

## SAINTMARY UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

## THE EFFECT OF WORKING CAPITAL MANAGEMENT ON THE PERFORMANCE OF LARGE FOOD MANUFACTURING COMPANIES IN ETHIOPIA

BY

## SHEWAYE MESFIN

JUNE 2024

ADDIS ABABA, ETHIOPIA

## THE EFFECT OF WORKING CAPITAL MANAGEMENT ON THE PERFORMANCE OF LARGE FOOD MANUFACTURING COMPANIES IN ETHIOPIA

BY

SHEWAYE MESFIN

## ADVISOR

MISRAKU MOLLA (PHD)

## A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATES STUDIES IN PARTIAL FULFILLMENT FOR THE REQUIREMENT MSC DEGREE IN ACCOUNTING AND FINANCE

JUNE 2024

ADDIS ABABA, ETHIOPIA

# ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES SCHOOL OF BUSINESS

## THE EFFECT OF WORKING CAPITAL MANAGEMENT ON THE PERFORMANCE OF LARGE FOOD MANUFACTURING COMPANIES IN ETHIOPIA

## APPROVED BY BOARD OF EXAMINERS

	Name	Signature	Date
Dean, Graduate Studie	es		
Advisor's Name	Misraku Mola (PhD)		July 12/2024
			<u></u>
Internal Examiner	_Demis H/Gebreal (Phd)_	Ę	_July, 12/2024
External Examiner	Abebaw Fisseha (Asst Prof)	fring	_July, 12/2024

## Acknowledgement

First and foremost, I am immensely grateful to the Almighty God for granting me the ability to successfully complete this thesis. I would like to express my sincere gratitude to my advisor, Dr. Misraku Molla, for his invaluable comments, feedback, and guidance. His expertise and support have been instrumental in the completion of this research. I would also like to extend my heartfelt appreciation to the Federal Revenue Authority and its employees, particularly the respondents, for their unwavering contribution during the data collection process. Their cooperation and dedication have been crucial to the success of this study. Furthermore, I am deeply grateful to my family, friends, and all those who have encouraged me in completing this research. Your support has been invaluable, and I am truly thankful for your faithful encouragement. In conclusion, I am honored to have had the opportunity to work with such an extraordinary team of professionals. Your support and direction have been imperative to the success of this study, and I am deeply grateful for your contributions

Acknowledgement III		
List of Abbreviations and Acronyms VIII		
AbstractIX		
CHAPTER ONE		
1.1. Background of Study 1		
1.2. Statement of the Problem		
<b>1.3 Hypotheses of the Study</b>		
1.4. Objective of the Study		
1.4.1. General objective5		
1.4.2. Specific objective6		
1.5 Significance of the Study		
1.6 Scope of the Study		
1.7 Limitation of the study		
1.8 Organization of the Study		
CHAPTER TWO		
2. Literature Review		
2.1 Theoretical Review		
2.1.2 Conceptual Definition of working capital9		
2.1.4. The Pecking-Order Theory11		
2.1.5 Fisher's Separation Theory12		
2.1.6 Working Capital Management and its objective12		
2.1.7 Working Capital Policies		
2.1.8 Working Capital Strategies14		
2.1.9 Liquidity and Profitability16		
2.2. Empirical Reviews		
2.2.1. International evidence		
2.2.2. Local evidence		
2.3. Research Gap		
2.4. Hypotheses Development25		
2.4.1. Average collection Period and performance		
2.4.2. Average payment period and firm performance		

## **Table of Contents**

2.4.3. Cash Conversion Cycle and firm performance27		
2.4 Conceptual Framework		
CHAPTER THREE		
3. RESEARCH METHODOLOGY29		
3.1 Description of the study Area		
3.2 Research Design and Approach		
3.3. Types and Sources of Data		
3.4. Sample Design		
3.4.1 Target population and sample frame		
3.4.2 Sampling Technique		
3.5 Method of data analysis		
3.5.1 Model Specification		
3.6. Measurement of variables		
3.7 Diagnostic Analysis		
3.7.1. Multi collinearity Test35		
3.7.2 Heteroscedasticity		
3.7.3 Normality		
3.7.4 Autocorrelation Test		
CHAPTER FOUR		
DATA ANALYSIS, PRESENTATION AND DISCUSSION		
4.1. Descriptive Statistics for the study variables		
4.2 Diagnostic tests		
4.3.1 Test for Multicollinearity		
4.3.2 Testing for normality43		
4.3.3. Testing for heteroscedasticity44		
4.3.4 Testing for Autocorrelation45		
CHAPTER FIVE		
CONCLUSION AND RECOMMENDATION55		
5.1 Summary of Major Findings		
5.2 Conclusion		
5.3 Recommendation		
5.4 Suggestions for Further Research		

Reference	60
Appendix	68
Annex I	68
Annex II	69
Annex III	70
Annex IV	71
Annex V	i
Annex V	I

## List of table

Table 4.1 Descriptive statistics of sample companies.	38
Table 4.2 Test for Model selection	41
Table 4.3 shows the correlation matrix between independent variables	42
Table 4.4 : Bruesch-Pagan- test for heteroscedasticity	45
Table 4.5 Testing for Autocorrelation	46
Table 4.6 Regression result of model specification	46

## List of Figure

Figure 2:1. Conceptual framework	28
Figure 4.1: Regression Standardized Residual	43

## List of Abbreviations and Acronyms

- ACP: Average Collection Period
- APP: Average Payment Period
- CCC: Cash Conversion Cycle
- CR: Current ratio
- DR: Debt Ratio
- FEM; Fixed Effect Model
- ICP: Inventory Conversion Period
- MOR; Ministry of Revenue
- NWC: Net Working Capital
- OLS: Ordinary Least Square
- REM; Random Effect Model
- ROA: Return on Asset
- WC: Working Capital
- WCM; Working Capital Management

#### Abstract

The purpose of this study is to examine the effect of working capital management on firm profitability among large food manufacturing firms in Ethiopia, Addis Ababa. In order to achieve this goal, the study used an explanatory research design and a quantitative research approach to test a series of research hypothesis. The financial statement of a sample of twelve out of the total of 18 large food manufacturing companies were taken and used. Data was analyzed by using E- views version 10 on quantitative basis using descriptive and regression analysis (ordinary least square) method. The random effect model was used. It examined the components in working capital, such as average collection period, average payment period, cash conversion cycle, inventory conversion period, current ratio and debt ratio in relation to return on asset (ROA). The key findings from the statistical analysis are: first there is a positive link between return on asset and, average payment period, cash conversion cycle, inventory conversion period, current ratio, debt ratio. Second, there is a significant negative relationship between the return on asset and the average collecting period. Therefore, the managers of large food manufacturing companies can maximize the firm's value and profitability by improving administration of working capital at optimum level. It is also recommended that large manufacturing firms need adopt efficient and effective working capital management polices to keeping working capital at optimum level.

*Keywords:* Working capital management, large food manufacturing firms, profitability, Ethiopia

### **CHAPTER ONE**

### 1.1. Background of Study

Working capital is a critical factor for the sustainable operation and survival of any business firm. Since, the sustainability of any firm is depending on the efficient use of the firm's resources. Following this fact, an adequate planning and capital management are needed to stay in healthy business operation especially in large food manufactures highly competitive manufacturing industry. It is the most crucial tool that an organization must manage well because it determines organizational survival Korent & Orsag (2018).

Working capital management is critical to maximizing organizational performance. As a result, it necessitates undivided attention, careful planning, and management. Working capital denotes net investment in current assets after deducting current liabilities. Working capital is one of the most significant markers of a company's health and company's financial position Ibrahim & Alagidede (2018). As a result, careful management is required in any business organization, particularly large manufacturing companies, which are the focus of this study. The manufacturing sector is critical to economic stability and serves as a motivating factor economic growth and development by creating jobs, exporting goods, improving economic performance, and generating foreign exchange revenues.

Madugba, *et al.*, (2016) state the importance of working capital and its management, which includes financing, managing, and controlling a firm's current assets and current liabilities, cannot be overstated, particularly in large food manufacturing companies that, by definition, require large investments in working capital. The success or failure of these businesses is heavily dependent on good working capital management. A company's performance is typically measured by how successfully it can use its assets, share-holder capital, liability, revenue, and expenses to meet organizational goals Awunya (2018). The term is also used to compare similar organizations within industries or sectors as a Ffgeneral indicator of a company's total financial position strength over a certain period of time.

One of the issues is working capital management (WCM) that businesses face. It can give organizations with a simple and sufficient level of liquidity to satisfy their immediate financial responsibilities resulting from funding their operations allowing them to safeguard the survival of their business and increase their profits. WCM refers in relation to current assets and current liabilities which are important components of a company's overall assets. Keeping current assets at high levels causes the corporation to earn profits on its unprofitable entire short-term investments. In contrast, having a small number of current assets exposes the firm to challenges and problems, possibly leading to a failure to manage the firm's activities quickly, lowering the firm's ability to satisfy its immediate financial obligations and raising the firm's liquidity risk exposure. As a result, having an appropriate the working capital policy would be allow businesses to boost profitability while also creating value for investors Phan, *et al.*, (2020).

According to the study made by Oluwakemi (2017), Working capital management has significant effect on organizational performance of selected food and beverages manufacturing firms in Lagos state. The study found that management of selected manufacturing companies should pay attention to sound management of their working capital management components it influenced their profitability.

Arega et al. (2016) examined the impact of working capital management on profitability of food complex manufacturing companies operating in and around Addis Ababa from 2009 to 2013. The results provided evidence that the Cash Conversion Cycle, as a measure of working capital management, positively affects Return on Assets. A negative relationship between the Receivables Collection Period, strong positive relation of Inventory Conversion Period, Payment Deferral Period and profitability was also found. This indicates that companies can increase their profitability by shortening receivables, inventory and payables periods. Many researchers and authors clearly identified that effective working capital management focus on improving firms' performance to achieve their day-to-day operations. It is also obvious that, proper working capital management is significant to solve the challenges in financial instability of business organizations. A lot of research has been conducted in different countries to show the impacts of working capital management on firms Performance of manufacturing Sector. In the context of Ethiopia, to the knowledge of the researcher, limited researches have been conducted in working capital management and firm's profitability of food manufacturing sector.

There is also a gap on time periods the studies are conducted. Due to these limitations, this study will undertake to examine the effect of working capital management on financial performance in large food manufacturing firms in Ethiopia for the period from 2019-2023. However, according to the researcher's knowledge, there is a research gap to conduct this study. In light of the foregoing, the overall goal the research is to investigate the effect of working capital management on firm profitability on large food manufacturing companies in Ethiopia.

### **1.2. Statement of the Problem**

Efficient working capital management is critical for every firm to generate profit by running smooth day-to-day operations and maintaining a balance between profitability and liquidity. Excess working capital reduces profitability because an insufficient amount of working capital impairs a firm's liquidity. Furthermore, without proper management of working capital components, the firm's operations would be difficult to run smoothly.

According to Al Shra'ah, (2019) state that approximately 60% a typical financial manager's time is spent on working capital management. As a result, maintaining the required liquidity in day-to-day operations is critical to ensuring the firm's smooth operation and meeting its obligations (Ajetunmobi, *et al.*, 2017).

According to Omoregie, *et al* (2019). Many business failures in the past have been attributed to financial managers' failure to plan and control working capital, which results today in high bad debts, over/under stocking, and cash crises. It is a particularly vulnerable area of financial management because it involves the difficult decision on the composition of current assets and current liabilities (Mathuva, 2015).

According to Arunkumar & Ramanan, (2013), profitability and liquidity are two important aspects working capital management, as well as maintaining a satisfactory level of these components is one of the most popular influential factors. They also stress the importance of maintaining a tradeoff between these two factors in order to create value for shareholders. They also emphasize that when an asset is at risk of insolvency or when liquidity is prioritized over profitability. However, the problem lies in managers' efficient management of the various components that comprise working capital. This problem arises as a consequence of most managers' efforts to boost inventory turnover in order to increase profitability while ignoring the need to accelerate debtor collection and delay creditor payment periods as much as possible in order to provide the funds require to keep the cycle flowing. This puts the firms in a poor liquidity position, which has an effect on them profitability. As a result, most company managers' views on the management of working capital to shorten the cash conversion cycle (traditional views) in order to increase firm profitability. Furthermore, working capital management has evolved a significant issue, particularly in developed countries. According to Salam, et al., (2017), the effect of working capital on firm profitability an analysis of UK pharmaceutical and biotechnology FTSE all share index firms, demonstrates the relationship between working capital management variable and company profitability.

Many food large manufacturing sectors in Ethiopia do not practice working capital management due to outdate business processes and organizational structures. As a result, there is a considerable difference. In the manufacturing sector (Feyissa & Garomsa, 2011).

According to Assefa & Ayalew (2019), working capital management's impact on profitability of selected small and medium-sized firms in Addis Ababa. He conducted the analysis based on a sample of 30 small micro companies during a five-year period from 2005 to 2009. For data analysis, he employed Pearson correlation, regression analysis, and Ordinary least squares pooled. The data indicate that the cash conversion cycle and average collection period have an adverse effect on a firm's net operating profitability. Finally, he stated that good practices for working capital management can increase small firm profitability.

As a result, the previous researchers used the Cash conversion cycle, Average receivable period, Inventory conversion period, and Average payable period as independent variables of working capital management. Thus, this study includes debt ratio as additional independent variable which was not included in previous studies but that has an effect on business profitability.

This is identified as a research gap based on the literature. In this regard, although there are studies in different aspects of the related issue of the study, there is no well-articulated and comprehensive research which conducts on the effect of working capital management on firm profitability in large food manufacturing companies.

The main aim of this study is, therefore, to investigate the effect of working capital management on firm profitability on large food manufacturing companies in Ethiopia.

## **1.3 Hypotheses of the Study**

In light of the above research objective the following covers the hypotheses. This study is attempted to test:

- **H1:** Average collection period has a negative and significant effect on firm's performance.
- **H2:** Average payment period has a positive and significant effect on firm's performance.
- H3: Cash conversion cycle has a positive and significant effect on firm's performance.
- **H4:** Inventory conversion period has a positive and significant effect on firm's performance.

## **1.4.** Objective of the Study

## **1.4.1.** General objective

The general purpose of this research is to examine the effect of working capital management on firm profitability on large food manufacturing companies from the period of 2014 to 2023 in Ethiopia.

### 1.4.2. Specific objective

To achieve the general objective, the specific objectives of this study are:

- I. To analyze the effect of average collection period on performane of large food manufacturing firms.
- II. To examine the effect of average payment period on performance of large food manufacturing firms.
- III. To evaluate the effect of cash conversion cycle on performance of large food manufacturing firms.
- IV. To evaluate the effect of inventory conversion period on performance of large food manufacturing firms.

## 1.5 Significance of the Study

The result of this study benefits the financial managers of large manufacturing firms by creating awareness on optimum level management of working capital. The study also demonstrates how crucial working capital management strategies such as polices, Practice and tactics are used to secure the necessary finances at the right moment, from the appropriate source, and for the correct period of time, and how to exchange of liquidity and profitability be attained in big studies manufacturing firms. Similarly, the study's finding provides Fundamental recommendations for researchers, accountants and experts, financial managers, and policymakers.

## 1.6 Scope of the Study

The study is primarily concerned with the effect of working capital management on firm profitability, In the case of large food manufacturing firms invested in Ethiopia as a whole. The researchers rely on secondary data obtained from financial statements in the balance sheet and income statement of the Ministry of Federal Revenue's annual report. Data has been utilized for panel data based on an explanatory research design using a quantitative approach in an attached regression model for the past ten years. The study of working capital management has twelve samples from 2014 to 2023 for those companies their establishment is 10 years. Purposive sampling used to select these large food manufacturing companies.

### **1.7 Limitation of the study**

The research focuses on the effect of working capital management on the profitability of large industrial firms in. In the focal point of this study, there are 18 large manufacturing firms; however, the researcher of this study only uses 12 company. This is one of the limitations of this study. On the other hand, the study was only utilized secondary data and it lacks primary qualitative data and the study collected data for ten years, from 2014 to 2023.

