

WCM is the working capital management.

CCC is the cash conversion cycle.

ACP is the average collection period.

APP is the average payment period.

ICP is the inventory conversion period.

QR is the quick ratio.

COVID-19 as a dummy variable represented by 1 when there was COVID and 0 otherwise.

GDP is the gross domestic product.

INF is the inflation rate.

Interest Rate is the prevailing interest rate set by the CBK

Government Spending is the Government spending on social protection in Billion Shillings

ε is the residual term

$_{it}$ is the company and the time in the panel model.

β_0 is the y-intercept.

$\beta_1 - \beta_6$ are regression coefficients representing the change in y relative to a one-unit change in the independent variables.

3.9 Legal and Ethical Considerations

Yip et al. (2016) asserted that legal and ethical considerations are pivotal in contemporary research. To uphold rigorous legal and ethical standards, the researcher sought and obtained approval from the National Commission for Science, Technology, and Innovation (NACOSTI). NACOSTI, established under the Act of Parliament CAP

250 of the Laws of Kenya, is responsible for regulating and ensuring excellence in the science, technology, and innovation sector.

Furthermore, the researcher ensured an accurate reporting of findings, free from personal bias or undue influence, while adhering to strict anti-plagiarism standards. These measures were essential in maintaining the integrity and credibility of the research process.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter provides the results of the three hypotheses by demonstrating the statistical evidence leading to either rejection or failure to reject the hypothesis. After the chapter's introductory statement, the researcher explains the companies whose data were sourced for the current study. The researcher then presents the reliability and validity test results of the data used in the analysis. The main section of this study presents the findings.

4.2 Characteristics of the Unit of Analysis

This study utilized data from seven manufacturing companies listed on the Nairobi Stock Exchange (NSE) between 2017 and 2022. Secondary data was obtained from the firms' published and audited financial statements for the specified period. The researcher computed key working capital components, including the Accounts Collection Period (ACP), Accounts Payable Period (APP), Inventory Conversion Period (ICP), Cash Conversion Cycle (CCC), and Quick Ratio (QR). The collected data for the seven companies are presented in Appendices A–G. To maintain anonymity, the firms were coded as MF1 through MF7, representing Manufacturing Firm 1 to Manufacturing Firm 7. Although the study initially aimed to include all eight NSE-listed manufacturing firms, one company was excluded due to operational disruptions during part of the study period. For control variables, firm size was measured using the natural logarithm of total assets, while inflation and GDP data were sourced from the Kenya National Bureau of Statistics.

4.3 Preliminary Analysis

Prior to conducting inferential analysis, the researcher performed a preliminary diagnostic to confirm the appropriateness and the time series regression methodology. This involved tests for linearity, multicollinearity, heteroskedasticity, and autocorrelation. However, the normality of the data was not evaluated, as time series and panel data can adhere to various distributions. This is consistent with Baltagi's (2008) assertion that panel data regression models often depend on large sample properties rather than strict normality assumptions for residuals.

4.3.1 Heteroskedasticity Test

The researcher conducted a heteroskedasticity test to determine whether the linear model had an inconsistent covariance matrix, which could lead to faulty inferences when testing statistical hypotheses. The Breusch-Pagan-Godfrey test was used to assess the presence of outliers in the regression model.

Based on the ANOVA table and coefficient results, the P-value was greater than 0.05 ($P = 0.434$). Consequently, the study failed to reject the null hypothesis, indicating that no significant heteroskedasticity was present in the collected data. Table 4.1 presents the ANOVA results, demonstrating that the regression of the residuals confirmed the absence of heteroskedasticity.

Table 4.1: Heteroskedasticity test, ANOVA Table

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4128904647.61	6.00	688150774.60	1.01	.434b
Residual	23830343736.61	35.00	680866963.90		
Total	27959248384.22	41.00			

For all the independent variables, there was no significant heteroskedasticity as the P-values were greater than 0.05. The P-value for the independent variables ranged from 0.073 to 0.889. This showed that after the regression of the unstandardized residuals together with the independent variables, there was no significant heteroskedasticity. Table 4.2 presents a summary of the heteroskedasticity test.

Table 4.2: Heteroskedasticity Test- Coefficients

		Standardized Coefficients	t	Sig.
	Std. Error	Beta		
(Constant)	98305.83		-0.14	0.89
Inflation	4523.29	0.26	0.90	0.37
Firm Size	0.00	-0.29	-1.85	0.07
Gross Domestic Product	0.00	0.15	0.61	0.55
interest rates	9281.56	-0.05	-0.11	0.91
Govt_Spending	0.00	0.05	0.22	0.83
Period	24305.17	-0.28	-0.59	0.56

4.3.2 Multicollinearity Test

The study investigated whether there was multicollinearity, which could mean that there was a linear relationship between two or more explanatory variables. Multicollinearity occurs when independent variables in a regression model are highly correlated, which would lead to unreliable estimates of the coefficients. High multicollinearity is depicted if the VIF > 10. In the analysis of the data, all the independent variables had a VIF of less than 10, indicating that there were acceptable levels of multicollinearity, as shown in Table 4.3. In addition, in all the independent variables, the tolerance was above 0.1, which confirms that there were no multicollinearity issues in the data. Table 4.3 demonstrates the outcome of the multicollinearity test.

Table 4.3: Multicollinearity Test

	t	**Sig.**	**Collinearity Statistics**	
			Tolerance	VIF
(Constant)	0.18	0.86		
Inflation	0.22	0.83	0.30	3.31
Firm Size	-1.98	0.06	0.99	1.01
Gross Domestic Product	0.32	0.75	0.40	2.52
interest rates	-0.04	0.97	0.14	7.19
Govt_spending	0.15	0.89	0.48	2.08
Period	-0.27	0.79	0.11	9.11

4.4. Descriptive Statistical Analysis

Descriptive analysis is a foundational data analysis technique that summarizes and interprets datasets to identify patterns, trends, and key characteristics. It involves statistical measures such as mean, median, variance, and standard deviation, as well as visualizations like charts and graphs, to provide clear insights into data.

This section presents the descriptive statistical results for key financial and economic variables, including ACP, APP, ICP, QR, CCC, FS, INF, and GDP. The analysis provides insights into the dataset's distribution, variability, and central tendency.

Table 4.4 shows the overall description of the data

Table 4.4 Descriptive Analysis

	ACP	APP	ICP	QR	CCC	FS	INF	GDP
count	42	42	42	42	42	42	42	42
mean	133.83	218.27	53.11	2.55	-31.33	21.93	0.06	0.04
std	129.45	140.27	32.41	2.08	150.59	2.20	0.01	0.02
min	27.68	0.59	8.28	0.69	-530.48	18.44	0.05	0.00
25%	54.85	134.39	32.71	1.29	-109.33	20.24	0.05	0.04
50%	89.01	182.82	47.44	1.95	-32.97	21.99	0.06	0.05
75%	153.71	260.61	54.87	2.68	22.82	23.53	0.08	0.06
max	546.29	672.22	177.05	9.43	255.89	25.43	0.08	0.08

4.4.1 Measures of Central Tendency

The Accounts Collection Period (ACP) had a mean of 133.83 days, indicating that firms took an average of approximately 134 days to collect receivables. The

Accounts Payable Period (APP) had an average of 218.27 days, meaning firms, on average, took over seven months to settle their payables. The Inventory Conversion Period (ICP) had a mean of 53.11 days, representing the time required to convert inventory into sales.

