DOES CAPITAL STRUCTURE THEORY REMAIN RELEVANT UNDER ABNORMAL MACROECONOMIC ENVIRONMENT: THE CASE OF ZIMBABWEAN MANUFACTURING FIRMS DURING THE PERIOD 2009- 2018

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DEDICATION

I dedicate this to my loving mother, Grace Magomo, and to my late father, Attain Magomo. To my dear friend, Carlos Khumalo, may your soul rest in eternal peace.

ABSTRACT

DOES CAPITAL STRUCTURE THEORY REMAIN RELEVANT UNDER ABNORMAL MACROECONOMIC ENVIRONMENT: THE CASE OF ZIMBABWEAN MANUFACTURING FIRMS DURING THE PERIOD 2009- 2018.

The main objective of this study was to test if the applicability of known capital structure theories holds water in abnormal economic environments, in particular, in Zimbabwe. Using secondary data collected for listed manufacturing firms from 2009-2018, results from a fixed effects regression model concluded that profitability, company size, non-debt tax shields, firm liquidity, inflation and GDP were significant in explaining capital structure decisions in Zimbabwe. In the context of South Africa, company size, asset tangibility, firm liquidity and inflation were found to be significant. The pecking order and trade-off theories were the only two theories that were found to be applicable in the Zimbabwean context, and the application of both theories indicated the use of internally generated funds as opposed to external finance sources, such as debt and equity. These results attribute to the abnormality and instability of the Zimbabwean economy, especially with regards to limited access to capital.

Keywords:

Capital structure, economic environment, manufacturing sector, Zimbabwe, South Africa, fixed effects regression model, profitability, company size, non-debt tax shields, firm liquidity, inflation, GDP, asset tangibility, growth opportunities, earnings volatility, pecking order theory, trade-off theory.

LIST OF ACRONYMS

MM	MILLER AND MODIGLIANI
ZSE	ZIMBABWE STOCK EXCHANGE
JSE	JOHANNESBURG STOCK EXCHANGE
BVL	BOOK VALUE OF LEVERAGE
PRO	PROFITABILITY
CS	COMPANY SIZE
AT	ASSET TANGIBILITY
NDTS	NON-DEBT TAX SHIELDS
GO	GROWTH OPPORTUNITIES
EV	EARNINGS VOLATILITY
FL	FIRMS LIQUIDITY
INF	INFLATION
GDP	GROSS DOMESTIC PRODUCT
OLS	ORDINARY LEAST SQUARES
RBZ	RESERVE BANK OF ZIMBABWE
GDP	GROSS DOMESTIC PRODUCT
USA	UNITED STATES OF AMERICA
MCEP	MANUFACTURING COMPETITIVENESS ENHANCEMENT PROGRAMME

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CHAPTER 1: INTRODUCTION AND BACKGROUND

In its purest form, capital structure describes the way a firm chooses to finance its development and operations. A company can either be debt financed, equity financed, or can choose to have a combination of both debt and equity capital. In other terms, capital structure describes the mix of owned capital (equity, reserves and retained earnings) and borrowed capital (debentures and long term loans) that a company holds (Pandey, 2013).

The innovatory work on capital structure theory was first established by Miller and Modigliani (1958). The trailblazing work by Modigliani and Miller in 1958 has given rise to a large number of subsequent capital structure articles (Jensen & Meckling, 1976; Ross, 1977; Bradley, Jarrell & Kim, 1984; Myers, 1984; Baker & Wurgler, 2002), all of which were in pursuit of establishing whether an exclusive blend of debt and equity capital will maximise the value of the firm, and assuming this is the case, what variables could affect the firm's ideal capital structure. This led to the development of other theories of capital structure, namely, the Trade-Off theory, the Pecking Order theory, the Signaling theory, the Market Timing theory and the Agency Cost theory.

Subsequent literature on the theory of capital structure were centred on the debate surrounding Modigliani and Miller's irrelevancy proposition, developed in 1958. The Irrelevancy Proposition suggested that a firm's weighted average cost of capital is independent of its capital structure choices, but is instead equivalent to the capitalisation rate of expected returns before interest (Miller & Modigliani, 1958). This entails that a firm's blend between debt and equity capital has no effect on its cost of capital. However, the MM Propositions of 1958 were based upon the assumption of a perfect capital market, which in reality, fails to hold, due to existing market imperfections, such as the agency problem and information asymmetry, for instance. Further, these market imperfections accordingly appear to have an impact on the firm's capital structure choice.

However, in 1963, Modigliani and Miller (1963) revised their 1958 "world with no taxes" theory, and established that the tax shields provided by debt financing are in actual fact, greater than they had originally envisioned. Modigliani and Miller (1963) argued that a firm is able to maximise its value by taking on more debt due to the tax advantages associated with the use of debt. Therefore, firms will benefit from employing more debt.

Further, Jensen and Meckling (1976) explained the capital structure theory in light of agency costs. They argued that the capital structure of the firm is affected by the agency problem that exists between managers and shareholders, and shareholders and debt holders. Jensen and Meckling (1976) suggested that the optimal capital structure which will increase firm performance is achieved at a point where agency costs are at their minimum. They established that the existence of debt allows managers and stockholders to pursue the same interests; at the same time, an increase in the level of debt will lead to debt holders incurring more monitoring costs to secure their repayment, thus the agency problem is minimised both ways and all parties are acting in the best interest of the firm (Jensen & Meckling, 1976).

Myers (1984) developed the static trade off and pecking order theories in his capital structure puzzle paper. The standard exhibition of the static trade-off theory was provided by Bradley, Jarrell and Kim (1984) and states that the optimal capital structure is a trade-off between the benefits of debt (tax shields) and the costs of debt (bankruptcy or financial embarrassment). In this light, Myers (1984) argued that a firm will set a target debt to value ratio, and gradually move towards it. Therefore, the firm has to substitute debt with equity, or, vice versa towards a point where the value of the firm is maximised (Myers, 1984).

In contrast to the static trade off theory, Myers (1984) and Myers and Majluf (1984) developed the pecking order theory , which suggests that a firm will follow a particular priority when it comes to the way in which it is financed. Myers (1984) established that a firm prefers internal to external financing and prefers debt to equity financing when the source of financing is external.

Furthermore, Ross (1977) developed the signaling theory of capital structure which suggests that capital structure decisions by managers signal information to the market. The signaling theory asserts that an issue of debt implies that the firm is undervalued. This is premised on the notion that a debt issue usually implies that the managers anticipate positive future prospects for the firm, and the firm is more than able to meet its debt obligations to avoid bankruptcy. On the contrary, Ross (1977) established that an equity issue signals overvaluation of the firm.

In developing the market timing theory, Baker and Wurgler (2002: 1-32) established that “the current capital structure is strongly related to historical market values”. The results of their paper suggested the theory that capital structure is the “cumulative outcome of past attempts to time the equity market” (Baker & Wurgler, 2002). This theory argues that firms will issue equity at a time

when the stock price is allegedly overvalued and will buy back their shares at a point in time where the stock price is allegedly undervalued.

With regards to the importance of capital structure in strategic management, Wernerfelt (1984) reiterates the interconnectedness of a firm's products and its resources. Wernerfelt (1984) emphasised the significance of capital structure decisions on the value of the firm in that the success of a firm is dependent upon the ability of the firm to manipulate its resources in a way that creates competitive advantage. However, Wernerfelt (1984) did not shy away from the influence of the macroeconomic environment on the relationship between capital structure and firm value. Once macroeconomic conditions become undesirable, as in the case of Zimbabwe (which is used as a unit of analysis in this study), resources become scarce (Wernerfelt, 1984). This forces firms to operate in survival mode due to uncertainty, and results in poor firm performance which in turn, leads to erosion of firm value.

Hence, the question of whether a firm's resources will be flexible enough to allow managers to adjust its capital structure in a way which will maximise firm value, as provided by theory, during an economic downturn, is a significant one. For instance, while Modigliani and Miller (1963); Jensen and Meckling (1976); Ross (1977) provide that an increase in debt will increase the firm value, economic or business cycles provide that during economic downturn, the corporate debt burden increases. This implies that the ability of a firm to meet its debt obligation is impaired due to an increase in financial distress, which may lead to bankruptcy. Further, as in the case of Zimbabwe, firm access to debt capital is stringent.

In the same way, while Myers (1984) provides that a firm may substitute debt and equity until it reaches its optimal capital structure, the issue of how flexible a firm's resources can be in abnormal economic conditions still remains. Further, the channels by which firms can access funds become limited, therefore the firms' choices with regards to their sources of finance are also limited.

The findings from an early study on this subject topic by Korajczyk and Levy (2002) concluded that macroeconomic circumstances are significant factors for firms' financing choices. As macroeconomic conditions fluctuate over time (i.e. the economy goes through the normal business cycle of expansion and contraction), capital structure decisions, including the adjustment process, also diverge over time and across firms (Korajczyk & Levy, 2002). In agreement, Ezeoha (2011) stated that most developing countries, in particular Nigeria, depend heavily on short term debt to finance non-growth investments and equity to finance growth investments due to the prevalence

of unstable business environments. This implies that firms in developing countries endure relatively high costs of financing compared to developed countries, since they rely on the costliest sources of financing.

1.1 Research Gap

The global financial crisis of 2007 to 2008 originated in the United States of America (USA) mortgage markets, and gradually became global. The effects of this crisis were more pronounced in some countries than in others. Amongst those that were greatly affected were Greece, Venezuela and Zimbabwe (which was already experiencing problems of its own).

Subsequently, the economy of Greece was seen to be crippled with government debt of up to $300 billion within the period 2009 to 2018 (Amaro, 2018). Further, hyperinflation reached an alarming 10 million percent in this same period in Venezuela (Sanchez, 2019). While it can be said that the economies of these two countries are quite abnormal, their abnormalities are unmatched with those of Zimbabwe, which has experienced unique economic changes[1] that have never been experienced elsewhere. On the other hand, Zimbabwe has and is still experiencing, all the economic abnormalities that are being experienced by Greece and Venezuela.

Undeniably so, existing theory and empirical literature on capital structure has been derived from well-developed economies, particularly the United States of America, where institutional characteristics are quite similar (Booth, Aivazian & Demirguc-Kunt, 2001). As such, very little work regarding the topic has been done to capture the institutional differences that exist in developing countries (Booth, Aivazian & Demirguc-Kunt, 2001; Choi, 2014; Mutenheri & Munangagwa, 2015; Pandey, Bhama & Singh, 2019).