### **1.8 Organization of the Study**

This paper is well-structured under five consequential chapters, the first chapter deals with the background of the study, statement of the problem, and the objectives of the study, a research hypothesis, the scope and significance of the study. In chapter two, various theories and empirical studies are reviewed and summarized. The third chapter is the methodology section, which includes the research design, type of data used, and sampling design. The study's findings were presented and analyzed in chapter four. Finally, in Chapter five the findings were summarized, conclusion was reached based on the findings, and recommendation part of the study.

#### **CHAPTER TWO**

#### 2. Literature Review

This chapter contains a review of related literature. The goal of this chapter is to examine the effect of working capital management and firm profitability measures. As a result, the chapter is splits into three parts. The initial section presents a theoretical review of working capital management, while the second section examines empirical evidence on working capital management. The third section presents the findings of the review of literature and identifies the researcher's knowledge gap, which this study attempts to fill.

#### **2.1 Theoretical Review**

The gap between an organization's current assets and current liabilities is its working capital. It is the fund made accessible for the day-to-day operation of the business. Working capital management entails the implementation of a firm's current assets and liabilities in such a way that an optimal level of working capital is maintained to foster a satisfactory level of profitability and maximize shareholder wealth (Olaoye, et al., 2019). Working capital is significant because of the implications it has on profitability. Working capital management is the crucial component that secures and ensures sustainability, regardless of a firm's size or business kind. Maintaining appropriate working capital is beneficial not just for short-term financial needs, but also for the long-term survival of a corporation. To maximize shareholder wealth, working capital management efficiency is crucial in corporate finance. It is a type of short-term resource management that is closely related to short-term finance and investment decisions. Effective WCM has a considerable impact on profitability; this link is critical in business conditions (Akbar, 2021). According to Kwenda & Matanda, (2015), managers can use working capital reserves and seek profitable investment opportunities without going to the capital market to issue expensive and high-risk securities, thereby avoiding the negative signals associated with external securities. Furthermore, good working capital management is critical since it unlocks cash within a business, which is a far cheaper strategy than external funding. Working capital management is important for lowering the possibility of insolvency because it does not rely on external markets is used to raise capital. Working capital management is critical in business. As a result, the emergence of working capital management plays an essential role in the finance area, as it is mostly tied to short-term investment and financing (Makori & Jagongo, 2013). In the framework of working capital management, a financial manager's objective is to focus on the organization's short-term operations and ensure that funds are available to support them. Working capital management is an essential component of financial management in all aspects of corporate operations. It focuses on the liquidity components of a company's short-term current assets and current liabilities (Aktas, *et al.*, 2015).

The purpose of working capital management, according to Ukaegbu, (2014), is to ensuring that a company's operating expenses are met while also when it pays its short-term debt it is due. Furthermore, in order to maximize profitability and maintain liquidity levels, working capital management necessitates the management of both current assets and current liabilities. Working capital management seeks to keep track of a company's current assets and current liabilities in order to strike a balance between profitability and risk that contributes to the firm's worth. Firms must keep a specific level of working capital on hand in order to run successfully and efficiently. For example, if the firm's operating capital is insufficient, it faces an increased risk of insolvency. Excessive working capital reduces corporate profitability, whereas insufficient working capital threatens firm solvency (Aravind, *et al.*, 2016).

### 2.1.2 Conceptual Definition of working capital

Working capital, defined as current assets minus current liabilities, is the source of shortterm capital, and investing in working capital is one of the simplest ways to increase shareholder value. Although managers must exercise sound judgment when investing in working capital, Akinleye & Roseline, (2019) argue that working capital investment is not the only decision to be made, and that working capital financing strategies have an impact on its performance. Working capital funding is critical, and any bank that cannot consistently fund it may be unable to capitalize on attractive growth possibilities. Working capital has been studied in several contexts (Chang *et al.*, 2019); (Zimon & Tarighi, 2021).

Profitability measures to determine the firm performance. A corporation is regarded to be functioning well financially if it makes better use of its assets than competitors or competitors (Morara & Sibindi, 2021). According to Al-Abass, (2018), Profitability consists of two words: profit and capability. Profit refers to a company's entire income or return, whereas ability refers to management's ability to earn money and how successfully it does so by using all available resources. Working capital management is one of several resources available to a company in order to generate positive results. Profitability is defined as the difference between incomes and costs those results in a higher internal rate of return.

### 2.1.3 The agency theory

The agency theory is based on the notion that managers will not always act in the best interest of the shareholders. Jensen and Meckling (1976: 305) further elaborate on this concept by identifying two main conflicts between parties to a company, firstly, between the managers and shareholders, and secondly, between the shareholders and the creditors. In the first instance, managers are tempted to pursue the profits of the firms they manage to their own personal gain at the expense of the shareholders. In the latter instance, debt provides shareholders with the incentive to invest sub-optimally. Harris and Raviv (1991: 301) argue that if an investment yield returns higher than the face value of the debt, the benefits accrue to the shareholders. Conversely, if the investment fails, the shareholders enjoy limited liability by exercising their right to walk away. Another potential agency cost of debt is pointed out by Myers (1977: 149). He notes that when firms are on the verge of bankruptcy, there is no incentive for shareholders to invest more equity capital, even if positive NPV projects are available. This is because the value derived from the projects will accrue mainly to the debt holders. The implication is that high debt levels may result in the rejection of value increasing projects. Stulz (1990: 4) argues that debt payments may affect shareholders both positively and negatively. On the positive note, debt payments force managers to pay out interest thereby reducing the potential overinvestment problem. On the negative side, excessive debt may lead to high interest repayments, which may lead to the rejection of profitable projects, thus leading to the underinvestment problem. Capital structure is therefore determined by a trade-off between the benefits and costs of debt. Considerable work has been done to test the validity of the agency cost hypothesis.

Kim and Sorensen (1986: 139) detect the presence of agency costs in Compustal listed firms in the form of a strong relationship between insider ownership and leverage. Vilasuso and Minkler (2001: 65) employ a dynamic model of capital structure on a set of 28 publicly held firms, and demonstrate that agency costs are associated with shifts in leverage. Harvey, Lins and Roper (2004) investigate whether debt can control the effects of agency costs for a set of emerging market firms, and they observe that the benefits of debt are concentrated among firms with high expected agency costs. Berger and Bonaccorsi di Patti (2006: 1069) develop a profit efficient indicator as a measure of firm performance, and they confirm the predictions of the agency theory that higher leverage is positively related to profit efficiency. However, Brounen, DeJong and Koedijk (2006: 1409) survey managers in European countries and they find no evidence to suggest that agency costs influence capital structure decisions. Overall, evidence suggests that there is some support for the agency theory.

#### 2.1.4. The Pecking-Order Theory

It considers a firm with assets-in-place and a growth opportunity that requires additional financing. Myers and Majluf also assume perfect market like Modigliani and Miller except for information asymmetry between the insiders and the outsiders. If the managers act in the interest of the existing shareholders, they will not issue new shares if undervalued unless the transfer of value is more than offset by the growth opportunity. In equilibrium a firm issues new stock only at a market down price (Myers & Majluf, 1984) and hence perceived as a bad news about the assets in place. It turns out that the bad news associated with the assets in place always outweighs the good news associated with the positive NPV growth opportunity. This leads to price drop in share price upon new issues. The problem increases as the information asymmetry increases. This price drop is Dependent on the value of growth opportunity Vs assets in place and therefore growth Firms are more credible issuers than mature firms. Between debt and equity, as debt has the prior claim over equity, debt issuers are less prone to information asymmetry Problem. Hence, issue of the debt should have less impact on price as compared to the Share issue. This has been confirmed by Eckbo (1986) and Shyam-Sunder (1991). Kim and Stulz (1988) found that stock price increased with the announcement of debt issue.

Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986 and Schipper and Smith (1986) found that the stock price dipped upon announcement of Equity issue. The pecking order theory suggests that the firms will rely first on internal sources (lowest information asymmetry costs), then debt and lastly equity (highest information asymmetry costs). There is no optimal debt ratio and hence the firm's debt ratio reflects the cumulative external financing required. According to this theory, more profitable firms will issue less debt. It also predicts mean reverting debt ratio only if the free cash flow varies with business cycles. The pecking order theory proposes that net debt issue should more closely follow financial deficit than net equity issue. Myers (1984) came up with modified pecking order theory. He proposes that the firm takes advantage of the window of opportunity i.e. build financial slack by issuing equity when the information asymmetry is less. This way later they can issue debt with more flexibility. This may explain why some growth firms keep low debt issues. Shyam-Sunder and Myers (1999) and Chaplinsky and Niehaus (1990) find strong support

For the pecking order theory, However, Frank and Goyal (2003) found little support for the same. Similarly Korajczyk et al. (1990) found that debt issues did not rise prior to equity issues. Even if the firms follow the pecking order they may not issue debt when faced with financial deficit if working near their debt capacity. Debt capacity is the point when adding more debt reduces the firm's value. Issue of 'debt capacity' is an important point in understanding and testing the pecking order theory. If the firm is constrained by this, they will issue equity even when debt is preferred debt. Hence, the debt capacity is similar to the target debt concept defined in the trade off theory of capital structure.

#### 2.1.5 Fisher's Separation Theory

According to Price, (1972) separation theorem, a corporation should avoid conflating "investment in current assets" and "financing current assets." This theory is related to working capital since a corporation should always distinguish between how much it invests in working capital and how it funds working capital (Price, 1972).

## 2.1.6 Working Capital Management and its objective

Working capital management is a managerial accounting strategy used by a company to monitor and utilize the two components of working capital, current assets and current liabilities, to ensure the most financially successful operation possible Ehrhardt & Brigham, (2016). As a result, the primary goal of working capital management at a company is to manage the short-term funds required for a company's day-to-day business activities. The organization requires an effective working capital management policy for continuous, ongoing business and sales activities (Zhao & Ajay, 2015).

The two objectives of working capital management are to raise a company's profitability and to maintain sufficient liquidity to satisfy short-term obligations when they come due. Ajayi, *et al.*, (2017), Profitability is linked to the shareholder's purpose of wealth maximization; hence investments in working capital should be made only if a favorable return is foreseen. To reduce the risk of illiquidity and inefficiency, a company should have working capital policies in place for the management of inventories, trade receivables, cash, and short-term investments (Aminu & Zainudin, 2015).

## 2.1.7 Working Capital Policies

According to Temtime, (2016), a working capital policy (WCP) is a decision to invest in and fund current assets and current liabilities. Investment policies are for current assets, while working capital financing policies are for current liabilities. This implies that managers must develop and implement an appropriate WCP for how much investment is to be made in working capital and how the working capital would be financed in order to maximize profit. "Working capital policy" is defined by Mengesha, (2014) as "the strategy that provides guidelines for managing current assets such as accounts receivable, inventory, and cash, as well as current liabilities such as accounts payable and accruals."

The working capital method can help to establish the sort of finance that would be employed to fund variable and permanent current assets. Firms select various policies to support their working capital and, thus, their operations. According to Nyabuti & Alala, (2014), a firm's policy on working capital management might be aggressive or cautious. To keep cash requirements on track, financial managers in any company should maintain a constant check on working capital balances. Inadequate attention to working capital investment may result in cash problems. According to Irene & Ondigo, (2018), investment policy reveals how much a corporation has invested in existing assets. A large amount of working capital indicates conservatism, whereas a low level of current asset investment indicates ambition.

### 2.1.8 Working Capital Strategies

According to, Enqvist, *et al.*, (2014); working capital strategies emphasize the liquidity of current assets. Liquidity is more crucial since a firm with extraordinarily high liquidity has a large amount of idle capital to manage and must absorb the expense of these idle assets.

According to Louw, *et al.*, (2016), working capital management differs by industry and state, and it would be more beneficial to evaluate the relationship between working capital management and profitability within a single industry. Current asset investments and financing decisions can be undertaken in three ways: aggressively, conservatively, or moderately. For example, a company with a high volume of sales requires more current asset finance than one with a low sales growth rate. Firms may take a high-risk approach by financing current assets with short-term debt, which has a low interest rate. Short-term debt, on the other hand, carries a higher risk than long-term debt (Dhole et al., 2019).

**Aggressive strategy:** Aggressive financing entails using short-term and non-spontaneous debt to finance all short-term current assets, long-term current assets, and certain fixed assets while long-term financing is used for remaining fixed assets. If a company keeps a small fraction of its overall assets in the form of current assets or employs a large part of the short-term debt it may be pursuing an aggressive strategy. As a result, this policy would raise earnings while increasing the chance of the company defaulting. Aggressive tactics aim to keep current assets low in relation to current liabilities. The high amount of receivables is due to trade credit sales being oriented to regular clients with low trustworthiness Enqvist, *et al.*, (2014); Zimon & Tarighi, (2021). This working capital investment strategy yields a low CCC and implies that the firm receives payments from clients rapidly while postponing payments to suppliers until the due date." Although this method is less expensive, it is riskier owing to short-term fund swings (interest rates) that are not always readily available when required. A company with an aggressive working

capital policy provides short credit terms to consumers, has less inventory on hand, and has fewer liquid assets (Chen & Kieschnick, 2018).

**Conservative strategy:** non-current assets, permanent current assets, and some temporary current assets are all funded with long-term debt in a prudent strategy. Short-term debt is used to finance the remaining short-term assets. This requires retaining a large amount of cash on hand, as well as a small amount of customer receivables and supplier obligations (Zimon, 2020). As a result, if a company follows a conservative working capital plan, it would have plenty of cash on hand; plenty of inventories in the warehouses, and all payables would be current. This point of view is supported by (Zimon & Tarighi, 2021), who argue that the conservative strategy is connected with a high level of liquidity. This strategy involves less risk due to repayments spread over a longer period of time and lesser profits. Because of unneeded liquidity, the firm is less profitable under this technique Mandipa & Sibindi, (2022). The drawbacks of this technique include increased financing costs and the fact that substantial investments are hampered by temporary working capital.

**Moderate strategy:** As cited to Seyoum, *et al.*, (2016), corporations used a moderate approach to finance their fixed assets and the majority of their current assets by utilizing long-term debt and equity. The moderate strategy, which sits between the conservative and aggressive approaches, can also distinguished Cole, *et al.*, (2017).For a given level of turnover, a more conservative and flexible working capital policy would be associated with having a larger cash position, possibly even investing in short-term securities, providing more favorable credit terms to consumers, and maintaining higher levels of stock. Such a policy would result in a lesser chance of financial or stock difficulties, however, at the expense of lower profitability (Eugene, *et al.*, 2009).

A moderate policy would fall somewhere in the middle of the aggressive and conservative approaches. It should be emphasized that a company's working capital policies may only be classified as aggressive, moderate, or conservative by comparing them to similar companies' working capital policies. There are no definitive benchmarks for what constitutes aggressive or non-aggressive behavior, but these characterizations

are valuable for analyzing how particular organizations address the operational problem of working capital management (Eugène, *et al.*, 2009).

### **2.1.9 Liquidity and Profitability**

Liquidity indicates that the corporation must always have enough cash on hand to pay bills as they come due, as well as enough cash reserves to address crises and unforeseen requests. Profitability, on the other hand, necessitates the most efficient use of a company's resources. As a result, it is difficult to increase liquidity while sacrificing profitability. When liquidity is high, profitability is low, and vice versa. The finance manager must cope with this contradiction because all financial decisions involve both liquidity and profitability. Creditors of the company always want the corporation to retain its short-term assets higher than its short-term liabilities in order to safeguard their money. When current assets exceed current liabilities, the creditors are in a comfortable position. Managers of the company, on the other hand, do not think in the same manner. Obviously, each manager wants to pay the mature liabilities, but they also realize that excess current assets are a costly and idle resource that does not provide any return. A high level of inventory, for example, increases warehouse costs. Managers seek to keep the ideal amount of current assets, which is enough to complete current liabilities, rather than keeping excessive current assets (cash, inventory, account receivable). Managers also desire to invest exorbitant amounts in order to make a return. As a result, managers must choose between two extreme positions: long-term investments, investments in noncurrent assets such as subsidiaries (equity), with high profitability i.e. high return and limited liquidity. Short-term investments with low profitability, i.e. low return and large liquidity, on the other hand. However, the company's creditors prefer managers to invest in short-term assets since they are easy to liquidate, but this diminishes profitability due to the low interest rate. If, on the other hand, management prefers long-term investments to boost profitability, lenders or creditors will have to wait longer and incur some expense to sell these assets in the event of a failure because the liquidity of long-term investments is low.