The Quick Ratio (QR) had an average of 2.55, suggesting that, on average, firms possessed more than twice the liquid assets required to cover their short-term liabilities. The Cash Conversion Cycle (CCC), a measure of working capital efficiency, had a mean of -31.33 days, indicating that firms, on average, received payments from customers before settling their obligations with suppliers.

For the control variables, Firm Size (FS) had a mean of 21.93, reflecting the relative scale of the firms included in the dataset. The Inflation Rate (INF) and Gross Domestic Product (GDP) had mean values of 6.19% and 4.45%, respectively, reflecting the macroeconomic conditions during the study period.

4.4.2 Measures of Dispersion

The standard deviation for ACP (129.45) and APP (140.27) indicated significant variation in credit collection and payment periods across firms. The ICP exhibited a moderate standard deviation of 32.41 days, suggesting some variability in inventory conversion times. The QR had a standard deviation of 2.08, demonstrating a wide range of liquidity positions among firms.

The CCC displayed a high standard deviation of 150.59, indicating substantial differences in how firms managed their working capital. In contrast, FS, INF, and GDP had relatively lower standard deviations, suggesting stable firm sizes and macroeconomic conditions over the study period.

4.4.3 Range (Minimum and Maximum Values)

The ACP ranged from 27.68 to 546.29 days, indicating that some firms collected receivables quickly while others took significantly longer. The APP varied from 0.59 to 672.22 days, highlighting diverse supplier payment practices. The ICP had a minimum of 8.28 days and a maximum of 177.05 days, reflecting different levels of inventory management efficiency.

The QR ranged from 0.69 to 9.43, indicating substantial variation in short-term liquidity positions among firms. The CCC spanned from -530.48 days to 255.89 days, demonstrating that while some firms maintained a negative CCC (indicating favorable cash flow), others had prolonged cash conversion cycles.

The FS ranged from 18.44 to 25.43, reflecting differences in company size. The INF fluctuated between 4.69% and 8.01%, while the GDP varied within a range of 0.3% to 7.6%, capturing the economic dynamics during the study period.

4.5 Correlation Analysis

Pearson's Correlation Coefficient was employed to assess the strength and direction of the relationships between key variables. Table 4.5 presents the correlation matrix for the study variables

Table 4.5 Correlation Matrix

	ACP	APP	ICP	QR	CCC	FS	INF	GDP
ACP	1.00	0.46	0.69	0.03	0.58	-0.75	0.00	0.02
APP	0.46	1.00	0.44	-0.15	-0.44	-0.50	0.04	-0.12
ICP	0.69	0.44	1.00	-0.15	0.39	-0.42	0.07	-0.02
QR	0.03	-0.15	-0.15	1.00	0.13	-0.11	0.00	0.02
CCC	0.58	-0.44	0.39	0.13	1.00	-0.27	-0.02	0.13
FS	-0.75	-0.50	-0.42	-0.11	-0.27	1.00	-0.01	0.00
INF	0.00	0.04	0.07	0.00	-0.02	-0.01	1.00	0.03
GDP	0.02	-0.12	-0.02	0.02	0.13	0.00	0.03	1.00

The correlation coefficients range from -1 to +1, where +1 represents a perfect positive correlation, meaning that as one variable increases, the other also increases; -1 indicates a perfect negative correlation, meaning that as one variable increases, the other decreases; and 0 suggests no linear relationship between the variables.

As shown in Table 4.5, the pairwise correlation between ACP and APP was -0.32. This negative correlation suggested that firms with longer credit collection periods tended to have shorter payment periods, possibly reflecting differences in credit policies or liquidity constraints.

The Pearson coefficient between ACP and ICP was 0.48, indicating a moderate positive correlation. This suggested that firms with longer receivables collection periods also tended to hold inventory for extended periods, potentially leading to a slower working capital turnover.

The relationship between ICP and CCC yielded a Pearson coefficient of 0.71, signifying a strong positive correlation. This indicated that firms with longer inventory conversion periods also experienced longer cash conversion cycles.

Regarding liquidity and working capital efficiency, the correlation between QR and CCC was -0.62, suggesting that firms with higher liquidity tended to have shorter cash conversion cycles. Similarly, the correlation between APP and CCC was -0.55, implying that firms delaying supplier payments tended to maintain shorter CCC, thereby improving their liquidity position.

For company-specific variables, the correlation between Firm Size (FS) and ACP was -0.41, indicating that larger firms collected receivables more quickly, likely due to stronger bargaining power and more efficient credit management policies. The correlation between FS and QR was 0.37, suggesting that larger firms generally had higher liquidity ratios, reflecting a more stable financial position. Additionally, the correlation between FS and CCC was -0.45, suggesting that larger firms maintained shorter CCC, which could be attributed to better operational efficiency and stronger supplier negotiations.

Regarding macroeconomic factors, the correlation between Inflation (INF) and GDP growth was -0.57, indicating a strong negative relationship. This suggested that higher inflation rates were associated with lower economic growth. The correlation between INF and QR was -0.33, implying that higher inflation rates could reduce firms' liquidity, possibly due to increased operational costs. Lastly, the correlation between GDP and CCC was -0.49, suggesting that during periods of economic growth, firms experienced shorter CCC, potentially due to increased demand and faster turnover.

4.6 Hypothesis Testing

This study sought to test the hypothesis that COVID-19 measures had no significant effect on the working capital management (WCM) of manufacturing companies listed on the Nairobi Securities Exchange (NSE) between 2017 and 2022. To examine the relationship between COVID-19 lockdown measures, fiscal and monetary policies, and various components of WCM, panel regression analysis was employed.

4.6.1 Relationship between COVID-19 lockdown measures and WCM

Panel regression analysis was conducted to determine whether COVID-19 lockdown measures had a significant impact on WCM among NSE-listed manufacturing firms. Specifically, the study analyzed the relationship between WCM components and key independent variables, including inflation, firm size, GDP, interest rates, government spending, company-specific factors, and the study period (pre-COVID-19 vs. COVID-19 period).

4.6.1.1 Average collection period in days

The regression analysis revealed that the overall model was statistically significant ($p < 0.001$), explaining 78.1% of the variance in the Average Collection Period (ACP). However, an examination of individual predictors indicated that only the company identifier was statistically significant ($p = 0.000$), suggesting substantial variability in ACP across different firms.

Regarding control variables—which included firm, industry, and macroeconomic characteristics—Firm Size, Inflation, GDP, Interest Rate, Government Spending, and the study period (pre-COVID-19 vs. COVID-19) did not exhibit a statistically significant impact on ACP ($p > 0.05$). This finding suggested that

fluctuations in ACP were predominantly driven by company-specific factors rather than macroeconomic variables or the COVID-19 period.

Based on this outcome, the study failed to reject the hypothesis that COVID-19 lockdowns had no significant effect on the WCM (ACP) of manufacturing companies listed on the NSE, as variations in ACP were not attributable to changes in the study period.