It will be a fair conclusion if one were to conclude that these theories have been mostly proven to work or were designed to work in developed economies. To the best of the researcher's knowledge, no study has been done on the application and benefits of capital structure theories in abnormal economies like that of Zimbabwe. It is with this understanding that this study sought to establish whether capital structure theories and their derived benefits hold in abnormal economies like that of Zimbabwe during the period 2009 to 2018.

[1] These economic changes include (1) the espousal of the multicurrency regime in 2009, (2) the liquidity crisis since 2007, (3) the introduction of bond notes in 2016 and (4) the shortage of foreign currency since 2016

1.2 Problem Statement

Antoniou, Guney and Paudyal (2002) assert that the capital structure decisions of firms are not solely influenced by firm-specific characteristics, but also by its surrounding environment. This suggests that the macroeconomic environment has an impact on the firm's target capital structure. Substantially, as the macroeconomic environment fluctuates over time, going through periods of economic booms and depressions, the choice of financing for firms also varies over time and across firms.

Under normal economic conditions, firms will adopt capital structures as provided by the theories outlined in the background above. Firms will strategically make capital structure decisions that will maximise firm value, in line with what has been proven to work by a particular proven theory of capital structure. However, Zimbabwe has undergone abnormal economic conditions over the period 2009 to 2018, and firm behaviour with respect to capital structure has not remained the same.

Due to major economic changes, predominantly, (1) the liquidity crisis (2008), (2) the espousal of the multicurrency system (2009), (3) the introduction of bond notes (2016) and (4) the shortage of foreign currency (2016), the manufacturing sector in Zimbabwe has struggled over the period under study and has faced significant deterioration owing to persistent challenges impacting the sector. Kaseke (2015) concluded that the sector faced little to no access to debt financing from financial institutions. The sector was crippled with low retained income (due to low profitability caused by low capacity utilisation) to use as a source of internal funding, with investors who were highly reluctant to invest in the declining sector (Kaseke, 2015). Furthermore, the failure of the Reserve Bank of Zimbabwe to step in as the lender of last resort further exacerbated the situation. All these factors are influential towards the firms' capital structure.

In this respect, many manufacturing firms in Zimbabwe have switched into a survival mode, thus challenging the application of the capital structure theories as advocated by many researchers. The main question therefore remains, do capital structure theories hold water under abnormal economic environments?

This study sought answers to this question and in addition, sought to establish the main causes of changes in behaviour and their consequences in the manufacturing sector in Zimbabwe.

1.3 Primary Objective

The main aim of this study was to investigate the capital structure of manufacturing firms in Zimbabwe and track the capital structure deviations from well-theorised capital structure theories. The capital structure of a selected few South African manufacturing firms is looked at as an abler for comparisons.

1.4 Secondary Objectives

In order to achieve the research aim above, the following objectives were pursued:

1. To examine the variables that determine the capital structure of a number of manufacturing firms listed on the Zimbabwe Stock Exchange.
2. To examine the variables that determine the capital structure of a number of manufacturing firms listed on the Johannesburg Stock Exchange
3. To determine if existing theories of capital structure remain relevant in unstable economies like Zimbabwe.
4. To determine if existing theories of capital structure remain constant across different economic environments, particularly that of Zimbabwe and South Africa.

1.5 Research Questions

1. What variables can be derived as determinants of capital structure from existing literature and the theory of capital structure?
2. What theories are available in the literature of capital structure?
3. To what extent may these theories be expected to hold in developing countries, and in particular, in Zimbabwe?
4. What are the capital compositions of listed manufacturing firms in Zimbabwe and South Africa?
5. What are the main causes of capital structure variances between Zimbabwe and South Africa and what impact has this had on operations?

1.6 Research Hypothesis

1. NULL HYPOTHESIS (H_0): Theoretical determinants of capital structure[2] remain relevant under abnormal macroeconomic environments.

2. Alternative hypothesis (H_1): Theoretical determinants of capital structure do not hold under abnormal macroeconomic environments.

1.7 Research Rationale and Justification

The main objective of this study was to investigate the determinants of capital structure and the capital structure impacts on the performance of a number of Zimbabwean and South African listed manufacturing firms. In general, this study covers the existing theories that assist in comprehending the topic, as well as in trying to determine the variables that influence the capital structure of the firms operating under abnormal economic environments.

According to Miller and Modigliani (1958), there are three classes of economists who are concerned with the issues surrounding the cost of capital and the capital structure of the firm, these include "the corporation finance specialist concerned with the techniques of financing firms so as to ensure their survival and growth; the managerial economist concerned with capital budgeting; and the economic theorist concerned with explaining investment behaviour at both the micro and macro 1evels".

All these theories are examined in the context of Zimbabwe and South Africa.

1.7.1 Managers

Under normal circumstances, managers will want to retain control of the firm, thus, a decision to issue new equity may jeopardise control while new debt creates debt contracts. Furthermore, managers prioritise the flexibility of the firm. External funding diminishes control more, in comparison to internal sources of funding.

However, under abnormal macroeconomic conditions like that of Zimbabwe, the focus of managers may tend to shift towards basic job security, thereby ensuring the companies' survival by any means possible. This study will especially help the managers to make the financing decision

[2] Theoretical determinants of capital structure to be considered in this study are profitability, company size, growth opportunities, earnings volatility, asset tangibility, non-debt tax shields, firm's liquidity, inflation, and GDP growth.

for their firms in a manner that maximises the financial performance of the firm as well as ensures firm survival in hostile economic environments.

1.7.2 Creditors

The creditors can also take the benefit to minimise their risk, in funding specific sector firms. Lenders of funds, more than anything, want to ensure that the borrower repays the amount extended to them. As such, creditors prefer to lend to companies which provide tangible collateral, such that in the case of default, the cost of debt and interest payments can be reimbursed from the sale of the asset/s. This reduces the associated risk. Creditors are less likely to lend to firms with high debt obligations.

1.7.3 Investors

This study will be beneficial to both Zimbabwean and South African listed companies' management and investors in making clear decisions on capital structure. An investor can hence make a decision on whether to invest or not, based on the level of leverage a firm has as well as the prevailing economic conditions. Investors are less likely to invest in a highly levered firm as high leverage is associated with bankruptcy, especially in periods of economic depression, where the ability of a firm to service its debt obligation may be impaired. In the case of financial distress, creditors are the first to be compensated, then the equity holders come last.

1.7.4 Economist and Policy Makers

This study will also be beneficial to economists and policy makers in developing countries by way of suggesting areas in which the manufacturing sector can be assisted in terms of financing, so as to procreate capital structures that are efficient enough to revive the dying sector. The "economic theorist concerned with explaining investment behaviour at both the micro and macro 1evels", as provided by Miller and Modigliani (1958) , will be able to derive the theories of capital structure which will hold in hostile economic conditions, and to isolate those that prove to be not so efficient therefrom. Most importantly, they will be able to explain changes in behaviour with regards to capital structure decisions in undesirable economic circumstances.

In addition to the above, a large body of literature has been written in relation to the endless argument on capital structure theories. This study is another contribution to the existing work on the study of the impact of capital structure on the performance of Zimbabwean and South African listed manufacturing firms.

1.8 Scope of the study

This research is limited to the capital structure for manufacturing firms listed on the Zimbabwe Stock Exchange and Johannesburg Stock Exchange between 2009 and 2018. Financial Leverage is regressed against factors like profitability, size of the firm, growth opportunities, earnings volatility, inflation, and Gross Domestic Product. Furthermore, the focus of this study is on the determinants that explain the debt-equity structure of companies. In this regard, no special attention is given to the dividend policy of companies and hence the Modigliani and Miller, pecking order, trade-off and market timing theories are used only to explain the amount of debt in the capital structure of companies.

1.9 Limitations of the study

The period under study is too short, thus might not provide the necessary variability required for an objective study, especially where the study is on a single firm. However, as purported by Hsiao (2007), the use of panel data magnifies the data points.

1.10 Research Methodology

1.10.1 Study Population

The study is centred on Manufacturing Companies that are listed on the Zimbabwe Stock Exchange and Johannesburg Stock Exchange. Unlisted manufacturing companies are left out due to the challenge of limited access to information, particularly financial statements. Listed companies are required by statute to publish financial statements annually, thus allowing easier access to pertinent information.

1.10.2 Sampling Framework

The researcher employed a convenience, non-probability technique where firms were selected on the basis of the availability of information, in this case, the availability of Integrated Annual Reports throughout the study period from 2009-2018. Salkind (2012) describes convenience sampling as a technique where the sample is selected due to availability.

1.10.3 Data Collection

In this research, data were obtained from a secondary source, in particular the ZSE, the JSE and World Bank Statistics were applied as the main data sources.

1.11 Organization of the study

Chapter One: Background and Introduction

This chapter laid the foundation upon which the research is executed, with the introduction of the principle purpose of the research.

Chapter Two: Theoretical and Empirical Literature Review on the subject of Capital Structure

The chapter is basically for literature review or the theoretical and conceptual framework, which provides a platform from which the research can be synchronised with existing opinions, facts and results by previous researchers on similar studies.

Chapter Three: The Zimbabwean and South African Manufacturing Sectors – An Overview

This chapter provides an historical structure for the manufacturing sector in Zimbabwe, as well as providing a current overview and comparison with the manufacturing sector in South Africa.

Chapter Four: Research Design and Econometric Methodology

Chapter four presents the method of the research, including the development of an econometric model in relation to determinant variables.

Chapter Five: Results and Data Analysis

Chapter five provides and presents the results of an econometric model, and analysis of data under investigation.

Chapter Six: Conclusions and Discussions

The research finishes off with the sixth chapter which analyses the findings derived in chapter four and continues to conclude and give recommendations. After the sixth chapter, the reference list and the appendices follow.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Capital structure, and how it affects the firm's performance has gained significant attention in the field of corporate finance over the years (Bradley, Jarrell & Kim, 1984). This attention is centred on debates emanating from the innovatory work by Miller and Modigliani (1958) on the issue of capital structure and its impact on the firm's market value. MM 1958 conclude that a firm's value is independent of its debt or equity proportions but is rather dependent on its expected cash flows. Although the propositions brought forward by Miller and Modigliani (1958) were based on impracticable assumptions of a perfect capital market, many other theories have been developed which use the MM theory as a focal foundation. These theories include the Trade-Off theory, the Pecking Order theory, the Signaling theory, the Market Timing theory and the Agency Cost theory.