In practice, no manager chooses both of these two extremes; instead, they seek a balance of profitability and liquidity that meets their liquidity needs while still providing the appropriate degree of profitability (Arnold, 2008). Profitability ratio, on the other hand, is a percentage-based measure of the profit created by the business. Although profitability is not an explicit component of working capital, it is included since every change in working capital components has an immediate influence on profits. Indeed, if profit ratios have declined or are lower than those of competitors, this may signal working capital improvement issues and opportunities. Profits to sales and return on equity (ROE) ratios are important profitability statistics. Return is another word for profit, and these ratios compute after tax returns (Doan & Bui, 2021).

#### **2.2. Empirical Reviews**

This part focused on a critical analysis of prior research findings on the impact of working capital management on company profitability. Working capital management and its implications in improving financial performance remains a hot topic among academics. Numerous available literatures investigate the effect of working capital management on firm profitability from various perspectives and in various sectors; however, the researcher selectively focused on studies that include the relationship and impact of working capital management on profitability in the manufacturing sector.

### 2.2.1. International evidence

Working capital management and profitability in a developing economy the goal of this research is to investigate the impact of working capital management on the profitability of Argentine manufacturing enterprises by employing the major theoretical framework proposed by the literature. Many researches have been conducted in industrialized economies to address this issue, but similar studies are uncommon in rising and developing economies. The companies for analysis were chosen using a stratified sample technique based on an economic criterion.

The information was gathered over a three-year period using a questionnaire. We utilized a fixed-effects regression model to explain working capital management's impact on profitability in order to fulfill the study objectives. The findings revealed a favorable and statistically significant relationship between all working capital components and profitability implying that each variable increases evaluated leads to an improvement in ROA and ROE performance. In contrast, leverage has been found to have a statistically significant negative relationship with profitability, implying that increasing debt has a detrimental influence on company performance (Álvarez-Risco, 2020).

According to Giraldo, et al., (2018) state. Evidence from Iran on working capital management and company profitability the primary goal of this the purpose of this research is to look into the relationship between working capital management and profitability. The cash conversion cycle is an important measure for calculating the efficiency of working capital management. The research was conducted between 2001 and 2006, and the companies investigated were those listed on the Tehran stock exchange. In general, the company was chosen as a top company for 1063 out of 2628. The hypothesis was then tested using multiple regressions and Pearson's correlation. The statistical test results show that there is a negative significant relationship between the number of days accounts receivable and profitability, a negative significant relationship between inventory turnover in days and profitability, a direct significant relationship between the number of days accounts payable and profitability, and a negative significant relationship between cash conversion cycle and profitability. The research results show that there is a significant relationship between working capital management and profitability in the studied companies, and working capital management has a significant effect on the profitability of the companies, and managers can create value for shareholders by decreasing account receivable and inventory.

Numerous researches found conflicting outcomes when it came to debt financing and corporate success Joy, *et al.*, (2019) research on 10 listed manufacturing firms in Bangladesh finds that debt ratio has a positive impact on manufacturing firm profitability in Bangladesh. While Mishra, *et al.*, (2019), indicate that debt has a negative impact on the profitability of manufacturing enterprises in India. According to the findings of Habib, *et al.*, (2016), there is a strong but negative association between debt and return on asset. According to Yazdanfar & Öhman, (2015), there is a negative association between debt and firm performance.

According to Alsulayhim, (2019). Working capital management and profitability in Saudi non-financial enterprises listed on the Saudi Stock Exchange. The purpose of this research is to look into the relationship between working capital management and profitability in non-financial enterprises listed on the Saudi Stock Exchange. For ten years (2007-2016), a sample of 67 firms was used. For analysis, a quantitative method with multiple linear regressions and a pooled data set is applied. The findings suggest a linked between working capital management and profitability. However, each company's optimal level of working capital may differ and may necessitate different techniques to achieve profitability. The scope of this research is confined to non-financial enterprises listed on the Saudi Stock Exchange. This study contributes to the literature on working capital management by using a very large sample, a longer time span, and several profitability proxies in the setting of Saudi Arabia, which has few studies in this field.

The effect of working capital management on Croatian software profitability the purpose of this article is to examine and offer empirical evidence on the nature of the relationship between working capital management and profitability in Croatian firms in Group 62.0 (Computer Programming, Consulting, and Related Activities). Over a six-year period (2008-2013), the study was done on a balanced sample of 442 firms. The research makes used of panel data regression analysis, which allows for the control of unobserved heterogeneity and endogeneity. The testing of the first hypothesis yielded two results. Specifically, after controlling for the impact of net working capital on company profitability by company size, age, and annual revenue growth, percentage of fixed assets in a company's total assets, company market power, and real GDP growth, the results show that increasing the level of net working capital increases the company's profitability. The preceding supports a conservative working capital management technique. However, once the impact of net working capital on company profitability is controlled for financial leverage, the relationship between net working capital and company profitability becomes inverted, indicating that companies with lower levels of net working capital in relation to total revenue are more profitable on average (Korent & Orsag, 2018).

According to Cruz, *et al.*, (2018). Working capital management and its effect on profitability: Empirical data from the Malaysian capital market, several empirical researches on WCM have been conducted around the world in relation to its effect on the performance of the company. Despite existing evidence, findings from Malaysians may

differ due to differences in business environments between different nations. The goal of this study is to determine the impact of DSI's negative relationship with profit, DSO's negative relationship with profit, DPO's negative relationship with profitability, and CCC's negative relationship with profitability on the financial performance of Malaysian listed companies. These findings will assist organizations in developing a robust WCM to ensure that the company can reach high profit without experiencing liquidity issues.

According to Salam, *et al.*, (2017), the effect of working capital on profitability an analysis of UK pharmaceutical and biotechnology FTSE all share index firms, demonstrates the relationship between working capital management variable and company profitability. The findings revealed a positive relationship between the cash conversion cycle and profit, a negative relationship between the inventory conversion period and firm profitability, a negative relationship between the average payment period and firm profit, and an inverse relationship between the account receivable period and firm profit.

Devi, *et al.*, (2018) states from 2012 to 2016, the impact of working capital on Maruti Suzuki India Limited's profitability was investigated. Secondary data obtained from the company's published annual reports, books, journals, magazines, newspapers, and websites is used in the research. The study found a negative link between profitability and the company's working capital during the study period. The company's performance has significantly improved during the study period.

Ramesh, *et al.*, (2017) on their study on the effect of working capital management on the financial performance of manufacturing firms in sultanate of Oman the study covered period of 10 years with sample of 19 manufacturing companies seeking to find out the effect of debtors' management, inventory management, creditors management and cash management on financial performance of manufacturing firms in Sultanate. Correlation and regression analysis revealed that debtor management; inventory management creditor's management and cash conversion cycle negatively affect the financial performance of manufacturing firms in sultanate.

Mtani & Masanja, (2018) assessed the impact of working capital management on financial performance of supermarket in Arusha city, Tanzania. Primary data was collected using questionnaires from sample of 10 supermarkets in Arusha city from January to October 2018 and it was evaluated using descriptive and inferential statistics. The relationship was evaluated through correlation and regression analysis. The study revealed that there existed weak impact in financial performance when working capital components changed. The study recommended supermarkets adopt different policies, such as aggressive policies, and not rely just on conservative policies.

Ratemo, (2018) evaluated the effect of working capital management and profitability of selected Supermarket in Nairobi County, Kenya. The study analyzed secondary data that was collected through data collection sheet from financial statement of 31 sampled supermarkets out of 102 targeted populations. The period under study was 7 years from 2010 to 2016. Based on the findings the study concluded that working capital management turnover, inventory turnover and accounts payable turn over had significant effect on profitability of the supermarkets.

#### 2.2.2. Local evidence

Nega, *et al.*, (2021) states, the impact of working capital management on the performance of Ethiopian government-owned public firms the purpose of this research is to investigate the impact of working capital management on the performance of Ethiopian government-owned public enterprises. Previous relevant studies did not include state-owned firms in their research and hence were unable to explain the issue. As a result, the study fills this need. The dependent variable in this study was Return on Asset (ROA), while the independent variables were cash conversion time, accounts receivable days, inventory conversion period, current asset to total asset, current liability to total asset, and company size. Views 10 is used to analyze the Ordinary least squares (OLS) regression data obtained from eight companies over a five-year period from 2013 to 2017. The important findings were that account receivable days, account payable days, current asset to total asset ratio, and business size all had a significant and favorable impact on profitability. This indicates that organizations must maintain higher levels of account receivable days,

account payable days, current asset to total asset, and company size in order to be successful, which would allow them to manage their working capital more effectively.

As stated by Ashebir & Ayele, (2019).Working capital management's impact on firm profitability: The Case of Steel Manufacturing Firms in Addis Ababa seeks to investigate the effect of working capital management on the profitability of steel manufacturing firms in Addis Ababa. He used a purposive sampling strategy to collect data from 16 steel manufacturing enterprises from fiscal years 2013 to 2017. He analyzed data using descriptive statistics and multiple regression analysis. The regression analysis of account payable periods revealed that there is a substantial negative relationship between these days and firm profitability, which is statistically significant at the 5% level. Furthermore, cash conversion cycle regression analysis show that there is no relationship between cash conversion cycle and business profitability at the 5% significance level, and advised the researcher to advise the firm's 73 managers to recover their account receivables as soon as possible. The researcher also advised organizations to maintain relationships with clients who have paid their credit in a timely manner in order to avoid losing future customers who have delayed payments.

According to Assefa & Ayalew (2019). The effect of working capital management on the profitability of selected small and medium-sized firms in Addis Ababa. He conducted the analysis on a sample of 30 small micro companies during a five-year period from 2005 to 2009. For data analysis, he employed Pearson correlation, regression analysis, and pooled ordinary least squares. According to the findings, the cash conversion cycle and average collection period have a negative impact on a firm's net operating profitability. Finally, he stated that good working capital management practices can increase small firm profitability.

According to Filketu & Negash,(2023). The impact of working capital Management on the Profitability of Ethiopian alcohol and liquor manufacturing firms: A case Study of the national Alcohol and liquor factory with the goal of examining the impact of working capital management on business profitability using the national alcohol and liquor factory as an example. As a sampling technique, the researcher used non-probability sampling. The researcher concluded that there is a significant negative relationship between average

collection period (ACP) and profitability (ROA) of national alcohol and spirits factory using multiple linear regression models as data analysis, indicating that delay in collecting receivables reduces profitability.

According to Geddafa, *et al.*, (2020). Investigate the effect of working capital management on small business profitability in Chiro, West Hararghe & Ethiopia. Interviews with crucial informants to collect primary data, 25 and semi-structured questionnaire questionnaires were employed. A non-probabilistic purposive sampling strategy was used to collect cross-sectional data from 15 selected small businesses. Descriptive statistics were utilized to investigate the impact of the cash conversion cycle on return on asset, accounts receivable period, accounts payable period, and inventory conversion period. The study's findings indicate that believing there is a positive relationship between payable and accounts receivable periods and a small firm's profitability. However, the cash conversion cycle and the duration of inventory conversion have a considerable negative impact on profitability.

According to Mulat, et al., (2021). An empirical analysis of Ethiopian exporters' the Impact of Working Capital Management on Firm Performance Companies may have an ideal level of working capital that maximizes their values by effectively managing current liabilities and assets. Previously, many studies were conducted on the impact of working capital management on the performance of companies in various sectors; however, its impact on the performance of firms engaged in export activities was not taken into account, and this study aimed to study the underlying impact of working capital management on the success of Ethiopian export enterprises. There are a total of 164 Ethiopian exporters were chosen as a sample for this study, and both primary and secondary data gathering methods were used. The data collected from the study's sample a multiple linear regression model was used to analyze the data, and the results demonstrate that working capital management, as the performance of Ethiopian exporting enterprises, as assessed by the account receivables period, cash conversion cycle, and accounts payable time, has a statistically significant and positive link, as measured by both return on assets and return on investment. Working capital management, as evaluated by the inventory conversion period, has a statistically significant and favorable

impact on return on investment, but has no effect on the performance of sampled Ethiopian export enterprises as assessed by return on assets. Based on the findings of the study, businesses may need to extend credit terms to clients, extend their cash conversion cycle, require a longer payment time, and may or may not maintain a large volume of inventory. All extended periods and cycles must be made up to the point of achieving an optimal level of working capital and better implementing a conservative working capital management policy. As a result, it is recommended that companies examine the findings of this study when making decisions about their working capital management in order to improve their performance.

#### 2.3. Research Gap

Under the topic of empirical literature review, a wide number of literatures have been analyzed and examined. The literature review showed a number of results on the effect of working capital management on a firm's profitability, including elements such as the Cash Conversion Cycle. According to Nega, *et al.*,(2021), empirical research revealed no consistent conclusions on the impact of WC on profitability. This could be due to the absence of all vital and important variables utilized to calculate both WC and profitability.

Overall, the preceding and other empirical research showed that working capital has an effect on corporate performance. The variables studied in these analyses, however, differed, as did the findings obtained. For example, Ashebir & Ayele, (2019) concluded that at a 5% significance level, there is no relationship between cash conversion cycle and business profitability. whereas Assefa & Ayalew, (2019) stated that the cash conversion cycle and average collection period have a negative impact on a firm's net operating profitability and the findings demonstrated a positive association between the cash conversion cycle and organizational profitability, according to(A. Salam et al., 2017). The researcher became interested in doing this study because of the large manufacturing companies in Addis Ababa did not properly practice working capital management to enhance the firm's profitability. Previous studies used return on asset as a dependent variable to determine the effect of working capital management on firm profitability, and those previous researchers as independent working capital variables, the cash conversion

cycle, average receivable period, inventory conversion period, and average payable period were used. As a result, this study included some additional control variables that are not included in previous studies but are thought to have an effect on firm profitability. The Variable consists of current ratio and Debt Ratio is included to determine the effect of working capital financing policy on firm profitability.

Finally, as far as the researcher's knowledge concern, there is a gap on the effect of working capital management on large food manufacturing firm's profitability in the case of in Ethiopia. In this regard, although there are studies in different aspects of the focal point of the study, there is a research gap in debit ratio on financial policy of firm's profitability as well as area and sector related a gap that has to be filled by this research work. This study therefore, seeks to contribute to this research gap and identify which variables of working capital have a significant effect on the profitability of large food manufacturing companies in Ethiopia. This study also aims to fill a research gap by identifying which working capital variables have a significant effect on the profitability of large food manufacturing companies in Ethiopia.

## 2.4. Hypotheses Development

A corporation can maximize its rate of return while minimizing its liquidity and business risk by managing its cash, receivables, and inventory properly. The amount to be invested in a certain current asset should be determined by the financial manager. The amount invested may vary from day to day, necessitating regular monitoring of account balances. If cash tied up in an asset may be used more profitably elsewhere, current assets are mismanaged. Using debt to finance such assets incurs excessive interest costs. Large account balances also suggest risk since inventory, for example, may not be sellable and/or accounts receivable may not be collected. Inadequate current asset levels, on the other hand, can be costly, as when business is lost due to a shortage of inventory, which prevents prompt fulfillment of customer orders (Shim, *et al.*, 2020).

### **2.4.1.** Average collection Period and performance

Average collection period is commonly calculated annually, quarterly, or monthly; it is a measure of the average numbers of days it takes a company to receive payment after sale. It is critical for a company to collect unpaid account receivables as soon as possible. According to Raheman & Nasr, (2007), Firms with longer receivables periods incur higher opportunity costs, which have a negative impact on profitability. There are mixed findings of the impacts of on the average collecting period the firm's profitability. For example, Ademola, (2014) investigated a positive relationship between Average collection period and business profitability. On the other hand, Fernandez, *et al.*, (2020), discover a negative influence of average collecting period on a firm's profitability. Thus, we proposed the first hypothesis as follow.