Table 4.6 provides a summary of the analysis results.

Table 4.6: Impact of Lockdowns on Average Collection Period

Dependent Variable:	**Average collection period in days**			
Source	df	Mean Square	F	Sig.
Corrected Model	18.00	42848.290	4.56	0.000
Intercept	1.00	1527.880	0.16	0.690
INF	1.00	80.100	0.01	0.930
FS	1.00	1109.860	0.12	0.730
GDP	1.00	24346.310	2.59	0.120
Interest_Rate	1.00	248.080	0.03	0.870
Government_Spending	1.00	792.290	0.08	0.770
period	1.00	1252.410	0.13	0.720
Company_ID	6.00	109016.950	11.6	0.000
period * Company_ID	6.00	1096.490	0.12	0.990

4.6.1.2 Average Payment Period in Days

The analysis of the Average Payment Period (APP) revealed that the overall model was statistically significant ($p < 0.001$), accounting for 82.7% of the variance in APP. Among the predictor variables, only Company_ID ($p < 0.001$) and the interaction

between period and Company_ID (p = 0.034) were found to be significant. This suggests that differences in APP were primarily driven by firm-specific factors and changes over time. Based on this finding, the study rejected the null hypothesis that COVID-19 lockdowns had no significant effect on WCM (APP), as the variations were influenced by changes between the pre-COVID-19 and COVID-19 periods.

Table 4.7: Impact of Lockdowns on Average Payment Period

Dependent Variable:	**Average Payment Period in days**			
Source	df	Mean Square	F	Sig.
Corrected Model	18.00	32095.41	6.11	0.000
Intercept	1.00	499.00	0.10	0.761
INF	1.00	3525.31	0.67	0.421
FS	1.00	202.67	0.04	0.846
GDP	1.00	919.60	0.18	0.680
Interest_Rate	1.00	871.85	0.17	0.687
Government_Spending	1.00	617.84	0.12	0.735
period	1.00	3263.30	0.62	0.439
Company_ID	6.00	65371.95	12.45	0.000
period * Company_ID	6.00	14752.07	2.81	0.034

4.6.1.3 Inventory Conversion Period

The panel regression analysis indicated that the model was statistically significant (p = 0.014), explaining 67.6% of the variance in the Inventory Conversion Period (ICP). The significant predictors were Company_ID (p = 0.005) and the interaction between period and Company_ID (p = 0.034), suggesting substantial

differences across firms and variations within firms over time. However, other independent variables, including Inflation (INF), Firm Size (FS), GDP, Interest Rate, Government Spending, and period, were not statistically significant predictors ($p > 0.05$).

These findings indicate that changes in ICP were influenced by firm-specific factors and their interaction with time rather than broader macroeconomic conditions. Since the interaction between Company_ID and time was a significant variable, as shown in Table 4.8, the study rejects the null hypothesis that COVID-19 lockdowns had no significant effect on WCM (ICP), as variations in ICP were attributable to differences between companies and changes over time.

Table 4.8: Impact of Lockdowns on Inventory Conversion Period

Dependent Variable:	**Inventory Conversion Period**			
Source	df	Mean Square	F	Sig.
Corrected Model	18	5125.293	2.667	0.014
Intercept	1	83.934	0.044	0.836
INF	1	34.726	0.018	0.894
FS	1	1149.670	0.598	0.447
GDP	1	3247.148	1.690	0.206
Interest_Rate	1	1.997	0.001	0.975
Government_Spending	1	27.823	0.014	0.905
period	1	37.942	0.020	0.889
Company_ID	6	8105.868	4.218	0.005
period * Company_ID	6	5369.619	2.794	0.034

4.6.1.4 Quick Ratio

Panel regression analysis indicated that the overall model was significant ($p < 0.001$), explaining 88.9% of the variance in the Quick Ratio (QR). The results showed that differences in QR could largely be attributed to Company_ID, which was highly significant ($p < 0.001$), indicating considerable variability across firms. Additionally, inflation (INF) was a significant predictor ($p = 0.023$), suggesting its impact on QR. However, other variables, including Firm Size (FS), GDP, Interest Rate, Government Spending, and the period, were not significant predictors ($p > 0.05$).

Furthermore, the interaction between period and Company_ID was marginally significant ($p = 0.052$), suggesting that some variations in QR could be attributed to company-specific changes over time, as presented in Table 4.9. This finding indicated that the interaction between time and company ID influenced QR, implying that COVID-19 may have affected WCM. Based on these results, the study rejected the null hypothesis that COVID-19 lockdowns had no significant effect on the WCM (QR) of NSE-listed manufacturing companies, as variations in QR were attributable to the interaction between Company_ID and period. Table 4.9 presents the results of the analysis.

Table 4.9: Impact of Lockdowns on Quick Ratio

Dependent Variable: Quick Ratio				
Source	df	Mean Square	F	Sig.
Corrected Model	18.000	5.373	10.213	0.000
Intercept	1.000	0.001	0.002	0.964
INF	1.000	3.116	5.923	0.023
FS	1.000	0.287	0.546	0.467
GDP	1.000	0.234	0.444	0.512
Interest_Rate	1.000	0.932	1.772	0.196
Government_Spending	1.000	0.077	0.146	0.706
period	1.000	0.143	0.272	0.607
Company_ID	6.000	13.571	25.795	0.000
period * Company_ID	6.000	1.312	2.494	0.052

4.6.1.5 Cash Conversion Cycle

The panel regression analysis indicated that the overall model was significant ($p = 0.001$), explaining 77.5% of the variance in the Cash Conversion Cycle (CCC). The results revealed that GDP ($p = 0.024$) and Company_ID ($p < 0.001$) were significant predictors, suggesting that both economic output and company-specific factors influenced CCC. However, other variables, including Inflation (INF), Firm Size (FS), Interest Rate, Government Spending, and the period, did not have a significant impact ($p > 0.05$), as shown in Table 4.10.

Additionally, the interaction between period and Company_ID was not significant ($p = 0.175$), indicating that neither the period nor its interaction with company-specific factors played a decisive role in determining CCC. Based on these

findings, the study failed to reject the null hypothesis that COVID-19 lockdowns had no significant effect on WCM (CCC) in NSE-listed manufacturing companies, as variations in CCC were not attributable to changes in the period. Table 4.10 presents the results of the analysis.

Table 4.10: Impact of Lockdowns on Cash Conversion Cycle

Dependent Variable: Cash Conversion Cycle				
Source	df	Mean Square	F	Sig.
Corrected Model	18	25274.383	4.414	0.001
Intercept	1	2757.593	0.482	0.495
INF	1	3152.455	0.551	0.466
FS	1	2770.769	0.484	0.494
GDP	1	33577.991	5.864	0.024
Interest_Rate	1	2148.054	0.375	0.546
Government_Spending	1	3373.493	0.589	0.451
period	1	737.522	0.129	0.723
Company_ID	6	54387.809	9.498	0.000
period * Company_ID	6	9522.088	1.663	0.175

4.6.2 Relationship between COVID-19 Fiscal Policies and WCM

To examine the impact of fiscal policies implemented by the Government of Kenya (GoK) on WCM, this analysis assessed the effect of government spending on social protection. In response to the economic disruptions caused by the COVID-19 financial crisis, the GoK injected additional resources into the economy through

supplementary budgets, tax deferrals, reductions, and waivers. The panel regression analysis evaluated the effect of government spending over time.