The issue of financing is quite crucial in the management of any firm as it ensures financial continuity, growth and maintenance of competitive advantage in a business environment (Šarlija & Harc, 2016). This proves to be especially true for developing economies which are characterised by underdeveloped capital markets, where debt seems to be the most prominent source of funding (Šarlija & Harc, 2016).

This chapter provides a theoretical foundation for the determinants of capital structure, as well as critically dissects the provisions of each theory. Further, the chapter establishes a synthesis of already existing empirical research, and examines variances and similarities in the work of various researchers therefrom.

2.2 Capital structure

In any firm, the role of a financial manager is centred on making three core decisions, namely the investing decision, financing decision and dividend decision. The financing decision is one of the most important decisions a financial manager has to make that has a bearing on the firm's market value (Modugu, 2013). According to Brealey, Myers and Marcus (2015), investment decisions spend money and financing decisions raise money for investment.

After committing to implement a certain project (investing decision), the financial manager has to organise the necessary capital needed for the project. Hence, capital structure recounts the decision regarding the pooling of capital resources through long term instruments such as debt or equity to fund the growth of the corporation. Ehrhardt and Brigham (2011) assert that a firm's capital

structure decision includes its choice of a target capital structure, the average maturity of its debt, and the specific types of financing it decides to use at any particular time.

2.3 Definitions of capital structure

Many scholars have attempted to define capital structure. Most of the definitions of capital structure have focused on the proportionate amounts of securities on the right-hand sides of firms' balance sheets i.e. debt and equity (Myers 2001). According to Myers (2001), the study of capital structure undertakes to explain the combination of securities and financing sources used by corporations to finance real investment. These securities are mainly debt and equity instruments.

Brealey, Myers and Allen (2011) provide a simple definition of capital structure and describe capital structure as "a firm's mix of debt and equity financing". Similarly, Pandey (2013) defines capital structure as "the proportionate relationship between debt and equity".

Aljamaan (2018) propounds that capital structure is the permanent funding of the firm, which is represented principally by long-term debt and equity. This however, does not imply that the capital structure of a firm stays stagnant over time, but can vary. Brealey, Myers and Marcus (2015) emphasise that the capital structure of any firm is not immutable and can be changed over time in line with the financial manager's preferences. Although a firm's debt to equity ratio may vary somewhat over time, most firms try to benchmark their financing mix to a target capital structure (Brigham & Daves, 2007).

In its purest form, capital structure describes the way a firm chooses to finance its development and operations. In other terms, capital structure describes the mix of owned capital (equity, reserves and retained earnings) and borrowed capital (debentures and long-term loans) that a company holds.

2.4 Components of Capital Structure

According to Raniszewski (1959), capital can either be in the form of equity capital, resulting from stock issues and characterised by the proprietary or ownership interest of the stockholders, or debt capital, representing corporate borrowing and characterised by a debtor-creditor relationship between corporation and holders of the bonds or notes. However, Raniszewski (1959) states that there is no hard and fast rule to be applied in determining the proportion of one form to another.

2.4.1 Equity

Equity refers to the shareholders' or owners' stake in the company. In any company setting, shareholders are the real owners of the business as they are the originators of capital. Hence, equity represents the shareholders' rights to the company in monetary terms. According to Brealey, Myers and Marcus (2015), shareholders are the owners of the corporation, who have an indirect claim to the business via the financial assets of the business (equity). Since shareholders are the real owners of the company, they are also the real risk bearers, but they also enjoy returns in form of dividends.

Since equity capital is a permanent form of capital, it cannot be withdrawn throughout the lifespan of the business (Aljamaan, 2018). Equity capital includes preference share capital, ordinary share capital and retained earnings. Raniszewski (1959) describes equity capital as representing the fixed assets of a corporation.

2.4.2 Debt

According to Aljamaan (2018), debt refers to any form of borrowed capital that the firm holds, therefore, it represents the outsiders' stake in the company. The use of debt in a company's capital structure is referred to as "financial leverage". Debt is provided for a fixed tenure at a fixed rate of interest. Therefore, the company has a monetary obligation to service its debt obligations by way of paying back interest and principal to debt holders, in accordance with the contractual terms of the debt instrument. The fixed interest on debt, paid by the company, is deductible as an expense against income before tax. This implies that the payment of interest reduces the tax liability of the firm. This concept is referred to as "the tax shield of debt". Examples of debt instruments include loans, debentures, and bonds.

2.4.3 Cost of capital

As explained above, capital structure is made up of two components, debt, and equity capital. Hence, the cost of capital is an aggregate of the cost of equity financing and the cost of debt financing. Brealey, Myers and Marcus (2015) defined cost of capital as the minimum acceptable rate of return on capital investment. According to Miller and Modigliani (1958), the cost of capital can be described as the rate of return which the company has to pay to the providers of capital. Further, Brigham and Daves (2007) described cost of capital as the rate of return necessary to satisfy all of the firm's investors, both stockholders and debtholders.

Brigham and Daves (2007) assert that the cost of capital has two main variations, one being the overall cost of capital, the other being the weighted average cost of capital (WACC). The overall cost of capital is made up of the cost of each component of the capital structure, without giving particular weight to any source of financing. On the other hand, with the weighted average cost of capital, weights are assigned to the respective costs of the various financing sources (Ehrhardt and Brigham, 2011).

2.4.4 Cost of equity (K_e)

When shareholders invest in a firm, they become partial owners of the firm, as well as acquiring a right to receive dividends when and if the financial manager sees fit. The cost of equity refers to the minimum rate of return that a firm has to earn on equity to maintain the value of its shares (Brigham and Daves, 2007).

2.4.5 Cost of debt (K_d)

For the purpose of calculating the cost of capital of a firm, debt usually represents interest bearing loans. Such loans are made on different contractual terms but can be conveniently differentiated into fixed and floating rate debt instruments. According to Brigham and Daves (2007) the cost of debt for a levered company can be referred to as the market interest rate of debt, less the tax component as shown in the equation hereunder.

$$K_D = I\,(1 - t) \qquad \textit{Equation 2.1}$$

2.5 Capital structure theories and optimal capital structure

According to Myers (2001), there is no universal theory of the debt-equity choice, and no reason to expect one. All the theories of capital structure deliberate on the effect of decisions made by financial management regarding the debt to equity mix on the cost of capital and the market value of the firm. The main thrust of all theories of capital structure is to investigate the possibility of an optimal capital structure and maximum market value and how it can be achieved by manipulating the debt to equity mix. However, there are several useful conditional theories which are discussed in this chapter. These theories include the Trade-Off theory, the Pecking Order theory, the Signaling theory, the Market Timing theory and the Agency Cost theory.

2.5.1 Modigliani and Miller (MM) Approach

"The pizza delivery man comes to Yogi Berra after the game and says, Yogi, how do you want this pizza cut, into quarters or eights? And Yogi says, cut it in eight pieces. I'm feeling hungry tonight" [3]**- *(Miller, 1997 explains the capital structure irrelevance proposition)***

The above statement attempts to explain the irrelevance proposition of capital structure. In their 1958 paper, *"The Cost of Capital, Corporation Finance and the Theory of Investment"*, Franco Modigliani and Merton H. Miller advocated their views on the existence of an optimal capital structure. This has become known as the "MM Approach". According to Miller and Modigliani (1958: 261-297) , "the market value of any firm is independent of its capital structure and is given by capitalizing its expected returns at the rate appropriate to its class". This implies that the debt to equity mix is irrelevant to the value of the firm.

2.5.1.1 ***Assumptions***

The MM approach was based on the assumption of a perfect capital market. It is however apparent that the ideology of a perfect capital market controverts the "real world" approach. Miller and Modigliani (1958) based their approach on a set of assumptions that describe a perfect capital market. These assumptions include but are not limited to frictionless markets, the absence of taxes, the absence of bankruptcy costs, the ability of individuals and firms to borrow at the same risk-free rate and the absence of information asymmetry, etc.

2.5.1.2 ***MM Approach Propositions***

The MM Approach provided two propositions, as hereunder.

***MM Proposition I*:** Any firm's market value is independent of its capital structure.

***MM Proposition II*:** The expected return on equity in a leveraged company will increase proportionally with the debt-to-equity ratio.

2.5.1.3 ***Proposition I: Value of the levered and unlevered firm***

This proposition speculates that, in a perfect capital market, the value of a firm is given by the market capitalisation rate of its expected returns and is independent of its financing patterns. This

[3] Peter J. Tanous interviewed Merton Miller in the book *Investment Gurus* (1997, p. 194). Miller, when asked to explain the MM Approach Proposition 1, he summarizes it in a joke about pizza. He illustrates that the number of times a pizza is cut does not alter the actual size of the pizza. Likewise, the proportions of debt and equity in a firm's capital structure does not affect the value of the firm.

implies that the value of all firms in the same risk class, whether levered or unlevered, remains the same. This is because any change in the capital structure can be duplicated or undone by shareholders, under the assumption that both firms and individual investors can borrow and lend at the same risk-free rate. Thus, investors are able to create their own portfolios. Proposition I can be shown as:

$$\mathbf{V_L = V_U = S_L + D} \quad \text{.....} \textit{Equation 2.2}$$

Where:

V_L *is value of a levered firm*

V_U *is value of an unlevered firm*

S_L *is the value of the levered firm's stock*

D is the value of debt in a levered firm

The above equation proposes that the aggregate market value of a firm's securities is equivalent to the market value of its assets, despite whether the firm is leveraged or not. This proposition implies that firm value is a constant, regardless of the ratio of debt to equity, given that the assets and growth opportunities on the left hand side of the statement of financial position are held constant (Miller & Modigliani, 1958).

2.5.1.4 ***Proposition II: Perception of Shareholders on Financial Risk***

Traditionally, debt is a relatively favourable source of financing compared to equity due to the tax deductibility of interest on debt (i.e. tax shield of debt). However, debt also introduces an aspect of financial risk to the shareholders, by way of risk of financial distress. Thus, shareholders will increase their rate of return (i.e. cost of equity) to match the increase in financial risk. The MM Proposition II propounded that any benefit conveyed by an increase in debt, will be offset by an increase in the rate of return on equity. Miller and Modigliani (1958) agreed that the use of debt increases the expected rate of return on shareholders' investments, but it also increases the risk of the firm's shares (Brealey, Myers & Allen, 2011). The MM Approach showed that the higher risk exactly offsets the increase in expected return, leaving stockholders no better or worse off (Brealey, Myers & Allen, 2011).