H1: Average collection period has a negative and significant effect on firm's performance.

#### 2.4.2. Average payment period and firm performance

A monetary ratio that is typically calculated on a yearly, quarterly, or monthly basis is an average payment period. It specifies the average number of days required for a company to pay its invoices and bills to trade creditors. Instead of paying its invoices upfront, a company with a high average payment time might postpone payments and use the available capital for short-term investments such as producing additional items, managing operations, or earning income. As a result of this, firms' WC and free cash flow increase. Kayani, *et al.*, (2020) and Phan, *et al.*, (2020) discovered that average payment period had a positive impact on business profitability. Boukhatem & Moussa, (2018), on the other hand, discovered a negative influence of average Payment period on business profitability. The second hypothesis postulated as follow.

H2: Average payment period has a positive and significant effect on firm's performance.
### 2.4.3. Cash Conversion Cycle and firm performance

The Cash Conversion Cycle measures time in days and transforms a company's investments in inventory and other resources into cash flows from sales. It means that CCC measures how quickly a company can convert its invested cash into returns. The lower the CCC values the better. According to Prasad, *et al.*, (2018), CCC is the most extensively utilized component for measuring WC. CCC was calculated in the current study by subtracting the average payment period from the sum of the average collecting period and the inventory conversion period, i.e. CCC = ACP + ICP - APP. According to Baños, *et al.*, (2014), the value of CCC provides an easy appraisal for further financing needs in favor of WC. For example, Khatib & Nour, (2021), & Dalci, *et al.*, (2019), emphasized a negative relationship between CCC and firm profitability. Dhole, *et al.*, (2019); Altaf & Shah, (2018) on the other hand, investigated a positive relationship between the variables. The hypothesis developed as follow.

H3: Cash conversion cycle has a positive and significant effect on firm's performance.

## 2 4.4. Inventory Conversion Period

The inventory conversion period specifies the average number of days it takes a company to convert its inventory, including work-in-process products, into sales. A fewer number of inventory conversion periods is recommended because it takes less time to clear out inventory. A greater number of inventory conversion periods entail significant expenditures such as warehousing charges, opportunity costs, and insurance costs, among other things, and these costs may reduce the firm's profitability. Fernández, *et al.*, (2020) looked into the negative relationship between the inventory conversion period and business profitability. On the other hand, Phan, *et al.*, (2020); Kusuma & Dhiyaullatief Bachtiar, (2018), discovered a positive relationship between the variables. The last hypothesis developed as follow.

H4: Inventory conversion period has a positive and significant effect on firm's performance.

## 2.4 Conceptual Framework

To examine the effect of working capital management on the performance of large food manufacturing companies, we propose the following conceptual framework



Figure 2:1. Conceptual framework

## **CHAPTER THREE**

## **3. RESEARCH METHODOLOGY**

The general research methodology has been employed in this research. This section contains the important methodology techniques for carrying out this research are discussed as follows. The following topics were discussed: research design, data type and source of data, sampling and sampling techniques description of study area, data collection tool, data analysis approach, definition of variables i.e. dependent, independent variables and control variable, model specification and the final dissemination of the findings of this study.

## **3.1 Description of the study Area**

The Ministry of Federal Revenue Authority, which the controller Large Tax Payers companies, is located in South Addis Ababa around Kadisco. The firms under this study are companies established as share companies and private limited register the Ministry of Trade companies. The manufacturing companies process the raw material into a finished, tangible product and entails making a process more efficient by converting the particular assets into another resource, or product frequently for purposes of selling to consumers. These companies are large tax payer and controlled under Ethiopian Federal Authority Accordingly, in under Ethiopian Federal Revenue Authority there are 18 large food manufacturing companies report and registered.

## **3.2 Research Design and Approach**

A research design, according to Creswell & Miller, (2000), is a master plan that specifies methods and procedures for measuring and analyzing the required information. This study illustrates an explanatory research design. The basic purpose of an explanatory research design is to identify any causal linkages between the elements or variables related to the research problem.

In this study, the quantitative approach is applied to meet overall objective of study and to answer the hypothesis under it. The quantitative approach is the process of gathering and analyzing numerical data, and it is used to find patterns and averages, make predictions, evaluate causal relationships, and generalize results to large populations.

## 3.3. Types and Sources of Data

The type of data for this study was quantitative data obtained from secondary data source through document analysis. The panel data that have been used in this study covers twelve large food manufacturing companies having available financial data of ten years from 2014 to 2023.

The study used secondary source of data which were collected from Ministry of Revenue (Federal) annual reports of twelve large manufacturing companies included in the sample for the period of ten years (2014–2023). The expected total number of observations is 120(12\*10)

## 3.4. Sample Design

## **3.4.1 Target population and sample frame**

The collection of all possible observation of a special characteristic of interest is called a population while a collection of observations representing only a portion of the population is called a sample. According to ministry of revenue 18 large food manufacturing firms are listed in Ethiopia. In this study, the target population is only 12 large food manufacturing firms which have completed ten years audited financial report. The population inference is made due to the availability of the data necessary for the study and also most of the large manufacturing firms reside in large tax payer's branch office.

## 3.4.2 Sampling Technique

Purposive sampling, according to Adugna, *et al.*, (2020), is appropriate when the subjects included in the sample are homogeneous. Purposive sampling was utilized in this investigation. Purposive sampling allows the investigator entire choice in selecting his sample based on his preferences and desires while simultaneously being led by highly experienced and current information. It is also less expensive and takes less time. The population of the study includes all large manufacturing companies registered with the Ministry of Revenue and currently operating Federal Ethiopia. There are now 18 large food manufacturing companies as a total the Samples are eighteen (18) large

manufacturing companies are chosen, twelve (12) large food manufacturing companies. Using a balanced panel of data acquired from the Ministry of Revenue's report of financial accounts and income statements, which are analyzed for ten consecutive years from 2014 to 2023.

## **3.5 Method of data analysis**

In this inquiry, data inferential and descriptive analysis statistics are employed. Maximum and minimum are phrases used to represent the highest and lowest numbers. The standard deviation measures the dispersion of the values of all dependent and independent variables. It also shows how strong the correlation is between the independent and dependent variables. In this study, regression analysis is used to evaluate the relationship between working capital management and firm profitability of a large manufacturing company and chosen independent variables. Panel data would be chosen to satisfy the research objectives since it is more appropriate than time series or crosssectional data. Working capital management on firm profitability company in firm has been released for the first time Johari & Jha, (2020). E-Views10 version software is used to analyze the data to discover the most relevant and influential explanatory variables affecting large manufacturing firms when panel data regression analysis is done, there are mainly two types of regression procedures used, according to (Brooks, 2019). Fixed effects models (FEM) and random effects models (REM) are the two types. This study was also used in correlation analysis. Correlation analysis is used to determine the degree of correlation between two variables, and the correlation coefficient reflects the strength of the link between variables (Tay, et al., 2017).

## **3.5.1 Model Specification**

The balanced panel data was chosen above the imbalanced panel data in this study. This is due to the fact that balanced panel data provides for equal observation for every unit of observation during each time period Tauringana & Adjapong Afrifa, (2013). One critical option in panel data analysis is whether to use a fixed effects model or a random effects model. The random effects model assumes a single common intercept term and that each company intercepts vary randomly from this common intercept, whereas the fixed effects model assumes different intercepts for individual companies. Following comparable

studies Karaduman, *et al.*, (2010); Tauringana & Adjapong Afrifa, (2013), random effects panel data regression analysis would be used.

The assumptions and selected variables in the economic model can be stated as ROA= (ACP, APP, CCC, ICP, CR and DR). According to (Wooldridge, 2015), the general economic model can be derived from intuition or observation and then made realistic by deducting it into an economic model.

From the above economic model, the following econometric model is specified:

 $ROAit = \beta 0 + \Sigma \beta Xit + ui \qquad \dots \qquad 1$ 

Where:

ROAit: Return on Asset of firm i at time t.

 $\beta$ 0: The intercept of equation;

Bi: Coefficients of Xit variables;

Xit: different independent variables for working capital Management of firm i at time t (Time);

Uit: The error term;

Specifically, the above panel least squares model is converted into specified variables it becomes:

 $ROAit=\beta 0+\beta 1ACPit+\beta 2APPit+\beta 3CCC+\beta 4CRit+\beta 5DRit+\beta 6ICPit+uit.$ 

Where:

 $\beta$ 0: The intercept of equation

ROA: the return on assets

ACP: average collection period

App: average payment period

CCC: Cash Conversion Cycle

CR: Current ratio

DR: Debt ratio

ICP: inventory Conversion Period

## **3.6.** Measurement of variables

## 3.6.1. Dependent variable

Return on Assets (ROA) is a measure of a company's profitability in relation to its total assets. This ratio measures a company's performance by comparing its profit (net income) to the capital it has invested in assets. The higher the rate of return, the more productive and efficient management is in allocating economic resources. The firms' profitability determine by their return on assets (ROA). The return on assets (ROA) as a measure of profitability calculate by using the earnings after interest and taxes (EAIT) and total assets (T.A) (Olawale & Garwe, 2010). ROA=NI/TA

## **3.6.2. Independent variables**

## Average collection period

Average collection period is frequently determined on an annual, quarterly, or on monthly basis.

It is a measure of the average number of days that takes a firm to collect payment after a sale has been made. It is important for a firm to collect its outstanding account receivables as fast as possible. According to, Raheman & Nasr, (2007) firms with longer period of account receivable face higher opportunity costs which impact on declining their profitability. There are mixed findings of the impacts of average collection period on the firm's profitability. For example, Ademola (2014), investigated a positive relationship between Average collection period and business profitability. On the other hand, Fernandez, *et al.*, (2020) discover a negative influence of average collecting period on a firm's profitability.

Average collection period=365days/Account Receivable turnover ratio

## Average payment period (APP)

A financial ratio that is typically calculated on a yearly, quarterly, or monthly basis is average payment period. It specifies the average number of days it takes a company to pay its invoices and bills to trade creditors. Instead of paying its invoices upfront, a company with a high average payment time might postpone payments and use the available capital for short-term investments such as manufacturing more goods, managing operations, or earning interest. As a result, the firms' WC and free cash flow increase. Kayani,*et al.*, (2020) and Phan,*et al.*,(2020) discovered that average payment period had a positive impact on business profitability. Boukhatem & Moussa, (2018), on the other hand, discovered a negative influence of average Payment period on business profitability.

Average Payment Period = 365 days/ Account Payable turnover ratio

## Cash conversion cycle (CCC)

The Cash Conversion Cycle measures time in days and transforms a company's investments in inventory and other resources into cash flows from sales. It means that CCC measures how quickly a company can convert its invested cash into returns. The lower the CCC values the better. According to Prasad, *et al.*, (2018), CCC is the most extensively utilized component for measuring WC. CCC was calculated in the current study by subtracting the average payment period from the sum of the average collecting period and the inventory conversion period, i.e. CCC = ACP + ICP - APP. According to Baños, *et al.*, (2014), the value of CCC provides an easy appraisal for further financing needs in favor of WC. For example, Khatib & Nour (2021), & Dalci,*et al.*, (2019), emphasized a negative relationship between CCC and firm profitability Dhole et al., (2019); Altaf & Shah, (2018), on the other hand, investigated a positive relationship between the variables. CCC= (ACP+ICP)-APP.

## **Inventory Conversion Period (ICP)**

The inventory conversion period specifies the average number of days it takes a company to convert its inventory, including work-in-process products, into sales. A fewer number of inventory conversion periods is recommended because it takes less time to clear out inventory. A greater number of inventory conversion periods entail significant expenditures such as warehousing charges, opportunity costs, and insurance costs, among other things, and these costs may reduce the firm's profitability Fernández-López, *et al.*, (2020) looked into a negative relationship between the inventory conversion period and

business profitability. On the other hand, Phan, *et al.*, (2020), Kusuma & Dhiyaullatief Bachtiar, (2018), discovered a positive relationship between the variables. Inventory conversion period = (Inventory/Costof Goods sold) \* 365 days **3.6.3. Control variables** 

## **Debt Ratio** (DR)

Debt ratio is often referred to as debt-to-assets ratio. This ratio is used to assess the company's leverage and displayed the percentage of debt utilized to finance assets. Numerous researches found conflicting outcomes when it came to debt financing and corporate success. Joy, *et al.*, (2019) research on 10 listed manufacturing firms in Bangladesh finds that debt ratio has a favorable impact on manufacturing firm profitability in Bangladesh. While Pandey & Sahu, (2019) indicate that debt has a negative impact on the profitability of manufacturing enterprises in India. According to the findings of Habib,*et al.*, (2016), there is a strong but negative association between debt and return on asset. According to Yazdanfar & Öhman(2015), there is a negative association between debt and firm performance. Debt Ratio =Total Debt/Total Asset

## **Current ratio**

Short term liquidity (Current Ratio) Liquidity is one of independent variable which affects profitability of firms.

Current Ratio (CR) Current Asset/Current Liability

## **3.7 Diagnostic Analysis**

The following assumption would be checked to guess the value of the error term based on the Classical Linear Regressions Model.

## **3.7.1**. Multi collinearity Test

Multicollinearity is defined as the presence of strong linear correlations between independent variables in more than 75% of cases Gujarati, (2004). Inefficient estimates would result if two variables were very collinear.

## **3.7.2 Heteroscedasticity**

Heteroscedasticity, as defined by Bentley, *et al.*, (2008), denotes that error terms do not have a constant variance. If there is heteroscedasticity, the estimators of the ordinary least square approach are inefficient, and hypothesis testing is no longer accurate or valid since the variances and standard errors are underestimated. The Park Test, Glesjer Test, Breusch-Pagan-LM Test, White's Test, and Autoregressive Conditional Heteroscedasticity (ARCH) test are all used to determine heteroscedasticity. In this situation, Breusch-Pagan-LM Test.

H0: There is no heteroscedasticity (homoscedasticity) in the model.

H1: The model has a heteroscedasticity problem.

Decision Rule: Reject  $H_0$  if p-value less than significance level. Otherwise, do not reject  $H_0$ .

## **3.7.3** Normality

To establish if a data collection is well-modeled by a normal distribution, normality tests were applied. Ordinary least square estimation may be easily derived with the normality assumption and is significantly more valid and straightforward. The Jarque-Bera Test (JB test) would be performed in this study to determine if the error term is regularly distributed or not. Jarque-Bera employs the mean, variance, skewness, and kurtosis properties of a normally distributed random variable.

Skewness indicates the extent to which a distribution is asymmetric about its mean value, whereas kurtosis measures the fatness of the distribution's tails. The normal distribution must not be skewed and must have a kurtosis coefficient of three. The results of the Jarque-Bera normally tests can also be observed on the p-value. If the residuals are normally distributed, the histogram should be bell shaped, and the Jarque - Bera statistic should be zero.

H0: The error term has a normal distribution.

H1: The error term is not distributed normally.

Decision Rule: Reject  $H_0$  if p-value of JB tests greater than significance level. Otherwise, do not reject  $H_0$ .

## **3.7.4 Autocorrelation Test**

Fourth multiple linear regression analysis demands that the data be free of autocorrelation. Autocorrelation can only occur in the model that include time series data and it means that either the model is specified with an insufficient number of lagged variables or not all the relevant explanatory variables are specified in the model. Autocorrelation test is also regarded as misspecification test. Incorrect functional forms, omitted variables and an inadequate dynamic specification of the model can cause autocorrelation (UĞUR, 2013). The independence of the residuals can be measured by Durbin-Watson statistics. The value of the Durbin-Watson statistic ranges from 0 to 4. As a general rule, the residuals are independent (not correlated from one observation to the other) if the Durbin-Watson statistic is approximately 2, and an acceptable range is 1.50–2.50 (Muluadam, 2015).

## CHAPTER FOUR DATA ANALYSIS, PRESENTATION AND DISCUSSION

The purpose of this chapter is analyze the data and its results. This chapter has been organized as the descriptive statistics, correlation coefficient of the study variables, brief description on test for fulfillment of the classical linear regression model assumptions and the econometric analysis and findings of the results are presented.

