RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND FINANCIAL DISTRESS: A CASE OF MANUFACTURING INDUSTRY IN RWANDA

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DECLARATION

Declaration by the Student

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

Governments and private investors have long been concerned about financial hardship in businesses. A precipitous fall in a firm's financial performance may ultimately end in bankruptcy, causing significant financial loss to investors as well as creditors. It is on this basis that the study examined the relationship between working capital management and financial distress among the private companies in the flour milling and animal feed manufacturing industry in Rwanda. The specific objectives include; to establish the link between average collection period and financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda, to assess the influence of average payment period on financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda, as well as to examine the relationship between number of days inventory and financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. Lastly, to establish the influence of cash conversion cycle on financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. The study adopted a descriptive-correlational research design in examining the eight private companies in the flour milling and animal feed manufacturing sectors in Rwanda. Financial distress was computed via A Z score. The panel data were analyzed using a random effect model. The results indicate that working capital management, comprising the average collection duration, the average payment period, and the number of day's inventory, has a substantial impact on financial hardship among private businesses in Rwanda's flour milling and animal feed manufacturing sectors. Based on the study finding, there is need of the government to subsidize the operating cost of firms' especially private companies via reducing cost of taxation to avoid undergoing into more debts. Further, there is need for further training to organizational managers with regards to averting operational, managerial and financial difficulties associated with poor inventory management.

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DEDICATION

This dissertation is dedicated to my family, namely my wife Naomi as well as our two sons Albert and Ethan. I value their encouragement, support, and tolerance throughout the time I was working on this project.

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ABBREVIATIONS AND ACRONYMS

ACP Average Collection Period

APP Average payment Period

INV Number of days Inventory

CCC Cash Conversion Cycle

ACR Accounts Receivable

ACP Accounts Payable

SIZE Firm size

DR Debt Ratio

MDA Multivariate Discriminant Analysis

OLS Ordinary Least Squares

ROA Return on Assets

ROE Return on Equity

ROI Return on Investment

TERMS AND DEFINITIONS

Working Capital Management: Ability to control effectively and efficiently the current assets and liabilities in a manner that provides the firm with maximum return on its assets and minimizes payment for its liabilities

Financial Distress: Generally the inability of a firm to pay its liabilities within appropriate time frame

Bankruptcy: The final phase in economic life of companies that affects all shareholders of a company since it is a normal phenomenon in the corporate life cycle and also an outcome of financial distress

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Working capital has a direct impact on a business's profitability, and a business must focus on it. Historically, literature on corporate finance has paid attention on the outcomes of choices in the long-run, such as investments, capital structure, dividends and business values (Knauer & Wohrman, 2013; Garcia-Teruel & Martinez-Solano, 2017). Majority of the companies use a combination of working capital and payables that are short-term as a way of financing (Baos-Caballero, Garca-Teruel, & Martnez-Solano, 2014). Due to the direct effect on liquidity and profitability, neglecting the liquidity management process may result in significant problems and losses (Bandara, 2015).

Numerous variables, both internal and external, may affect business managers' choices about the amount of current assets and liabilities deemed optimum. Working capital management policies are either aggressive or conservative, with a large concentration of minimal investment and non-current assets, most notably low inventory levels, low cash balances and extremely restricted customers' credit to maximize profits. In Portugal, this method carries a significant risk of inadequate cash for daily operations and payment of short-term obligations (Pais & Gama, 2015). The second strategy is more flexible and cautious, focusing on current assets rather than non-current assets, particularly bigger cash holdings, inventory levels, and customer credit, all of which may generate value for the business (Womack & Jones, 2015).

Governments and the investing public have long been concerned about financial difficulty in businesses. A sustained and substantial deterioration in a company's financial performance may ultimately end in bankruptcy, causing significant financial loss to investors and creditors. When a business is in financial difficulty, operational conditions may worsen, severe financial obligations become frequent, salaries are renegotiated lower, and bankruptcy may become a possibility, particularly in West and East African nations (Garlappi & Yan, 2011; Bergman et al., 2012). The added debt a business utilizes to fund its activities, the greater the danger of financial hardship, particularly when revenues produced are insufficient to meet operational expenses and fixed financing charges. Financial hardship, on the other hand, does not always result in business bankruptcy, as shown in South Africa, Botswana, Kenya, Ghana, and Nigeria. The aim of this study was to investigate the connection between working capital management (WCM) and financial hardship (FH) in Rwandan manufacturing firms.

1.1.1 Working Capital Management

WCM is the capacity to handle current assets and liabilities effectively and effectively in such a way that the company maximizes the return on its assets and minimizes payments on its obligations (Kajola, Olayiwola & Ekpudu, 2018). A well-managed working capital improves a firm's liquidity in markets and also works in favour of shareholder value development (Makori & Jagongo, 2013).

According to Osuma, Babajide, Ikpefan, Nwuba, & Jegede, (2019), net working capital indicates the surplus of current assets over current liabilities and is a pointer of the company’s capability to meet its financial obligations in short run. Following Hoskisson, Gambeta, Green, & Li, (2018) actual working capital management involves application of approaches that eliminate the threat as well as absence of capability of paying short term obligations, while preventing additional venture in these assets by planning as well as governing not only current assets but also current liabilities

Administration of CA & CL is linked to working capital management. It directly affects the liquidity and performance of a firm (Appuhami, 2008; Dash & Ravipati, 2009; Talha, Christopher and Kamalavalli, 2010). Managing working capital has performance and liquidity consequences and suggests a conversant front for growth and liquidness of the firm. To attain ideal WCM the manager for that firm needs to regulate the balance between growth maximization as well as liquidity accurately (Raheman, & Mohamed, 2007). An ideal WCM is anticipated to add positively to the generation of the value for firm (Howorth, & Weshead, 2003; Deloof, 2003; Afza &Nazir, 2009).

There are many reasons especially importance associated with WCM. For example, the CAs of ordinary business account for approximately half of overall value of resources (assets) and thus, additional quantities or amount of CAs may result easily in a company's getting a poor return on investment (Nyoike, 2015). According to Shah and Khan (2018) firms with too few CAs may experience scarcities and thus may consider to maintain smooth operations.

In enhancing efficiency of WCM, there must be a balance between CAs and CLs. Literature has overtime showed that executives employ substantial time in addressing especially day-to-day challenges involving decisions linked to working capital (Eljelly, 2004; Raheman & Mohamed, 2007). This is particularly focused on the fact that CAs are not long-lived investments undergoing continuous conversion into other types of asset (Shah & Khan, 2018). Considering CLs, the company is accountable for remunerating these commitments on an opportune basis. Liquidity for the ongoing business is not dependent on the asset's liquidity value, but instead on the working cash flows generated by those assets (Azam & Haider, 2011).

According to Afrifa and Padachi, (2016) WCM is a very complex aspect as it entails the choice of the quantity and structure of CAs and the funding of these assets. CAs include all those properties that in the normal way of business return can within short duration, (mostly within a year) can be converted to cash or money given a particular rise of a need. The eventual aim of any enterprise is to realize improved performance. But, conserving liquidity of the business is a significant objective as well. The challenge is that raising returns at the expense of liquidity may lead to grave hitches to an enterprise (Azam & Haider, 2011). Thus, it’s important to have a trade- off the purpose(s) of the business. One purpose need not be at expense of the other since both have their significance. If a business fails to consider returns, it may not live for a lengthier time while if it doesn’t care about cash flow, it may encounter the challenge of indebtedness or liquidation. For these explanations, WCM need proper attention as it eventually influences the growth of businesses across various sectors including manufacturing industry.

Efficiency in working capital management is critical for manufacturing and construction companies, because a significant portion of assets are current assets (Agyemang & Kwame, 2013; Sari & Sedana, 2020). It has a direct effect on the profitability and liquidity of businesses. The profitability-liquidity trade-off is critical because without proper consideration of working capital management, businesses are prone to fail and risk bankruptcy (Makori & Jagongo, 2013). The significance of effective working capital management is unquestionable (Kasiran, Mohamad & Chin, 2016). Working capital is referred to as the life force of every economic unit ((Makori & Jagongo, 2013), and its management is viewed as one of the most critical functions of corporate management. Working capital is required by all companies, regardless of their size or raison d'être. Working capital management is a critical component of comparing companies' liquidity and profitability (Sari & Sedana, 2020), as it entails determining the quantity and composition of current assets as well as their financing. With all other variables being constant, the higher the percentage of liquid assets, the lower the danger of cash shortage. Each component of working capital, has marketable securities, cash, receivables and inventory management, is critical to a firm's success (Makori & Jagongo, 2013).

The research on WCM is divided into two opposing perspectives on working capital investment. According to one perspective, more working capital enables businesses to boost sales and get larger discounts for early payments (Baos-Caballero, Garca-Teruel, & Martnez-Solano, 2014), thus increasing the firm's worth. Alternatively, increased working capital levels need funding, increasing the likelihood of a business filing bankruptcy (Kieschnick, LaPlante & Moussawi, 2011). By merging these negative and positive working capital impacts, we may anticipate a nonlinear relationship between working capital investment and company value.

Given the critical nature of WCM and the growing businesses experiencing financial hardship, this research scrutinized the connection among WCM and financial distress (FDs).

1.1.2 Financial Distress

Financial distress is a term that refers to a business's failure to pay its debts in a timely manner (Saleem, Muhammad & Umara, 2013). It is a state of affairs in which a business is unable to meet its debt obligations to creditors. If not addressed properly, financial hardship may result in bankruptcy. The more debt a business incurs to fund its activities, the greater the likelihood that it may face financial difficulty.

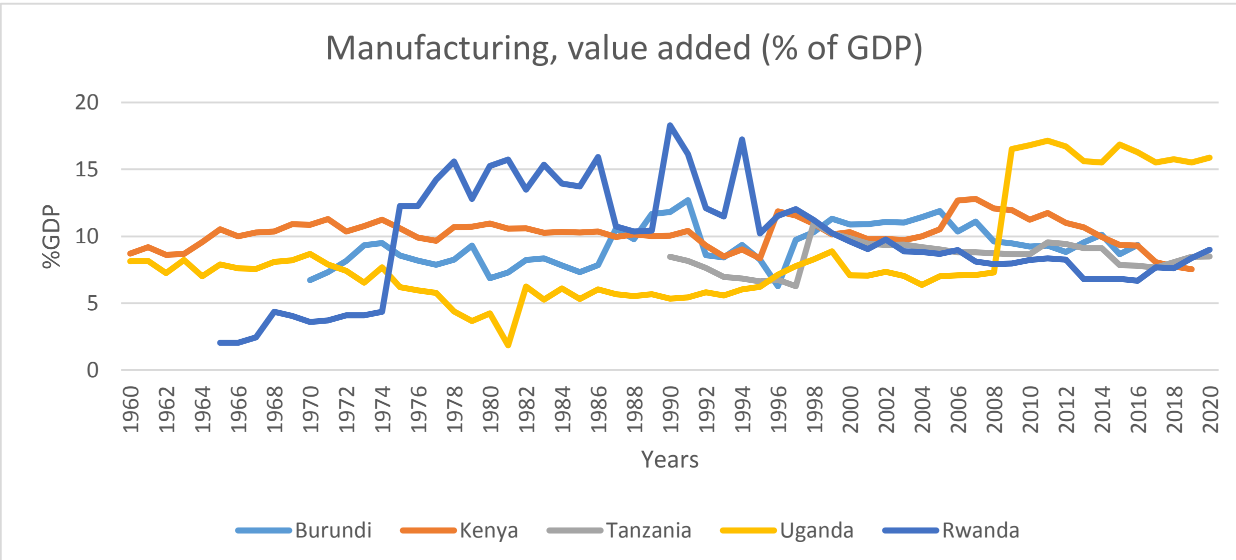
Financial distress (FD), according to some research, occurs when creditors' commitments are breached or impossible to fulfil, and financial hardship is linked to the company's leverage choice (Senbet et al., 2012). FD, according to Adeyemi (2012), is a state when an organization is experiencing managerial, working or financial problems. When a business is in financial difficulty, operational state may worsen, severe financial obligations have to be the norm, salaries are renegotiated lower, and if the situation persists, bankruptcy may become a possibility (Garlappi & Yan, 2011; Bergman et al., 2012).

Habib and Borlan (2012) performed research on the connection among financial hardship, earnings and accrual global financial crisis in market pricing. FD is quantified as an independent variable in this study using Habib, Bhuiyan, and Islam's (2013) distress/non-distress classification, in which a company is categorized as stressed when it has at least one of the specified signals for financial distress, which include bottom-line net loss in the most recent year, working capital that is negative in the most recent year or both. They gave a score of one to firms that exhibited any of the predefined financial distress indicators and zero to those that did not.

Habib, Bhuiyan, and Islam published a research in 2013 that examined the connection between accruals and financial hardship. For multivariate analyses on the association among financial hardship and accruals, using the characteristics listed in Altman (1968) as control variables, Altman Z-score model was utilized.

Figure 1.1 shows trends of the contribution of manufacturing sector to the GDP of East Africa Community (EAC) states. As can be observed, Rwanda has been performing better compared to most EAC countries. Between the years 1964 and 1978, the performance increased spontaneously from where it started fluctuating around 15 percent between the years 1978 and 1994. The trends have been deteriorating trading below 10 percent. Between the years 2010 and 2020, Uganda outperformed all EAC states by trending above 15% with Rwanda recording poor performance of 5 and 9 percent compared to other countries that reported rates between 8 and 15 percent. More details are as shown below;

Figure 1.1: Trends in the contribution of manufacturing firms to the GDP among the EAC states



Source: World Development Indicators (2021).

The poor ratings experienced by Rwanda manufacturing firms could be attributed to the much strain experienced in the industry and effects of the 'small' economy. In any event that these firms are undergoing through financial distress, effective rescue strategies should be engaged.

1.1.3 Working Capital Management and Financial Distress

Numerous research on working capital management, financial hardship, and other factors have been performed. The gross working capital concept is linked with optimization of investment in CA and how CA need to be financed. Net working capital is an idea that shows the liquidity state of the enterprise and recommends the magnitude to which WC needs can be funded through long-term capital. A feeble liquidity state poses a challenge to solvency of the business. Therefore, both gross as well as net WC concepts are similarly significant for effective management (García-Teruel, & Martinez-Solano, (2007).

According to Nyoike (2015), companies may use WCM components such as Cash Management (CM), Accounts Receivables (AR), inventory management, and Accounts Payables (AP). The primary objective in managing these components of working capital (WC) is to create an equilibrium condition between returns and risk that provides value to the company. Businesses that invest significantly in working capital (inventory and account receivables) may have increased sales but worse profitability as more money is committed to working capital. As companies increase their investment in CA, the risk and therefore the reward decrease. However, a smaller investment in CA entails a greater chance of insolvency but also larger profits. It is critical for a business to identify the optimum level of investment in the WC. The management of WC has an effect on the profitability and value of a business (Deloof, 2003).