The MM Proposition can be expressed, for a levered firm, as:

$$K_E = K_U + (K_U - K_D)\frac{D}{E}$$ ..... ***Equation 2.3***

According to equation 2.3 above, the return on levered equity (**K_E**) equals the unlevered return (**K_U**), plus and extra "kick" because of leverage (**$\frac{D}{E} \times (K_U - K_D)$**). This impact causes a significantly high return on levered equity when the firm performs well (i.e. when **$K_U > K_D$**), yet making it drop sharply when the firm performs inadequately (i.e. when **$K_U < K_D$**).

2.5.1.5 *Criticisms of the 1958 MM Approach*

Brigham and Daves (2007) contend that academics who challenge the MM Propositions generally do so on the grounds that the assumptions on which the propositions are grounded are practically incorrect. The following are some of the most common criticisms of the MM approaches by various scholars.

According to Brealey, Myers and Allen (2011), traditionalists argue that market imperfections make personal borrowing excessively costly, risky, and inconvenient for some investors. This implies that individual investors and corporations cannot borrow and lend at the same risk-free rate. Corporations always have a higher creditworthiness, thus, they can borrow at a relatively cheaper rate of interest.

Further, Abeywardhana (2017) challenged the MM Approach by stating that capital structure irrelevance theory was theoretically sound but was based on an unrealistic set of assumptions. Even though their theory was valid theoretically, a world without taxes was not valid in reality (Abeywardhana, 2017). Due to the existence of market imperfections, arbitrage may fail to hold, and the value of a levered and unlevered firm may differ. Market imperfections are more pronounced in developing countries, which are usually characterised by underdeveloped capital markets. Thus, the assumption of a perfect capital market, as suggested by the MM Approach, may particularly fail to hold in developing countries.

The issue of homemade leverage has also been criticised. Brigham and Daves (2007) challenged Miller and Modigliani's assumption of personal and corporate leverage being perfect substitutes. Brigham and Daves (2007) contend that an individual investing in a levered firm has less loss exposure as a result of corporate limited liability than if he or she used homemade leverage.

Further, the assumptions of the non-existence of corporate taxes and transactional costs tend to be impractical. Practically, interest payments are tax deductible, which implies that the cost of borrowing will be cheaper than the annual rate of interest. Moreover, transactional costs of buying and selling financial securities do exist. Brigham and Daves (2007) provided that brokerage and other transaction costs do exist, and they too hinder the arbitrage process.

2.5.2 MM Hypothesis under Corporate Taxes

The findings of the MM Approach of 1958 were based on the assumption of the absence of corporate taxes. In 1963, Miller and Modigliani revised their "world with no taxes" hypothesis. Modigliani and Miller (1963) established that the tax shields of debt are actually greater than they had initially anticipated. This statement implied that firms are able to benefit significantly (by way of an increase in firm value) from the tax shields of debt, by increasing the proportion of debt in their capital structures.

Practically, corporate taxes do exist and make debt financing advantageous to shareholders due to its effect on tax liability. According to Abeywardhana (2017), the tax deductibility of debt lowers the firm's net tax payment, which in turn, lowers the firm's cost of capital. Therefore, Modigliani and Miller (1963) concluded that firm value increases with leverage, and that the value of a levered firm will be higher than that of a unlevered firm. This is because the Tax Code permits firms to deduct interest payments against income as an expense, but dividend payments to shareholders are non-tax deductible (Brigham & Daves, 2007). To this effect, Modigliani and Miller (1963: 433-443) stated that "the deduction of interest in computing taxable corporate profits will prevent the arbitrage process from making the value of all firms in a given class proportional to the expected returns generated by their physical assets".

However, Modigliani and Miller (1963) reiterate that, even though the tax advantages of debts are significant, it does not imply that companies should constantly seek to maximise the debt proportion in their capital structure. Other sources of financing, such as retained earnings may still be notably cheaper. Further, the company should maintain a certain degree of flexibility, so as to preserve a notable reserve of borrowing power (Modigliani & Miller, 1963).

2.5.3 Trade-off Theory

The term "trade-off theory" is used by different authors to describe a family of related theories. The original version of a traditional trade-off theory was coined from the debate over the Miller

and Modigliani (1958) irrelevance propositions. Based on the theory, there is an advantage to debt financing which is the tax shield, and there is also a cost attached to debt financing which is the obligation of interest payments and the risk of financial distress and bankruptcy. Within this fact, firms undertake to reach an optimal capital structure through matching the benefits and the costs of the each source[4] of funds (Ramadan, 2015).

Bankruptcy can be quite costly to firms. Costs associated with bankruptcy include high legal and accounting expenses and loss of key customers, suppliers, and employees. Further, bankruptcy often forces a firm to liquidate or sell assets for less than they would be worth if the firm were to continue operating (Ehrhardt & Brigham, 2011). In essence, bankruptcy costs prevent firms from pushing their debt usage to unwarranted levels.

Relatively, Bradley, Jarrell and Kim (1984) hypothesised that the optimal capital structure is a trade-off between the benefits of debt (tax shields) and the costs of debt (bankruptcy or financial embarrassment). Frank and Goyal (2008) assert that according to the trade-off theory, the finance manager evaluates the cost and benefits of various leverage strategies.

In his 1984 paper *"The Capital Structure Puzzle"*, Stewart C. Myers developed what has become known as the static trade-off theory. Myers (1984: 575-592) begins his paper by asking a critical question, "How do firms choose their capital structures?" .To answer this question, Myers (1984) theorised that the firm is viewed as setting a target debt-to-value ratio and gradually moving towards it. This target is achieved by matching the tax shields of debt against costs of bankruptcy (Frank & Goyal, 2008). Myers (1984) notes that a firm will substitute debt for equity, or equity for debt, until the value of the firm is maximised.

According to Frank and Goyal (2008), the key implication of the trade-off theory is that leverage demonstrates target adjustment, such that, deviances from the target capital structure can be progressively eradicated. Firms will favour debt over equity until the point where the likelihood of financial distress begins to be significant. The static trade-off theory, as per Myers (1984), can be explained by way of the diagram shown in Figure 2.1.

[4] The sources of financing referred to in this instance are debt and equity financing.

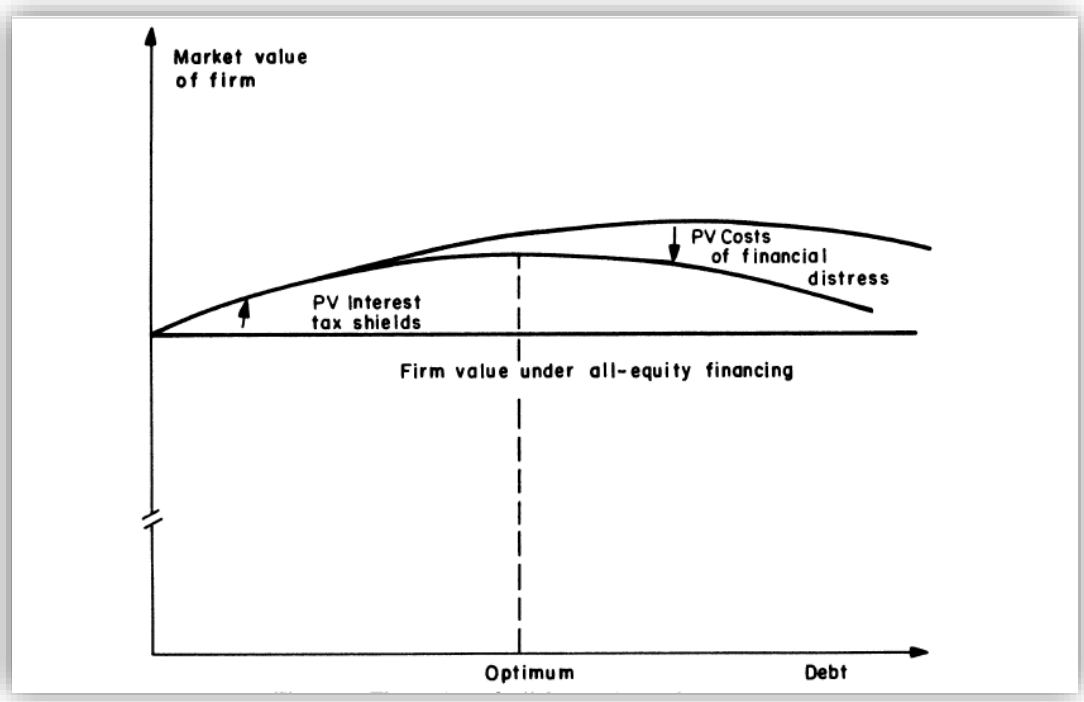

Figure 2.1: Trade-Off Theory

Source: Myers (1984)

In light of the trade-off theory, Brigham and Daves (2007) concluded that debt finance offers benefits to the firm due to the tax deductibility of interest, thus firms ought to have debt in their capital structures. However, agency costs and financial distress present a limit to the use of debt; beyond a certain threshold, these costs begin to offset the tax advantages of debt (Brigham & Daves, 2007).

2.5.4 Pecking Order Theory

The Pecking order theory was developed by Stewart C. Myers and Nicholas S. Majluf in 1984 who, in turn, were influenced by earlier institutional literature, including the book by Donaldson (1961). The theory suggested that a firm follows a certain preference when it comes to deciding a source of financing. While the trade-off theory takes into consideration an optimal capital structure, the pecking order theory discusses the conflict arising between inside and outside investors due to information asymmetry. In the words of Ehrhardt and Brigham (2011), the existence of flotation costs and asymmetric information may cause a firm to raise capital according to a pecking order.

Myers (1984: 575-592) provided four conclusions on the pecking order hypothesis as:

1. Firms prefer internal finance to external finance.
2. Firms adapt their target dividend payout ratios to their investment opportunities, although dividends are sticky and target payout ratios are only gradually adjusted to shifts in the extent of valuable investment opportunities.
3. Sticky dividend policies, plus unpredictable fluctuations in profitability and investment opportunities, mean that internally-generated cash flow may be more or less than investment outlays. If it is less, the firm first draws down its cash balance or marketable securities portfolio.
4. If external finance is required, firms issue the safest security first. That is, they start with debt, then possibly hybrid securities such as convertible bonds, then perhaps equity as a last resort. In this story, there is no well-defined target debt-equity mix, because there are two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom. Each firm's observed debt ratio reflects its cumulative requirements for external finance.