## 4.1. Descriptive Statistics for the study variables

Descriptive statistics according to Vetter(2017), are methods for calculating, characterizing, and summarizing obtained Data should be researched in a rational manner, understandable, and efficient manner.

Table 4.1 displays a summary of descriptive statistics for the dependent and independent variables for large food manufacturing firms for a period of ten years from 2014 to 2023 with 18 total observations after adjustment was used. The table includes the number of observation, mean, standard deviation, minimum and maximum value for the dependent (explained) variable, return on asset, independent variables (explanatory) variable average collection period (ACP), average payment period (APP), cash conversion cycle (CCC), inventory conversion period (ICP) and control variables current ratio(CR) and debt ratio (DR) of the model. It shows the average indicator of variables computed from the financial statements.

	ROA	С	ACP	APP	CCC	CR	DR	ICP
Mean	1.357	1.	0.385	0.040	0.366	7.466	0.12	1.4
Median	1.345	1.	0.40	0.039	0.37	8.0	0.11	1.44
Maximum	1.720	1.	0.711	0.077	0.52	9.0	0.34	1.88
Minimum	0.920	1.	0.010	0.018	0.200	5.00	0.02	1.2
Std. Dev.	0.167	0	0.091	0.014	0.076	1.18	0.08	0.148
Skewness	-0.255	NA	-0.640	0.54	-0.201	-0.603	1.50	0.8
Kurtosis	2.978	NA	7.162	2.86	2.23	1.984	4.79	3.51
Observations	120	120	120	120	120	120	120	120

Table 4.1 Descriptive statistics of sample companies.

Source: E-views output financial statement 2014 -2023

Table 4.1 presents descriptive statistics for 12 large food manufacturing firms in Ethiopia, register in Ministry of Federal Revenue authority, Ethiopia, for a period of ten years from 2014 to 2023. The study has used seven variables for the analysis purpose which classified in to one dependent variable, four independent variables and two control variables. The dependent variable which measures the profitability of the firm is return on asset. Four independent variables are average collection period, average payment period, cash conversion cycle and inventory conversion period. And two control variables debt ratio, current ratio. Return on asset is measured by net income over total asset. The mean of return on asset was 135.7583 percent and the standard deviation of 16.7076 percent. This indicates that the large food manufacturing firms, under the period of study have return 135.7583 percent of their total asset as a net income. The standard deviation indicates the amount of return on asset that deviated from its mean to both sides by 16.7076 percent up to the maximum 172 percent and minimum of 92 percent return on asset. The descriptive statistics show that firms under the study receive payment on sales on average of 9.1047 percent and it can vary by 38.58 percent to both sides of the mean value. The minimum and the maximum average collection period for the sampled firms are 1.04 and 71.17 percent respectively.

On average, firms wait 4.07 percent to pay for their purchase. Its standard deviation for the firms under study is 1.4 percent which deviates with both sides of the mean value. The account payable period ranges between 1.8 to 7.7 percent to pay their credit purchase the descriptive statistics show that it takes on average of 147.38 percent to sell inventory. The cash conversion cycle, used as a comprehensive measure of working capital management has an average 38.58 percent and the standard deviation of 9.1 percent. The minimum value the cash conversion cycle shows 20 percent and on the other way, the maximum time for the cash conversion period is 52 percent. The result of the descriptive statistics shows that the average debt ratio for the large food manufacturing firms is 128.6 percent on average and standard deviation of 8.23 percent from mean value of debt ratio to both directions. The maximum debt ratio used by the firm is 34.1 and its minimum level is 2.8 percent. The descriptive statistics show that the mean value of inventory conversion period is 147.38 percent. As it is shown the above table standard deviation is

14.86 percent. To the sample firms the inventory conversion period range between 121 to 188 percent of minimum and maximum value respectively.

## **4.2 Diagnostic tests**

Diagnostic tests are robust statistical tests carried out to verify if the data used have met the assumptions underlying the ordinary least square regression and where possible to remove the problem associated with panel data.

## Model Selection Criteria (Random vs. Fixed effect model)

One of the issues that a researcher faces when working with panel data is deciding whether to use the Fixed Effect Model (FEM) or the Random Effect Model (REM). To answer this question, one must consider the likelihood of a correlation between the individual or cross-sectional mistake components and the x's repressors. If the disturbance term is supposed to be ( $\varepsilon i$ ) and the x's regresses are uncorrelated REM is appropriate. If the disturbance term ( $\varepsilon i$ ) and x's are correlated FEM is appropriate Gujarati(2004). As a result, the researcher used the Hausman test to assess which model is appropriate for the provided data. This test determines whether the unobservable heterogeneity exists. Term is it correlated with explanatory variables. The null hypothesis for this test is that the unobservable heterogeneity term is not associated or that the random effect model with the independent variables is appropriate. If the null hypothesis is rejected, we use fixed (Padachi, 2006).

H0: Random Effect model is appropriate

H1: Fixed Effect model is appropriate

Decision Rule: Reject H0 if P- value less than significance level 5%. Otherwise, do not reject.

Correlated Random Effects				
Equation: Untitled				
Test cross-section random effects				
Test Summary	Chi-Sq.	Chi-Sq. d.f.	Prob.	
-	Statistic	-		
Cross-section random	0.000000	6	1.0000	

**Table 4.2 Test for Model selection** 

Source: E-views output financial statement 2014-2023

Based on the Hausman test result above table, the p-value is insignificant at 5% level; therefore, we cannot reject the null hypothesis and which states that random effect model is appropriate.

## **4.3.1** Test for Multicollinearity

Before conducting any regression analysis, it is essential to check whether the problem of multicollinearity exists or not. Multicollinearity is a correlation or linear relationship between explanatory variables. It is a data problem and also collinearity always presents between independent variables. It becomes a problem and violation of the classical assumption if the correlations among the independent variables are very strong. It can affect accuracy of the parameter estimates UGUR(2013). Correlation matrix between return on asset and independent variables The ROA reflects the ability of large food manufacturing to generate profits from the company asset, and this profitability measure is correlated with other independent variables either positively or negatively. In table 4.3 below, the correlation analysis was undertaken between profitability measures (ROA and independent variables (average collection period, average payment period, cash conversion period and inventory conversion period) and two control variables (current ratio and debt ratio). As it can be seen from the table below, there was a positive correlation between (ROA and independent variables (, average payment period, cash conversion period and inventory conversion period, current ratio and debt ratio). As per the table below, the correlation coefficient between ROA and Average collection period was minus 0.233309, which is the smallest correlation coefficient as compared to other variables. This means that average collection period has a small association with profitability. But debt ratio had the highest positive correlation coefficient compared to other variables. This result shows that the debt ratio is high in the large food manufacturing companies; it shows a positive correlation with profitability measured by return on asset. This means that these variables played a major role in the profitability of large food manufacturing companies.

### **Correlation matrix of independent variables**

The correlation between the independent variables average collection period, average payment period, cash conversion cycle, current ratio, debt ratio and inventory conversion period included in this study is presented and analyzed. According to table 4.5 below, the current ratio of large food manufacturing companies with average payment period and current ratio with cash conversion period are highly correlated as compared to other independent variables.

	ACP	APP	CCC	CR	DR	ICP
ACP	1	-0.05485	0.22673	0.13237	-0.06506	-0.28614
APP	-0.05485	1	0.49316	0.58973	0.129447	0.4414
CCC	0.22673	0.49316	1	0.40978	0.10138	-0.00966
CR	0.13237	0.5897	0.40978	1	0.08603	0.31398
DR	-0.06506	0.12944	0.10138	0.08603	1	0.05654
ICP	-0.28614	0.44146	-0.00966	0.31398	0.05654	1

Table 4.3 shows the correlation matrix between independent variables.

Source: E-views output financial statement 2014-2023

From the above table, we can see that the current ratio of large food manufacturing company is positively related to all independent variables. The debt ratio of large food manufacturing company is positively related to all independent variables except average collection period. Cash conversion cycle has a positive correlation coefficient with all independent variables except inventory conversion period. Average payment period has a positive correlation coefficient with all independent variables except average collection period has a negative correlation coefficient with average payment period has a negative correlation coefficient with average payment period, debt ratio and inventory conversion period.

## **4.3.2** Testing for normality

Normality is a condition in which variables to be used in the model follow the standard normally distribution. According to Brooks (2014) financial modeling is quite often the case that one or two very extreme residuals cause a rejection of the normality assumption. The Jarque-Bera statistics was used to test the normality of the variable under different conditions and under the hypothesis;

H0: the series is normally distributed

H1: the series is not normally distributed

If the series are normally distributed, the histogram should be bell shaped and the Jarque-Bera statistics significant. It thus follows that series would be normally distributed at 5% level of significance if the probability of Jaque-Bera statistics is greater than 0.05.

Hence the four models regressed found to be normally distributed as presented below



Model: ROA C ACP ICP APP CCC CR DR

Source: E-views output financial statement 2014-2023

## Figure 4.1: Regression Standardized Residual

Figure 4.1 Testing for normality

Source E-views output results and author's computation 2014-2023

Based on the above test result fig 4.1 the residual was normally distributed because histogram is relatively bell-shaped for all models and its Jaque -Bera is insignificant at 5% levels. Therefore, the null hypothesis is that states residual follows a normal distribution would not be rejected.

## 4.3.3. Testing for heteroscedasticity

The heteroscedasticity is one of the assumptions of the classical linear regression model which states that the variance of the error must be constant. If the errors do not have a constant variance, they are said to be heteroscedasticity UĞUR, (2013). The test can be represented in an auxiliary regression form, in which the square residuals the proposed model are regressed on the predictors believed to be the cause of the hetroscedasticity. Heteroscedasticity uses the Bruesch-Pagan test for heteroscedasticity which takes as its null hypothesis that the variance is constant across all observations. The alternative hypothesis is that variance is constant (i.e. that there is hetroscedasticity). The calculated statistic has a chi-squared distribution test states that if the p-value is significant at 95 confidence intervals, the data has hetroscedasticity problem, where as if the value is insignificant (greater than 0.1 in case of this study), the data has no hetroscedasticity problem.

The hypothesis for the hetroscedasticity test was formulated as follows:

H0: There is no hetroscedasticity problem in the model

H1: There is hetroscedasticity problem in the model

Decision Rule: Reject H0: If p-value less than significant level 0.05, Otherwise do not reject H0.

## Table 4.4 : Bruesch-Pagan- test for heteroscedasticity

Residual Cross-Section Dependence Test Null hypothesis: No cross-section dependence (correlation) in residuals Equation: Untitled Periods included: 10

Cross-sections included: 12 Total panel observations: 120 Note: non-zero cross-section means detected in data Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	78.14146	66	0.1456
Pesaran scaled LM	1.056779		0.2906
Pesaran CD	-1.593723		0.1110

Source: E-views output financial statement 2014-2023

From table above The Breusch-Pagan LM test statistic of 78.14146 with a p-value of 0.1456 indicates that the test statistic is high, suggesting a potential presence of heteroscedasticity in the regression model. However, the p-value of 0.1456 is above the typical significance level of 0.05. In this test, failing to reject the null hypothesis would imply that there is not enough evidence to conclude that heteroskedasticity is present in the model based on the Breusch-Pagan test results. The Pesaran scaled LM test statistic is 1.056779, with a p-value of 0.2906. This means that the null hypothesis of no cross-sectional dependence cannot be rejected at the 5% significance level, as the p-value is greater than 0.05. The Pesaran CD test statistic is minus1.593723, with a p-value of 0.1110. Similar to the scaled LM test, this p-value is also greater than 0.05, so the null hypothesis of no cross-sectional dependence cannot be rejected at the 5% significance level. Both the Pesaran scaled LM test and the Pesaran CD test fail to reject the null hypothesis of no cross-sectional dependence in the panel data model, at the 5% significance level.

## **4.3.4 Testing for Autocorrelation**

Autocorrelation can only occur in the model that include time series data and it means that either the model is specified with an insufficient number of lagged variables or not all the relevant explanatory variables are specified in the model. Autocorrelation test is also regarded as misspecification test. Incorrect functional forms, omitted variables and an inadequate dynamic specification of the model can cause autocorrelation (UĞUR, 2013). The independence of the residuals can be measured by Durbin-Watson statistics. The value of the Durbin-Watson statistic ranges from 0 to 4. As a general rule, the residuals are independent (not correlated from one observation to the other) if the Durbin-Watson statistic is approximately 2, and an acceptable range is 1.50–2.50 (Muluadam, 2015).

## Table 4.5 Testing for Autocorrelation

Weighted Statistics				
F-statistic Prob(F-statistic)	53.10624 0.000000	Durbin-Watson stat	1.58756	

From the above Table 4.3.3, the output value of Durbin-Watson is 1.58756, indicating that there is no correlation or independence among the residuals

# Table 4.6 Regression result of model specificationModel specification

Dependent Variable: ROA Method: Panel Least Squares Date: 06/02/24 Time: 20:35 Sample: 2014 2023 Periods included: 10 Cross-sections included: 12 Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	0.284617	0.119229	2.387148	0.0186
ACP	-0.295787	0.103086	-2.869319	0.0049
APP	3.371897	0.892749	3.776982	0.0003
CCC	0.321826	0.138654	2.321079	0.0221
CR	0.032946	0.009312	3.538055	0.0006
DR	0.276598	0.104846	2.638128	0.0095
ICP	0.441091	0.069704	6.328029	0.0000
R-squared	0.705646	Mean depend	lent var	1.357583
Adjusted R-squared	0.690017	S.D. dependent var		0.167076
S.E. of regression	0.093021	Akaike info criterion		-1.855415
Sum squared resid	0.977784	Schwarz criterion		-1.692811
Log likelihood	118.3249	Hannan-Quinn criter.		-1.789380
F-statistic Prob(F-statistic)	45.14865 0.000000	Durbin-Watson stat		1.587563

### Source: E-views 10 output 2024

Model: ROAit= $\beta$ 0+ $\beta$ 1ACPit+ $\beta$ 2APPit+ $\beta$ 3CCCit+ $\beta$ 4ICPit+ $\beta$ 5CRit +  $\beta$ 6DRit+ uit. roait=-0.295787ACPit+3.371897APPit+0.321826CCCit+0.44109ICPit+0.032946CRit+ 0.276598DRit+ uit.

Table 4.6 reveals the summary statistics of regression specification. The explanatory power of the model as can be seen is that the R squared values are equal to 70.56 percent. This implies that 70.56 percent of the variation in the return on asset large food manufacturing firms can be explained by the variables used in the model, whereas the remaining 29.44 percent of variation would be explained by other variables which couldn't be included in this study. The R-squared values in this study are found to be sufficient enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). If  $R^2$  is small we doubt the adequacy of the fitted model however, we do not arrive at a final conclusion before during an objective test or we are missed out the influential explanatory variables.

The F-statistic is used to test the model specification. From the table 4.7 the result of one can see that the model is fit with statistics 45.14865 at p-value of 0.000000

Model adequacy:  $\beta$ 1acp+ $\beta$ 2app+ $\beta$ 3ccc+ $\beta$ 4icp+ $\beta$ 5cr+ $\beta$ 6dr+ ut*i* 

H0:  $\beta 2 = \beta 3 = 0$ 

H1: at least one  $\beta j \neq 0$  j=2, 3

Test statistics

F= 45.14865

P-value= (prob (F-statistics) =0.0000<0.05

## Decision: Reject H0

Conclusion: at least one of the explanatory variables is significant the model is adequate. In this study six variables; average collection period, average payment period, inventory conversion period, current ratio and debt ratio are significant. So, the model is adequate.

### Average collection period (ACP)

The regression results of the relation between average collection period and return on asset on large food manufacturing firms have negative and statistically significant relationship at1% significance level. The E-views output in the above table 4.7 showed that the coefficient of average collection period is negative. According to the regression result, the coefficient of average collection period is -0.295787nand it is statistically significant at 5% level of significance. It implies that a day increase in average collection period is associated with decreased profitability by 29.5787 percent.