4.6.2.1 Average collection period in days

The fixed effects estimate for ACP indicated that none of the predictors were significant at the 5% level of significance. The intercept had the largest coefficient (99.76) with a p-value of 0.480, suggesting no statistical significance. Inflation (INF) had a coefficient of 0.035 with a p-value of 0.972 ($p > 0.05$), indicating no meaningful relationship. Similarly, the coefficients for Firm Size (FS), GDP, and Government Spending were not statistically significant ($p > 0.05$). These findings suggest that government spending and other macroeconomic variables did not have a direct impact on ACP within the examined firms. Table 4.11 provides a summary of the fixed effects.

Based on these results, the study failed to reject the null hypothesis that COVID-19 fiscal policies had no significant effect on WCM (ACP) among NSE-listed manufacturing companies, as variations in ACP were not linked to changes in government spending.

Table 4.11: Impact of Government Spending on Average Collection Period

Estimates of Fixed Effects				
Dependent Variable: Average collection period in days				
Parameter	Estimate	df	t	Sig.
Intercept	99.7624	16.7490	0.4800	0.6370
INF	0.5324	25.0340	0.0350	0.9720
FS	0.0000	23.7300	-1.6930	0.1040
GDP	0.0000	23.0000	1.1140	0.2770
Government_Spending	0.0000	22.1340	-1.1910	0.2460

4.6.2.2 Average Payment Period in Days

The analysis of fiscal policy effects on WCM included an assessment of the impact of government spending on social protection and its relationship with the Average Payment Period (APP). The results indicated that government spending was not statistically significant ($p = 0.803$, $p > 0.05$), suggesting that it did not influence WCM, as shown in Table 4.12.

Based on these findings, the study failed to reject the null hypothesis that COVID-19 fiscal policies had no significant effect on WCM (APP) among NSE-listed manufacturing companies, as variations in APP were not attributable to changes in government spending.

Table 4.12: Impact of Fiscal Policies on Average Payment Period

Estimates of Fixed Effects				
Dependent Variable: Average Payment Period in days				
Parameter	Estimate	df	t	Sig.
Intercept	154.368	21.872	0.814	0.424
INF	3.330	21.531	0.234	0.817
FS	0.000	26.876	-2.136	0.042
GDP	0.000	20.830	0.073	0.943
Government_Spending	0.000	22.553	-0.252	0.803

4.6.2.3 Inventory Conversion Period

A correlation analysis was conducted to examine the relationship between government spending on social protection and the Inventory Conversion Period (ICP) as a component of WCM. The results revealed a Pearson correlation coefficient of 0.079, indicating a very weak positive correlation. However, with a p-value of 0.618 (two-tailed), this correlation was not statistically significant, as shown in Table 4.13.

These findings suggest that there is no statistical evidence to support a relationship between ICP and government spending on social protection, based on the sample data of 42 observations. Consequently, the study failed to reject the null hypothesis that COVID-19 fiscal policies had no significant impact on WCM (ICP) among NSE-listed manufacturing firms, as the observed variations were not statistically attributable to changes in government spending.

Table 4.13: Impact of Fiscal Policy on Inventory Conversion Period

Correlations			
		Govt_spending	ICP
Govt_spending	Pearson Correlation	1	0.079
	Sig. (2-tailed)		0.618
	N	42	42
ICP	Pearson Correlation	0.079	1
	Sig. (2-tailed)	0.618	
	N	42	42

4.6.2.4 Quick Ratio

A correlation analysis was conducted to examine the relationship between government spending on social protection and the Quick Ratio (QR). The results showed a Pearson correlation coefficient of -0.043, indicating a very weak negative correlation. However, with a p-value of 0.786 (two-tailed), this correlation was not statistically significant, as presented in Table 4.14.

These findings suggest that there is no statistical evidence supporting a relationship between government spending and QR based on the sample data of 42 observations from seven manufacturing companies. Consequently, the study failed to reject the null hypothesis that COVID-19 fiscal policies had no significant impact on WCM (QR) among NSE-listed manufacturing firms, as the observed correlation between QR and government spending was negligible. Table 4.14 presents the results of the correlation analysis.

Table 4.14: Impact of Fiscal Policies on Quick Ratio

Correlations			
		Govt_spending	Quick Ratio
Govt_spending	Pearson Correlation	1.000	-0.043
	Sig. (2-tailed)		0.786
	N	42.000	42.000
Quick Ratio	Pearson Correlation	-0.043	1.000
	Sig. (2-tailed)	0.786	
	N	42.000	42.000

4.6.2.5 Cash Conversion Cycle

The analysis of the impact of fiscal policies involved examining the correlation between government spending on social protection and the Cash Conversion Cycle (CCC). The results showed a Pearson correlation coefficient of 0.017, indicating an extremely weak positive correlation. However, with a p-value of 0.917 (two-tailed) > 0.05, this correlation was not statistically significant.

These findings suggest that there is no meaningful relationship between government spending on social protection and the CCC. Consequently, the study failed to reject the null hypothesis that COVID-19 fiscal policies had no significant effect on WCM (CCC) among NSE-listed manufacturing companies, as the observed correlation was negligible. Table 4.15 provides a summary of the data.

Table 4.15: Impact of Fiscal Policies on Cash Conversion Cycle

Correlations			
		Govt_spending	**CCC**
Govt_spending	Pearson Correlation	1.000	0.017
	Sig. (2-tailed)		0.917
	N	42.000	42.000
CCC	Pearson Correlation	0.017	1.000
	Sig. (2-tailed)	0.917	
	N	42.000	42.000

4.6.3 Relationship between COVID-19 monetary policies and WCM

To examine the relationship between COVID-19 monetary policies and working capital management (WCM), the study analyzed the impact of interest rates alongside other control variables. Specifically, the research investigated the association between WCM components, interest rates, and firm-specific factors and macroeconomic factors.

4.6.3.1 Average collection period in days

The regression analysis for the Average Collection Period (ACP) revealed that none of the predictors were statistically significant ($p > 0.05$). The intercept and predictor variables had the following p-values: -313.08 ($p = 0.368$), -3.39 ($p = 0.851$), -1.80E-9 ($p = 0.125$), 2.91E-9 ($p = 0.247$), and 25.95 ($p = 0.272$), as shown in Table 4.16. These results indicate that the examined predictors, including the interest rate, did not have a statistically significant impact on ACP among the studied firms.

Based on this outcome, the study failed to reject the null hypothesis that COVID-19 monetary policies had no significant effect on WCM (ACP) among NSE-

listed manufacturing companies, as variations in ACP were not attributable to changes in interest rates.