In simple terms, Myers and Majluf (1984) provided that companies prefer internal funding (retained earnings) to external funding (share issues or debt financing). Further, when faced with external funding, firms will prefer debt financing, then preferred stock and lastly, ordinary stock, in that order. The pecking order hypothesis can be shown by way of a diagram in Figure 2.2.

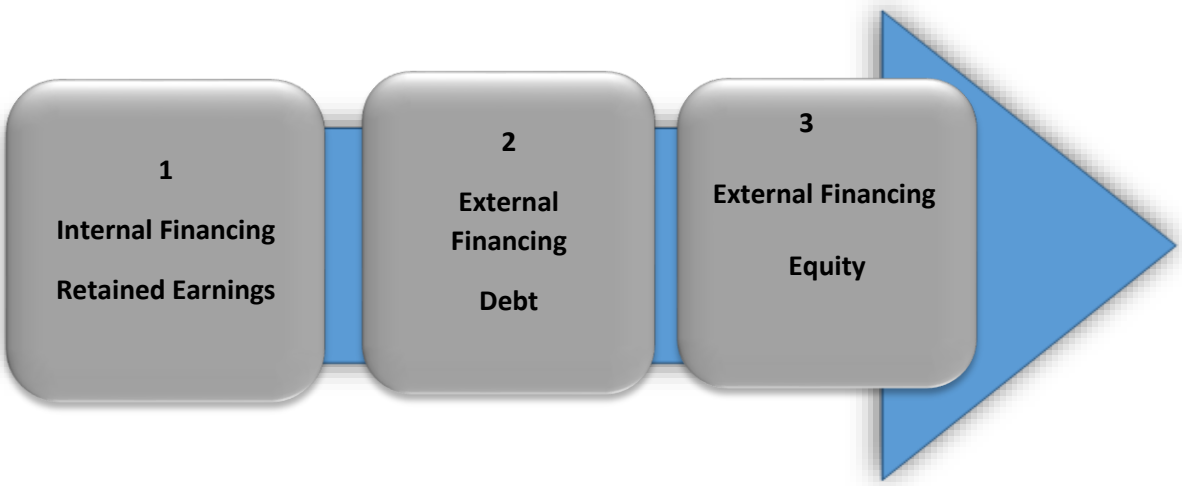

Figure 2.2: Pecking Order Theory

Source: Author's Contribution

2.5.5 Agency Cost Theory

In their 1976 paper, *"Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure"*, Michael C. Jensen and William H. Meckling attempted to integrate the theory of property rights, the theory of agency and the theory of finance to develop a theory of capital structure for the firm.

Jensen and Meckling (1976: 305-360) defined the agency relationship as "…a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent". However, if both parties to this relationship are utility maximisers, it is pertinent to believe that the agent will not always act in the best interest of the principal (Jensen & Meckling, 1976). This concept is what has become known as the agency problem.

Closely related to the agency problem, is the concept of agency costs. In basic terms, agency costs are the costs incurred by both the principal and the agent with regards to minimising the agency problem. Jensen and Meckling (1976) defined agency costs as the aggregate of 1) the monitoring expenditures by the principal, 2) the bonding expenditures by the agent and 3) the residual loss. Similarly, Brigham and Daves (2007) provided that agency costs include all costs borne by shareholders to encourage managers to maximise the firm's long-term stock price rather than act in their own self-interest. It is generally impossible for the principle or agent to ensure that the agent acts in the best interest of the principle at zero costs (Jensen & Meckling, 1976).

In developing the theory, Jensen and Meckling (1976) isolated two agency relationships, 1) between the manager and the shareholders and 2) between the debtholders and shareholders. Managers may tend to utilise a large proportion of the firm's resources towards perquisites (or personal benefits) such as luxurious offices, large bonus packages and 'building empires', as long as they do not bear the residual loss. The residual loss is defined by Jensen and Meckling (1976) as the dollar value of the agent's divergence from maximising the principal's welfare.

The agency cost theory of capital structure hypothesises that an optimal capital structure is achieved at a point where agency costs are at their minimum (Jensen & Meckling, 1976). According to Jensen and Meckling (1976), an increase in debt will reduce the agency costs, and in turn, increase the value of the firm through shareholder wealth maximisation.

Once the firm has an obligation to service debt, managers have less free cash flow to spend on perquisites and are afraid to lose their jobs, given the company runs into bankruptcy due to financial distress. Owing to these factors, the manager will invest capital into high return projects to ensure that principal and interest from debt are paid back. According to Harris and Raviv (1991), an increase in the proportion of debt held by the firm increases the manager's share of the equity and alleviates the loss arising from the conflict between the manager and shareholders.

Consequently, the conflict of interest between shareholders and debtholders arises when the debt contract allows the shareholders an incentive to invest sub-optimally (Harris & Raviv, 1991). This simply implies that, if the project for which the debt financing has been invested generates returns that are over and above the cost of debt, it is the shareholders who stand to benefit. On the other hand, if the investment fails, debtholders bear the loss due to limited liability on the part of shareholders. If debtholders anticipate that shareholders will make poor investment decisions in this respect, then the shareholders will receive less for the debt than they otherwise would. This eradicates the agency problem because shareholders will now bear the cost of the incentive of investing in value decreasing projects (Harris & Raviv, 1991).

2.5.6 Signaling Theory

The signaling theory of capital structure was developed by Stephen A. Ross in his 1977 paper "*The determination of financial structure: the incentive-signaling approach*". This theory was built on the argument concerning the MM Approach irrelevancy proposition. The irrelevancy proposition assumed that there is no asymmetric information. This implies that the market possesses full information regarding the activity of firms. Ross (1977: 23-40) challenged this assumption and stated that "if managers possess inside information, then the choice of a managerial incentive schedule and of a financial structure signals information to the market, and in competitive equilibrium the inferences drawn from the signals will be validated". The signaling theory therefore suggests that a firm's capital structure strategy sends diverse signals to potential investors about the financial dependence of the firm (Akorsu, 2014).

The signaling theory provides that an issue of debt signals undervaluation of the firm. This is due to the fact that a debt issue usually implies that the managers anticipate positive future prospects for the firm, and the firm is more than able to meet its debt obligations to avoid bankruptcy. On the contrary, Ross (1977) established that an equity issue signals overvaluation of the firm. The

conclusions of the signaling theory show that an increase in financial leverage will increase the firm's value, since an increased leverage increases the market's perception of value (Ross, 1977).

2.5.7 Market Timing Theory

According to the empirical discoveries of the "windows-of-opportunity" hypothesis, Baker and Wurgler (2002) were the first to hypothetically and empirically discover and establish a relationship between the capital structure of a firm and the market timing effect of equity. In developing the market timing theory, Baker and Wurgler (2002) hypothesised that the current capital structure is strongly related to historical market values. Baker and Wurgler (2002: 1-32) stated that "capital structure is the cumulative outcome of a firm's past attempts to time the equity market".

In corporate finance, the term "equity market timing" refers to the practice of issuing shares at a high price and buying them back at a low price (Baker & Wurgler, 2002). The main aim is to take advantage of temporary fluctuations in the cost of equity in relation to the cost of other sources of capital. The market timing theory of capital structure suggests that firms will issue new equity when their share price is overvalued, and will buy back equity when their share price is undervalued (Baker & Wurgler, 2002). This fluctuation in the share price has an impact on corporate financing decisions and eventually, the capital structure of the firm (Abeywardhana, 2017). Further, managers are able to identify times at which it is less costly to issue equity compared to other sources of financing due to the markets' overvaluation of the firm's equity.

Unlike the trade-off theory, the market timing theory is not based on a target optimal capital structure, but retains any adjustment to the debt–equity mix. The results of the market timing theory show that the effects of timing the equity market on capital structure are large and persistent, and can last up to ten years (Baker & Wurgler, 2002).

2.6 Firm Specific Determinants of Capital Structure

2.6.1 Profitability

Profitability has been one of the most prominent determinants throughout most capital structure literature. The effect of profitability on leverage levels can be explained using a number of theories. In light of the pecking order theory, as explained above, firms prefer internal funding to external funding. The order of preference is from the least risky source of financing to the most risky source of financing (Myers, 1984). In this respect, profitable firms with access to retained income can

utilise them as a source of funding as opposed to external sources, such as debt. A negative relation between profitability and leverage is therefore anticipated. Rajan and Zingales (1995) and Titman and Wessels (1988) agreed with this relation and concluded that firms with relatively high profit rates will generally maintain low levels of debt, ceteris paribus.

However, other theories predict a positive relationship between profitability and leverage. Such theories include the trade-off theory. The trade-off theory provides that the optimal capital structure is a trade-off between the tax benefits of debt and the cost of financial distress. The theory suggests that a firm will benefit from an increase in debt financing (through the tax shields of debt) up to a point where the cost of financial distress starts to outweigh the tax benefit of debt. By this token, profitable firms are able to borrow more as they are more prepared to meet their debt obligations as they fall due and have a lesser risk of bankruptcy. In a tradeoff view, the risk of bankruptcy decreases with an increase in profitability.

The agency cost theory also predicts a positive relationship between profitability and leverage. The agency cost theory holds that an optimal structure is one that minimises agency costs (Jensen & Meckling, 1976). According to Jensen and Meckling (1976), an increase in debt will assist in minimising agency costs, hence an optimal capital structure. For profitable firms, an increase in debt will reduce the amount of free cash flow available for managers to utilise for perquisites. At the same time, debtholders are more willing to lend to profitable firms since they have a lower risk of financial distress.

Further, the signaling theory supports a positive prediction on the relationship between profitability and leverage. A debt issue will signal that the managers anticipate positive future prospects for the firm (Ross, 1977).

Empirically, most researchers' findings concur with the predictions of the pecking order theory, and find that profitability is negatively related to leverage (Titman & Wessels, 1988; Harris & Raviv, 1991; Rajan & Zingales, 1995; Booth, Aivazian & Demirguc-Kunt, 2001). In more recent years, Shubita and Alsawalhah (2012) studied industrial firms listed on the Amman Stock Exchange and also found a negative relationship between profitability and leverage. Their results suggested that more profitable firms depend on equity as their primary source of financing, instead of debt. Velnampy and Niresh (2012) studied 10 Sri Lankan listed banks over eight years and found a negative association between profitability and capital structure. In contradiction, Jensen and Meckling (1976) found a positive relationship in agreement with the agency cost theory.

Chavali and Rosario (2018) concluded that an increase in debt will increase the profitability as debt is the cheapest source of financing, following a positive relationship between profitability and leverage.