Management and evaluation of WC in businesses ensures that the firms' CA and CL are employed in an optimal way to achieve the goal of profit maximization or performance. According to Nyoike (2015) performance is the level of growth of an enterprise over a particular duration, articulated in terms of aggregate earnings and losses over that period. Profitability is the rate of return on an enterprise's investment and is the measure that has been used in other studies to assess financial performance. Most firms carry out their business with the main aim of maximizing profits. A firm that is consistently profitable is more likely to survive compared to others that are either inconsistent or loss making. Also, liquidity of the firm is also important as it enables firms to carry out its activities smoothly. While high liquidity safeguards the firm against challenges such as stock outs, it may adversely affect profitability as lots of funds are tied in inventory, AR and cash at the expense of investing in short term financial instruments (Takon & Atseye, (2015).

Numerous investment choices made with the goal of increasing profitability are inversely related to the companies' liquidity. On the other side, a higher emphasis on liquidity has a detrimental effect on performance. A business's sales may increase as a result of a liberal credit policy. Numerous studies, however, have shown that the longer the Cash Conversion Cycle (CCC), the lower the returns (Deloof, 2003). The purpose of cash management in any company is to control and organize cash, securities that are sellable and dependable, in accordance with the firm's processes or objectives (Onwonga, 2016; Osei, 2016). Cash and market securities management must be handled in such a way that a balance is maintained between the risk of bankruptcy or near-liquid resources and the expense of keeping excessively large amounts of these assets. Accounts Payable (AP) is a term that refers to the resources that suppliers provide to a business (or enterprises) (Tater, Dechu, Mani, & Maurya, 2018). The purpose of extending the payback term is to fund the CA investment from trade suppliers, thus reducing the need for external financing. Management must ensure that all expenses associated with extending AP are measured in order to determine the maximum extending duration consistent with maximizing value (Takon, & Atseye, 2015).

Management of Accounts Receivable (AR) also is due to sales on credit. The aim of credit sales is to encourage sales so as to propagate the market share (Takon, & Atseye, 2015). The risks associated with AR involve bad debts as well as debtor delinquency, since they lower the profits of the business from the venture in accounts receivable, and in case it is incompetently supervised may severely influence growth of the business. Inventory management should lower the expenses of handling and carry the inventory as well as their funding (Takon, & Atseye, 2015). The way of managing inventory influences the quantity of raw materials, work in progress, and finished goods required to tolerate competent tasks and sales. In both short and long term, holding an optimal level of inventory maximizes performance of businesses.

According to Lyngstadas and Berg (2016), profitability is negatively related to the variables INV, ACR, ACP, and CCC (WCM). This is consistent with prior studies (Pais & Gama, 2015). Gul et al. (2013) examined the effect of WCM on the performance of Pakistan's small and medium-sized businesses. Return on Assets (ROA) was utilized as a proxy for profitability in this research. Number of days Accounts receivable (ACR), Number of days Accounts payable (ACP), Number of days Inventory (INV), and Cash conversion cycle were independent factors (CCC). Additionally, other factors such as firm size (SIZE), debt ratio (DR), and growth were utilized (GROWTH). The connection between WCM and performance was determined using regression analysis. The results indicate that ACP, GROWTH, and SIZE all correlate positively with profitability, while ACR, INV, CCC, and DR all correlate negatively with profitability.

Khurshid et al. (2018) examined the relationship between corporate governance and the probability of financial hardship. They used binary logistic regression. The findings indicated that the greater the number of directors and supervisors held by the biggest shareholder and the greater the stock pledge ratio, the greater the chance that the company will experience financial difficulty. According to Habib, Bhuiyan, and Islam (2013), there is a connection between accruals and financial hardship. Excessive accruals increase the likelihood of financial trouble for businesses.

For many years, a substantial amount of empirical research has concentrated and/or focused on the impacts of WCM on company performance or profitability (Elfani & Lois, 2010; Sharma & Skumar, 2011). Financial distress research has focused on company governance and the probability of financial hardship (Khurshid et al., 2018). Specific study on the impact of working capital management on financial hardship continues to be an under-researched topic of empirical research. On that point, this research is being conducted with the goal of elucidating the impact of WCM on financial hardship.

1.2 Problem Statement

Working WCM is critical for manufacturing and construction companies, since a significant portion of their assets are current assets (Agyemang & Kwame, 2013). When working capital is handled effectively, the danger of bankruptcy is reduced, investment in working capital is reduced, and the rate of return on capital employed is increased. Mr. Kaplan (2012). In general, the company is able to fulfil its financial commitments, and payments to business creditors are paid on a timely basis. Both in established and developing nations, an increasing number of businesses are experiencing financial difficulty, with the latter seeing a more alarming trend.

In Rwanda, manufacturing firms contribute immensely to the economic growth. The sector's contribution to the national Gross Domestic Product (GDP) of Rwanda historically has at one point hit the lows of 2% and the highs of 18% (World Development Indicators, 2021). Despite doing better in most sectors, Rwanda's publicly listed manufacturing entities are gradually facing imminent demise because of financial distress. GDP from manufacturing in Rwanda decreased to 198 RWF Billion in the first quarter of 2021 from 207 RWF Billion in the fourth quarter of 2020. Available statistics show that some recently listed firms were faced with challenges associated with haphazard cash flows, declining margins and poor profits, extended payment days, increase in interest payments as well as difficulty in raising capital among other challenges. From the literature, Tan (2012) and Makini (2015) argued that financially distressed companies usually perform below average. The ensuing scenario is where the manufacturing firms contribution to national economic decline instead of growth of the national economy.

The study has focused on working capital and profitability, working capital and financial performance, and corporate governance problems relating to financial crisis. Gakure et al. (2012), for example, examined the connection between WCM and performance of manufacturing companies listed on the Nairobi stock market. Omesa et al. (2013) investigated the link between WCM and corporate performance of Nairobi-listed manufacturing companies. Wesley (2013) conducted an investigation on the link between corporate governance and financial distress. Working capital is critical in financial decision-making, and financial distress is becoming a more frequent occurrence in all sectors, for both small and large businesses, even those that report profits.

There is a clear issue that requires investigation via study, namely the rise in the number of industrial companies experiencing financial difficulty. The limited research studies conducted have not shown a link between working capital and financial distress, particularly among industrial firms in Rwanda. Thus, the purpose of this research was to close this knowledge gap by examining the connection between WCM and financial distress in manufacturing firms in Rwanda. The presence or absence of a connection is what motivated the conduct of this research. As such, the aim of this study is to investigate the connection between WCM and financial distress.

1.3 Objective of the Study

1.3.1 General Objective

To examine the relationship between working capital management and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

1.3.2 Specific Objectives

The specific objectives of carrying out this research are:

i. To determine the relationship between average collection period and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

ii. To assess the influence of average payment period on financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

iii. To examine the relationship between number of days inventory and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

iv. To establish the influence of cash conversion cycle on financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

1.4 Research Hypotheses

This study sought to address the following research hypotheses:

H1: There is no significant relationship between average collection period and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

H2: There is no significant relationship between average payment period and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

H3: There is no significant relationship between number of days of inventory and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

H4: There is no significant relationship between cash conversion cycle and financial distress among the private companies in the flour milling and animal feed manufacturing sectors in Rwanda.

1.5 Significance of Study

The study's results may be particularly useful and beneficial to a variety of stakeholders, including financial managers, board of directors, management, and academics. To the financial Managers, this study will help to fully understand the relationship between WCM and financial distress leading to efficient utilization of working capital funds. For the board of directors it will empower them to make sound strategic decisions that reduce the likelihood of financial distress and corporate failure and for the scholars it will establish a foundation for future empirical study in this field.

1.6 Scope of the Study

The research examined a total of eight private manufacturing firms in Rwanda which are the registered private companies in the flour milling and animal feed manufacturing sub sectors according to Rwanda Development Board records (RDB) as at the time of carrying out the study. The businesses chosen were involved in the production of human food and animal feed. The research examined financial records and reports for the past seven audited years, from 2014 to 2020.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section conducts a review of the literature on working capital management and financial hardship. It begins by examining progressive ideas in the fields of WCM and financial crisis. Following the literature research, a conceptual framework is created that serves as the foundation and connects the important factors in this study. The empirical review is followed by a discussion of the research gap in working capital management and financial hardship that this study will address.

2.2 Theoretical Review

This section discusses models and hypotheses developed by various academics in connection to working capital and financial hardship. A business may be endowed with assets and lucrative yet financially-strapped if its assets are not easily convertible to cash. Positive working capital is needed to guarantee that a business can continue operating and has adequate money to meet commitments as they mature, most notably payment of debt. Working capital management include overseeing inventory, accounts receivable, payable, as well as cash. A rise in working capital implies that the company has raised its current assets (accounts receivable or other CA) or reduced its current obligations (has paid off some short-term liabilities). The pioneering works of (Baumol, 1952) on a stock management model and (Miller & Orr, 1966) on a Cash Management Model are the most well-known in this area, with the assumptions of both models educating managers on WCM techniques.

2.2.1 Baumol's Cash Management Model

William J. Baumol created this model to minimize the total of the opportunity cost of keeping monies and the trading expenses involved with changing short-term securities to cash. The Baumol model allows businesses determine their desired cash balance levels with confidence. The Baumol model of cash management is based on the trade-off amongst the liquidities offered by money (abilities to conduct businesses) as well as the interest lost by keeping non-interest bearing money as an asset. The nominal rates of interest, the levels of real incomes that match to the volume of anticipated transactions, and a fixed cost of moving wealth amongst liquid cash and interests bearing assets are thus the main factors affecting the demand for money.

As per Baumol's model, cash and stock management issues are synonymous, and this is the convergence point at which this theory and the idea in investigation intersect. Inventory management is one of the sub variables examined under working capital management in order to see whether there is a connection between it and the dependent variable, financial hardship. This model was helpful in elucidating the econometric relationship between working capital components (cash conversion cycle and inventory holding time) as well as financial hardship among manufacturing companies. This theory helps to comprehend our main objective which is relationship between working capital management and financial distress.

2.2.2 Conversion Cycle Theory

Gitman pioneered the conversion cycle hypothesis (1974). The CCC, which depicts the interplay amongst working capital constituents and cash flow within a business, may be employed to estimate amounts of cash required for any levels of sales. It is the time required for a business to turn purchases into cash receipts from clients (Mshelia, 2017). CCC indicates the total days a business' cash still tied up within the operations of the business. A cash flow investigation using CCC also indicates in, an overall manner, how efficiently the business is administering its working capital. Gittman (1974) defined CCC as a component of the operational cycle. It is computed by adding the inventory period to the ACR subtracting the ACP. It is concerned with the time period amongst the purchase of inputs such as raw materials and other inputs and the cash inflows from the sale of completed products, and therefore reflects the number of days of operation that need financing.

Because it includes data from both the balance sheet and income statement, the CCC is a dynamic indication of ongoing liquidity management (Jose & Lancaster, 1996). While assessing a business's CCC is helpful, industry standards are essential for evaluating a business's CCC performance and identifying areas for improvement, since CCC length differs by industry. Thus, the appropriate approach is to associate a specific business to the sector in which it operates (Hutchinson, 2007). The CCC is a comprehensive indication of cash flow since it illustrates the time interval between raw material expenditures and income from completed product sales (Padachi, 2006). The management of a firm's short-term assets and liabilities on a day-to-day basis is important to the firm's success.

A short cycle allows a business to quickly acquire cash that can be utilized for extra procurements or payment of debt (Slawsky, & Zafar, 2017). More healthy or successful businesses generally operate, hence low cash conversion cycle. Businesses endeavor to shorten the CCC by speeding up and slowing down payments from clients and suppliers respectively.

Without sound liquidity management, businesses with increasing long-term prospects and strong bottom lines will not stay solvent (Jose & Lancaster, 1996). According to Richards and Laughlin

(1980), conventional ratios such as the current ratio, the quick acid test, and cash ratios do not give reliable information regarding working capital. This theory helps in comprehending the fourth objective of our study, which is the cash conversion cycle, and how it relates directly to the present research, since it provides insightful information.

2.2.3 Ernest Walker Theory of Working Capital

Ernest W. Walker proposed a four-tiered theory of working capital in 1964. The theory established that a firm's success is partially influenced by how its working capital is handled. When working capital is increased in relation to sales without matching increases in output, the profit position deteriorates. When the flow of money generated by working capital movement is disrupted, both the turnover of working capital and the rate of return on investment are reduced. Walker has established four criteria for working capital investing in this regard.

The first premise is as follows: This section discusses the relationship between working capital and sales. His premise is that by varying working capital in relation to sales, a firm's risk exposure and potential for gain or loss are enhanced. This indicates that there is a clear relationship between the degree of risk assumed by management and the rate of return. The more risk a business takes, the higher the potential for profit or loss. Additionally, it is assumed that by properly analyzing the factors affecting the amount of various components of working capital as well as forecasting the state of the economy, management can determine the optimal level of working capital that balances the rate of return on investment with the ability to assume risk. However, since most managers have no clue what the future holds, they often invest in working capital beyond the optimal amount. This excess is of importance to us, since the amount of the investment affects the rate of return on investment for a business.

The second concept is that money should be invested in each component of working capital as the firm's equity position improves. This approach is predicated on the premise that each rupee invested in fixed or working capital should add to the firm's net value. Third principle is associated with the kind of capital used to fund working capital has a direct impact on the amount of risk assumed by a business, as well as the potential for profit or loss and the cost of capital. It is unquestionable that various forms of capital carry varied degrees of risk. Investors associate this risk with the price at which they are prepared to sell their money. They may charge less for debt than for equity, owing to the lower risk associated with borrowed capital. Thus, risk is proportional to reward. Increased risk may also indicate a greater return. Unlike the rate of return, the cost of capital is inversely proportional to risk. Management's cost of capital decreases when more risk capital is deployed. This connection persists until the company achieves its optimal capital structure.

The fourth principle is as follows: the larger the difference between the maturities of a firm's short-term debt instruments and its internal cash flow, the higher the risk, and vice versa. This concept is analogous to the recommendation to utilize debt, with the quantity to be employed decided by the degree of risk that management wants to accept. It is worth noting that risk is not just proportional to the quantity of debt utilized in comparison to equity; it is also proportional to the type of the contracts signed by the borrower. Some of the most significant features of debt contracts that have a direct impact on a business's functioning are the contracts' restrictive provisions and maturity dates. This theory was helpful in understanding the role of working capital management components on financial distress of manufacturing firms in Rwanda thus improves comprehension of our main objective relationship between working capital management and financial distress.

2.2.4 The Pecking Order Theory

The Pecking Order Theory (POT) considers information unevenness which shows that managers know more about the businesses' value than potential investors (Padachi, 2006). The information asymmetry influences the decision made between internal and external financing. Based on this idea, the POT argues that businesses tend to depend on internal source of finance to be funded, and choose to issue debt to equity if outer/outside funding is needed (Saleheen, Levina, Melolinna & Tatomir, 2017). The theory is in line with variables as it involves sourcing of fund either externally or internally.

Following Saleheen, et al., (2017), POT is grounded on the thought that "*Internally produced resources are not subject to transaction costs, and the fact that issuing new bonds tends to convey a good message about the company, while issuing new stocks conveys a negative message*." The information asymmetry reduces the price of newly issued bonds and, as a consequence, raises the transaction costs associated with the lack of cash in the capital markets (Roychowdhury & Srinivasan, 2019). From this point of view, firms don't advance a particular objective for the debt level and they use external finance only when internal finances are not enough.