The finding confirmed that the firms account collection period increase bad debt would increase and profitability decrease. This means that the shorter the firm's average collection period the higher would be the longer the average collecting period, the lower the profitability of the firm. However, corporations must collect early in order to have available funds and improve their profit. The finding is in line with the study of . Cruz, *et al.*, (2018);Fernández-López,*et al.*, (2020) there is negative relationship indicates that the slow collection of account receivable is correlated with low profitability. however, the regression result in contrary with the findings of Ademola, (2014), Mulat, *et al.*, (2021); Geddafa, *et al.*, (2020); Salam, (2017) found positive relationship account receivable period and profitability of firms. This means the shorter account receivable period increase the performance of firms.

**H1:** Average Collection Period has a significant effect on firm Profitability measured in terms of return on asset.

H0:  $\beta 1 = \beta 2$ 

H1: at least one  $\beta j=0$  j  $\neq 2, 3$ 

P- Value = 0.0049 < 0.01

Decision: Reject H0 at 1% level of significance.

Conclusion: there is a significant linear relationship between return on asset and average collection period. So average collection period is significant

## Interpretation: $\beta$ 1=-0.295787

When return on asset increased by 1 percent average collection period decreased by 29.5787 percent. Keeping other explanatory variables; average payment period, cash conversion cycle, and inventory conversion period and other control variable; current ratio and debt ratio is constant.

## Average payment period

The regression results of the relation between average payment period and return on asset on large food manufacturing firms have positive and statistically significant relationship at 5% level of significance. The E-views output in the above table 4.7 showed that the coefficient of average payment period is positive. According to the regression result, the coefficient of average payment period is 3.371897 and it is statistically significant at 5% level of significant. It implies that a day increase in average payment period is associated with increase in profitability by 337.1897 percent. The finding is in the line with the prior researcher of Kayani, et al (2020), Phan, et al (2020), this implies that they withhold their payment to suppliers so as to take advantage of the cash available for their working capital needs. It implies that a day increase in account payable period is associated with an increase in profitability. The result also shows that more profitable firms wait longer to pay their bills. This means that the longer the firm average payment period, the higher profitability and vice versa. The regression result is on the contrary with the result of Salam, et al., (2017), found that a negative significant relationship between average payment period and profitability can be explained by the benefit of early payment discounts.

**H2:** Average payment period has a significant effect on firm profitability measured in terms of return on asset.

Н0: β2=о

H1: β2 ≠0

P- Value = 0.0003 < 0.01

Decision: Reject Ho at 1% of level of significance

Conclusion: there is a significant linear relationship between return on asset and average payment period. So average payment period is significant

Interpretation:  $\beta 2 = 3.371897$ 

When return on asset increased by 1 percent average payment period increased by 337.1897 percent. Keeping other explanatory variables; average collection period, cash conversion cycle and inventory conversion period and other control variable; current ratio and debt ratio is constant.

## **Cash conversion cycle**

The regression results of the relation between cash conversion cycle and return on asset large food manufacturing firms in Ethiopia have negative and statistically insignificant relationship at 5% significance level. The E-views output in the above table showed that the coefficient of cash conversion cycle is positive. According to the regression result, the coefficient of cash conversion cycle is 0.321826 and it is statistically significant at 5% level of significance. This means that a day decrease in cash conversion cycle is associated with increase in profitability by 32.1826 percent and statistically significant. The finding implies that shorter the firm's cash conversion cycles the higher the profitability and the higher the firm's cash conversion cycle, the lower the profitability. The length of time tied up in working capital, or the length of time between paying for working capital and collecting cash from the sale of the working capital. Shortening the cash conversion cycle resulted in higher profits and better stock price performance. Therefore, large food manufacturing firms can increase their profitability by making higher the length of cash conversion cycle and keeping each different component (account receivable, account payables, and inventory) to the optimal level. The findings in the line with the previous the studies of Khatib & N of Dhole, et al., (2019); Altaf & Shah, (2018) found positive relationship cash conversion cycle and profitability of firms. However, the regression result contradicts the findings of Nour, (2021), Dalci, et al., (2019), found that the cash conversion cycle and firms have a negative relationship.

**H3:** Cash Conversion Cycle has a significant effect on firm Profitability measured in terms of return on asset.

H0: β3=0

H1: β3≠0

P-value =0.0221 >0.05

Decision: Reject H0 at 1% level of significance.

Conclusion: there is a significant linear relationship between return on asset and cash conversion cycle. So, cash conversion cycle is significant.

Interpretation:  $\beta 3 = 0.32946$ 

When return on asset increased by 1 percent cash conversion cycle increased by 32.946 percent. Keeping other explanatory variables; average collection period, average payment period and inventory conversion period and other control variable; current ratio and debt ratio is constant.

## Inventory conversion period

The regression results of the relationship between return on asset and inventory conversion period on large food manufacturing firms in Ethiopia have a positive and statistically significant at 1% level of significance. The E-views output the above table 4.7 showed that the coefficient of inventory conversion period is positive. According to the regression result the coefficient of inventory conversion period is 0.441091 and it is statistically significant at 1% level of significance. It implies that a day increase in inventory collection period is associated with increased profitability by 44.1091 percent. A greater number of inventory conversion periods entail significant expenditures such as warehousing charges, opportunity costs, and insurance costs, among other things, and these costs may reduce the firm's profitability. Phan, *et al.*, (2020); Kusuma & Dhiyaullatief Bachtiar, (2018),looked in to a positive relationship between the inventory conversion period and business profitability. On the other hand, Fernández, *et al.*, (2020)

**H4:** Inventory Conversion Period has a significant effect on firm Profitability measured in terms of return on asset.

H0: β4=0
H1: β4≠0
P-value =0.0000
Decision: Reject H0: at 1% level of significance
Conclusion: there is a significant linear relationship between return on asset and inventory conversion period. So, Inventory conversion period is significant.
Interpretation: β5=0.441091

When return on asset increased by 1 percent inventory conversion period increased by 44.1091 percent. Keeping other explanatory variables; average collection period, average payment period, cash conversion cycle and other control variables; current ratio and debt ratio is constant.

## Current ratio (CR)

The result of the relation between Current ratio and return on asset on large food manufacturing firm in Ethiopia have positive and statistically significant relationship at 1% significance level. The E-views output in the above table showed that coefficient of current ratio is positive. According to the regression result, the coefficient of current ratio is 0.033398 and it is statistically significant at 1% level of significant. This means unit increase in current ratio is associated with an increase in profitability by 0.033398 all other variables remain constant. The finding confirmed that Current ratio used to evaluate company's ability to pay its short-term obligations those that come due within a year. The current ratio is calculated by dividing a company's current assets by its current liabilities and the higher the current ratio, the more liquid a company is. The finding is in line with findings of the previous the studies Bagh, et al (2016)

**H5:** current ratio has a significant effect on firm Profitability measured in terms of return on asset.

H0: β5=0 H1: β5≠0

## P-value =0.0005

Decision: Reject H0: at 1% level of significance

Conclusion: there is a significant linear relationship between return on asset and current ratio. So, current ratio is significant.

Interpretation:  $\beta 6=0.033398$ 

When return on asset increased by 1 percent current ratio is increased by 3.3398 percent. Keeping other explanatory variables; average collection period, average payment period, cash conversion cycle and inventory conversion period and other control variables, current ratio and debt ratio is constant.

## **Debt ratio**

The regression results of the relation between debt ratio and return on asset on large manufacturing firm in Ethiopia have positive and statistically significant relationship at 5% significance level. The E-views output the above table 4.7 showed that the coefficient of debt ratio is positive. According to the regression result the coefficient of debt ratio is 0.276598 and it is statistically significant at 5% level of significance. This means that an increase of debt in the sample large food manufacturing firm by 1% on average would be result in 27.6598% reduction in return on asset holding all other variables remain constant. The finding confirmed that debt ratio is used to measure solvency of a company, its financial structure and how to operate with the given fund (equity and debt). It is used by creditors, as well as the internal management to evaluate the company's growth. The findings is in line with findings of the previous the studies of Pandey & Sahu, (2019), Habib, *et al.*, (2016) found that there is a positive relationships between debt ratio and firm's profitability.

**H6:** Debt ratio has a significant effect on firm profitability measured in terms of return on asset.

H0: β6=0

H1: β6≠0

P-value = 0.0095 < 0.05

Decision: Don't reject H0 at 5% level of significance

Conclusion: there is a significant linear relationship between return on asset and debt ratio. So, debt ratio is significant.

Interpretation: β6=0.267633

When return on asset increased by 1 percent debt ratio is increased by 26.7633 percent. Keeping other explanatory variables; average collection period, average payment period, cash conversion cycle and inventory conversion period and other control variables, debt ratio is constant.

## CHAPTER FIVE CONCLUSION AND RECOMMENDATION

## 5.1 Summary of Major Findings

The regression results is the relation between average collection period and return on asset on large food manufacturing firms in Ethiopia have negative and statistically significant relationship these days and firms' profitability. It implies that a day increase in account collection period is associated with decrease in profitability.

There is negative relationship that slow collection of account receivable is correlated with low profitability. This finding confirms within the line of working capital management rule that large manufacturing firms Ethiopia must strive to collect their debts from debtors as quickly possible. The firms account collection period increase bad debt would increase and profitability may fall down.

The regression results between average payment period and return on asset on large food manufacturing firms in Ethiopia have positive and statistically significant relationship these days and firms' profitability. It implies that a day increase in account payable period is associated with increase in profitability. The result shows that more profitable firms wait longer to pay their bills. This means that the longer the firm's account payable period, the higher the profitability and vice versa.

The regression results of the relation between cash conversion cycle and return on asset on large food manufacturing firms in Ethiopia have positive and statistically significant these days and firms' profitability. This implies that higher the firm's cash conversion cycles the higher the profitability and the higher the firm's cash conversion cycle, the higher the profitability. The length of time tied up in working capital, or the length of time between paying for working capital and collecting cash from the sale of the working capital. Therefore, large food manufacturing firms can increase their profitability by making higher the length of cash conversion cycle and keeping each different component (account receivable, account payables, and inventory) to the optimal level.

The regression results of the relation between inventory conversion period and return on asset on large food manufacturing firms in Ethiopia have positive and statistically significant. It implies that a day increase in inventory collection period is associated with increased profitability. A greater number of inventory conversion periods entail significant expenditures such as warehousing charges, opportunity costs, and insurance costs, among other things, and these costs may reduce the firm's profitability

The regression results of the relation between debt ratio and return on asset on large food manufacturing firms in Ethiopia have positive and statistically significant. It implies that an increase of debt that would be increased return on asset. The finding confirmed that debt ratio is used to measure solvency of a company, its financial structure and how to operate with the given fund (equity and debt). It is used by creditors, as well as the internal management to evaluate the company's growth.

The finding is also confirmed that both measures of liquidity- current ratio and debt ratio, show significant positive relationship between profitability and liquidity on financial performance of large food manufacturing in Ethiopia. This result is consistent with the view that there is a trade-off between liquidity and profitability Thus, large food manufacturing firms in Ethiopia can increase profitability by increasing their liquidity position at least to the commonly known level for current ratio and debt ratio). Managers, therefore, can increase firms' profitability by improving the efficiency of management of working capital investment and financing policies while, also keeping in view of the trade-off between liquidity and profitability

## 5.2 Conclusion

This paper provides through review of the many issues in the area of the effect of working capital management and its implication on variables such as average collection period, average payment period, cash conversion cycle, inventory conversion period, debt ratio and current ratio. At a certain level of working capital, the value of firm is maximized. Therefore, working capital management is determined by a combination of endogenous and exogenous factor. Efficient management of working capital poses a problem of reconciling the conflicting demands of liquidity and profitability. This is an onerous task for the financial managers.

There was significant positive relationship between average collection period and profitability. Showing that the longer it takes firms to collect their receivables the less

profitable they would be. These positive relationships can be explained as the number of days to collect cash from credit customers becomes too short; it would favorably for profitability of the firms.

The regression analysis of average payment period indicates that there is strong positive relation between these days and firms' profitability and statistically significant. This means the larger the firms account payable period related the higher the profitability and vice versa. Firms settle their credit bill early can increase profit ability. If firms paid their credit on short period of time, they may entitle for early payment discount and might waive interest expense.

The regression analysis of cash conversion cycle indicates that there is strong relation between cash conversion cycle and large manufacturing firm's profitability at 5% significant level.

The researcher found that the positive relationship between debt ratio and firms' profitability. Implying that, increasing debt has a detrimental influence on company performance.

The researcher also found that the positive relationship between inventory conversion period and profitability. It shows that the higher it takes firms to replenish the inventory, the high profitable they would be. This suggests the desirability of inventory due to higher.

Finally, liquidity current ratio and debt ratio both measures, how significant positive relationship between profitability and liquidity on financial performance of large food manufacturing in Ethiopia. This result is consistent with the view that there is a trade-off between liquidity and profitability Thus, large food manufacturing firms in Ethiopia can increase profitability by increasing their liquidity position at least to the commonly known level for current ratio, Managers, therefore, can increase firms' profitability by improving the efficiency of management of working capital investment and financing policies while, also keeping in view of the trade-off between liquidity and profitability. In general, the study concluded that there was strong relationship between working capital components and firms' profitability. This can be interpreted that effective working capital

management has a significant impact on the financial performance of performance of large food manufacturing in Ethiopia. Inventory period leads to higher profitability.

## **5.3 Recommendation**

The recommendations of the research were premised on the summary and conclusions from the results and discussion. The study has shown a clear understanding of working capital components and its impact on profitability of firms. In order to improve firm's performance, management of working capital components is necessary. Therefore, recommends the following points based on the study findings.

The results of the study revealed that average collection period has negative impact on profitability. Thus, it recommended the firms should reduce the period of converting account receivable in to cash to its possible minimum days. The result suggest that managers can increase profitability of large manufacturing firms by reducing the number of day's shortening account receivable days.

The study also found positive relationship between account payable period and firm's profitability. It indicates that whenever firms paid their account payables Longley, increase profitability. Firms settle early their credit it creates a good business relation and its strength long term supplier customer relation. Therefore, the researcher recommend that firms should consider the terms of APP to be longer to have direct effect on firm's profitability. In this regard the researcher recommended that the managements should make a trade credit policy which is allow paying their account payable too soon in order to maximize their profit.

The result of the study revealed that inventory conversion period has a positive impact on firm profitability. This is recommended that the firms should be reduced the inventory conversion period to reasonable levels to become profitable. A fewer number of inventory conversion periods is recommended because it takes less time to clear out inventory.

The studies highlighted various recommendations for firms in order to improve financial performance. So, the studies recommended to firms to reduce their account receivable and inventory to reasonable levels equally study recommended firms to take long to pay

their creditors and also work on cash conversion cycle to be shorter. Debt ratio also recommended to be kept at optimum level. Additionally, the study recommends that the firm's manager should develop effective policies on working capital management to ensure that can maximize profitability and ensure the firms liquidity to meet their current obligation.

## **5.4 Suggestions for Further Research**

There is a need for further study to carry out in effect of working capital profitability of firms by incorporating more working capital variables that affect profitability and by adding one or more independent variable. This research has opened many avenues for future research. There are several potential opportunities for future research and improvements in working capital management.

First, since now global is changing from GAAP to IFRS and in that IFRS gives more emphasis or especial consideration for working capital components such as assets and inventory valuations and in addition to this, there is also general shortage of working capital studies in case of large food manufacturing firms' companies in Addis, Ethiopia, this study can be extended by using more data from a cross-section of Ethiopian food manufacturing.

This is important area of the working capital management for the financial sectors, it improves current understanding of Working Capital Management and associated performance in developing countries.

Second, another important area is the working capital management for the financial sectors. This is again an area where studies needed to be undertaken because the working capital requirements for the financial sectors are different from those of the non-financial or manufacturing sectors.