2.6.2 Firm size

In light of the trade-off theory, larger firms are more diversified, therefore having a lower probability of bankruptcy due to low risk levels (Titman & Wessels, 1988). Additionally, large firms have more stable cash flows and have good reputations in the debt market, owing to higher credit ratings. This implies that larger firms are able to tolerate large debt ratios in comparison to smaller firms. As cited by Abor (2008), Castanias (1983) stated that smaller firms maintain lower debt ratios since it is quite costly for them to resolve information asymmetries with debt providers. The trade-off predicts an inverse relationship between firm size and the likelihood of bankruptcy, this follows that a positive relationship between firm size and leverage is anticipated.

On the contrary, the pecking order theory predicts a negative relationship between firm size and leverage. As mentioned above, larger firms have more stable earnings and can therefore make use of retained earnings as a source of financing first. Rajan and Zingales (1995) supported this negative relationship between size and leverage and provided an alternative source of this relationship. Rajan and Zingales (1995) explained that there are fewer information asymmetries between large firms and participants in the capital market, thus, large firms are more able to issue information sensitive securities such as equity, resulting in low debt levels.

The results of empirical research (Titman & Wessels, 1988; Booth, Aivazian & Demirguc-Kunt, 2001; Sayılgan, Karabacak & Küçükkocaoğlu, 2006; Daskalakis & Psillaki, 2008) generally show that firm size is positively related with leverage. Wahome, Memba and Muturi (2015) studied the influence of firm specific factors on Kenyan insurance firms between 2003 and 2012 and found that size had a significant influence on capital structure with moderating effect of the management control. Drobetz *et al.* (2003) found that size is positively related to leverage, signifying that size is a proxy for a low likelihood of default. On the contrary, Faris (2011) found a negative relationship between size and leverage.

2.6.3 Asset Tangibility

The assets structure of any firm has been regarded, by many articles in corporate finance, to have a significant impact on its capital structure. However, there is no consensus among authors

regarding the direction of the relationship between asset structure and leverage (Bereźnicka, 2013; Šarlija & Harc, 2016). Tangible assets can be defined as physical items with a known purchase value that are used by the business to produce goods and services. Examples of tangible assets include fixed assets, such as machinery and buildings, and current assets, such as inventory.

In a trade-off theory perspective, a positive relationship between asset tangibility and leverage is anticipated. This is because tangible assets represent collateral and offer security to lenders in the occurrence of financial distress, therefore allowing firms to issue debt. Harris and Raviv (1991) concur with this explanation and argued that firms that hold a large proportion of tangible assets have higher liquidation values. Subsequently, the Harris and Raviv (1991) model provided that firms with high liquidation values will hold more debt. In the case of bankruptcy, tangible assets have a higher value compared to intangible assets.

Daskalakis and Psillaki (2008) assert that the asset structure is closely linked to the cost of financial distress. The cost of financial distress for any firm is dependent upon its asset structure. According to Daskalakis and Psillaki (2008), if a firm is holding large investments, tangible assets such as land and equipment, it will have lower costs of financial distress in comparison to a firm that is relying on intangible assets. To this effect, firms with a larger proportion of tangible assets is able to borrow more.

The agency cost theory also predicts a positive relationship between asset tangibility and leverage. This is also based on the availability of tangible assets as collateral for debt. As such, debtholders are more comfortable lending to a firm that has large collateral in case of bankruptcy so as to ensure restitution of principal and interests. Rajan and Zingales (1995) correspond with the agency theory and stated that if a firm is holding a large fraction of tangible assets, then these assets should serve as collateral, reducing the risk of debtholders suffering the agency costs of debt (like risk shifting).

In contrast, the pecking order theory predicts a negative relationship between asset tangibility and leverage. As explained above, tangible assets are the physical assets that are used to produce goods and services for the business. Therefore, a firm with more tangible assets tends to rely more on the internal financing generated by these assets (Šarlija & Harc, 2016).

Empirically, most researchers concur with the predictions of trade-off and agency theories. Nilssen's (2014) findings on a study of 90 Norwegian firms between 2007 and 2013 showed that asset tangibility is the most important firm characteristic to consider when making capital structure

decisions. On a study conducted with a sample consisting of 500 Croatian SMEs over the period 2005-2010, Harc (2011) found that the relationship between tangible assets and long-term leverage is positive in all observed years and statistically significant. Sanyal and Mann (2010) investigated the financial structures of startup firms and found that startups with more tangible assets are more likely to use external debt in the financial structure since these assets have a high liquidation value. Bas, Muradoglu and Phylaktis (2009) found a positive relationship between asset tangibility and long-term debt but found a negative relationship between asset tangibility and short term debt.

2.6.4 Non-Debt Tax Shields

Modigliani and Miller (1963) introduced corporate taxes into their "world with no taxes" proposition and concluded that a company can benefit from employing debt since debt interests are allowable against profit, thereby reducing the taxable income. This is what is known as the "tax shields" of debt. According to the trade-off theory, the tax shields of debt allows the firm an incentive to employ more debt in its capital structure but only to a point where financial distress costs begin to outweigh the tax benefit. However, interest deductions create tax shields only if they significantly offset the taxable income, which is less likely with the presence of substantial non-debt tax shields (DeAngelo & Masulis, 1980). As cited by Downs (1993), Ross (1985) stated that the expected value of the tax shields of debt declines with significant non-debt tax shields, and the incentive of debt financing is reduced. In this respect, debt financing is 'crowded out'" by non-debt tax shields, as such a negative relationship between non-debt tax shields and leverage is anticipated (Downs, 1993).

Nasution, Panggabean and Siregar (2017: 65-74) defined non-debt tax shields as "fixed tax-deductible expenses such as depreciation, depletion, amortisation, research and development expense, investment tax credit, and others that act as tax shield with similar benefits to interest expenses from debt financing, thus lowering the probability that the firm would have to incur more debt". Ali, Yadav and Islamia (2011) earlier developed with this definition and pointed out that firms can make use of such non-interest items to decrease their taxable income and help their bottom-line, as such firms with higher non-debt tax shields are more likely to use less debt.

Downs (1993) found a positive relationship between non-debt tax shields and leverage and concluded that firms with a significant cash flow from depreciation tap into their higher debt capacity by preserving a financial structure with substantially higher debt than otherwise. In

contradiction, Ali, Yadav and Islamia (2011) found a negative relationship between non-debt tax shields and leverage. Nasution, Panggabean and Siregar (2017) studied manufacturing firms listed on the Indonesia Stock Exchange and also found a negative relationship between non-debt tax shields and corporate leverage. Similarly, Gao (2016) found a significant negative relation between non-debt tax shields and corporate debt levels in a study of A-share listed corporations of China from 2008 to 2013.

2.6.5 Growth Opportunities

Taking a trade-off theory perspective, there should be a negative relationship between growth opportunities and leverage. This is because growing firms are more prone to the effects of financial distress and bankruptcy compared to mature firms. Myers (1984) stated that expected cost of financial distress for growing firms does not only depend on the probability of trouble, but the value at risk if trouble comes. Further, the trade-off model predicts that firms with more investment opportunities have less leverage because they have stronger incentives to avoid underinvestment and asset substitution that can arise from stockholder-bondholder agency conflicts (Myers, 1984).

Booth, Aivazian and Demirguc-Kunt (2001) explained growth opportunities in light of the agency cost theory, and suggested that growing firms will have higher agency costs of debt since debt providers anticipate that growing firms will invest in risky projects into the future. Therefore, the agency cost theory predicts a negative relationship between growth opportunities and leverage.

The pecking order theory predicts a positive relationship between growth opportunities and leverage. The pecking order theory suggests that firms will make use of internal sources of financing first (retained earnings), and if firms are faced with external financing, they will choose debt over equity. In this respect, growing firms have little to no retained income, which may be insufficient for the firm's growth and expansion. The following option for a growing firm is therefore debt financing, which is a relatively cheaper source of financing in comparison to equity financing. This implies that firms with more growth opportunities will have a higher level of leverage (Drobetz *et al.*, 2003). Further, growing firms have a higher need of funds and may tend to borrow more. They will especially issue securities with less information asymmetries such as short term debt (Ali, Yadav & Islamia, 2011).

Miller and Modigliani (1958) also concur to a positive relationship between growth opportunities and leverage. As per the MM Approach, growing firms may not favour issuing common stock to finance major projects at the then presiding price, as this price may not be sufficient enough to

realise the full potential of the new venture. Instead, growing firms may prefer to issue debt, and once the project proves profitable, they can pay back the debt either by issuing common stock at a price that reflects the true value of the firm or by retained earnings (Modigliani & Miller, 1963).

Empirical research show contradicting results on the relationship between growth opportunities and leverage. Rajan and Zingales (1995) found a negative relation between growth opportunities and leverage in support of the trade-off and agency theories. The results of a study by Drobetz *et al.* (2003) on the determinants of capital structure in Switzerland showed that firms with more investment opportunities apply less leverage, which supports the trade-off model. On the contrary, Titman and Wessels (1988) found a positive result in support of the pecking order theory. Chen and Zhao (2006) also found a positive relationship between mark-to-book-ratio (a commonly used proxy for growth opportunities) and leverage for more than 88% of COMPUSTAT firms.

2.6.6 Earnings Volatility

Earnings volatility represents the business risk that a firm is faced with. Booth, Aivazian and Demirguc-Kunt (2001) defined earnings volatility as a proxy for the probability of financial distress. According to the trade-off theory, there is an inverse relationship between the firm's risk and its leverage ratio. This is because leverage increases the risk of financial distress, as such, a negative relationship between earnings volatility and leverage is expected (Lim, 2012). Titman and Wessels (1988) earlier set out this explanation and stated that a firm's optimal debt level is a decreasing function of the volatility of earnings. Firms with high earnings volatility run the risk of the earnings decreasing to a level that is below their debt servicing obligations, thus a higher financial distress cost (Bhaduri, 2002).This follows that firms with high earnings volatility should maintain low levels of debt so as to reduce the likelihood of bankruptcy.

Although Frank and Goyal (2009) concluded that earnings volatility does not significantly explain capital structure, Booth, Aivazian and Demirguc-Kunt (2001) found a strong negative relationship between earnings volatility and leverage. In more recent years, Keefe and Yaghoubi (2014) also found a significant negative relation between earnings volatility and leverage.