External source(s) of finances are less desirable since the information asymmetry between managers as well as stakeholders implies that external finances are under-priced in relation to the asymmetry level (Roychowdhury & Srinivasan, 2019). According to Saleheen, et al., (2017) the theory describe the firm's decision to keep an amount of reserve in cash or other forms of financial slacks to evade the challenge of absence of assets and the necessity of outside sources. From the point of view of this study, cash is same to "negative debt", obtaining external finance when there is no cash and in return payment of debt when there is additional cash. Thus, the businesses makes a decision on a more passive cash management policy, waiting to liquidate an existing debt in any time with no cost (Miller, & Sowerbutts, 2018). This theory contributes to the research variables; how does cash conversion cycle influence financial distress of firms? Thus it helps in comprehending our fourth objective which is to establish the influence of cash conversion cycle on financial distress.

2.2.5 Multiple Discriminant Analysis Model

Altman (1968) pioneered the use of Multiple Discriminant Analysis (MDA) to the area of bankruptcy predictability. Altman's Z-Score model is a commonly used and recognized method of determining bankruptcy. The author analyzed a sample of 33 solvent and 33 troubled businesses. Altman (1968) created a model for predicting bankruptcy using the Z-score and established a cut-off point of Z-score (2.675) to differentiate between healthy and troubled businesses. The findings indicated that although the Z-score model performed well one year and two years before to financial hardship, it lacked predictive value three to five years prior to bankruptcy (Altman, 1968).

MDA is a method that enables the separation of two or more groups of objects based on many factors; in this instance, the separation of failing and non-failing businesses in terms of financial distress. This model utilizes five financial measures that are weighted to increase the model's prediction ability. The model generates an aggregate discriminant score, referred to as a Z-score or zeta model (Altman, 1968). Altman's Z-score included a variety of profitability and risk indicators. The resultant model showed a company's insolvency risk in comparison to a benchmark. The Z-score model of Altman is a linear combination of a variety of ratios. The original Z score for public manufacturing companies was as follows.

$$Z = 1.2T1+1.4T2+3.3T3+0.6T4+.999T5$$

The MDA method's purpose in a categorization setting is to allocate a company to the failing or non-failing category founded on its discriminant score. The business was allocated to the group to which it has the closest resemblance. The ratios used in the original Z-score prediction model are as follows: T1 = WC/TA, T2 = RE/TA, T3 = Earnings before Interest and Taxes/Total Assets, T4 = Market Value of Equity/Total Liabilities, and T5 = SALES/TA.

Altman then updated the Z-score model further by changing the market value of equity to the book value of equity in order to make the model relevant to private as well as nonmanufacturing companies. Additionally, he came up with a variety of coefficients for the ratio, as shown below.

$$Z=0.717T1+0.847T2+3.107T3+0.420T4+0.998T5$$

This was updated in 1995 to cover developing markets, where the model may be used by manufacturing as well as non-manufacturing businesses, as well as public and private firms. According to the model, lower Z-score values imply financial hardship inside an organization, which may result in poor financial performance. Unfortunately, the model examined just the forecast of financial distress or bankruptcy and did not take into account the impact of several important financial distress indicators on financial institution performance. Additionally, the Altman Z-score model was designed primarily for industrial companies with more than $1 million in assets (Acharrya, Pierriet, & Stefifen, 2016). According to Mammo (2011), the Altman Z-Score model cannot be a perfect indicator of commercial banks' financial difficulty, nor can it correctly determine important financial distress variables that may affect financial firms' performance.

This model shows that the main financial ratios affecting financial hardship or insolvency, including working capital, retained earnings, profits before interest and taxes, and sales, are all linked to the firm's operational efficiency (Aissa & Goaied, 2016; Baik, Chae, Choi, & Farber, 2013; Kortmann, et al., 2014). Thus, our model demonstrates that operational efficiency is a major determinant in financial hardship, as defined by the MDA.

2.3 Empirical Literature Review

Numerous academics have done study in related topics, with some focusing on the connection amongst WCM and profitability, while others have examined the association amongst WCM and company performance. Additional studies have been performed in areas such as corporate governance and financial hardship.

2.3.1 Average Collection Period and Performance

Accounts receivables is described as the credit a firm provides its client(s) during sale of goods or services which takes the form of either business credit that is extended by the firm to other firms (Breza, & Liberman, 2017). It could also refer to the consumer credit, that is extended by the business to its final consumers who have not yet made payment and so the effectiveness of business' credit strategies can have a significant influence on its overall performance. It is characterized by monitoring of accounts payable, optimum account receivable administration as well as accounts receivable management policy.

Javid and Dalian (2014) examined the impact of (WCM) on the performance of SMEs in Pakistan. The target population of the study was 54 SME's listed selected on the Karachi stock exchange. The study period was 2006-2010 a five years period. The study variables were accounting and market valuation perspectives as a measure of performance. The study employed a random effect regression model using panel data. based on the findings revealed that SMEs that contain a short holding period of an inventory and short accounts receivable, as well as short payable period, depicted a high. On the other hand net trading cycle and cash conversion cycle depicted no significant effect on the profitability and market value of the SMEs. Moreover, firm size and sales growth depicted a significant effect on performance. The study recommended a tin increase in working capital since it depicts a positive significance on performance.

Charritou, Elffani, and Louis (2010) performed a research on the impact of WCM on developing market companies' financial performance. They used multivariate regression analysis to determine that the CCC and all of its main components, namely days in inventory, days sales outstanding, as well as creditors payment period, are related to the profitability of the business. The results showed that there is a positive correlation between return on assets (ROA) on the current liabilities to total liabilities ratio, the current asset to total asset ratio, and the current ratio of manufacturing companies under consideration. The hypothesis test was carried out on the relationship between the slope of ROA and each measure of working capital management revealed that WCM and ROA depicted an insignificant relationship. As a result, the report suggests that managers focus on conservative policies that require strong cash balances and stock reserves.

Napompech (2012) investigated the effect of WCM on the performance of a sample of Nigerian manufacturing firms. The research used a panel of quoted non-financial companies from 1996 to 2005. The research examined the impact of the average collection time, inventory turnover in days, average payment period, as well as CCC on the profitability of Nigerian businesses. The research used regression to integrate as well as estimate cross-sectional and cross sectional data. Their research established a negative correlation between net operating income and firm profitability. On the other side, profitability was positively impacted by the average collection duration, inventory turnover in days, average payment period, and cash conversion cycle. The research suggests that businesses manage their cash, inventory, and accounts payable and receivables with the goal of shortening the cash conversion cycle and therefore increasing profitability.

Companies that are effective in management of the receivables need to establish their ideal credit which lessens the overall costs of providing credit (Martínez-Sola, et al., 2018). As established by Afrifa & Padachi, (2016) in an investigation, a rise in the amount of accounts receivables in a business grows receivables as well both lead to a decline in the worth of an enterprise. In a related study by Deloof (2003) who revealed that the length of receivables collection time has an inverse influence on a business's profitability. This confirmed the results obtained in a study undertaken by Samiloglu, & Akgün, (2016) who concluded that enterprises may generate worth by lowering their number of days of accounts receivable. Also, a study by Karim (2019) asserted that, having a sound credit policy guarantees appropriate debt gathering process and is key in growing efficiency in management of the receivables thus the growth of enterprises.

A cross sectional investigation by Lazaridis and Tryfonidis (2006) found a statistically significant link between performance, measured through total operating profit, the CCC and its components (accounts receivables, accounts payables, and inventory). The study targeted 131 businesses listed on the Athens Stock Exchange for the period between 2001 and 2004. In another study, Adediran, & Alade, (2013) established the impact of WCM on Profitability of SMEs in Nigeria. The study obtained data from 30 small and medium-sized businesses and other collected from secondary sources and was evaluated through the use of quantitative regression models. Findings that were robust to the existence of endogeneity exhibit that managers can generate value by lowering their company's number of day's accounts receivable as well as restricting CCC increases profitability.

García-Teruel, & Martinez-Solano, (2007) made an empirical investigation about the impact of working capital management on the performance of SMEs. Their association evaluated indicated a negative and significant link between the ROAs and the number of day's accounts receivable. This affirmed the study undertaken by Makori & Jagongo (2013) that explored the effect of WCM on businesses' performance through the use of balanced panel data of five businesses under manufacturing sector and five businesses under construction industry listed on the Nairobi Securities Exchange (NSE) for the period between 2003 and 2012. These researchers established a negative link between performance and number of day's accounts receivable.

Kweri (2011) conducted research on the relationship between WCM and profitability of manufacturing firms listed on the Nairobi Securities Exchange. The study demonstrated that the components of WC are inextricably connected, and that their efficient administration is critical in defining these companies' degree of productivity. Additionally, Mathai (2012) examined the connection between WCM and the performance of Kenyan retail supermarkets. The research discovered that investing in accounts receivables involves a risk-reward trade-off. Machui, Mungai, Kabaka, Mumbua, and Bonyi (2015) investigated the impact of WCM on the profitability of East African reinsurance companies. The research established a connection between WCM and the profitability of East African reinsurance companies. Managers are therefore encouraged to maximize earnings for their companies by controlling and maintaining an optimal level of WC account receivables (s).

2.3.2 Average Payment Period and Performance

These are main sources of unsecured temporary funding. Utilization of the worth of relationship with payee is thus a comprehensive task that need to be stressed as significant as possessing the ideal level of inventories (Takon, & Atseye, 2015). As a result, robust union between the firm and its dealers strategically grow production lines and reinforce credit information for upcoming extension. It is characterized by optimum account receivable management, monitoring of accounts receivable management and accounts receivable management policy. Bhutto, Rajper, Mangi, & Ghumro, (2019) argued that expansion of the payable deferral time may as well contribute to performance. However, they thought that over broadening of the payable deferral time to be equally uncertain as it could harm the business's trustworthiness and credit status in the long run. The study its evaluation on a proportion containing 2123 Japanese of the target non-financial companies listed in the Tokyo Stock Exchange for a period spanning between 1990 and 2004. The researchers, after evaluating the findings, asserted that Japanese enterprises need to pay attention on restricting their receivable collection period, inventory conversion period and cash conversion cycle to enhance overall performance.

Mohamad and Saad (2010) conducted a study based on secondary data collected from 172 Malaysian enterprises in 2010. In this study, the researchers looked at the impact of various working capital components on the profitability and market value of enterprises. From 2003 to 2007, a total of five years were dedicated to the investigation. Several working capital components were used to do this, including cash conversion cycles (CCC), debt ratios (DR), current asset to total asset (CATAR), current liability to total asset (CLTAR), and current ratios (CR). They used Tobin's Q (TQ), return on invested capital (ROIC), and return on assets (ROA) as indices of the financial performance of the selected organisations in order to examine the influence of these working capital components on financial performance. In order to deduce the results, the researchers used correlations and multivariate regression analysis. In the study, the researchers discovered that there is a negative relationship between numerous components of working capital and the success of the company.

Azam and Haider (2011) explored the influence of WCM on business's performance for non- financial organizations listed in Karachi Stock Exchange. The study analysed a panel data with the use of canonical correlation for period between 2001 and 2010. APP was revealed to be positive and significant in determining ROA as well as ROE showing that if there is a rise in time period of supplier's payment then total performance of the firm also grows. CCC and NTC shows significant negative relation ROA and ROE indicating that company's profitability can be raised within short time. Similarly, García-Teruel, & Martinez-Solano, (2007) in their research, their correlation evaluation showed a negative and highly significant link between the ROAs and the number of days AP.

In a close study, Oganga (2015) in the study to investigate the effect of WCM on performance of SMEs in Nairobi County established a negative relationship between accounts payables and performance of SMEs. In the regression analysis, a unit increase in the accounts payable period led to a 0.344 (p=0.049) decrease in profitability. However, when integrating all working capital management variables as reviewed in this study, they led to a positive influence on profitability of SMEs in Nairobi County.

2.3.3 Number of days inventory and performance

Inventory refers to touchable possessions that are held for sale, in the normal process of trade or, in the course of production for selling or for consumption. This practice endeavors to attain optimum inventory management level and ensure presence of inventory management policy. According to Kajola, Olayiwola, and Ekpudu (2018), who conducted research in Nigeria on the connection amongst working capital and performance. Between 2010 and 2016, the survey examined the effect of management of working capital techniques on the profitability of twenty-five Nigerian publicly traded non-financial businesses. Pooled ordinary least squares (POLS) and random effects generalized least squares (REGLS) were employed to analyze the data. The findings indicated that the three components of working capital management, namely average collection length, inventory turnover time, as well as CCC, had a favorable and substantial impact on the performance of Nigerian businesses. According to the study's results, efficient management of working capital components is a way to boost profitability and shareholder value. The findings show that Nigerian businesses adopted aggressive policies as a working capital management strategy to achieve organizational success during the time studied.

Mwariri (2020) assessed the association of working capital management practices and financial distress. The study objectives were to establish the influence of cash management, the role of receivable management practices, and role of payable management practices on the financial distress of firms and influence of inventory management practices. The target population was 67 publicly listed in Kenya. And data analyzed using descriptive and inferential statistics. Results revealed that cash conversion period, Inventory conversion period depicted a negative relationship with financial distress of these listed companies while ARP depicted an inverse relationship with financial distress on the other hand Accounts payable period depicted a positive impact on financial distress. The study recommended that companies would increase their accounts payable period to minimize the likely hood of financial distress. This findings agrees with findings by Muigai (2016).

Charitouet al. (2010) conducted research on the impactct of WCM on the profitability of developing market businesses. They determined via multivariate regression analysis that the cash conversion cycle and all of its main components, including days in inventory, days sales outstanding, and creditors payment period, are all linked to the profitability of the company. They discovered that inventory days had a negative association with profitability.

The connection between net operational profitability and inventory turnover in days was studied by Nguyen, Pham, and Nguyen (2020). The research used a panel of listed non-financial companies in Nigeria from 1996 to 2005, calculated regression using time series and cross-sectional data, and discovered a negative association between net operational profitability and inventory turnover in days. Additionally, Kasozi (2017) performed research on the WCM impact on profitability in South African firms. The findings for this research agreed with the findings above.

The objective of inventory management is to convert over inventory as rapidly as probable while not losing sales from stock-outs. In an empirical investigation, Talha, et al., (2010) utilized a sample of fourteen of the fifty one listed corporate hospitals in India to determine the effect of the WCM on the performance of Indian Corporate Hospitals. The study used panel data for the period between 1996 all through to 2006. The findings of their study showed that Inventory Turnover ratio, Debtors Turnover ratio and Working Capital Turnover were positively linked with the Return On Investment (ROI), a factor utilized to measure a business‘s profitability. Azam and Haider (2011) in a related study examined the influence of WCM on firms’ growth for non- financial institutes listed in Karachi Stock Exchange (KSE-30) Index. The study also explored a panel data for the period between 2001 and 2010 as well they applied a canonical correlation. It was found that inventory turnover in days has negative link with ROA and ROE implying that firm’s profitability can be grown by lowering inventory in days.