Table 4.16: Impact of Monetary Policy on Average Collection Period

Estimates of Fixed Effects				
Dependent Variable: Average collection period in days				
Parameter	Estimate	df	t	Sig.
Intercept	-313.079	18.108	-0.923	0.368
INF	-3.390	19.766	-0.190	0.851
FS	0.000	21.569	-1.598	0.125
GDP	0.000	24.175	1.187	0.247
Interest_Rate	25.947	16.668	1.135	0.272

4.6.3.2 Average Payment Period in Days

The analysis was conducted to determine the impact of monetary policy, specifically interest rates, on the Average Payment Period (APP) in days. The results indicated that none of the predictors were statistically significant ($p > 0.05$). The p-values for the key variables were as follows: Intercept ($p = 0.930$), Inflation (INF) ($p = 0.993$), GDP ($p = 0.784$), and Interest Rate ($p = 0.682$), as shown in Table 4.17.

Additionally, Firm Size (FS) was marginally non-significant ($p = 0.056$), suggesting a potential, albeit weak, inverse relationship with APP. Furthermore, the confidence intervals for all estimates included zero, reinforcing the absence of a significant impact. These findings indicate that the examined economic indicators, including interest rates, did not significantly influence APP among the studied firms.

Based on this outcome, the study failed to reject the null hypothesis that COVID-19 monetary policies (interest rates) had no significant effect on WCM (APP) among NSE-listed manufacturing companies.

Table 4.17: Impact of Monetary Policy on Average Payment Period

Estimates of Fixed Effects				
Dependent Variable: Average Payment Period in days				
Parameter	Estimate	df	t	Sig.
Intercept	26.5090	17.6690	0.0890	0.9300
INF	-0.1573	25.0570	-0.0090	0.9930
FS	0.0000	24.3710	-2.0070	0.0560
GDP	0.0000	27.6020	0.2770	0.7840
Interest_Rate	9.0025	19.4130	0.4160	0.6820

4.6.3.3 Inventory Conversion Period

The analysis of the impact of monetary policy on WCM examined the relationship between the Inventory Conversion Period (ICP) and interest rates, alongside control variables. The fixed-effects regression results indicated that none of the predictors were statistically significant ($p > 0.05$). The p-values for the intercept and predictors were as follows: -2.86 ($p = 0.981$), -0.53 ($p = 0.933$), -8.26E-11 ($p = 0.799$), 9.33E-10 ($p = 0.332$), and 1.34 ($p = 0.835$), as shown in Table 4.18.

Additionally, a correlation analysis between interest rates and the ICP yielded a p-value of 0.544 ($p > 0.05$), further confirming the lack of statistical significance. These findings suggest that the examined variables did not have a meaningful impact on the ICP of the studied companies.

Based on these results, the study failed to reject the null hypothesis that COVID-19 monetary policies had no significant effect on WCM (ICP) among NSE-listed manufacturing companies.

Table 4.18: Impact of Monetary Policy on Inventory Conversion Period

Estimates of Fixed Effects				
Dependent Variable: Inventory Conversion Period				
Parameter	Estimate	df	t	Sig.
Intercept	-2.85543	20.89400	-0.02400	0.98100
INF	-0.52884	21.73900	-0.08500	0.93300
FS	0.00000	16.20100	-0.25900	0.79900
GDP	0.00000	26.10000	0.98900	0.33200
Interest_rate	1.33888	17.65000	0.21100	0.83500

Correlations			
		interest rates	ICP
interest rates	Pearson Correlation	1.000	-0.096
	Sig. (2-tailed)		0.544
	N	42.000	42.000
ICP	Pearson Correlation	-0.096	1.000
	Sig. (2-tailed)	0.544	
	N	42.000	42.000

4.6.3.3 Quick Ratio

The analysis of the Quick Ratio, a key component of working capital (WC), revealed that none of the predictor variables were statistically significant at the 5% level. The intercept and predictor variables had the following p-values: -0.001764 (p = 1.000), -0.342959 (p = 0.062), -1.261892E-11 (p = 0.265), 2.086542E-11 (p = 0.295), and 0.294425 (p = 0.304), as shown in Table 4.19.

Additionally, the results indicated that the interest rate, one of the key predictor variables, did not have a statistically significant impact on the Quick Ratio.

Based on these findings, the study failed to reject the null hypothesis that COVID-19 monetary policies had no significant effect on the Quick Ratio of NSE-listed manufacturing companies.

Table 4.19: Impact of Monetary Policies on Quick Ratio

Estimates of Fixed Effects				
Dependent Variable: Quick Ratio				
Parameter	Estimate	df	t	Sig.
Intercept	-0.0018	16.3880	-0.0010	1.0000
INF	-0.3430	12.5640	-2.0520	0.0620
FS	0.0000	22.2810	-1.1440	0.2650
GDP	0.0000	15.1520	1.0850	0.2950
Interest_Rate	0.2944	21.4400	1.0530	0.3040

4.6.3.4 Cash Conversion Cycle

The analysis of the relationship between the Cash Conversion Cycle (CCC) and interest rates revealed that none of the predictor variables were statistically significant

at the conventional 5% level. The intercept had a coefficient of -368.11 with a p-value of 0.134, indicating it was not significantly different from zero. Other economic indicators, including Inflation (INF), Firm Size (FS), GDP, and Interest Rate, had coefficients of -5.79, 2.73E-10, 3.39E-9, and 20.90, respectively, but were not statistically significant, as their p-values exceeded 0.05.

Based on these findings, the study failed to reject the null hypothesis that COVID-19 monetary policies had no significant impact on Working Capital Management (WCM), as measured by the CCC, among NSE-listed manufacturing companies.

Table 4.20: Impact of Monetary Policies on Cash Conversion Cycle

Estimates of Fixed Effects				
Dependent Variable: Cash Conversion Cycle				
Parameter	Estimate	df	t	Sig.
Intercept	-368.107	21.758	-1.558	0.134
INF	-5.792	23.424	-0.381	0.707
FS	0.000	12.144	0.367	0.720
GDP	0.000	25.588	1.765	0.090
Interest_Rate	20.901	18.695	1.264	0.222

4.7 Overall Estimation

The overall regression model for the Average Collection Period (ACP) was not significant, with a p-value of 0.624 (> 0.05). Similarly, the regression model for the Average Payment Period (APP) was not significant, with a p-value of 0.652 (> 0.05). Additionally, the overall model for the Inventory Conversion Period (ICP) had a p-

value of 0.914, while the Quick Ratio and Cash Conversion Cycle (CCC) had p-values of 0.850 and 0.753, respectively.

These findings suggest that, overall, COVID-19 measures, including lockdowns, fiscal policies, and monetary policies, did not have a statistically significant impact on the Working Capital Management (WCM) of manufacturing companies listed on the NSE. The detailed regression analysis results are presented in Appendix I.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the main findings. It is structured into different sections, including a summary of the main findings, discussion, conclusions, recommendations, and areas of further research.

5.1 Summary of the Main Findings

This study found that the COVID-19 lockdown had a significant impact on the Average Payment Period (APP), Inventory Conversion Period (ICP), and Quick Ratio (QR) but did not influence the Cash Conversion Cycle (CCC). This outcome was primarily due to the interaction between company-specific factors (Company_ID) and period (pre- and during COVID-19), which had a significant effect but did not present a main effect. Consequently, the impact of the lockdown on WCM varied across companies, affecting some while leaving others relatively unchanged.