2.6.7 Liquidity

Liquidity of an asset refers to the ease at which the asset can be converted into cash. Myers and Rajan (1998) provided a similar definition and stated that the liquidity of an asset represents the ease with which it can be traded. To measure the liquidity of a firm, the Current Ratio is used. The

current ratio shows how well a firm's current assets are able to cover its current liabilities at a given time. A current ratio of 1 entails that a company is able to meet its short term obligations as they fall due, whereas a current ratio of less than 1 means that the company's current assets are not sufficient to meet its short term obligations.

Taking a pecking order stand, a negative relation between liquidity and leverage is anticipated. The explanation therefrom is that, according to the pecking order theory, firms utilise internal funds first before external funds. It follows that firms with highly liquid assets are able to convert them into cash easily and utilise the proceeds to finance investment projects.

In contradiction, the trade-off theory predicts a positive relationship between asset liquidity and leverage. Nilssen (2014) defined liquidity as the ability of a firm to utilise its current assets to meet its current liabilities. This implies that liquidity also speaks to the way a firm meets its short-term obligations as they fall due. According to the trade-off theory, highly liquid firms are more able to meet their debt obligations as they fall due, thus employing more debt.

Empirical results regarding the relationship between liquidity and leverage are contradictory. While Morellec (2001) and Myers and Rajan (1998) found that the relationship between liquidity and leverage is negative or curvilinear, Williamson (1988) and Shleifer and Vishny (1992) found a positive effect. Sibilkov (2009) tested the correlation in U.S public companies and found that asset liquidity has a positive effect on debt levels.

2.7 Macroeconomic Determinants of capital structure

2.7.1 Inflation

The inflation rate has been widely considered as a determinant of capital structure decisions by various scholars (Chen & Boness, 1975; Fan, Titman & Twite, 2012; Yinusa, Alimi & Ilo, 2016; Mallisa & Kusuma, 2017). Samuelson and Nordhaus (2010) defined inflation simply as a rise in the general level of prices. Cachanosky (2009:1-7) provided a more complex definition of inflation – "an increase in the price of money that is not offset by an increase in the need for money".

A negative relationship between inflation rate and leverage is anticipated. As the inflation rate increases, the rate of interest also increases therefore leading to a higher cost of borrowing. In agreement, Chen and Boness (1975) concluded that uncertainty in the inflation rate increases the cost of capital thereby affecting both investment and financing decisions of a firm. Further, Fan, Titman and Twite (2012) stated that high inflation is usually associated with high levels of

uncertainty about the future, thus driving lenders away from long term debt. On the contrary, firms prefer to use debt finance in inflationary periods because inflation lowers the real cost of debt. Most researchers find a significant negative relationship between the inflation rate and corporate borrowing (Booth, Aivazian & Demirguc-Kunt, 2001; Fan, Titman & Twite, 2012; Yinusa, Alimi & Ilo, 2016).

2.7.2 Gross Domestic Product

The Gross Domestic Product (GDP) is widely used to measure a country's overall economic performance. According to Samuelson and Nordhaus (2010), GDP is the aggregate market value of the final output of goods and services produced within a country in a given year. Since the GDP represents a nation's wealth, it is expected that as countries become wealthier, more funding becomes available. As such, a positive relationship between GDP growth and leverage is anticipated. However, empirical findings on this relationship are inconsistent. While Jong, Kabir and Nguyen (2008) found a positive relationship between GDP growth and leverage, Demirgüç-Kunt and Maksimovic (1998) found a negative result.

2.8 Review of Empirical Literature

2.8.1 Evidence of work done in Developed Countries

Bradley, Jarrell and Kim (1984) investigated the capital structure of 851 firms in the United States over 20 years. The results of their study showed that earnings volatility has a significant inverse correlation with leverage. Research and development and advertising costs also have a negative impact on debt levels. Astonishingly, they found a strong direct relationship between non-debt tax shields and leverage.

Titman and Wessels (1988) explored the explanatory power of an extensive set of theories of capital structure. They analysed different types of debt securities including short-term debt, long-term debt and convertible debt instead of an aggregate measure of total debt. Their study analysed 469 American firms from 1974 to 1982, making use of data from the Annual Compustat Industrial File and the U.S Department of Labor. One of the significant findings of this study showed that leverage is negatively correlated to the "uniqueness" of the firm's line of business. Titman and Wessels (1988) showed that transaction costs are an important determinant of capital structure, but failed to find any significant results in support of an effect on leverage stemming from volatility,

future growth, non-debt tax shields and collateral value. However, they also found a negative relation between profitability and debt, and between firm size and short-term debt.

Rajan and Zingales (1995) investigated capital structure decisions of public firms in the major developed countries (G-7 countries, which are United States, Japan, Germany, France, Italy, the United Kingdom, and Canada). They made use of data from the Global Vantage database, which contained accounting data for about 8000 firms from 31 countries in the period 1987 to 1991. The findings of their study showed that firm size and asset tangibility are positively correlated with leverage. On the other hand, Rajan and Zingales (1995) found a negative correlation between profitability and leverage, and between mark-to-book ratio and leverage.

Further, Drobetz *et al.* (2003) tested the trade-off and pecking order on Swiss firms. Although the leverage levels of Swiss firms are generally low, they based the results on the exact definition of leverage. Drobetz *et al.* (2003) found an inverse correlation between profitability and leverage, which confirms the pecking order theory. They also found an inverse relationship between growth opportunities and leverage, which supports the trade-off theory. Lastly, Drobetz *et al.* (2003) found that leverage significantly correlated with asset tangibility and earnings volatility.

In more recent years, Frank and Goyal (2009) investigated the capital structure decisions of publicly traded firms in America over the period 1950 to 2003. The results of their study showed that profitability and mark-to-book assets ratios are negatively correlated to leverage. On the other hand, expected inflation and log of assets have a positive impact on debt levels.

2.8.2 Evidence of work done in Developing Countries

Relatively less work has been done in developing countries with regards to capital structure decisions. The main variance between developing and developed economies lies in the tenure of the debt financing. In developed economies, firms finance their investments with long-term debt whereas short-term debt is mainly contributing in leverage of firms in developing economies (Booth, Aivazian & Demirguc-Kunt, 2001).

The standout study on capital structure decisions in developing countries is the one by Booth, Aivazian and Demirguc-Kunt (2001). Booth, Aivazian and Demirguc-Kunt (2001) studied the capital structure decisions of 10 developing countries from 1980 to 1991, and found that the factors that affect financing choices are the same for firms in developing countries but are different across countries, providing evidence of the presence of country-specific forces. The 10 countries

examined in this study included India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea. The results of this study showed that profitability, asset tangibility and size are significant determinants of capital structure in all countries in the data set. However, Booth, Aivazian and Demirguc-Kunt (2001) also stressed the importance of country-specific factors in determining capital structure.

Ezeoha (2011) investigated the financing decisions of firms operating in unstable macroeconomic environments, in particular Nigeria. In agreement with Booth, Aivazian and Demirguc-Kunt (2001), Ezeoha (2011) found that 90% of Nigerian firms are financed with short-term debt. The results of this study showed that profitability is negatively and significantly correlated with leverage, in support of the pecking order theory. The study also found a strong positive relationship between asset tangibility and long-term debt. Ezeoha (2011) found size to be negatively correlated with leverage.

In China , Lim (2012) analysed the capital structure determinants of 36 A-share listed firms in the financial service sector between 2005 to 2009. The results of the study showed that profitability, firm size, non-debt tax shields and earnings volatility have significant impact on financing decisions in the financial service sector. Most importantly, Lim (2012) found a positive relation between firm size and the corporate leverage ratio. However, the study found that profitability, non-debt tax shields and earnings volatility are negatively and significantly correlated with debt levels.

Further, Awan and Amin (2014) conducted their study of financing decisions on 68 textile firms in Pakistan in the period 2005 to 2012. The study showed that firm size, profitability, and earnings volatility have a significant negative impact on financial leverage. However, asset tangibility, non-debt tax shields and liquidity have a significant positive impact on financial leverage. Variables such as profitability and firm size conformed to the pecking order theory, whereas earnings volatility, liquidity and asset tangibility supported the trade-off theory.

Mutenheri and Munangagwa (2015) examined the capital structure decisions of 43 Zimbabwean listed firms during the multi-currency regime (2010-2013). The results of this study showed that profitability, tangibility and firm size are significant determinants of capital structure but had different signs from those previously conveyed under different regimes. Their result serves to show capital structure decisions may change over time, depending on institutional environment. Mutenheri and Munangagwa (2015) found a positive relation between profitability and leverage.

On the other hand, they found that asset tangibility and firm size have a significant negative impact on financial leverage.

In 2016, Šarlija and Harc (2016) investigated the capital structure of small to medium enterprises (SMEs) in Croatia. Their data set comprised 500 SMEs in the period 2005 to 2011. The results of a fixed effects regression model showed a negative relationship between profitability and leverage, in support of the pecking order theory. On the contrary, Šarlija and Harc (2016) showed that asset tangibility, firm size and growth opportunities have a positive impact on the debt levels of Croatian SMEs. The results for asset tangibility and firm size supported the trade-off theory, whereas growth opportunities conformed to the pecking order theory.

Suarez (2016) studied capital structure in the context of 35 listed industrial companies in Colombia in the period 2011 to 2012. The results revealed that factors such as tangibility, tax rates and age do not have any significant impact on the firm's leverage. On the contrary, Suarez (2016) found that firm size has a significant positive impact on financial leverage.

2.9 Chapter Summary

In this chapter, the author provided the theoretical fulcrum regarding capital structure. The provisions of each theory of capital structure were examined and critiques raised therefrom. A number of variables that are deemed by theory as determinants of capital structure were also examined. These include, but are not limited to profitability, firm size, asset tangibility, non-debt tax shields, growth opportunities, earnings volatility and liquidity. Lastly, empirical views and findings on the subject matter were compared and contrasted.

CHAPTER 3: OVERVIEW OF THE MANUFACTURING SECTOR IN ZIMBABWE AND A BRIEF SYNOPSIS OF THE SOUTH AFRICAN MANUFACTURING SECTOR

3.1 The role and importance of the manufacturing sector in an economy

Amongst the wide number of academics who were in the quest of establishing an underlying relationship between manufacturing and economic growth, was Nicholas Kaldor. In his 1966 inaugural lecture at Cambridge University, Nicholas Kaldor developed what has become known as the "Kaldorian Laws", in which he opposed the endogenous growth theory which suggested that economic growth is generated internally within a system. Kaldor (1966) was of the contention that some external factors of demand and supply are also instrumental towards economic growth in the long run. In the words of Kaldor (1966), "manufacturing is the engine of growth".