In a study undertaken to assess the link between WCM and performance of SMEs in Nairobi County by Oganga (2015), a positive effect of inventory management on performance of SMEs was established. The study employed both descriptive as well as quantitative research designs. The study targeted a population consisting of SMEs in Nairobi County and a sample of 150 SMEs was utilized. In a related study, Makori & Jagongo (2013) investigated the influence of WCM on a company’s profitability. The study employed correlation and OLS models. A positive link between profitability and number of days of inventory and number of day’s payable was reported. They also found out that control variables such as growth in sales, financial leverage, current ratio as well as the size of the firm had a statistically significant influence on the business’s performance.

Murega (2013) investigated the effects of WCM on corporate profitability among firms listed at NSE, Kenya. From the analysis, it is was established that Day of Sales Inventory (DSI) had negative link with Return on Sales (ROS) and Return on Assets (ROA). The study findings indicate that management of WC properly is vital. Furthermore, management of inventory as well as CCC to an ideal level produces more profit.

2.3.4 Cash Conversion Cycle and Performance

Cash implies owned liquid assets by a business. It comprises cheques, money orders and bank drafts. Managing of cash therefore means effective gathering and distribution of cash and any temporary investing of cash (Edem, 2017). In this context, cash management is mainly characterized by achieving optimum cash, observing cash conversion cycle, as well as management policies in place. Cash conversion cycle (CCC) management is said to be optimum when the cash to hold is efficiently determined by bearing in mind the trading-off between the opportunity cost of holding a lot of cash and the trade cost of holding too little as observed by Martínez-Sola, García-Teruel, & Martínez-Solano, (2018). Cash management therefore need careful planning and monitoring for optimum results just as averred by Edem, (2017) that there is a necessity for careful planning as well as monitoring of cash flow over time so as to establish the ideal cash to hold.

Sugathadasa, (2018) on the connection amongst the CCC and Company Profitability of manufacturing sector companies traded on the Colombo Stock Exchange. The debtor conversion period and inventory conversion period were coupled with the creditor conversion period to calculate the CCC, (ROA), and (ROE). The study used a stratified sample method to collect data for 10 listed firms that manufacture electrical appliances over a five-year period, from 2013 to 2017. Linear multiple regression models and regression analysis were used to evaluate the hypothesis. The results revealed a positive correlation between inventory conversion period and receivable conversion period, as well as a negative correlation between payable conversion periods and ROA, as well as an adverse association between all components of the CCC and ROE as profitability measures. The study recommends, the study on Cash Conversion Cycle on other sectors like financial institutions.

Gul et al., (2013) examined the effect of (WCM) on the performance of Pakistan's small and medium-sized businesses. (ROA) was utilized as a substitute for profitability in this research. (ACR), (ACP), (INV), and CCC were independent factors (CCC). Additionally, other factors such as company size (SIZE), debt ratio (DR), and growth were utilized (GROWTH). The connection between WCM and performance was determined using regression analysis. The findings indicate that (CCC) is negatively linked to profitability, implying that there is a negative association amongst CCC and performance.

Al-Mohareb (2019) explored the effect of WCM and its components on profitability, as well as how it is compatible with the theoretical aspect. The study variable was the influence of financial factors on profitability of Amman Stock Exchange for a five year period (2016-2018). The study variable was WCM role was clearer on company profitability. Findings revealed a significant association amongst the CCC, which is considered as a proxy of WCM, and profitability of the manufacturing companies. This is a chance to increase shareholder value by reducing receivable accounts and inventories, increasing business profitability, shortening the collection period, and implementing appropriate credit policies.

In Pakistan, a research by Bhutto, Abbas, Rehman, and Shah (2015) examined the relationship between Cash Conversion Cycle (CCC) and company size and discovered a strong negative correlation between the two. That is, the bigger the firm, the shorter the CCC, and vice versa. Additionally, they discovered a positive and substantial relationship between the CCC's length and the current and quick ratios. In empirical research performed to investigate the liquidity profitability trade-off, a negative and significant connection between profitability and CCC duration was discovered (Lazaridis and Tryfondis, 2006; Uyar 2009). Another research by Hutchinson, Alexander, Quinn, and Doherty (2007) found a positive correlation with shorter

CCC and increased profitability. Additionally, the CCC was shown to be favorably correlated with the Return on Assets (ROA). Khan, Hijazi, and Kamal (2006) discovered that a firm's performance is adversely correlated with its day's inventory outstanding, day's payable outstanding, and CCC. Shah and Sana (2005) discovered a strong negative relationship between the Cash Conversion Cycle and gross profit. This result indicates that by shortening the cash conversion cycle, profit rises as well, as emphasized by (Mathuva, 2015).

A study was undertaken to explore the link between corporate profitability and working capital management for companies listed at Athens Stock Exchange (Lazaridis and Tryfonidis, 2006). A statistically significant relationship between profitability measured by gross operating profit and the CCC was revealed. Furthermore, management can generate profit by correctly handling the individual elements of WC to an ideal level. In a related study, Prasad, Narayanasamy, Paul, Chattopadhyay, & Saravanan, (2019) observed that the CCC and net trade cycle offer easy as well as valuable approaches of identifying WCM efficiency. For value generation of stakeholders, businesses must try to maintain numbers of days to least level(s).

García-Teruel, & Martinez-Solano, (2007) were probably the first to initiate an experimental investigation with regards to the influence of working capital management on the performance of SMEs. In their study, they took a sample of 8,872 small and medium Spanish enterprises spanning a period of between 1996 and 2002 for the aim of establishing an empirical link between profitability and working capital management. The association between the CCC and the performance factor was significant but negative.

Another study by Karaduman, Akbas, Ozsozgun, & Durer (2010) studied the relationship of working capital management and profitability by utilizing information or data spanning for a period of five years of non-financial firms listed at Istanbul Stock Exchange. The study adopted a balanced panel sample of 127 firms which was evaluated and gave about 635 observations. Cash conversion cycle was utilized as a measure of working capital management whereas ROA was employed to measure profitability. The findings revealed that effective management of cash conversion cycle leads to greater revenues. Lyroudi and Lazaridis, (2000) cited in Shahidi (2011) conducted an exclusive investigation of the Greek Food Industry to establish the link between the CCC and the old liquidity measures, such as the Current and the quick ratios. The findings depicted a positive and significant correlation between the modern and traditional liquidity signifiers. Further, it was shown that ROA was positively and significantly influenced by the Cash Conversion Cycle.

Ikpefan, Folashade, Agwu, and Odunaike (2014) examined the impact of financial strategy on liquidity, focusing on Nestle Nigeria Plc. between 2004 and 2009. The effect of several WCM variables on the gross profit movement coefficient was evaluated. These variables included the current ratio and collection days. The results indicated a negative correlation between current ratio and performance. This implies that when the current ratio decreases, an enterprise's profitability increases. On the other hand, when collecting days were regressed against profitability, it was shown that the two variables had a negative association. This demonstrates that when collection days are reduced, the firm's performance improves proportionately. Thus, the company must be proactive in managing its working capital in order to promote and maintain profitability.

In a related study, Makori & Jagongo (2013) examined the influence of WCM on firm’s profitability using balanced panel data of 5 manufacturing firms and 5 construction firms listed on the Nairobi Securities Exchange (NSE) for the period 2003- 2012. The study employed

Pearson's Correlation and Ordinary Least Square (OLS) models to determine the link between WCM and an enterprise's profitability. The researchers found a negative association between profitability and CCC.

2.3.5 Financial Distress and other Variables (Corporate Governance and Accruals)

Udin, Khan, and Javid (2017) examined association amongst corporate governance and the probability of financial hardship. Binary logistic regression was used in this research. The results provided corporate executives and investors with further insight into the association amongst the quality of corporate governance and the degree of financial hardship experienced by Pakistani companies. Additionally, this research adds to the current body of knowledge by including fresh data from emerging countries such as Pakistan that will aid regulatory authorities and regulators in creating long-term corporate governance measures to mitigate financial crisis. It is widely known that improving the quality of corporate governance procedures increases capital market efficiency and decreases the likelihood of financial crisis. Additionally, the larger the stock pledge ratio, the greater the chance that the business would experience financial difficulty.

Muljono and Suk (2018) investigated the connection between accruals, financial hardship, and restrictive covenants on loans. The study's dependent variable was whether commercial lenders integrate financial distress information included in accruals into debt covenants. According to the findings, companies with high accruals are more likely to become distressed than those with low accruals. Additionally, the research investigated one potential use of the data in accruals by commercial lenders. The findings suggest that lenders do not adequately account for the relationship between accruals and financial hardship when determining the initial degree of debt constraint. covered For many years, most empirical research has centered and/or concentrated on the impact of WCM on company performance, whereas others have concentrated and/or concentrated on corporate governance and the probability of financial crisis, as stated before. There have been insufficient research papers examining the connection between working capital management and capital hardship in isolation. It continues to be an area of empirical study that is under-researched. On that point, this research is being conducted with the goal of elucidating the connection between cash flow control and investment hardship.

Ranjbar and Amanollahi (2018) In the study on the influence of corporate financial hardship on unanticipated net earnings and corporate profits on accepted businesses on the Tehran Stock Exchange was investigated for the period 2010-2015. The study hypotheses were tested using linear regression with panel data models. Findings indicated that financial distress coefficients of the financial distress, annual sales growth institutional ownership, company loss, the company's market share company size, and firm fixed costs are statistically meaningful. Further, independent variables increased unforeseen profit as well as earning management.

2.4 Summary and Research Gaps

The corpus of literature has mostly focused on the impact of WCM on the performance of businesses, particularly industrial businesses. The chapter emphasized the importance of companies developing effective WCM strategies that optimize profitability of the company value. A study of prior research shows debates on the risk-reward trade-offs associated with various workers' compensation systems. A more aggressive strategy to WCM is linked with greater returns but also with increased risk, while a more cautious approach is associated with lower returns but also with reduced risk. WCM is significant since it has an impact on the profitability, risk, and ultimately the value of a business (Rehn, 2012). By and large, there is no clear consensus on whether WCM policy is most profitable. The findings from the examined literatures indicated a mixed effect/association between the components of working capital and several performance indicators (profitability, ROAs, ROE, sales growth, and firm size) of businesses from various nations.

For example, while Talha et al. (2010), Raheman et al. (2010), Azam and Haider (2011), and Kulkanya (2012) all examined the effects of WCM on financial performance or profitability (ROA) of firms in Belgium, Athens, the United States of America, Pakistan, and India, respectively, they all demonstrated a positive effect of WCM on financial performance or profitability (ROA), growth in sales, firm size, and ROA. Additionally, studies performed in Pakistan, India, and Nigeria by academics such as Raheman and Nasr (2007), Azam and Haider (2011), Falope and Ajilore (2009; 2012), and Trindade (2016) all showed a negative correlation between WCM and measures of corporate success.

Considering accounts receivable management, firms that are efficient control their optimal credit. This minimizes the overall costs of granting credit. An increase in receivables leads to a decline in organizational performance. This finding was confirmed by other studies including Juan and Martinez (2002), and García-Teruel, & Martinez-Solano, (2007) in Athens stock exchange where the later used ROA as an indicator of profitability. In Kenya, both Kweri (2011) and Mathai (2012) concluded that investment of funds in accounts receivables entails a trade-off between productivity and uncertainty.

The reviewed literature illustrated that lengthening the payable deferral period is likely to contribute to performance. However, this is not guaranteed in a case of over lengthening of the same. Nobanee, Abdullatif, & AlHajjar, (2011) in the study of Japanese enterprises but not in financial sector listed in the Tokyo Stock Exchange, established that over lengthening of the payable deferral period could harm the firm's credibility and credit reputation in the long run. Also, a study conducted by Mohamad and Saad (2010) in Malaysia to observe the impact of these working capital elements on financial growth they used Tobin's Q, return on invested capital and ROA as indicators of performance (financial) of the identified businesses. The findings indicated that there was a negative effect between different WC components such as accounts payable and performance of firms.

Azam and Haider (2011) on the other hand, explore the effect of WCM on company's growth for non- financial organisations. Accounts payable was also found to have a positive and significant connection with ROA and ROE showing that if time period of supplier's payment rose then total business' growth also increases. Similarly, García-Teruel, & Martinez-Solano, (2007) also showed a highly significant inverse relationship between the ROAs and the number of day's AP. Further, in a close study, Oganga (2015) in Nairobi County found an inverse relationship between accounts payables and performance of SMEs. However, when integrating all working capital management variables as reviewed in this study, they led to a positive effect on profitability.

Further, literature alludes that inventory management is associated to turning over inventory as quickly as possible without losing sales from stock-outs. In India, Talha, et al., (2011) revealed a positive influence of inventory turn-over on return on investment whereas in Karachi, Azam and Haider (2011) revealed a negative influence of inventory turn-over in days of non-financial institutes on ROA and ROE. In Kenya, Makori and Jagongo (2013) showed a positive impact on productivity of listed firms whereas Murega (2013) and Oganga (2015) showed a negative relation between profitability and day of sales inventory for the former and number of days of inventory for the later study.

Further, under cash conversion cycle, studies have suggested for a careful planning and monitoring for optimum results. Bhutto et al. (2015) for example established a negative relationship between cash conversion circle and performance similar to Lazaridis and Tryfonidis (2006) in Athens stock exchange as confirmed by other studies such as García-Teruel, & Martinez-Solano (2007), Khan, Hijazi and Kamal (2006) in Spanish and Pakistani Stock Exchange. In Africa, studies focusing on cash management and performance include Ikpefan, et al., (2014) from Nigeria whereas Makori and Jagongo (2013) from Kenya both focusing on listed firms established a negative relationship between cash management and profitability. Nevertheless, other studies revealed a positive effect of cash management and performance of firms (Hutchison et al. 2007; Karaduma et al. 2011) in Istanbul stock exchange further led to inconclusiveness on the contribution of cash management on performance of the firm.

On research gaps, the study considered the specific objectives. First, accounts receivables is associated with growth of businesses. It is argued that ideal credit lowers the overall costs of providing credit. Deloof (2003) revealed that the duration of receivables collection period has a negative impact on a company's productivity. Studies conducted focusing on accounts receivable including Adediran, et al. (2012) and Samiloglu, & Akgün, (2016) were based in economies with improved financial systems. They further concentrated with firms that are listed at their stock exchange. Both cross sectional and panel data of firms was considered. Therefore the role of accounts payable in the business financial distress need to be investigated since most of these businesses are not in the caliber of being listed at the stock market in Rwandan case.

Second, accounts payable had a positive effect on profitability of businesses. For example, Azam and Haider (2011) in their study in Karachi established that accounts payable has significant and positive association with ROA and ROE indicating that if time period of supplier’s payment is increased then overall firm’s performance also improves. However, other studies established an inverse relationship between accounts payable component of working capital and performance of firms (Mohamad & Saad, 2010). This debate needs to be explored with reference of private companies in the flour milling and animal feed manufacturing companies in developing countries in this case Rwanda.