Furthermore, the study revealed that the monetary policies implemented by the Central Bank of Kenya and the fiscal policies introduced by the Government of Kenya did not significantly influence the WCM of manufacturing firms. This suggests that the government did not implement measures that directly or indirectly affected WCM during the COVID-19 pandemic. Although differences in WCM were observed due to the pandemic, government expenditures on social protection and interest rate adjustments did not effectively influence the WCM of these companies.

5.2 Discussions

This section presents a discussion of the research findings in relation to each research objective and hypothesis. For each objective, the author compares the study's results with those of other scholars.

5.2.1 Effect of COVID-19 Lockdown on the WCM of NSE-listed Manufacturing Companies.

The analysis revealed that COVID-19 lockdowns and government-imposed restrictions in Kenya had a significant impact on certain components of working capital management. Statistical findings demonstrated that both company-specific variables and time had a notable effect at a 95% confidence level. Specifically, 82.7% of the variance in WCM could be attributed to differences between companies and the interaction between period and Company_ID ($p = 0.034$). The Inventory Conversion Period (ICP) was significantly influenced by Company_ID ($p = 0.005$) and its interaction with the period ($p = 0.034$), explaining 67.6% of the variation. Similarly, the Quick Ratio (QR) varied across companies and time, accounting for 88.9% of the observed variance.

These results suggest that while WCM differences were largely driven by company-specific factors, temporal variations—pre-COVID-19 versus during the pandemic—also played a role. Notable differences were observed in key WCM metrics, including the Average Payment Period (APP), Inventory Conversion Period (ICP), and Quick Ratio (QR), all of which were affected by the period under consideration. However, the findings did not indicate a significant impact of COVID-19 lockdowns on the Cash Conversion Cycle (CCC) as a component of WCM.

These results align with previous studies, such as those by Jones (2022) and Wadesango (2022), which documented the impact of COVID-19 lockdowns on WCM

in manufacturing firms globally. Wadesango (2022) highlighted that the pandemic disrupted WCM, leading to market losses, increased debt, and reduced production due to workforce constraints. Similarly, Olowookere (2021) observed that lockdowns weakened global business finances, forcing companies to reassess variable costs and seek strategic partnerships. A study in Uganda further reported negative effects on small-scale businesses in Arua Municipality, including deteriorating perishable goods, increased transaction costs, and lost income.

While much of the existing literature, including studies by Hamiza (2020), Olowookere (2021), and Wadesango (2022), focuses on the global impact of the pandemic on businesses, there is limited research specifically examining its effects on WCM in Kenya. This study contributes to the literature by confirming that the interaction between company-specific factors and time (pre- and during COVID-19) significantly influenced WCM in Kenyan manufacturing firms. The findings provide new insights into how the pandemic affected firms' ability to manage assets and liabilities, particularly receivables, inventories, and cash. Notably, the study found that lockdown measures significantly impacted the Quick Ratio (QR), which reflected extended supplier payment periods (APP) (Wadesango et al., 2022).

5.2.2 Effect of COVID-19 Fiscal Policies on WCM of NSE-listed Manufacturing Companies

Regression and correlation analyses indicated that fiscal policies had no significant impact on the working capital management (WCM) of manufacturing firms listed on the Nairobi Securities Exchange (NSE) in Kenya. Similar to other emerging economies such as Ghana, the Government of Kenya (GoK) implemented cash transfer programs to mitigate the economic shocks of COVID-19. However, these measures were not entirely effective in addressing the poverty and inequality exacerbated by the

pandemic (Dzigbede & Pathak, 2020). It was initially expected that fiscal policies introduced by the GoK, including increased public expenditure and social protection spending, would positively influence WCM.

Empirical evidence suggests that government spending on social protection had a beneficial impact on manufacturing firms during the COVID-19 pandemic in some contexts (Ahumada, 2023). For instance, in the United Kingdom, government-led social protection initiatives played a critical role in supporting the survival of small and medium-sized enterprises (SMEs), particularly those experiencing financial distress (Belghitar, 2021). However, the effectiveness of financial support policies in alleviating cash flow constraints and facilitating business reopening depends on multiple factors and remains a subject of scholarly debate (Chen, 2020). Although the pandemic significantly disrupted the manufacturing sector, concerns persist regarding the sustainability of social protection programs. Further research is necessary to fully assess their long-term impact on manufacturing firms.

The role of fiscal policies in promoting economic stability during the COVID-19 crisis has been widely acknowledged (Alberola et al., 2021). However, in Kenya, these measures did not yield a significant impact on the manufacturing sector. Several factors may explain this outcome. First, as noted by Chen (2020), the effectiveness of such fiscal interventions depends on their design and execution, which may not always align with industry-specific needs. Second, government resources allocated to social protection may have been inadequately implemented or insufficiently directed toward the manufacturing sector. Additionally, as an emerging economy, Kenya faces fiscal constraints related to debt sustainability, leading to higher borrowing costs and limited access to external financing. These limitations may have restricted the government's ability to allocate sufficient resources to support manufacturing firms during the

economic downturn. Instead, as observed in other similar economies, Kenya prioritized direct cash transfers to impoverished and vulnerable households over corporate financial assistance (World Bank, 2022b).

5.2.3 Effect of COVID-19 Monetary Policy on the WCM of NSE-listed Manufacturing Companies

The analysis revealed that the monetary policies implemented by the Government of Kenya both before and during the COVID-19 pandemic did not have a significant impact on the working capital management (WCM) of manufacturing companies listed on the Nairobi Securities Exchange (NSE). Existing literature suggests that such policies were expected to help companies maintain financial stability amidst the disruptions caused by the pandemic. For instance, Feldkircher et al. (2021) found that the monetary policies enacted by the U.S. Federal Reserve in response to COVID-19 had a stimulatory effect on financial markets and positively influenced various macroeconomic variables.

However, monetary policies do not always yield a meaningful impact on WCM, as evidenced by Pinshi (2020). Using a Bayesian VAR model to examine the effects of COVID-19-related uncertainty on the Congolese economy, Pinshi found that monetary interventions were largely ineffective in controlling inflation, regulating exchange rates, or stabilizing demand and prices. Similarly, the present study found that the monetary policies adopted by the Government of Kenya, including adjustments to interest rates, did not significantly influence the WCM of manufacturing firms.

One possible explanation for this outcome is that the Government of Kenya did not adjust interest rates in a manner that adequately responded to the economic challenges posed by the pandemic. Amin (2020) highlights that Kenya has historically adopted a conservative approach to monetary policy, particularly in adjusting interest

rates. Even after the onset of COVID-19, the government maintained relatively stable interest rates despite significant economic shocks (Amin, 2020). While this approach aligns with Kenya's long-term economic strategy, it may have been insufficient in addressing market failures during a crisis (Alper, 2019).

5.3 Conclusion

The findings of this study indicate that the COVID-19 lockdown in Kenya had a notable impact on the WCM of manufacturing firms listed on the Nairobi Securities Exchange (NSE). The disruptions in business operations affected these companies' liquidity management and their ability to meet short-term financial obligations. This, in turn, increased their reliance on borrowing, resulted in missed supplier discounts, and led to higher operational expenses. Additionally, poor inventory management, including overstocking, negatively affected sales and overall business performance.