## Reference

- Ackert, L. F. (2014). Traditional and behavioral finance. *Investor Behavior: The Psychology of Financial Planning and Investing*, 25–41.
- Ademola, O. J. (2014). Working capital management and profitability of selected quoted food and beverages manufacturing firms in Nigeria. *European Journal of Accounting Auditing* and Finance Research, 2(3), 10–21.
- Adugna, D. G., Enyew, E. F., & Jemberie, M. T. (2020). Prevalence and associated factors of macrosomia among newborns delivered in University of Gondar Comprehensive Specialized Hospital, Gondar, Ethiopia: An institution-based cross-sectional study. *Pediatric Health, Medicine and Therapeutics*, 495–503.
- Ajayi, M. A., Abogun, S., & Odediran, T. H. (2017). Impact of working capital management on financial performance of quoted consumer goods manufacturing firms in Nigeria.
- Ajetunmobi, O. O., Adesina, K., Faboyede, O. S., & Adejana, B. P. (2017). *The impact of treasury single account on the liquidity of banks in Nigeria*.
- Akande, J. O., & Kwenda, F. (2017). P-SVAR analysis of stability in sub-Saharan Africa commercial banks. SPOUDAI-Journal of Economics and Business, 67(3), 49–78.
- Akbar, J. (2021). Crisis in the Built Environment: The Case of the Muslim city. İnsan Yayınları.
- Akinleye, G. T., & Roseline, A. (2019). Assessing working capital management and performance of listed manufacturing firms: Nigeria evidence. *Information Management and Business Review*, 11(2 (I)), 27–34.
- Aktas, N., Croci, E., & Petmezas, D. (2015). Is working capital management value-enhancing? Evidence from firm performance and investments. *Journal of Corporate Finance*, 30, 98– 113.
- Al Shra'ah, A. E. M. (2019). Working capital management and profitability: Evidence from Jordanian mining and extraction industry sector., 27(1).
- Al-Abass, H. S. (2018). Effect of working capital management on profitability of cement sector listed companies. *International Journal of Academic Research in Accounting, Finance* and Management Sciences, 8(1), 137–142.
- Alsulayhim, N. (2019). The relationship between working capital management and profitability.
- Altaf, N., & Shah, F. A. (2018). How does working capital management affect the profitability of Indian companies? *Journal of Advances in Management Research*.
- Álvarez-Risco, A. (2020). *Clasificación de las investigaciones*.

- Aminu, Y., & Zainudin, N. (2015). A review of anatomy of working capital management theories and the relevant linkages to working capital components: A theoretical building approach. *European Journal of Business and Management*, 7(2), 10–18.
- Aravind, P., Subramanyan, V., Ferro, S., & Gopalakrishnan, R. (2016). Eco-friendly and facile integrated biological-cum-photo assisted electrooxidation process for degradation of textile wastewater. *Water Research*, 93, 230–241.
- Arnold, G. (2008). Corporate financial management. Pearson Education.
- Arunkumar, O. N., & Ramanan, T. R. (2013). Working capital management and profitability: A sensitivity analysis. *International Journal of Research and Development*, 2(1), 52–58.
- Ashebir, N. Y., & Ayele, B. W. (2019). Prevalence and risk factors of acute backache after spinal anesthesia in surgical procedures at asella teaching and referal hospital, asella, Ethiopia. *International Journal of Medicine and Medical Sciences*, 11(1), 1–10.
- Assefa, F., & Ayalew, D. (2019). Status and control measures of fall armyworm (Spodoptera frugiperda) infestations in maize fields in Ethiopia: A review. *Cogent Food & Agriculture*, 5(1), 1641902.
- Awunya, R. I. (2018). Effect of Working Capital Management Policies on Financial Performance of Commercial and Services sector firms. *International Journal of Economic, Commerce* and Management.
- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2014). Working capital management, corporate performance, and financial constraints. *Journal of Business Research*, 67(3), 332–338.
- Bentley, D. R., Balasubramanian, S., Swerdlow, H. P., Smith, G. P., Milton, J., Brown, C. G., Hall, K. P., Evers, D. J., Barnes, C. L., & Bignell, H. R. (2008). Accurate whole human genome sequencing using reversible terminator chemistry. *Nature*, 456(7218), 53–59.
- Boukhatem, J., & Moussa, F. B. (2018). The effect of Islamic banks on GDP growth: Some evidence from selected MENA countries. *Borsa Istanbul Review*, *18*(3), 231–247.
- Brooks, C. (2019). Introductory econometrics for finance. Cambridge university press.
- Chang, T.-K., Lin, C.-W., & Chang, S. (2019). 39-3: Invited paper: LTPO TFT technology for AMOLEDs. *SID Symposium Digest of Technical Papers*, 50(1), 545–548.
- Chen, C., & Kieschnick, R. (2018). Bank credit and corporate working capital management. *Journal of Corporate Finance*, 48, 579–596.
- Cole, T. W., Han, M.-J. K., Janina Sarol, M., Biel, M., & Maus, D. (2017). Using linked open data to enhance the discoverability, functionality and impact of Emblematica Online. *Library Hi Tech*, 35(1), 159–178.

- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, *39*(3), 124–130.
- Cruz, J. P., Aguinaldo, A. N., Estacio, J. C., Alotaibi, A., Arguvanli, S., Cayaban, A. R. R., John Cecily, H. S., Machuca Contreras, F. A., Hussein, A., & Idemudia, E. S. (2018). A multicountry perspective on Cultural competence among baccalaureate nursing students. *Journal of Nursing Scholarship*, 50(1), 92–101.
- Cruz, N., Bustos, C. A., Aguayo, M. G., Cloutier, A., & Castillo, R. (2018). Impact of the chemical composition of Pinus radiata wood on its physical and mechanical properties following thermo-hygromechanical densification. *BioResources*, 13(2), 2268–2282.
- Dalci, I., Tanova, C., Ozyapici, H., & Bein, M. A. (2019). The moderating impact of firm size on the relationship between working capital management and profitability. *Prague Economic Papers*, 28(3), 296–312.
- Devi, S., Zhang, M., & Law, C. L. (2018). Effect of ultrasound and microwave assisted vacuum frying on mushroom (Agaricus bisporus) chips quality. *Food Bioscience*, 25, 111–117.
- Dhole, S., Mishra, S., & Pal, A. M. (2019). Efficient working capital management, financial constraints and firm value: A text-based analysis. *Pacific-Basin Finance Journal*, 58, 101212.
- Doan, T., & Bui, T. (2021). How does liquidity influence bank profitability? A panel data approach. *Accounting*, 7(1), 59–64.
- Ehrhardt, M. C., & Brigham, E. F. (2016). *Corporate finance: A focused approach*. Cengage learning.
- Enqvist, J., Graham, M., & Nikkinen, J. (2014). The impact of working capital management on firm profitability in different business cycles: Evidence from Finland. *Research in International Business and Finance*, *32*, 36–49.
- Eugène, D., Deforges, S., Vibert, N., & Vidal, P.-P. (2009). Vestibular critical period, maturation of central vestibular neurons, and locomotor control. *Annals of the New York Academy of Sciences*, 1164(1), 180–187.
- Eugene, W., Hatley, L., McMullen, K., Brown, Q., Rankin, Y., & Lewis, S. (2009). This is who I am and this is what I do: Demystifying the process of designing culturally authentic technology. *Internationalization, Design and Global Development: Third International Conference, IDGD 2009, Held as Part of HCI International 2009, San Diego, CA, USA, July 19-24, 2009. Proceedings 3*, 19–28.
- Fernández-López, S., Rodeiro-Pazos, D., & Rey-Ares, L. (2020). Effects of working capital management on firms' profitability: Evidence from cheese-producing companies. *Agribusiness*, 36(4), 770–791.
- Feyissa, S., & Garomsa, T. (2011). Narrowing trade deficit through increased import substitution. Chamber of Commerce and Sectoral Association.
- Filketu, S. A., & Negash, Y. T. (2023). Developing a quality function deployment model for the Ethiopian leather industry: Requirements and solutions under linguistic variables. *Journal of Industrial and Production Engineering*, *40*(2), 126–142.
- Geddafa, T., Gedefa, F., & Abera, E. (2020). Assessing the Effect of Working Capital Management on the Profitability of Small Business in Chiro Town, West Hararghe Zone, Ormia Region, Ethiopia.
- Giraldo, N. A., Nguyen, P., Engle, E. L., Kaunitz, G. J., Cottrell, T. R., Berry, S., Green, B., Soni,
  A., Cuda, J. D., & Stein, J. E. (2018). Multidimensional, quantitative assessment of PD-1/PD-L1 expression in patients with Merkel cell carcinoma and association with response to pembrolizumab. *Journal for Immunotherapy of Cancer*, *6*, 1–11.
- Gujarati, D. (2004). Basic Econometrics.(4 th edtn) The McGraw-Hill Companies. Search In.
- Habib, S. H., Kausar, H., & Saud, H. M. (2016). Plant growth-promoting rhizobacteria enhance salinity stress tolerance in okra through ROS-scavenging enzymes. *BioMed Research International*, 2016.
- Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*, 40(6), 1104–1125.
- Irene, A. R., & Ondigo, H. (2018). The effect of working capital management policies on financial performance of commercial and services sector firms listed at the Nairobi Securities Exchange. *International Journal of Economics, Commerce and Management*, 5(2), 113–142.
- Johari, S., & Jha, K. N. (2020). Impact of work motivation on construction labor productivity. *Journal of Management in Engineering*, *36*(5), 04020052.
- Joy, S., Rahman, P. K., Khare, S. K., Soni, S. R., & Sharma, S. (2019). Statistical and sequential (fill-and-draw) approach to enhance rhamnolipid production using industrial lignocellulosic hydrolysate C6 stream from Achromobacter sp.(PS1). *Bioresource Technology*, 288, 121494.
- Karaduman, H. A., Akbas, H. E., Ozsozgun, A., & Durer, S. (2010). Effects of working capital management on profitability: The case for selected companies in the Istanbul stock exchange (2005-2008). *International Journal of Economics and Finance Studies*, 2(2), 47–54.
- Kayani, G. M., Ashfaq, S., & Siddique, A. (2020). Assessment of financial development on environmental effect: Implications for sustainable development. *Journal of Cleaner Production*, 261, 120984.

- Khatib, S. F., & Nour, A. (2021a). The impact of corporate governance on firm performance during the COVID-19 pandemic: Evidence from Malaysia. *Journal of Asian Finance*, *Economics and Business*, 8(2), 0943–0952.
- Khatib, S. F., & Nour, A. (2021b). The impact of corporate governance on firm performance during the COVID-19 pandemic: Evidence from Malaysia. *Journal of Asian Finance*, *Economics and Business*, 8(2), 0943–0952.
- Korent, D., & Orsag, S. (2018). The impact of working capital management on profitability of Croatian software companies. Zagreb International Review of Economics & Business, 21(1), 47–65.
- Kusuma, H., & Dhiyaullatief Bachtiar, A. (2018). Working capital management and corporate performance: Evidence from Indonesia. *Central European Management Journal*, 26(2), 76–88.
- Kwenda, F., & Matanda, E. (2015). Working Capital Management in Liquidity-Constrained Economy: A Case of Zimbabwe Stock Exchange Listed Firms in the Multiple Currency Era. *Public and Municipal Finance*, 4(1), 55–65.
- Li, J., Fleetwood, J., Hawley, W. B., & Kays, W. (2021). From materials to cell: State-of-the-art and prospective technologies for lithium-ion battery electrode processing. *Chemical Reviews*, *122*(1), 903–956.
- Louw, A., Zimney, K., Puentedura, E. J., & Diener, I. (2016). The efficacy of pain neuroscience education on musculoskeletal pain: A systematic review of the literature. *Physiotherapy Theory and Practice*, *32*(5), 332–355.
- Madugba, J. U., Ogbonnaya, A. K., & Okpe, I. I. (2016). An assessment of the casual relationship between economic growth and indirect taxes in Nigeria. *International Journal of Development and Economic Sustainability*, 4(5), 56–65.
- Makori, D. M., & Jagongo, A. (2013). Working capital management and firm profitability: Empirical evidence from manufacturing and construction firms listed on Nairobi securities exchange, Kenya. *International Journal of Accounting and Taxation*, 1(1), 1– 14.
- Mandipa, G., & Sibindi, A. B. (2022). Financial performance and working capital management practices in the retail sector: Empirical evidence from South Africa. *Risks*, *10*(3), 63.
- Mathuva, D. (2015). The Influence of working capital management components on corporate profitability.
- Mengesha, W. (2014). Impact of working capital management on firms' performance: The case of selected metal manufacturing companies in Addis Ababa, Ethiopia [PhD Thesis]. Jimma University.

- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67.
- Morara, K., & Sibindi, A. B. (2021). Assessing the Solvency, Underwriting Risk and Profitability of the Kenyan Insurance Sector. *Acta Universitatis Danubius. ØEconomica*, 17(5).
- Mtani, B. P., & Masanja, N. M. (2018). The Impact of Working Capital Management on Financial Performance of Supermarkets in Arusha City-Tanzania.
- Mulat, N., Gutema, H., & Wassie, G. T. (2021). Prevalence of depression and associated factors among elderly people in Womberma District, north-west, Ethiopia. *BMC Psychiatry*, 21(1), 1–9.
- Mulu, M. (2020). The Effect of Working Capital Management on Firm Profitability: Evidence from Large Manufacturing Companies in Amhara Region [PhD Thesis].
- Nega, P. W., Li, Z., Ghosh, V., Thapa, J., Sun, S., Hartono, N. T. P., Nellikkal, M. A. N., Norquist, A. J., Buonassisi, T., & Chan, E. M. (2021). Using automated serendipity to discover how trace water promotes and inhibits lead halide perovskite crystal formation. *Applied Physics Letters*, 119(4), 041903.
- Nyabuti, W. M., & Alala, O. B. (2014). The relationship between working capital management policy and financial performance of companies quoted at Nairobi securities exchange, Kenya. *International Journal of Economics, Finance, and Management Sciences*, 2(3), 212–219.
- Olaoye, C. O., Ogundipe, A. A., & Oluwadare, O. E. (2019). Tax revenue and economic development in Nigeria. *Advances in Social Sciences Research Journal*, 6(9), 312–321.
- Olawale, F., & Garwe, D. (2010). Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management*, 4(5), 729.
- Omoregie, O. K., Olofin, S. A., & Ikpesu, F. (2019). Capital structure and the profitabilityliquidity trade-off. *International Journal of Economics and Financial Issues*, 9(3), 105– 115.
- Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research Papers*, 2(2), 45–58.
- Pandey, K. D., & Sahu, T. N. (2019). Debt financing, agency cost and firm performance: Evidence from India. *Vision*, 23(3), 267–274.
- Phan, L. T., Nguyen, T. V., Luong, Q. C., Nguyen, T. V., Nguyen, H. T., Le, H. Q., Nguyen, T. T., Cao, T. M., & Pham, Q. D. (2020). Importation and human-to-human transmission of a novel coronavirus in Vietnam. *New England Journal of Medicine*, 382(9), 872–874.

- Prasad, S., Shankar, R., Gupta, R., & Roy, S. (2018). A TISM modeling of critical success factors of blockchain based cloud services. *Journal of Advances in Management Research*, 15(4), 434–456.
- Price, G. R. (1972). Fisher's 'fundamental theorem'made clear. Annals of Human Genetics, 36(2), 129–140.
- Raheman, A., & Nasr, M. (2007). Working capital management and profitability-case of Pakistani firms. *International Review of Business Research Papers*, *3*(1), 279–300.
- Ramesh, G., Al-Habsi, H., & Al-Sharji, T. (2017). Effect of working capital management on the financial performance of manufacturing firms in Sultanate of Oman. *Innovative Journal* of Business and Management, 6(3), 38–42.
- Ratemo, M. J. (2018). Influence of change management strategies on performance of selected media firms in Kenya. Journal of International Business, Innovation and Strategic Management, 1(2), 121–142.
- Salam, A., Mubashir, M., Mubashir, H., & Fatimi, S. H. (2017). Giant retrocardiac foregut duplication cyst presenting with left atrial compression and palpitations. *Case Reports*, 2017, bcr-2017.
- Salam, M. A. (2017). The mediating role of supply chain collaboration on the relationship between technology, trust and operational performance: An empirical investigation. *Benchmarking: An International Journal.*
- Seyoum, A., Tesfay, T., & Kassahun, T. (2016). Working Capital Management and Its Impact on Profitability Evidence from Food Complex Manufacturing Firms in Addis Ababa. *International Journal of Scientific and Research Publications*, 6(6), 815–833.
- Shim, J. S., Kim, J.-E., Jeong, S. H., Choi, Y. J., & Ryu, J. J. (2020). Printing accuracy, mechanical properties, surface characteristics, and microbial adhesion of 3D-printed resins with various printing orientations. *The Journal of Prosthetic Dentistry*, 124(4), 468–475.
- Tauringana, V., & Adjapong Afrifa, G. (2013). The relative importance of working capital management and its components to SMEs' profitability. *Journal of Small Business and Enterprise Development*, 20(3), 453–469.
- Tay, T. L., Mai, D., Dautzenberg, J., Fernández-Klett, F., Lin, G., Datta, M., Drougard, A., Stempfl, T., Ardura-Fabregat, A., & Staszewski, O. (2017). A new fate mapping system reveals context-dependent random or clonal expansion of microglia. *Nature Neuroscience*, 20(6), 793–803.
- Temtime, Z. T. (2016). *Relationship between working capital management, policies, and profitability of small manufacturing firms* [PhD Thesis]. Walden University.