Third, inventory management also was found to have a mixed findings leaving a definitive gap. For example, Talha, et al., (2011) found a positive effect of inventory management on performance of firms whereas other researchers including Azam and Haider (2011) established that inventory turnover in days had a negative relationship with performance (ROAs and ROE). The reviewed studies were purely quantitative and focused on corporate hospitals and non- financial institutes listed at developed markets with not only dissimilar characteristics as Kenyan stock markets but also failure to consider non-correlating nature of private companies in the flour milling and animal feed manufacturing companies ..

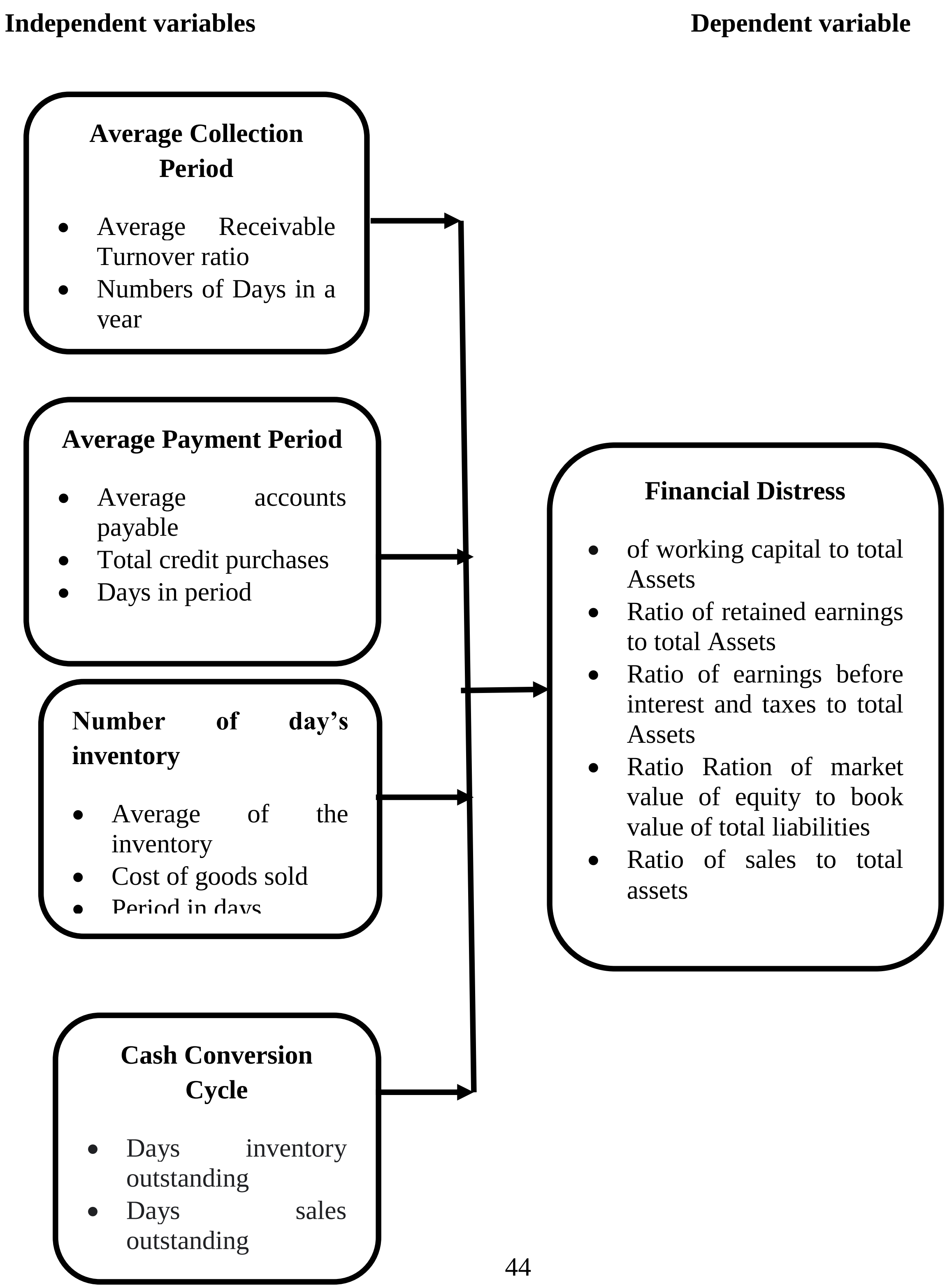
Lastly, cash conversion cycle was mostly as well as significantly linked to growth of a firm. From empirical literature, cash management was quantitatively measured and linked with financial performance of companies. Some of the measures used to determine profitability include ROAs and ROE. Similarly, CCC was employed as a measure of cash management (Lazaridis and Tryfondis 2006; García-Teruel, & Martinez-Solano, 2007; Hutchison et al. 2007). This not only leaves a gap on determining the influence of cash management on performance using non-financial measures but also failure of a focus on businesses that contribute immensely to the general welfare of the population(s).

2.5 Conceptual Framework

The conceptual framework presented in Figure 2.1 shows the relationships between the independent variables that is average collection period, average payment period, numbers of days inventory and cash conversion cycles and their relationship with financial distress among the manufacturing companies in Rwanda. The conceptual framework indicates how dependent variable financial distress is influenced by independent variable that is working capital management.

FIGURE 2.1

Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section covers the study technique and design. These are the steps that must be followed while collecting and analyzing data. This section includes the tools of research that the researcher utilized throughout the investigation. As such, it defines the study design, the target population, the data collecting methods, the data processing, and the analysis.

3.2 Research Design

The research design is the fundamental strategy that outlines the actions required to carry out the research endeavor. Conferring to Kothari (2009), a research design is the process of arranging the circumstances for data collection as well as analysis in such a way that they balance relevance to the study goal with procedural economy. It is the conceptual framework for doing research and serves as the blueprint for data collecting, measurement, and analysis. The study adopted a descriptive-correlational research design. This research design is vital in this study as it enables the researcher to compute, describe and establish a relationship between the dependent (financial distress) and independent variables (working capital management) using correlation and regression analyses.

3.3 Target Population

The study focused on private companies in the flour milling and animal feed manufacturing companies in Rwanda. There are a total of 8 private companies in the flour milling and animal feed manufacturing sub-sectors in Rwanda. These firms were selected because they contribute to almost half (48.5%) of the Rwandan GDP. In recent times this sector was leading with most firms listed as ‘likely’ to fall into ‘financial distress bracket’ (Rwanda economic outlook , 2020) The census approach was conducted where all among the private companies in the flour milling and animal feed manufacturing companies in Rwanda was considered. The unit of analysis was among the private companies in the flour milling and animal feed manufacturing companies in Rwanda.

3.4 Data Collection Procedures

According to Mugenda and Mugenda (2003), secondary data is information that a researcher gets through research papers, websites, and books. Primary data is information that a researcher gathers from primary sources. The majority of the data in this research came from secondary sources (published financial reports), management reports, and corporate social responsibility reports among other sources including world development indicators database. The period of the study constituted 2014-2020 of individual private companies in the flour milling and animal feed manufacturing companies in Rwanda. This period was informed by the fact that data for private companies in the flour milling and animal feed manufacturing companies in Rwanda was readily accessible.

3.5 Data Processing and Analysis

The research team utilized panel data from private businesses in Rwanda's flour milling and animal feed production industries to conduct their investigation. Several criteria were used to exclude companies that had insufficient data or had no operational activity during the time period under investigation. The dependent variable in this case was financial hardship.

From the literature, there are many approaches employed in modelling of corporate financial distress and bankruptcy. They however makes use publicly available historical accounting data (Altman, 1968) or relies on securities market information (Merton, 1974) to forecast insolvencies (distress). According to Mukoma (2020) there are a number of financial statement analysis techniques used to predict financial distress of listed entities but the most acceptable and widely used too is the Altman Z-score model. This study thus focused on Altman's' Z-Score model because of its wide and acceptable use. The Z score model was employed to measure a private manufacturing company's financial health and to predict the probability that the firm may collapse within 2 years.

A Z-Score is calculated as follows: 0.717X1 + 0.847X2 + 3.107X3 + 0.998X5 where X1 represents working capital, X2 represents retained earnings, X3 represents earnings before interest and taxes, X4 represents market value of equity divided by book value of total liabilities, and X5 represents sales divided by total assets.

The independent variables are as follows: the number of days of inventory (INV), which is calculated as (365x [inventory/cost of sales]); the number of days of accounts receivable (ACR), which is calculated as (365x [accounts receivable/(sales x (1+tVAT))]; and the number of days of accounts payable (ACP), which is calculated as (365x [accounts payable/purchases x (1 + t). The cash conversation cycle (CCC), which is computed as INV + ACR – ACP, is a measure of how quickly money is converted into cash.

3.6 Panel Data Eestimation Technique

The data for the research was gathered from industrial firms and included quantitative information. We used STATA version 14 to analyze the panel data statistically, doing descriptive and multiple regression analyses between the dependent variable (financial distress) and the independent factors (working capital management components). The general panel data model according to Baltagi (2005) was presented as follows;

$FD_{it} = \beta0 + \beta_1 WC_{i,t} + \varepsilon_{i,t}$

FD = Financial Distress, WC is working capital components (such as number of days inventory, accounts receivable, accounts payable, and cash conversion cycle), i = specific firm, t

= time; and ε = residual error (unobservable factors that vary over time and affect FD). There are several advantages to using the panel data estimation technique, including the fact that it has a higher degree of freedom and less multicollinearity, resulting in more efficient estimates (Hsiao, 2003), and that it provides greater flexibility in modeling differences in behavior across the firms under research, allowing us to manage for un-observed heterogeneity. Two major methods to panel data analysis are available: the Fixed Effects Model (FEM), which assume omitted effects specific to cross-sectional units are constant over time, as well as the Random Effects Model (REM), which believes omitted effects unique to cross-sectional units are variable over time. Hausman test was conducted so as to choose between the fixed and random effects. It examined the correlation of the different errors with the explanatory variables (Greene, 2008). The specified model was thus estimated using statistical program (STATA) and the effect was investigated through fundamental tests. The specified panel data regression model used was illustrated as;

$$FD_{it} = \beta 0 + \beta_1 INV_{i,t} + \beta 2ACR_{i,t} + \beta 3ACP_{i,t} + \beta 4CCC_{i,t} + \varepsilon_{i,t}$$

FD = Financial Distress, INV = number of days inventory, ACR = accounts receivable, ACP = accounts payable, CCC= cash conversion cycle, i = firm i, t = time; and ε = residual error (unobservable factors that vary over time and affect FDi,t).

3.7 Diagnostic Tests

Other primary assumptions that were examined before the regression analysis include unit root test via Levin Lin Chiu test of stationarity, homoscedasticity via scatter plots, and normality via Shapiro Wilk test, linearity and independence of the error terms. Before assumptions testing, the study investigated the presence of multicollinearity and outliers.

3.7.1 Multicollinearity Test

Multicollinearity exists in case of a perfect linear association between the variables in the study leading to biasness. This bias emerges when at least one sets of factors are completely connected to one another in size or magnitude and that the pairs of variables established through correlation matrix. Therefore, the Variance Inflation Factors (VIF) were inspected. The VIF test measures how the variance of an estimated coefficient increases due to collinearity. For VIF values greater than 10 and 1/VIF values less than 0.10 then it was concluded that multicollinearity is present.

3.7.2 Unit Root Test

To evade changes of the estimates over time due to unit root that leads to spurious results, the study applied unit root tests to explore or detect non-stationarity. A stochastic process is considered to be stationary if its mean as well as variance is the same as time changes. A stationary series has mean and variance that is time invariant. A series is said to be non-stationary if it's mean and variance changes with time. A stationary series is preferred because we can study its behavior at the specified time and be able to generalize for other time periods. The study applied dickey fuller unit -root test. The test is reasonable for such a dataset. Thusly, if factors are discovered to be non-fixed, first differencing or effective slacking was applied until the inclination is disposed of. The null hypothesis for this situation was expressed that the variable viable is non-fixed or has unit root.

3.7.3 Heteroscedasticity

Heteroscedasticity is necessary to confirm whether there is no variation of the error terms across observations or lack of constant variance by the study variables. The study used Breusch pagan test for heteroscedasticity.

3.7.4 Autocorrelation

Autocorrelation denotes the correlation of the random error terms in the subsequent time periods. If Autocorrelation is present before and after estimation, then its biasness leads to wrong estimates. The study employed Breusch - Godfrey test for autocorrelation.

3.7.5 Normality

The study also tested for normality of data. This enabled the researcher to proceed with estimation. The researcher used Shapiro Wilk test for normal data or distribution of the stochastic random error terms. If non normality is detected, the researcher employs nonlinear model where the dependent variable undergoes through a transformation.

3.7.6 Linearity

The research evaluated for linearity by determining if the plots are reasonably symmetrical around 45-degree lines, as determined by the researchers. This is useful for making predictions that are exceptionally big or tiny. It allows the model to avoid generating systematic mistakes as a result of the data. The scatter plot was modified to account for these effects in the research. That is, a scatter plot of the estimated residuals squared versus the fitted values is created.

3.8 Data Type and Source

The study covered the period 2014–2020 and used annual data for all the variables. Two key sectors that is manufacturing and agriculture sectors were considered. This sample would be quite adequate for the econometric exercise to be carried out in this study. Some models tend to gobble up the degrees of freedom pretty quickly and so the larger the data points, the more reliable the results were provided. Given that we have few coefficients to be estimated, observations considered are large enough to provide reliable estimates.

The time series data that was used by the study was obtained from secondary data sources, including the Kenya National Bureau of Statistics, National Treasury Annual Reports, CBK reports, Year Book of the International Monetary Fund (IMF), and International Financial Statistics (IFS). Specifically, data on GDP growth rate, School Enrollment Rates, and GDP were sourced from government monetary tables distributed every year in the measurable digests and financial studies by the KNBS. ODA data was sourced from the World Bank Indicators.

CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction

This chapter discusses the findings from the analysis of consolidated secondary data derived from financial statements of 8 different private companies in the flour milling and animal feed manufacturing industry in Rwanda shown in the preceding chapter on a seven-year time span (2014-2020). Since the data has taken panel dimension, we are able to tell from the private companies in the flour milling and animal feed manufacturing industry considered; the association between working capital management and financial distress. A thorough technical and basic examination is conducted, using a variety of particular criteria. The study's results are given descriptively in the form of tables and graphs and are arranged around the study's primary goals.

4.2 Descriptive Statistics

This study employed measures of central tendency as well as measures of dispersion to illustrate the distribution of the study variables. As shown in table 4.1, it was revealed that, on average, the financial distress was 1.294315 indicating generally majority the firms are in distress zone and likely to file for bankruptcy with the minimum of .4291155 while the maximum was 6.532915 indicating existence of firms in the industry that are on the safe zone and unlikely to file for bankruptcy. Number of days of accounts receivables (ACR) was on average 15.2917 days with the minimum being 3.28879 days while the maximum was 30.33931 days this actually indicates some firms had 30 days to collect their invoices.