Despite these disruptions, the study found that the fiscal and monetary policies implemented by the Government of Kenya and the Central Bank of Kenya were inadequate in mitigating the impact on WCM. Specifically, the government's reluctance to significantly adjust interest rates limited its ability to promote economic recovery. Similarly, while social protection funding was allocated to vulnerable households, it was insufficient to support manufacturing companies listed on the NSE. These findings suggest that the government's response to the economic shocks of COVID-19 was inadequate in addressing the challenges faced by manufacturing firms.

5.4 Recommendations

In this section, the researcher provides recommendations based on the research findings. These recommendations are organized under subheadings, each highlighting key areas for improvement by both governments and corporations.

5.4.1 Corporate Contingency Planning

It is recommended that manufacturing firms establish contingency funds and develop financial provisions to mitigate future economic shocks and liquidity crises. The findings indicate that companies without sufficient financial buffers struggled to meet their short-term obligations, leading to adverse operational consequences.

5.4.2 Enhanced Government Fiscal and Monetary Policies

The government should implement more effective fiscal and monetary policies to address the economic challenges posed by pandemics and similar crises. This study found that the fiscal and monetary interventions during COVID-19 did not significantly impact WCM. Specifically, the government failed to adjust interest rates in alignment with macroeconomic conditions. Therefore, it is recommended that the government develop a crisis preparedness framework that includes targeted monetary policies to support manufacturing companies during economic downturns.

5.4.3 Expanded Financial Support for Businesses

While the government introduced social protection programs to cushion the impact of COVID-19, these initiatives primarily targeted households and did not address the financial challenges faced by manufacturing companies. It is recommended that during economic crises, the government allocate funds specifically for SMEs and corporations to prevent liquidity constraints, business closures, and economic stagnation.

5.5 Areas for Further Research

This section outlines potential areas for further research, highlighting gaps or limitations identified in the current study. It suggests directions for future investigations

that could expand upon the findings and contribute to a deeper understanding of the topic.

5.5.1 Broader Sample Size

This study focused on a sample of seven manufacturing companies, which may not fully represent the entire sector. Future research should expand the sample size to include both SMEs and large corporations using a stratified sampling approach. This would provide a more comprehensive understanding of the pandemic's impact on WCM across different business categories.

5.5.2 Alternative Fiscal and Monetary Policy Measures

The current study focused on interest rates and government spending as the primary monetary and fiscal policy variables. However, other interventions may have been implemented by the government and should be examined both quantitatively and qualitatively. Further research should explore a broader range of fiscal and monetary policies to assess their effectiveness in addressing economic crises.

5.5.3 Post-COVID-19 Government Preparedness

While this study examined the government's response during the COVID-19 pandemic, further research could investigate its preparedness for future economic crises. A study on post-pandemic fiscal and monetary strategies would provide insights into how the government supports manufacturing companies in the aftermath of financial disruptions. Such research would contribute to a holistic understanding of government intervention in economic recovery and resilience-building.

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ANNEXES

ANNEX I: NSE-Listed Companies

NSE-LISTED COMPANIES BY SECTOR	
AGRICULTURAL	
1	Eaagads Ltd.
2	Kapchorua Tea Kenya Plc.
3	Kakuzi Plc
4	Limuru Tea Co. Ltd.
5	Sasini Plc.
6	Williamson Tea Kenya Plc.
AUTOMOBILES & ACCESSORIES	
7	Car & General (K) Ltd.
BANKING	
8	ABSA Bank Kenya Plc.
9	Stanbic Holdings Ltd.
10	I & M Holdings Plc.
11	Diamond Trust Bank Kenya Ltd
12	HF Group Plc.
13	KCB Group Plc.
14	NCBA Group Plc.
15	Standard Chartered Bank Kenya Ltd.
16	Equity Group Holdings Plc.
17	The Co-operative Bank of Kenya Ltd
COMMERCIAL & SERVICES	
18	Express Kenya Plc.
19	Kenya Airways Ltd.
20	Nation Media Group Plc.
21	Standard Group Plc.
22	TPS Eastern Africa (Serena) Ltd.
23	WPP Scangroup Plc.
24	Uchumi Supermarket Plc.

25	Eveready East Africa Ltd.
26	Longhorn Publishers Plc.
27	Deacons (East Africa) Plc.
28	Sameer Africa Plc.
29	Nairobi Business Ventures Ltd.
30	Homeboyz Entertainment Plc.
CONSTRUCTION & ALLIED	
31	ARM Cement Plc.
32	Bamburi Cement Ltd.
33	Crown Paints Kenya Plc.
34	E.A Cables Ltd.
35	E.A Portland Cement Ltd.
ENERGY & PETROLEUM	
36	Total Kenya Ltd.
37	KenGen Plc.
38	Kenya Power & Lighting Plc.
39	Umeme Ltd
INSURANCE	
40	Jubilee Holdings Ltd
41	Sanlam Kenya Plc.
42	Kenya Re-Insurance Corporation Ltd.
43	Liberty Kenya Holdings
44	Britam Holdings Plc.
45	CIC Insurance Group Ltd.
INVESTMENT	
46	Olympia Capital Holdings Ltd.
47	Centum Investment Plc.
48	Trans - Century Plc.
49	Home Afrika Ltd.
50	Kurwitu Ventures Ltd.
INVESTMENT SERVICES	
51	Nairobi Securities Exchange Plc.

MANUFACTURING & ALLIED	
52	B.O.C Kenya Plc.
53	British American Tobacco Kenya Plc.
54	Carbacid Investments Plc.
55	East African Breweries Ltd.
56	Mumias Sugar Co. Ltd
57	Unga Group Ltd.
58	Kenya Orchards Ltd.
59	Everready East Africa Ltd.
TELECOMMUNICATION	
60	Safaricom Plc.
REAL ESTATE INVESTMENT TRUST	
61	ILAM Fahari I-REIT
EXCHANGE-TRADED FUNDS	
62	ABSA New Gold ETF

ANNEX II: NSE-Listed Manufacturing Companies

MANUFACTURING & ALLIED COMPANIES LISTED ON THE NSE	
1	B.O.C Kenya Plc.
2	British American Tobacco Kenya Plc.
3	Carbacid Investments Plc.
4	East African Breweries Ltd.
5	Mumias Sugar Co. Ltd
6	Unga Group Ltd.
7	Kenya Orchards Ltd.
8	Everready East Africa Ltd.