- UĞUR, A. (2013). DENİZLİ ŞEHRİNDE MALA KARŞI İŞLENEN SUÇLARININ MEKÂNSAL ANALİZİ. Turkish Journal of Police Studies/Polis Bilimleri Dergisi, 15(2).
- Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance*, *31*, 1–16.
- Vetter, T. R. (2017). Descriptive statistics: Reporting the answers to the 5 basic questions of who, what, why, when, where, and a sixth, so what? *Anesthesia & Analgesia*, *125*(5), 1797–1802.
- Wooldridge, J. M. (2015). Introductory econometrics: A modern approach. Cengage learning.
- Yazdanfar, D., & Öhman, P. (2015). Debt financing and firm performance: An empirical study based on Swedish data. *The Journal of Risk Finance*, *16*(1), 102–118.
- Zhao, Z., & Ajay, K. (2015). An accurate iris segmentation framework under relaxed imaging constraints using total variation model. *Proceedings of the IEEE International Conference on Computer Vision*, 3828–3836.
- Zimon, G. (2020). Management strategies of working capital in polish services providing companies. WSEAS Transactions on Business and Economics, 17, 225–230.
- Zimon, G., & Tarighi, H. (2021). Effects of the COVID-19 global crisis on the working capital management policy: Evidence from Poland. *Journal of Risk and Financial Management*, 14(4), 169.

# Appendix

## Annex I

	ROA	С	ACP	APP	CCC	CR	DR	ICP
Mean	1.3575	1.0000	0.3858	0.0407	0.3663	7.4666	0.1286	1.4738
	83	00	63	92	17	67	00	33
Median	1.3450	1.0000	0.4004	0.0390	0.3725	8.0000	0.1115	1.4400
	00	00	50	00	00	00	00	00
Maximum	1.7200	1.0000	0.7117	0.0770	0.5200	9.0000	0.3410	1.8800
	00	00	00	00	00	00	00	00
Minimum	0.9200	1.0000	0.0104	0.0180	0.2000	5.0000	0.0280	1.2100
	00	00	00	00	00	00	00	00
Std. Dev.	0.1670	0.0000	0.0910	0.0140	0.0769	1.1848	0.0823	0.1486
	76	00	47	02	20	01	43	19
Skewness	-	NA	-	0.5441	-	-	1.5006	0.8378
	0.25570		0.64024	17	0.20137	0.60343	63	09
	6		8		2	2		
Kurtosis	2.9782	NA	7.1624	2.8667	2.2393	1.9847	4.7940	3.5185
	15		53	46	72	29	98	57
Observati ons	120	120	120	120	120	120	120	120

	ROA	ACP	APP	CCC	CR	DR	ICP
ROA	1	-0.23330	0.69315	0.35675	0.57459	0.24069	0.64287
ACP	-0.23330	1	-0.05485	0.2267	0.13237	-0.06506	-0.28614
APP	0.69315	-0.0548	1	0.49316	0.58973	0.12944	0.44146
CCC	0.35675	0.22673	0.49316	1	0.40978	0.10138	-0.00966
CR	0.57459	0.13237	0.58973	0.40978	1	0.08603	0.313988
DR	0.240696	-0.06506	0.12944	0.10138	0.08603	1	0.056543
ICP	0.64287	-0.28614	0.44146	-0.0096	0.31398	0.05654	1

### Annex II

Dependent Variable: ROA Method: Panel Least Squares Date: 06/02/24 Time: 20:35 Sample: 2014 2023 Periods included: 10 Cross-sections included: 12 Total panel (balanced) observations: 120

Variable	Variable Coefficient		t-Statistic	Prob.
С	C 0.284617		2.387148	0.0186
ACP	-0.295787	0.103086	-2.869319	0.0049
APP	3.371897	0.892749	3.776982	0.0003
CCC	0.321826	0.138654	2.321079	0.0221
CR	0.032946	0.009312	3.538055	0.0006
DR	0.276598	0.104846 2.638128		0.0095
ICP	0.441091	0.069704	6.328029	0.0000
R-squared	0.705646	Mean depend	lent var	1.357583
Adjusted R-squared	0.690017	S.D. depende	ent var	0.167076
S.E. of regression	0.093021	Akaike info	criterion	-1.855415
Sum squared resid	0.977784	Schwarz crite	erion	-1.692811
Log likelihood	118.3249	Hannan-Quinn criter.		-1.789380
F-statistic Prob(F-statistic)	45.14865 0.000000	Durbin-Watson stat		1.587563

#### Annex III

Correlated Random Effects - Hausman Test Equation: Untitled Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	i-Sq. d.f. Prob.		
Cross-section random	0.000000	6	1.0000		

Residual Cross-Section Dependence Test Null hypothesis: No cross-section dependence (correlation) in residuals Equation: Untitled Periods included: 10 Cross-sections included: 12 Total panel observations: 120 Note: non-zero cross-section means detected in data Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.	
Breusch-Pagan LM	78.14146	66	0.1456	
Pesaran scaled LM	1.056779		0.2906	
Pesaran CD	-1.593723		0.1110	



#### Annex IV

Residual Cross-Section Dependence Test Null hypothesis: No cross-section dependence (correlation) in residuals Equation: Untitled Periods included: 10 Cross-sections included: 12 Total panel observations: 120 Note: non-zero cross-section means detected in data Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	78.14146	66	0.1456
Pesaran scaled LM	1.056779		0.2906
Pesaran CD	-1.593723		0.1110

Weighted Statistics						
F-statistic Prob(F-statistic)	53.10624 0.000000	Durbin-Watson stat	1.58756			

COD E	Year	ROA	ACP	ICP	APP	ACC	CR	DR
1	2014	1.29	0.391	1.73	0.032	0.27	7	0.028
1	2015	1.39	0.421	1.68	0.028	0.25	7.2	0.181
1	2016	1.63	0.225	1.78	0.031	0.28	7.5	0.341
1	2017	1.28	0.246	1.72	0.028	0.26	7.1	0.135
1	2018	1.27	0.278	1.68	0.025	0.26	7	0.081
1	2019	1.25	0.311	1.56	0.024	0.37	6.8	0.077
1	2020	1.24	0.412	1.51	0.021	0.24	6.8	0.097
1	2021	1.25	0.387	1.53	0.023	0.25	6.9	0.074
1	2022	1.21	0.391	1.5	0.02	0.21	6.7	0.146
1	2023	1.2	0.342	1.42	0.018	0.2	6.5	0.126
2	2014	1.41	0.325	1.67	0.048	0.24	8.2	0.028
2	2015	1.5	0.311	1.68	0.052	0.27	8.5	0.181
2	2016	1.48	0.323	1.59	0.05	0.25	8.4	0.341
2	2017	1.53	0.291	1.64	0.054	0.28	8.6	0.135
2	2018	1.58	0.254	1.67	0.055	0.38	8.8	0.081
2	2019	1.28	0.331	1.41	0.039	0.29	8	0.077
2	2020	1.39	0.361	1.53	0.054	0.34	8.3	0.097
2	2021	1.39	0.344	1.55	0.057	0.36	8.3	0.074
2	2022	1.28	0.412	1.52	0.053	0.34	8.2	0.146
2	2023	1.49	0.401	1.57	0.059	0.35	8.7	0.126
3	2014	1.43	0.414	1.49	0.041	0.33	8.5	0.028
3	2015	1.34	0.424	1.41	0.037	0.31	8	0.181
3	2016	1.57	0.383	1.65	0.044	0.36	8.5	0.341
3	2017	1.58	0.368	1.88	0.048	0.39	8.6	0.135
3	2018	1.51	0.391	1.74	0.043	0.36	8.4	0.081
3	2019	1.53	0.354	1.88	0.047	0.4	8.5	0.077
3	2020	1.54	0.338	1.81	0.04	0.4	8.5	0.097
3	2021	1.63	0.311	1.83	0.042	0.41	8.5	0.074
3	2022	1.35	0.421	1.51	0.038	0.37	8.2	0.146
3	2023	1.44	0.403	1.54	0.041	0.38	8.2	0.126
4	2014	0.97	0.712	1.37	0.024	0.32	5.1	0.028
4	2015	1.03	0.588	1.35	0.027	0.3	5.3	0.181
4	2016	1.03	0.417	1.32	0.027	0.28	5	0.341
4	2017	1.23	0.39	1.46	0.031	0.29	5.2	0.135
4	2018	1.26	0.392	1.54	0.034	0.28	5.2	0.081
4	2019	1.27	0.392	1.39	0.034	0.34	5.2	0.077
4	2020	1.23	0.408	1.43	0.031	0.36	5.1	0.097
4	2021	1.32	0.4	1.36	0.037	0.32	5.4	0.074
4	2022	1.32	0.406	1.37	0.036	0.35	5.3	0.146

Annex V

4	2023	1.21	0.411	1.43	0.032	0.42	5.1	0.126
5	2014	1.64	0.444	1.45	0.072	0.48	9	0.028
5	2015	1.51	0.451	1.46	0.077	0.415	8.8	0.181
5	2016	1.32	0.458	1.42	0.042	0.51	8.5	0.341
5	2017	1.31	0.459	1.43	0.053	0.45	8.5	0.135
5	2018	1.45	0.413	1.41	0.051	0.415	8.7	0.081
5	2019	1.44	0.413	1.44	0.053	0.44	8.7	0.077
5	2020	1.65	0.401	1.42	0.055	0.47	8.7	0.097
5	2021	1.42	0.423	1.46	0.048	0.47	8.4	0.074
5	2022	1.38	0.433	1.45	0.046	0.38	8.2	0.146
5	2023	1.43	0.414	1.4	0.048	0.43	8.4	0.126
6	2014	1.33	0.341	1.4	0.031	0.35	8	0.028
6	2015	1.31	0.447	1.35	0.027	0.25	7.8	0.181
6	2016	1.45	0.321	1.38	0.029	0.32	8.3	0.341
6	2017	1.48	0.311	1.39	0.03	0.34	8.4	0.135
6	2018	1.31	0.582	1.32	0.026	0.28	8.1	0.081
6	2019	1.35	0.461	1.47	0.041	0.315	8.4	0.077
6	2020	1.28	0.471	1.42	0.038	0.267	8	0.097
6	2021	1.26	0.473	1.39	0.035	0.3	7.9	0.074
6	2022	1.35	0.412	1.44	0.038	0.3	8.3	0.146
6	2023	1.18	0.321	1.28	0.028	0.221	7.9	0.126
7	2014	1.29	0.32	1.33	0.029	0.29	6.5	0.028
7	2015	1.6	0.275	1.43	0.041	0.43	6.9	0.181
7	2016	1.64	0.266	1.63	0.039	0.42	7	0.341
7	2017	1.63	0.267	1.61	0.042	0.43	6.8	0.135
7	2018	1.56	0.293	1.55	0.038	0.4	6.2	0.081
7	2019	1.46	0.332	1.5	0.036	0.38	6	0.077
7	2020	1.33	0.366	1.47	0.035	0.36	5.9	0.097
7	2021	1.14	0.387	1.31	0.023	0.21	5.8	0.074
7	2022	1.2	0.372	1.3	0.02	0.27	5.7	0.146
7	2023	1.05	0.413	1.27	0.018	0.42	5.5	0.126
8	2014	1.32	0.507	1.43	0.034	0.42	8.7	0.028
8	2015	1.44	0.407	1.46	0.055	0.52	8.7	0.181
8	2016	1.72	0.387	1.52	0.058	0.47	8.7	0.341
8	2017	1.43	0.431	1.48	0.051	0.465	8.2	0.135
8	2018	1.33	0.472	1.44	0.047	0.43	8	0.081
8	2019	1.31	0.492	1.42	0.041	0.445	7.8	0.077
8	2020	1.24	0.533	1.4	0.038	0.47	8.7	0.097
8	2021	1.23	0.54	1.41	0.037	0.46	8.7	0.074
8	2022	1.17	0.55	1.28	0.028	0.42	8.7	0.146
8	2023	1.34	0.394	1.44	0.045	0.47	8.7	0.126
9	2014	1.21	0.506	1.34	0.024	0.39	6.7	0.028
9	2015	1.42	0.178	1.38	0.041	0.345	6.9	0.181
9	2016	1.34	0.407	1.33	0.038	0.42	6.6	0.341

9	2017	1.28	0.412	1.3	0.036	0.37	6.6	0.135
9	2018	1.26	0.363	1.29	0.032	0.375	6.5	0.081
9	2019	1.35	0.031	1.43	0.061	0.35	6.9	0.077
9	2020	1.58	0.01	1.87	0.068	0.32	7.1	0.097
9	2021	1.47	0.345	1.63	0.053	0.37	6.5	0.074
9	2022	1.43	0.403	1.57	0.048	0.39	6.5	0.146
9	2023	1.38	0.474	1.51	0.046	0.405	6.4	0.126
10	2014	1.5	0.397	1.87	0.072	0.4	8.2	0.028
10	2015	1.44	0.383	1.62	0.074	0.38	7.7	0.181
10	2016	1.52	0.411	1.64	0.071	0.42	7.9	0.341
10	2017	1.51	0.411	1.62	0.073	0.41	7.9	0.135
10	2018	0.92	0.281	1.24	0.024	0.43	6.4	0.081
10	2019	1.02	0.299	1.26	0.021	0.39	6.5	0.077
10	2020	1.14	0.301	1.24	0.029	0.37	6.5	0.097
10	2021	0.94	0.282	1.23	0.022	0.33	6.1	0.074
10	2022	1.06	0.298	1.21	0.028	0.295	6.2	0.146
10	2023	1.07	0.298	1.25	0.025	0.28	6.3	0.126
11	2014	1.46	0.332	1.5	0.036	0.38	6	0.028
11	2015	1.33	0.366	1.47	0.035	0.36	5.9	0.181
11	2016	1.14	0.387	1.31	0.023	0.21	5.8	0.341
11	2017	1.2	0.372	1.3	0.02	0.27	5.7	0.135
11	2018	1.05	0.413	1.27	0.018	0.42	5.5	0.081
11	2019	1.32	0.507	1.43	0.034	0.42	8.7	0.077
11	2020	1.44	0.407	1.46	0.055	0.52	8.7	0.097
11	2021	1.72	0.387	1.52	0.058	0.47	8.7	0.074
11	2022	1.43	0.431	1.48	0.051	0.465	8.2	0.146
11	2023	1.33	0.472	1.44	0.047	0.43	8	0.126
12	2014	1.51	0.451	1.46	0.077	0.415	8.8	0.028
12	2015	1.32	0.458	1.42	0.042	0.51	8.5	0.181
12	2016	1.31	0.459	1.43	0.053	0.45	8.5	0.341
12	2017	1.45	0.413	1.41	0.051	0.415	8.7	0.135
12	2018	1.44	0.413	1.44	0.053	0.44	8.7	0.081
12	2019	1.65	0.401	1.42	0.055	0.47	8.7	0.077
12	2020	1.42	0.423	1.46	0.048	0.47	8.4	0.097
12	2021	1.38	0.433	1.45	0.046	0.38	8.2	0.074
12	2022	1.43	0.414	1.4	0.048	0.43	8.4	0.146
12	2023	1.33	0.341	1.4	0.031	0.35	8	0.126