TABLE 4.1

Summary Statistics

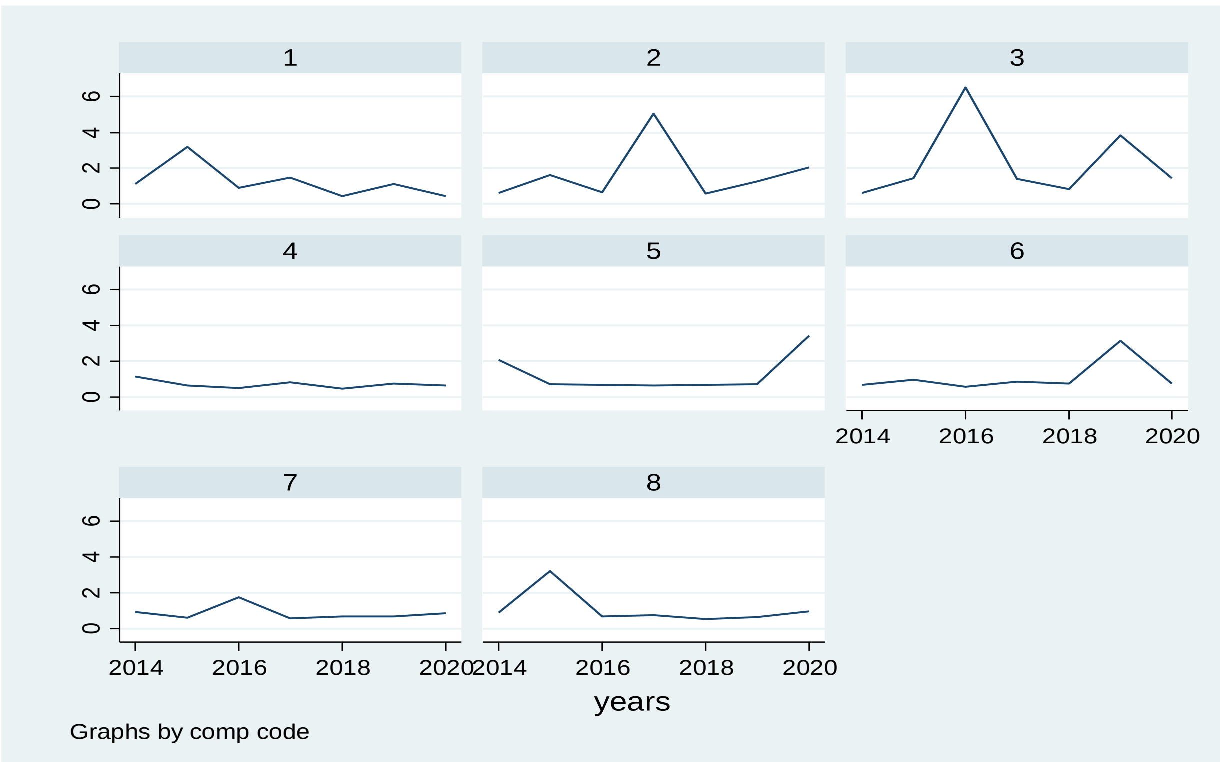
Variable	Obs	Mean	Std. Dev.	Min	Max
Financial distress (FD)	56	1.294315	1.196996	.4291155	6.532915
Average collection period (ACR)	56	15.2917	5.689199	3.28879	30.33931
Average payment period (ACP)	56	169.8839	279.0621	22.48023	1842.505
Number of days inventory (INV)	56	172.6422	165.2238	9.660943	612.3997
Cash conversion cycle (CCC)	56	18.05	342.8289	-1805.695	505.7785

From table 4.1 above; Average payment period or accounts payable (ACP) on average was 169.9 days that firms take to pay their suppliers maximum 1842.5 days this indicates some firms really taking a long period to pay off their debtors hence they are on financial distress and a minimum of 22.5 days indicating some firms have a higher ability to pay their abilities. Number of days inventory (INV) on average is 172.6 days while the maximum 612.4 indicating firms having funds tied up in inventory for up to 2 years. As well the minimum was 9.7 days indicating presence of highly efficient firm's terms of selling of inventory.

Cash conversion cycle (CCC) on average is 18.1 indicating that generally in majority of the firms working capital for are tied up for at least 18 days a minimum of -1805.7 indicating some firms with very high conversion/liquidity and maximum of 505.8 indicating some firms have many days to convert its investments in inventory and other resources into cash flows from sales. The results from these manufacturing firms in Rwanda ACP and INV have the largest contribution financial distress in Rwanda compared to ACR and CCC which have a smaller averages indicating more efficiency. The research also examined the nature of parameter variations in the businesses studied. The research used a variety of graphical representations to demonstrate the trend of all the variables of interest over the time periods shown in the panels. (see figure 4.1-4.5).

FIGURE 4.1

Trend Analysis of Financial Distress

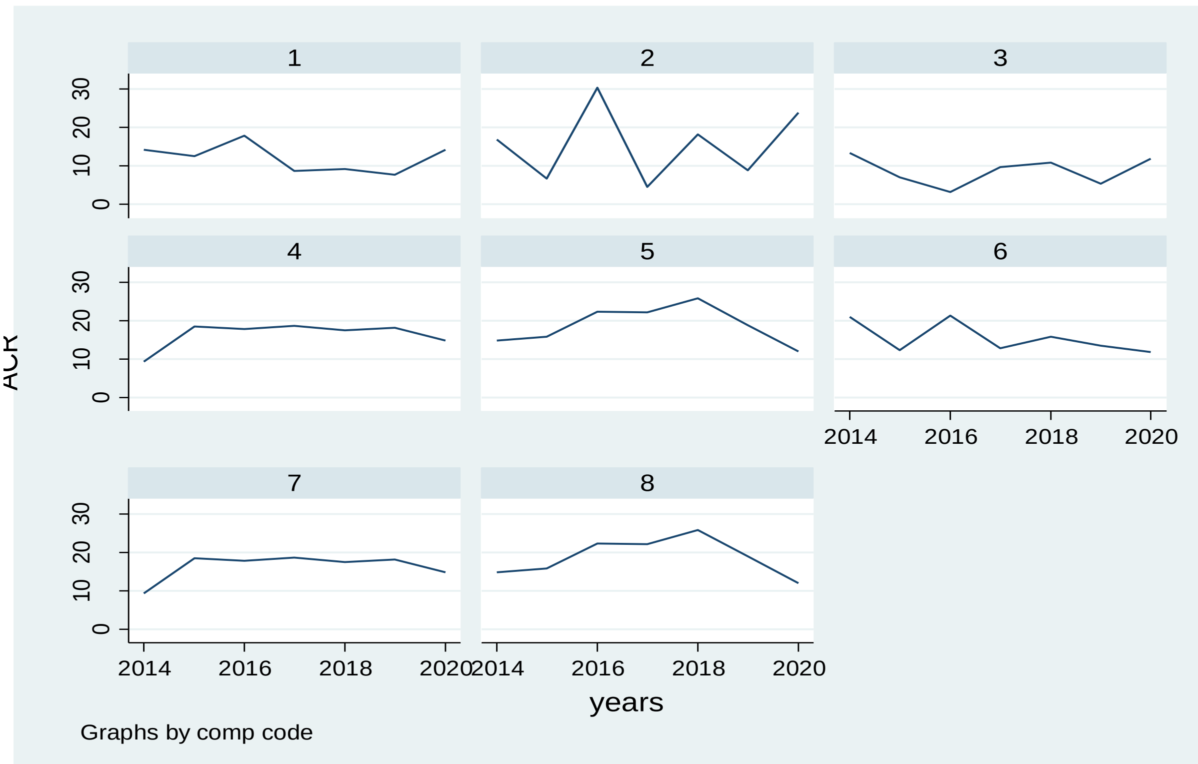


Where 1 -Minimex limited; 2 -Prodev Rwanda ltd; 3 -Gorilla FeedsCo ltd; 4 -Murama Grain Millers; 5 -Gasabo Grain milling Company; 6 - Murama Grain Millers; 7 -African Solution Private Ltd; and 8 -ZamuraFeeds Ltd

The figure shows no trends of constance for the company such as Minimax limited which shows a gradual decrease over the years, Prodev Rwanda ltd and gorilla FeedsCo ltd as shows series of active rises and fall in trends especially between 2016 to 2018 but Gorilla Feeds Co ltd there is gradual decrease 2018 to 2019 then a sharp increase and fall 2019 to 2020. The figure shows constant trends in other companies with Murama Grain Millers showing no significant increases and falls in financial distress, Gasabo Grain milling Company a gradual fall to 2017 then constant trends up to 2019 before another gradual increase from 2019 to 2020. For Zamura Feeds Ltd there is a sharp rise and fall in financial distress up to 2016 then a constant trend up to 2020 similar trend is observed for African Solution Private Ltd.

FIGURE 4.2

Trend Analysis of ACR

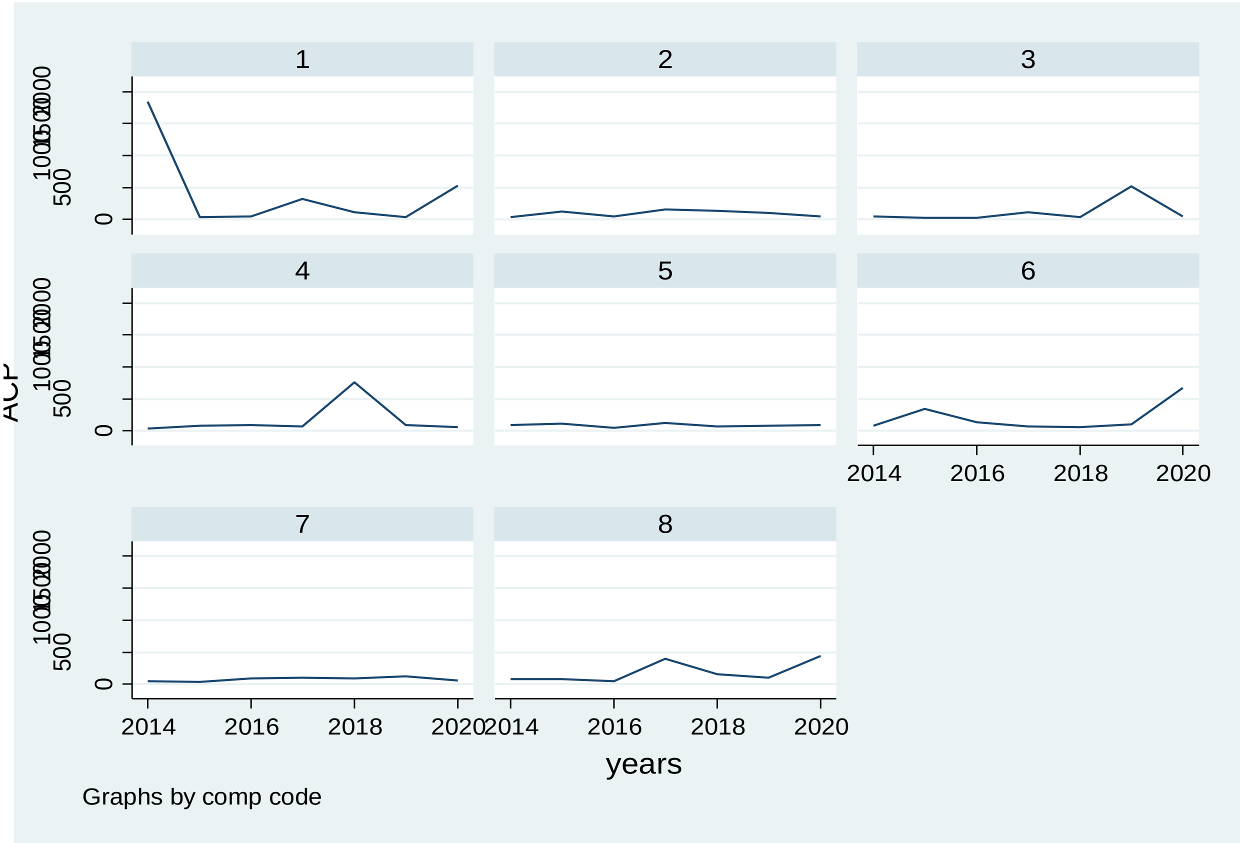


Where 1 -Minimex limited; 2 -Prodev Rwanda ltd; 3 -Gorilla FeedsCo ltd; 4 -Murama Grain Millers; 5 -Gasabo Grain milling Company; 6 - Murama Grain Millers; 7 -African Solution Private Ltd; and 8 -ZamuraFeeds Ltd

Companies Murama Grain Millers and African Solution Private Ltd indicate a gradual increase in ACR from 2014 to 2015 then constant trend up to 2019 before it starts to gradually decrease the other companies do not show constant trend because there is a series of increases and decrease in ACR over the years. Companies, Prodev Rwanda ltd, Murama Grain Millers, Murama Grain Millers are shown to be having a series of continuous rise and fall in the trends hence no constant trend.

FIGURE 4.3

Trend Analysis of ACP

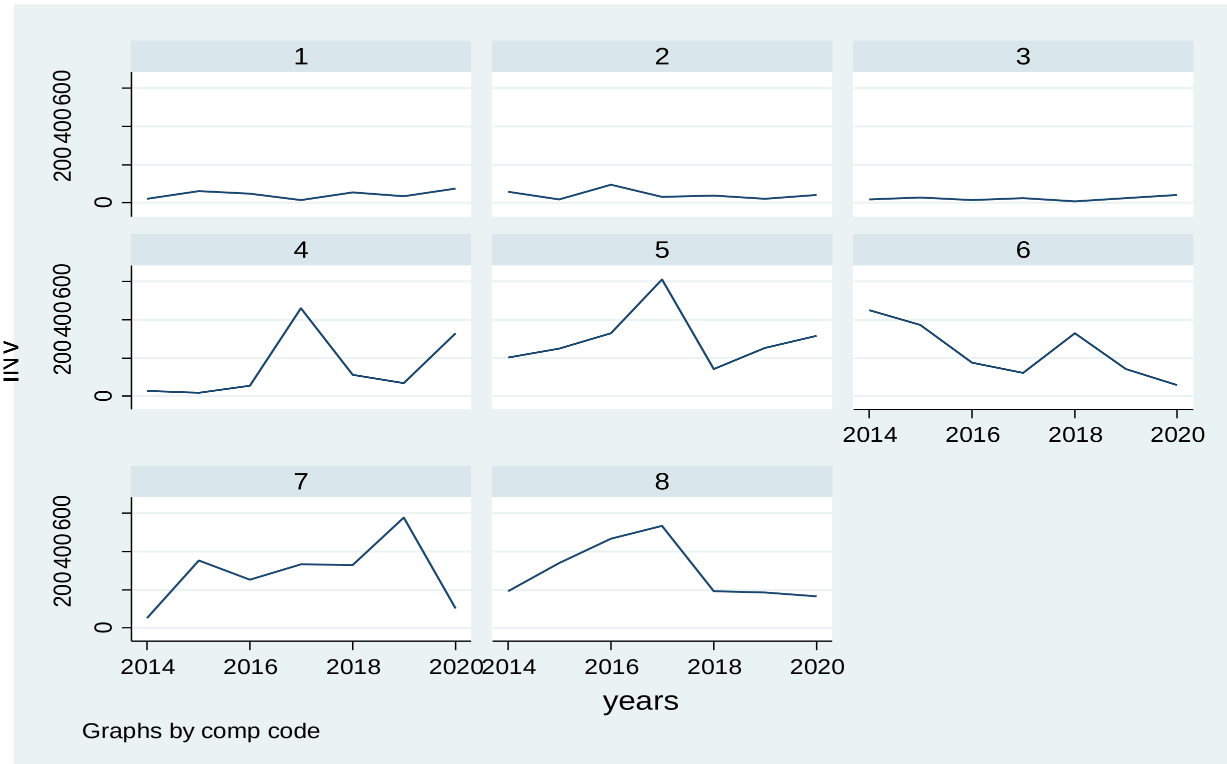


Where 1 -Minimex limited; 2 -Prodev Rwanda ltd; 3 -Gorilla FeedsCo ltd; 4 -Murama Grain Millers; 5 -Gasabo Grain milling Company; 6 - Murama Grain Millers; 7 -African Solution Private Ltd; and 8 -ZamuraFeeds Ltd

The figure above show constant trend indicating ACP was not increasing over time for Companies Prodev Rwanda ltd, Gasabo Grain milling Company, African Solution Private Ltd because there are no changes in the trends of ACP, it indicates constant trend in companies Gorilla FeedsCo ltd, Murama Grain Millers up to the years 2017 and 2018 respectively before there is a sharp increase for each company before another sharp decrease and then constant trend for Murama Grain Millers the other companies have a series of increase and decrease as well constant trends.