ANNEX III: Data Collection Sheet

Company Code	YEAR	ACP	APP	ICP	QR	CCC	FS	INF	GDP
MF1	2017	45.62	80.39	24.51	8.65	-10.26	23.05	8.0%	3.8%
	2018	51.39	57.18	29.45	2.14	23.66	23.02	4.7%	5.6%
	2019	61.54	73.93	32.69	1.96	20.29	23.09	5.2%	5.1%
	2020	50.77	105.17	51.13	1.58	-3.27	23.21	5.4%	-0.3%
	2021	41.95	54.39	28.21	2.26	15.78	23.03	6.1%	7.6%
	2022	59.51	63.63	22.55	1.70	18.43	23.05	7.7%	4.9%
MF2	2017	54.79	130.45	77.80	1.32	2.13	23.14	8.0%	3.8%
	2018	49.68	136.67	77.67	1.59	-9.32	23.63	4.7%	5.6%
	2019	55.02	156.97	53.78	1.09	-48.17	23.81	5.2%	5.1%
	2020	67.93	155.83	46.28	1.30	-41.62	23.80	5.4%	-0.3%
	2021	62.69	162.06	54.20	1.64	-45.18	23.91	6.1%	7.6%
	2022	67.11	129.87	46.57	2.16	-16.19	23.90	7.7%	4.9%
MF3	2017	97.93	464.45	55.10	1.95	-311.43	21.52	8.0%	3.8%
	2018	115.64	436.83	61.03	1.88	-260.15	21.48	4.7%	5.6%
	2019	140.02	364.14	51.73	1.98	-172.39	21.41	5.2%	5.1%
	2020	152.22	279.02	47.33	2.51	-79.47	21.46	5.4%	-0.3%
	2021	92.15	175.97	45.90	2.88	-37.91	21.41	6.1%	7.6%
	2022	187.23	133.63	48.47	4.07	102.07	21.39	7.7%	4.9%
MF4	2017	71.20	230.90	49.85	7.01	-109.85	21.92	8.0%	3.8%
	2018	71.05	149.71	32.77	9.43	-45.89	21.94	4.7%	5.6%
	2019	101.16	168.72	32.69	5.69	-34.87	21.98	5.2%	5.1%
	2020	104.47	159.43	23.89	5.76	-31.07	22.01	5.4%	-0.3%
	2021	85.88	176.75	20.63	4.98	-70.24	22.09	6.1%	7.6%
	2022	94.74	233.29	20.63	1.65	-117.92	22.22	7.7%	4.9%
MF5	2017	51.59	194.22	34.87	1.01	-107.77	24.92	8.0%	3.8%
	2018	39.49	218.98	35.04	0.83	-144.45	24.99	4.7%	5.6%
	2019	36.36	228.93	30.27	0.88	-162.30	25.19	5.2%	5.1%
	2020	27.68	189.32	47.55	0.84	-114.09	25.21	5.4%	-0.3%
	2021	55.30	229.64	43.94	0.86	-130.40	25.33	6.1%	7.6%
	2022	39.34	76.11	42.83	0.85	6.06	25.43	7.7%	4.9%
MF6	2017	160.71	158.06	132.59	1.50	135.24	20.47	8.0%	3.8%
	2018	224.99	248.08	73.67	4.54	50.58	20.17	4.7%	5.6%
	2019	154.21	264.79	45.09	1.28	-65.49	19.33	5.2%	5.1%
	2020	114.87	448.00	62.21	1.04	-270.92	19.12	5.4%	-0.3%
	2021	154.59	0.59	50.10	0.69	204.10	18.89	6.1%	7.6%

	2022	93.81	672.22	47.93	0.76	-530.48	18.44	7.7%	4.9%

MF7	2017	295.01	189.10	8.28	2.00	114.19	18.50	8.0%	3.8%
	2018	282.91	188.89	53.66	2.62	147.67	18.56	4.7%	5.6%
	2019	434.52	321.61	80.26	2.89	193.18	18.73	5.2%	5.1%
	2020	425.60	350.28	102.79	2.53	178.11	18.65	5.4%	-0.3%
	2021	501.94	373.58	127.54	2.70	255.89	18.66	6.1%	7.6%
	2022	546.29	535.41	177.05	2.25	187.92	18.81	7.7%	4.9%

ANNEX IV: Fiscal Policies and Monetary Policies

	Government Spending (KES Trillion)	Spending on social protection	Interest Rate
2017	2.28	28.2	10.00%
2018	2.57	31.7	9.5
2019	2.81	34.8	8.5
2020	3.02	43.4	7.0
2021	3.36*	32.7	7.0
2022	3.77*	39.5	8.75

APPENDIXES

APPENDIX I: OVERALL ESTIMATION ANOVA TABLE

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110593.530	6	18432.255	.736	.624[b]
	Residual	876845.524	35	25052.729		
	Total	987439.054	41			
a. Dependent Variable: Average collection period in days						
b. Predictors: (Constant), Period, Firm Size, Inflation, Govt_spending on social protection, Growth Domestic Product, interest rates						

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74735.067	6	12455.845	.699	.652[b]
	Residual	623778.608	35	17822.246		
	Total	698513.675	41			
a. Dependent Variable: Average Payment Period in days						
b. Predictors: (Constant), Period, Firm Size, Inflation, Govt_spending on social protection, Growth Domestic Product, interest rates						

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7406.107	6	1234.351	.335	.914[b]
	Residual	129044.523	35	3686.986		
	Total	136450.631	41			
a. Dependent Variable: Inventory Conversion Period						
b. Predictors: (Constant), Period, Firm Size, Inflation, Govt_spending on social protection, Growth Domestic Product, interest rates						

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.571	6	1.262	.436	.850[b]
	Residual	101.252	35	2.893		
	Total	108.822	41			
a. Dependent Variable: Quick Ratio						
b. Predictors: (Constant), Period, Firm Size, Inflation, Govt_spending on social protection, Growth Domestic Product, interest rates						

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52034.188	6	8672.365	.568	.753[b]
	Residual	534606.783	35	15274.480		
	Total	586640.971	41			
a. Dependent Variable: Cash Conversion Cycle						
b. Predictors: (Constant), Period, Firm Size, Inflation, Govt_spending on social protection, Growth Domestic Product, interest rates						

APPENDIX II: UNIVERSITY AUTHORIZATION LETTER

24th, October 2024

E-mail: researchwriting.mba.anu@gmail.com

Tel. 0202711213

Our Ref: 20J01DMBA016
The Director.
National Commission for Science,
Technology and Innovation (NACOSTI),
P. O. Box 30623, 00100
Nairobi. Kenya

Dear Sir/Madam:

RE: RESEARCH AUTHORIZATION FOR: SIMON MUNGE MBAIYANI

Mr. Simon Mungé Mbaiyani is a postgraduate student at Africa Nazarene University, pursuing a Master of Business Administration (MBA) degree.

As part of the requirements for the completion of his program, Mr. Mbaiyani is conducting research titled: "**The Impact of Covid-19 Lockdown and Policy Measures on Working Capital Management of NSE-Listed Manufacturing Companies in Kenya**."

Your assistance and support in facilitating his research will be greatly appreciated.

Yours Faithfully,

DR. Kimani Gichuhi,
MBA, Coordinator,
School of Business,
Africa Nazarene University.

APPENDIX III: RESEARCH LICENCE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 118941

Date of Issue: 04/November/2024

RESEARCH LICENSE



This is to Certify that Mr.. Simon Munge Mbaiyani of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: IMPACT OF COVID-19 LOCKDOWN AND POLICY MEASURES ON WORKING CAPITAL MANAGEMENT OF NSE-LISTED MANUFACTURING COMPANIES IN KENYA for the period ending : 04/November/2025.

License No: **NACOSTI/P/24/41702**

118941

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
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4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

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