FIGURE 4.4

Trend Analysis of INV

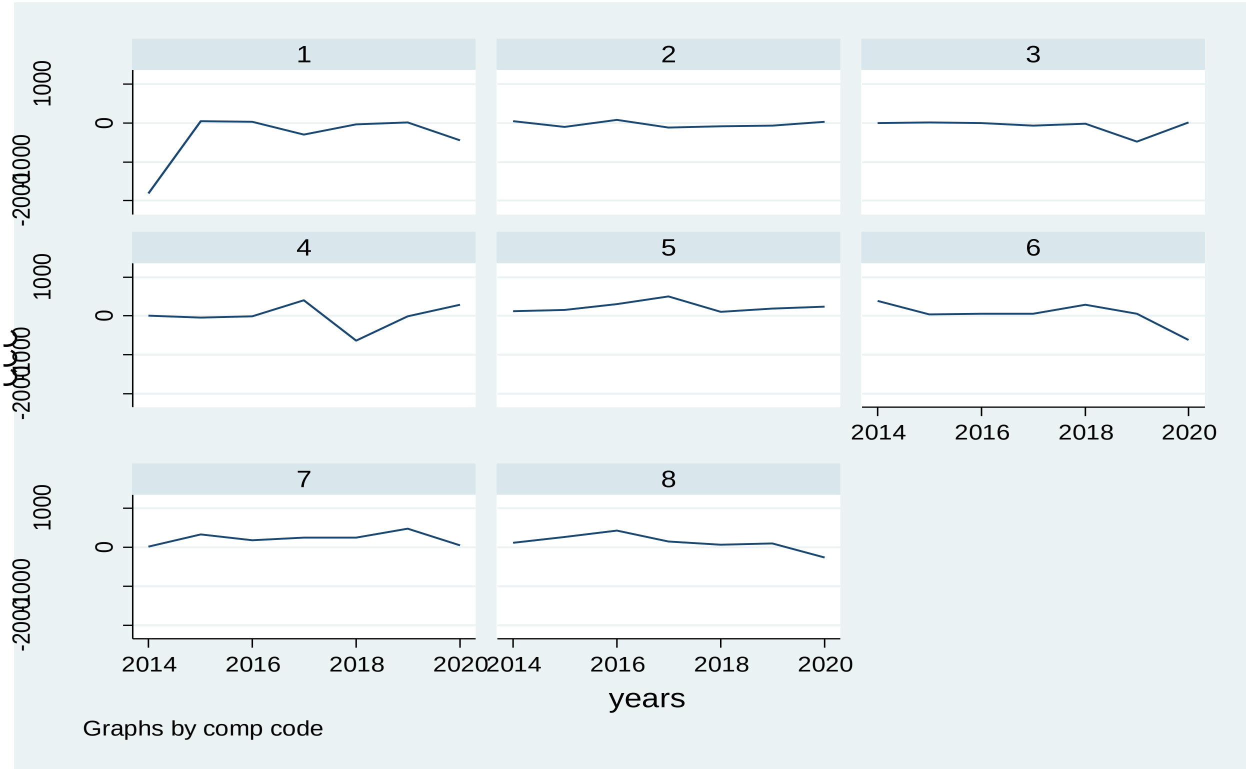


Where 1 -Minimex limited; 2 -Prodev Rwanda ltd; 3 -Gorilla FeedsCo ltd; 4 -Murama Grain Millers; 5 -Gasabo Grain milling Company; 6 - Murama Grain Millers; 7 -African Solution Private Ltd; and 8 -ZamuraFeeds Ltd

Figure 1.1 indicate constant trend, implying that the number of days inventory (INV) for Minimax limited Prodev Rwanda ltd, Gorilla FeedsCo ltd,was not substantially increasing or decreasing over time, the other companies -Murama Grain MillersGasabo Grain milling Kigali Animal, FeedsAfrican Solution Private Ltd, ZamuraFeeds are shown to have a series of fluctuations in the trends.

FIGURE 4.5

Trend Analysis of CCC



Where 1 -Minimex limited; 2 -Prodev Rwanda ltd; 3 -Gorilla FeedsCo ltd; 4 -Murama Grain Millers; 5 -Gasabo Grain milling Company; 6 - Murama Grain Millers; 7 -African Solution Private Ltd; and 8 -ZamuraFeeds Ltd

The figure above indicates constant trends for Companies, Prodev Rwanda ltd indicating no substantial increase in CCC, Gorilla Feeds Co ltd also had constant trend before a gradual decrease in 2018, the companies Gasabo Grain milling Company, Kigali Animal Feeds, African Solution Private Ltd shows gradual fluctuations in the trends and as well some constant trend. Minimax limited has a sharp increase in trend up to2017 then a gradual fall and increase, and fall. Murama Grain Millers is shown to have constant trend up to 2017 before gradual fluctuations increase and decrease in the trends up to 2020.

4.3 Correlation Analysis

Pearson's correlation analysis is shown in Table 4.2. To determine the degree of connection between two variables, the correlation method was employed. Connection coefficients vary from 1 to 1, with 1 indicating a strong positive correlation, 1 indicating a strong negative correlation, and 0 indicating no correlation between the two variables.

TABLE 4.2

Pearson's Correlation Analysis

		FD	ACR	ACP	INV	CCC
FD	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	56				
ACR	Pearson Correlation	-.652	1			
	Sig. (2-tailed)	.037				
	N	56	56			
ACP	Pearson Correlation	-.586**	.175	1		
	Sig. (2-tailed)	.000	.025			
	N	56	56	56		
INV	Pearson Correlation	-.663**	-.011**	.550**	1	
	Sig. (2-tailed)	.000	.044	.000		
	N	56	56	56	56	
CCC	Pearson Correlation	-.653	-.081**	.869**	.416**	1
	Sig. (2-tailed)	.057	.003	.000	.005	
	N	56	56	56	56	56

The findings show that all variables had significant relationship in their respective pairs. Financial distress negatively and significantly related to ACR (r=-0.652, p<0.05), ACP (r=-0.586, p<0.05), and INV (r=-0.663, p<0.05). However, it was not significantly and positively correlated with CCC (r=0.653, p>0.05). The other relationships are as indicated in table 4.2. In general it can be observed that all pairs of the variables were fairly or moderately correlated and that there was no coefficient that was above the absolute value of 0.7 except the correlation between ACP and CCC ($r=0.869$, $p<0.05$). The researcher conducted first difference (*D*) on CCC as a remedy implying that further analysis can be undertaken upon validating other pre and post estimation tests.

4.3 Effects of Working Capital Management on Financial Distress

The majority of businesses finance themselves with a considerable amount of cash invested in working capital, as well as huge sums of short-term payables. Due to the direct effect on liquidity and profitability, neglecting the liquidity management process may result in significant problems and losses. The main objective of this study thus intends to identify specific working capital management factors that may impact financial distress of firms in manufacturing sector in Rwanda. We examined how changes in observations and across factors clarify that tendency using descriptive statistics. In this aim, we sought to determine how the stochastic character of the aforementioned components correlates with financial hardship among private businesses in Rwanda's wheat milling and animal feed manufacturing industries. Following the adoption and modification of a model used by Mukoma (2020) which included variables utilized by Al-Mohareb (2019) based on the Ernest W. Walker four-tiered theory of working capital, The study was conducted using a dynamic panel model with cross sectional and time series components. These were used to illustrate the importance of financial hardship and its implications. Random effects with pre-estimation of unit roots and the Hausman specification test were used to estimate the hypothesized model.

4.3.1 Unit Root Test

To prevent estimates changing over time as a result of non-stationarity, the research used unit root tests to explore or identify non-stationarity in all study variables, which results in erroneous estimates. The study applied Levin-Lin-Chu unit-root test to all working capital management components as well as financial distress. Therefore, if variables are found to be non- stationary, first differencing or successful lagging is applied until the bias is eliminated. Table 4.3 shows the findings of unit root.

TABLE 4.3

Unit Root Test

Variable	Unadjusted t	Adjusted t*	p-value
Financial distress	-10.8516	-9.1289	0.0000
ACR	-12.9865	-11.3007	0.0000
ACP	-12.8632	-11.5264	0.0000
Inventory	-8.2428	-6.3655	0.0000
Cash conversion cycle	-13.1668	-11.7738	0.0000

In this instance, the null hypothesis was that the variable under examination was non-stationary or had a unit root, which was expressed as follows: Hypothesis 0 (H0): Alternative hypothesis (H1): Panels have unit roots. The Levin-Lin-Chu unit-root test showed that nearly all variables had p values less than the significance threshold of 0.05, indicating that the null hypothesis was rejected (that the variables had unit root).

4.3.2 Hausman Specification Test

The study examined fixed effects and random effects in model selection, with the former assuming that the true effect size is constant across all eight companies and the summary effect is our estimate of this common effect size, and the latter assuming that the true effect size varies across firms and the firms under study portray a random sample of possible effect sizes. Borenstein (2009) and Woodridge (2004) assert that while fixed effects models assume that all observed effect dispersion is due to sampling error, random effects models allow for the possibility that some observed effect dispersion demonstrates the association among both working capital management and financial distress.

To identify the best-fitting model of financial hardship, this research used the Hausman specification test, which compared the fixed effects and random effects model specifications. The null hypothesis was that there are no systematic variations in coefficients. As a result of performing the test, it was determined that the P-value of 0.3657 indicated that the optimum approach for modelling individual level effects is to use the random effects method. Table 4.4 indicates the findings of Hausman model specification.

TABLE 4.4

Hausman Specification Test

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fixed	Random	Difference	S.E.
ACR	-.0694517	-.0676646	-.0017871	.0089144
ACP	-.0001871	-.0006214	.0004343	.0002881
Inventory	-.0001645	-.0000211	-.0001435	.00051
CCC (D)	.0003332	.0001245	.0002087	.0001378

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 4.31

Prob>chi2 = 0.3657

The Hausman test favoured the random effects model to the fixed effects model in our research because the latter does not constrain the estimate effects of the mean of the distribution. Despite the fact that each business represented in our research provided information on a distinct impact size, the study needed to guarantee that all of these effect sizes were included in the summary estimate. According to Baltagi (2008), the preference for random effects means that the study's mean impact had to be estimated in the eight manufacturing companies studied. This model is used to test the null hypothesis that the mean effect is equal to zero.

4.4 Results for Random Effects Model

The random impacts model was selected because manufacturing was determined to have a common effect size in terms of financial distress, and the study's primary objective was to evaluate the link between WCM and financial distress in private companies in the flour milling and animal feed manufacturing industries. After performing the required diagnostic tests for pre-estimation as well as model selection test, the random effects are interpretable. Notably, the research maintained tight exogeneity in this model, as Anderson and Hsiao recommended (1982). The results of the calculated model are shown in Table 4.5.

TABLE 4.5

Random Effects (GLS) Regression

Random effects (GLS) regression Group variable: comp code R-sq.: within = 0.3050 between = 0.5751 overall = 0.3707 corr(u_i, Xb) = -0 (assumed)				Number of obs = 48 Number of groups = 8 Obs per group: min = 6 avg = 6.0 max = 6 Wald chi2 (4) = 24.84 Prob > F = 0.0001		
Lnfd	Coefficients	Std. Err.	t	P>t	[95% Conf. Interval]	
ACR	-.0677**	.0156	-4.34	0.000	-.0981931	-.0371362
ACP	-0.0147**	0.0073	-2.01	0.047	-0.0292926	-0.0001928
INV	-0.6464**	0.1684	-3.84	0.000	-0.9798064	-0.3129852
D.CCC	.000125	.00026	0.47	0.637	-.00039272	.000641701
Constant	1.1616	.2601	4.47	0.000	.651833513	1.67130321
Sigma_u 0.07111501 Sigma_e 0. 5528141 Rho = 0.01627932 (fraction of variance due to u_i) ***D*** is the first difference ***Lnfd***=natural logarithm of financial distress ** significant at 5% level						

The findings in Table 4.5 indicate that 37.1 percent of the variance explains financial hardship, whereas the remaining 37.1 percent might be accounted for by other variables not examined in this research. Additionally, 57.5 percent of the differences account for financial hardship across panels and roughly 30.5 percent account for financial suffering within panels. Considering the low variability in the corresponding panels, which is expected due the cross sectional element, the study shows an overall significance of 0.0001, indicating that all variables relating to working capital management included in the model were statistically significant at all significance levels in explaining the phenomenon of financial distress among private companies in the flour milling and animal feed manufacturing industries in Rwanda. Additionally, the standard deviations of residuals within as well as across groups were 0.0711 and 0.5528, respectively. On the other hand, the variance due to panel variations was 0.0162. Thus, there really is no connection between the error terms and the regressors, on the other hand. This means that the panel data method accounts for the fact that the error terms' variance varies over all observation in the panels and for any hypothesized or established connection between random error terms from later time frames. Thus, the subsequent post-estimation diagnostic tests were conducted to verify the resulting estimations. They include, multicollinearity, normality, heteroscedasticity, autocorrelation, and linearity.

4.4.1 Multicollinearity Test

Multi-collinearity is assumed to occur especially if the variables under study have a perfect linear connection. When one or more pairs of independent variables are completely associated with one another, a bias occurs. The findings for multicollinearity are shown in Table 4.6.

TABLE 4.6

Multicollinearity Test

Variable	VIF	1/VIF
ACR	3.52	0.283728
Inventory	2.78	0.359492
ACP	2.38	0.419345
D.CCC	1.59	0.628426
Mean VIF	2.57	

The mean VIF of the study is 2.57. Since all variables have a VIF less than 10 the data is considered to be free from multicollinearity.

4.4.2 Heteroscedasticity

The study used Breusch pagan test for heteroscedasticity. From table 4.7 below, it can be seen that 0.924 for financial distress model is more than 5% significance level which implies that there is constant variance implying no heteroscedasticity.

TABLE 4.7

Cook-Weisberg Test for Heteroscedasticity

Model	Variables: Fitted values
Financial distress model	Variables: Fitted values of the *FD* Chi2(1) = 0.01 Prob > Chi2 = 0.9420

Ho: Constant Variance

4.4.3 Autocorrelation

Autocorrelation refers to the correlation of the random error terms in the succeeding time periods. If Autocorrelation is present before and after estimation, then its biasness leads to wrong estimates. The study employed Breusch-Godfrey test for Autocorrelation. Table 4.8 shows the probability value of 27.06% was greater than the significance level of 5%. Therefore, we fail to reject the null hypothesis that there is no autocorrelation.

TABLE 4.8

Breusch-Godfrey LM test for Autocorrelation

Model	Lags (p)	Chi2	Degrees of freedom	Prob > chi2
Financial distress model	1	1.214	1	0.2706

H_0: No Autocorrelation

4.4.4 Normality Test

To proceed with estimation, the Shapiro Wilk test was used to determine if the data were normal or whether the stochastic random error components were distributed normally. According to Table 4.9, the total residuals of the variables were not normally distributed at the 5% level of significance.

TABLE 4.9

Test for Normality

Variable	Observations	W	Prob>z
Residuals	**48**	**0.7637**	**0.04286**

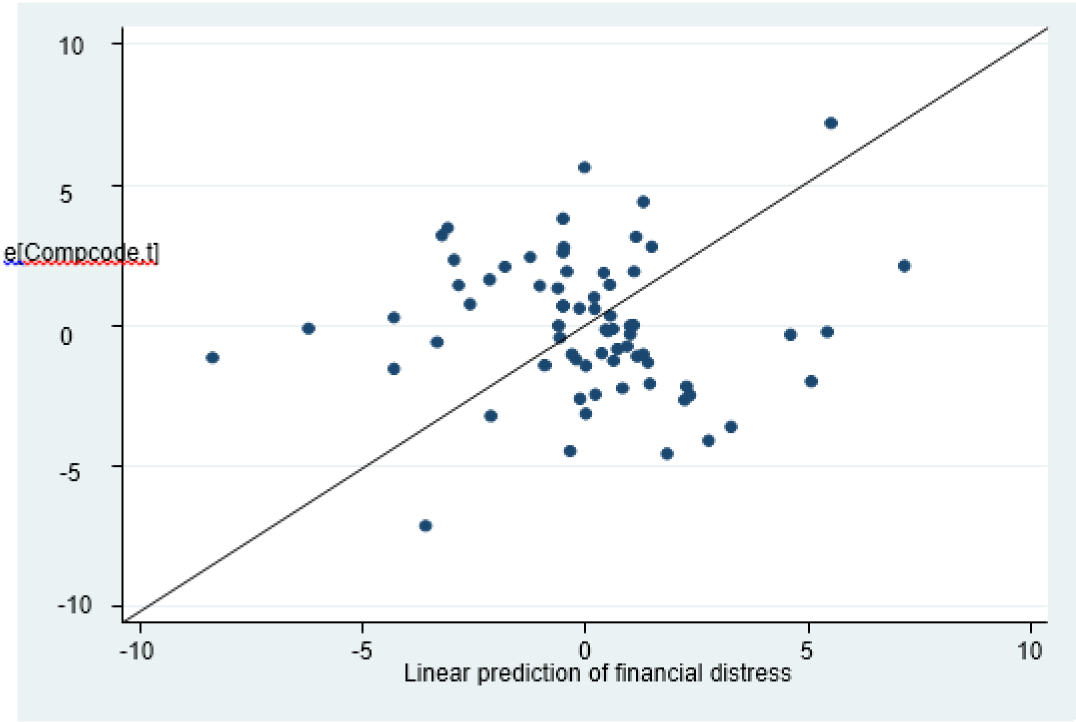
Table 4.6 indicates the p-value of the residuals of 0.04286 is less than 0.05 meaning that the null-hypothesis of normality of residuals is rejected. This means that these residuals are not normally distributed at 5% level. Therefore, the researcher transformed the dependent variable (financial distress) to natural logarithm to enhance normality of the residuals.

4.4.5 Linearity

The research modified the scatter plot to account for these impacts. Figures 4.6 following illustrate the scatter plot of estimated residuals squared versus predicted value. As can be seen, the plots are very symmetrical around the 45 degree lines, indicating that the model produces no systematic errors when generating exceptionally big or small predictions.

FIGURE 4.6

Graph of Residuals Against the Fitted Values of Financial Distress



4.5 Interpretation and Discussion of the Regression Model

Further, effects explicitly showed that the coefficients of the ACR, ACP and INV as being statistically significant on financial distress of private companies in the flour milling and animal feed manufacturing sector in Rwanda since their *t* statistics were significant whereas CCC was found to have a non-significant effect on financial distress. Note that the dependent variable is a natural transformation of the logarithm. From table 4.5, the following is the estimated model

lnFD= 1.1616 – 0.0677**ACR-** 0.0147**ACP** -0.6464**INV** + 0.000125**CCC**

From the estimated model, the findings show that, if all working components are held constant, financial distress will be 1.1616 percentage points higher. The study results revealed that for an additional day of accounts receivable, financial distress will be lower by 0.0677 percentage points. This implies that financial distress will increase significantly by 6.77 percent holding other factors constant. Secondly, for an additional day of accounts payable, financial distress will be lower by 0.0147 percentage points. This means that an extra day of accounts payment leads to a significant increase in financial distress by 1.47 percent holding other factors constant.

Third, the study established that an additional day of inventory holding leads to decline in financial distress by a 0.6464 percentage points. This implies that for an extra day of inventory holding, financial distress increases significantly by 64.64 percent holding other factors constant. Lastly, it was revealed that for an additional day of cash conversion cycle, financial distress increases by a 0.000125percentage points. This means that for an extra day of cash conversion cycle, there is a non-significant increase in financial distress by 0.0125 percent holding other factors constant.

In the aforementioned relationships on financial distress, from average collection period, average payment period, number of days inventory and cash conversion cycle, this section presents a discussion on the nature of relationships exhibited and whether the relationship was significant to warrant modelling. Under objective one, results indicate that the average collection period had a negative and significant association on financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. This negative and significant relationship shows that an increase by a day in the average collection period, leads to a corresponding increase in financial distress. Conversely, for the financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda to reduce, then a feasible effort to lower the number of days taken for debt collection should be adopted. This finding is consistent with Bonsall and Miller (2017) who emphasized that, positive financial performance of a firm relies on reduced number of days taken to recover a debt. Similarly, the study results were in line with the findings of Charitou, Elfani and Lois (2010) who examined the impact of WCM on company's profitability in the developing markets. They scholars revealed that there was a positive correlation amongst (ROA) on the current liabilities to total liabilities ratio, the current asset to total asset ratio of manufacturing companies under consideration.

In the second objective, the study findings reveal that the average payment period was negative and significantly related to financial distress among the flour milling and animal feed companies in Rwanda. The negative relationship indicates that for a one-day delay in paying the respective creditors, the financial distress of the private flour milling and animal feed manufacturing companies would rise. The rise in financial distress imply that the manufacturing companies studied may easily become bankrupt. The findings were in line with the results of Bahizi (2017) who concluded that an improper management of creditors, in terms of prompt credit repayment, exposes a firm to litigation over credit recovering which in extreme circumstances leads to insolvency which is aggravated bankruptcy. In addition, the finding are supported by the study findings of Napompech (2012) who studied the impact of WCM on profitability of traded manufacturing firms in Nigeria. Their research established a favourable correlation between the average payment time and company profitability.

On the third objective, the study results too indicate that more inventory days was adversely and significantly associated to financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. For every additional day inventory, there is an associated increase in financial distress levels. Again, it implies that, an additional day of converting stock into cash causes an increase in financial distress for the private flour milling and animal feed manufacturing companies in Rwanda. Concurring with Onchangwa (2019), stock into cash conversion frequency determines the financial state and performance of a firm and its competitive edge in the face of struggling firms, whose burden lies in a slow rate of stock turnover. As well, the study by Napompech (2012) exposed a positive link between stock turnover in days and profitability.

This finding were further in line with findings of Oganga (2015), undertaken to assess the link between WCM and performance of SMEs by a positive effect of inventory management on performance of SMEs was established. From the literature, our results were supported by the finding of Murega (2013) who investigated the effects of WCM on corporate profitability among firms listed at NSE, Kenya. From the analysis, it is was established that Day of Sales Inventory (DSI) had negative link with Return on Sales (ROS) and Return on Assets (ROA). The study findings indicate that management of WC properly is vital. Furthermore, management of inventory as well as CCC to an ideal level will produce more profit hence reduced financial distress.

Lastly, for the fourth objective, CCC was positively related to financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. However, the relationship was not significant. Hence, there was little evidence to conclude that CCC was either escalating or de-escalating the financial distress of private companies in the flour milling and animal feed manufacturing companies in Rwanda. The findings was not in line with the results of Sugathadasa, (2018) who explored the association amongst CCC and Firm

Profitability of manufacturing sector organizations listed in Colombo Stock Exchange. The study concluded that there was a negative correlation between all components of the cash conversion cycle. Additionally, Al-(2019) Mohareb's results contradicted previous findings, which indicated a strong connection between both the CCC, a proxy for working capital management, and manufacturing company profitability.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the research's results from the preceding chapter. Following that, conclusions are drawn with a particular emphasis on the proven link amongst WCM and financial hardship in private businesses engaged in flour milling and animal feed production. Later in the chapter, pertinent policy suggestions and topics for further study are proposed.

5.2 Summary of the Study Findings

Governments and private investors have long been concerned about financial distress in businesses. A precipitous fall in a company's financial performance may ultimately end in bankruptcy, causing significant financial loss to investors and creditors. It is on this basis that the research investigated the effect of WC on financial distress among the private companies in the flour milling and animal feed manufacturing industry in Rwanda. The specific objectives include; to examine the association amongst average collection period and financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda, to assess the influence of average payment period on financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda, as well as to examine the relationship between number of days inventory and financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda. Lastly, to establish the influence of cash conversion cycle on financial distress among the private companies in the flour milling and animal feed manufacturing companies in Rwanda.

The study employed a descriptive-correlational research design in examining the eight private companies in the flour milling and animal feed manufacturing companies in Rwanda. Financial distress was computed via A Z score. Hausman model specification test was conducted to select the estimation test. Random effect model was employed to analyze the panel data at 95% confidence interval. From the findings, working capital factors including average collection period, average payment period and number of days inventory were found to have a significant effect on financial distress among private firms in the flour milling and animal feed manufacturing companies in Rwanda. CCC was however not found to have a significant impact on financial distress. Therefore, significant factors that need attention include average collection period, average payment period and number of day's inventory.

5.2 Conclusions

Working capital management is critical for construction and manufacturing companies, since a significant portion of their assets are current assets. In developing countries including Rwanda, more and more firms are getting into financial distress situation, with the latter recording more worrying trend. The study thus investigated how working management affected financial distress. From the findings, the study concluded that; average collection period among private companies in the flour milling and animal feed manufacturing companies in Rwanda has a significant influence on financial distress. Second, average payment period among private companies in the flour milling and animal feed manufacturing companies in Rwanda has a significant effect on financial distress. Third, number of days inventory was found to have a significant effect on financial distress among private companies in the flour milling and animal feed manufacturing companies in Rwanda. Lastly, CCC had no significant influence on financial distress among private companies in the flour milling and animal feed manufacturing companies in Rwanda.

5.3 Policy Recommendations

When a business is in financial difficulty, operational conditions may worsen, severe financial obligations become frequent, salaries may be renegotiated lower, and bankruptcy may become a possibility, particularly in developing nations. Based on the study findings, first, there is need to maintain short days for accounts receivable which were depicted to be high. As a result, the report suggests that managers focus on conservative policies that require strong cash balances and stock reserves. The study thus recommends that firms should manage their account receivables with a view to reducing the cash conversion cycle so as to increase their profitability amongst other things.

Also, the study recommends for clear analytical consideration of consumer credit, that is extended by the business to its final consumers who have not yet made payment and so the effectiveness of business' credit strategies can have a significant influence on its overall performance. Business owners ought to be effective in management of the receivables by establishing the ideal credit which lessens the overall costs of providing credit. These suggestions are based on the fact that more days for accounts receivables significantly influences likelihood of private businesses engaged in flour milling and animal feed production falling into financial distress in Rwanda.

Second, effective planning must be implemented by the companies in order to prevent the inability to collect accounts receivables in a timely way, which may result in significant cash flow issues. The more debt a business utilizes to fund its operations, the greater the danger of financial distress, particularly when revenues produced are insufficient to meet operational expenses and fixed financing charges. Of the most importance, firms should focus on maintaining short payable period.

In addition, the study recognizes that utilization of the worth of relationship with payee is a comprehensive task that need to be stressed as significant as possessing the ideal level of inventories. Robust union between the firm and its dealers is recommended to strategically grow production lines and reinforce credit information for upcoming extension. Managers need to ensure that there is constant adherence to optimum account payable management, monitoring of accounts and accounts payment management policy. These suggestions are based on the fact that more days for accounts payable were associated with increased likelihood of private businesses engaged in flour milling and animal feed production falling into financial distress in Rwanda.

Third, there is need for manufacturing companies to steer forward the training of their top management teams with regards to averting operational, managerial and financial difficulties associated with poor inventory management. This was based on the fact that inventory days were associated with higher chances of falling into financial distress. The operating firms ought to ensure that firms do not experience conditions that are worsened, heavy financial burdens due to increased average collection, payment or inventory days. This will ensure that institutions or firms are not pushed to financial distress.

5.4 Areas for Further Study

The research mainly concentrated on examining how WCM impacts financial distress in Rwanda private companies in the flour milling and animal feed manufacturing companies. The study specifically explored the effect of average collection period, average payment period, INV and CCC on financial distress. There is thus need to investigate the same on financial performance of other organizations. Also, the study focused on the private companies in the flour milling and animal feed manufacturing companies. There is need to have similar study focusing either on companies both in public and private in other sectors of the economy.

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World Development Indicators (2021). Trends in World development indicators

APPENDICES

APPENDIX 1

Secondary Data Collection Sheet

Variable	Measurement
X1 = Working capital/total Assets	
X2 = Retained earnings/total Assets	
X3 = Earnings before interest and taxes/total Assets	
X4 = Market value of equity/book value of total liabilities	
X5 = Sales/Total Assets	
The number of days of inventory (INV)	
Inventories	
Cost of sales	
The number of days of accounts receivable (ACR)	
Accounts receivable	
Sales	
The number of days Accounts payable (ACP)	
Accounts payable	
Purchases	

*A Z-Score = 0.717X1 + 0.847X2 + 3.107X3 +0.420X4 + 0.998X5