In their simplest form, Kaldor's laws held that (1) manufacturing is the engine of economic growth, (2) there is a positive correlation between manufacturing growth and productivity growth in the manufacturing sector, this is also known as Verdoon's Law and (3) manufacturing growth induces productivity growth to other sectors of the economy.

Several studies (Szirma i & Verspagen, 2011; McKinsey Global Institute, 2012; Naudé & Szirmai, 2012) also support the notion of the manufacturing sector being instrumental to economic growth. Szirmai and Verspagen (2011) stated that the engine of growth proposition discreetly claims that the level of capital intensity in the manufacturing sector is relatively higher compared to other sectors of the economy. This assertion simply implies that the manufacturing sector, in any economy, plays a pivotal role towards economic growth and development.

In addition to being the keystone of many economies, the manufacturing sector has multiplier effects and thus is closely interconnected with spillover effects to other key sectors of an economy. According to Kaseke (2015), the manufacturing sector is a highly diversified sector which has robust linkages with other key sectors of the economy such as the mining, construction and agriculture sectors. These inter-sectoral linkages can either be backwards (for instance with mining and construction) or forwards (for instance with export trade) (Veugelers, 2013).

The manufacturing sector also stimulates the creation of employment. A continuous growth in the manufacturing sector in turn leads to a demand for labour, not only in the manufacturing sector alone, but in other closely linked sectors in the economy (due to the spillover effects of the

manufacturing sector). In agreement, Kaseke (2015) stated that the manufacturing sector has more than just strong synergies but also has ripple effects, such as employment creation and export earnings.

3.2 The Manufacturing Sector in Zimbabwe

In the period 1980-1990, Zimbabwe's economy was branded by robust economic connections and strong backward and forward inter-sectoral linkages which fostered economic progression and expansion (Saungweme, 2013). During this same period, the manufacturing sector was the main engine of economic growth, with a 32% contribution towards GDP. However, in the subsequent years leading to the 2000 recession, the country began to experience periods of economic retardation.

Due to this economic slowdown, the manufacturing sector in Zimbabwe has struggled incalculably. Coltart (2007) commented that the manufacturing sector had shrunk by more than 51% in the ten-year period from 1997-2007. To date, the sector continues to experience a boundless decline. The Reserve Bank of Zimbabwe's Quarterly Economic Review of March 2015, accredited the significant deterioration in manufacturing output to "tenacious challenges distressing the sector, which include high production costs, obsolete plant and machinery, inflow of cheap imports, strict labour laws, weak effective demand, as well as insistent liquidity restraints". Contribution of the sector towards GDP has decreased substantially.

Table 3.1: Contribution of the sector towards GDP

	POST INDEPENDENCE PERIOD (1980-1989)	LIBERIZATION PERIOD (1990-1996)	ECONOMIC CRISIS PERIOD (1997-2008)	MULTI CURRENCY PEIOD (2009-2018)	1980-2018
GDP CONTRIBUTION (%)	20.1837	21.07229	14.29833	11.1234	16.20915
MANUFACTURING OUTPUT (US$Bn)	1.457	1.598571	0.878333	2.048	1.455897

Source: ***https://data.worldbank.org***

Table 3.1 above shows how the manufacturing sector's contribution towards GDP continues to be on the decreasing end. Although the sector's output increased slightly in monetary value during the multicurrency regime, a sharp decrease can be seen during the economic crisis period.

3.3 Macroeconomic changes and how they have affected capital structure decisions in the sector

The capital structure decisions of any firm are not solely influenced by firm specific characteristics, but also by its surrounding environment (Antoniou, Guney & Paudyal, 2002). This suggests that the macroeconomic environment has an impact on the firms' target capital structure. As the macroeconomic environment fluctuates over time, going through periods of economic booms and depressions, the choice of financing for firms also varies over time and across firms.

The macroeconomic environment in Zimbabwe has been turbulent for a long time, backdating to even before the Global Financial Crisis of 2007 – 2008. Due to major macroeconomic changes, predominantly the liquidity crisis (2008), the espousal of the multicurrency system (2009), the introduction of bond notes (2016) and the shortage of foreign currency (2016), the manufacturing sector in Zimbabwe has struggled over the period under study and has faced serious deterioration owing to persistent challenges impacting the sector, which include low capacity utilisation, outmoded equipment, influx of cheap imports, rigid labour laws, weak effective demand, high cost of production, high cost of capital as well as persistent liquidity constrictions. These macro-economic changes have greatly affected the manner in which the manufacturing sector acquires financing, and hence the capital structure.

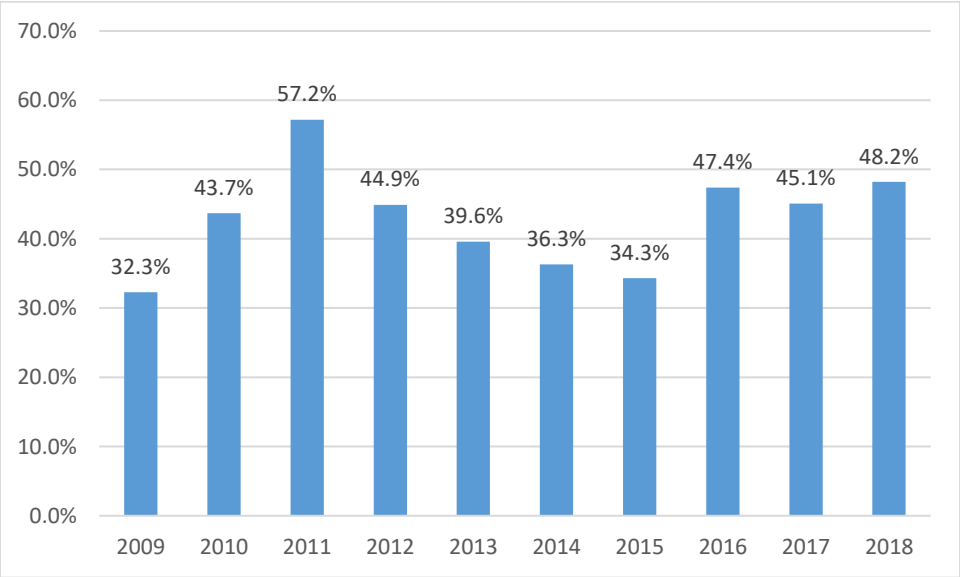

Figure 3.1: Capacity utilization in the Manufacturing Sector

Source: Reserve bank of Zimbabwe Quarterly Economic Review

The above graph illustrates how the majority of companies in the manufacturing sector continue to struggle, as evidenced by low levels of capacity utilisation below the 50% threshold. The

Confederation of Zimbabwe Industries (CZI, 2017) manufacturing sector survey concluded that low capacity utilisation in the sector is owing to factors such as "lack of capital inflow, the liquidity crunch, no change in economic policy and low domestic demand". These factors have remained unchanged over the years.

Low capacity utilisation implies that these manufacturing companies are not well capitalised and need to re-tool by way of raising capital. Therefore, the manner in which they are financed remains a critical issue in terms of achieving a higher capacity utilisation, creation of employment and an increase in exports, for instance. Hence, capital structure remains a pertinent issue by way of providing information to policy makers on how they can edify the manner in which the sector is being financed.

3.3.1.1 *Working Capital Constraints*

According to Rajan and Tokatlidis (2005), there is a sturdy relation between the cessation of capital flows to a country, the degree of dollarization of the country's banking sector, and the pervasiveness of banking crises. Kaseke (2015) asserted that one of the major challenges affecting the manufacturing sector in Zimbabwe was the lack of financing for both working capital and capital outlay, which works adversely against firm performance, affecting the capital structure of the firm. The number of companies that are facing closure, liquidation and delisting due to financial distress in the sector has since increased. Due to this increase in financial distress in the sector, many firms have defaulted on servicing their debt obligations, thus increasing the number of non-performing loans in the financial service sector (Kaseke, 2015).

According to Mutambanengwe (2013), since the adoption of the multicurrency regime, commercial banks in Zimbabwe have been reluctant to extend loans to the manufacturing and productive sectors, but rather prefer lending small amounts, for the shortest loan tenures and to what they perceive as the lowest risk activity in the economy. As a result, the manufacturing sector is still left unattended to in terms of financing, as mentioned before.

3.3.1.2 *High Cost of Capital*

The cost of debt on the local market is alarmingly high, leaving firms with equity capital as the only source of funding at their disposal. According to Nyarota *et al.* (2015) in an Reserve Bank of Zimbabwe (RBZ) working paper, lending rates were at a minimum of 12.9%, with a maximum of up to 19.6%. Nonetheless, the issue of new stock has a negative signaling effect to investors, it

suggests that management anticipates that the firm's stock is overvalued, thus investors are reluctant to invest in such a deteriorating sector.

3.3.1.3 *Foreign Currency Shortages*

The introduction of bond notes and the shortage of foreign currency in 2016 also adversely affected the manufacturing sector in Zimbabwe. Many manufacturing firms in the sector purchase raw materials outside the country, thus requiring foreign currency, while their products are being purchased using bond notes. The CZI (2017) manufacturing survey indicates that of those manufacturing companies that import raw materials, 53% cited South Africa as their major source, and only 50% of companies in the sector were getting foreign currency provisions directly from the RBZ. The remaining 50% firms in the sector can only borrow in RTGS bonds, which has to be further converted into foreign currency on the black market at exorbitant rates, thereby limiting the amount of foreign currency they have after conversion. The CZI (2017) noted that "the additional costs incurred in accessing foreign currency have a direct implication on the cost structure of a firm". Gumbe and Kaseke (2011) noted that, to curb foreign currency shortages, manufacturing firms in Zimbabwe engaged in illicit foreign currency transactions as a survival strategy. Evidence from their study showed that firms that were hesitant to adopt these survival strategies performed poorly in business (Gumbe and Kaseke, 2011).

In a nutshell, the sector is faced with little to no access to debt financing from financial institutions, coupled with low retained income (due to low profitability caused by low capacity utilisation) to use as a source of internal funding, with investors who are highly reluctant to invest in the declining sector. The failure of the RBZ to step in as the lender of last resort has further exacerbated the situation. All these factors are influential towards the firms' capital structure.

3.3.1.4 *Other challenges affecting the sector*

The CZI (2017) notes the below as some of the challenges the manufacturing sector in Zimbabwe is facing:

1. Influx of cheap imports: Locally produced goods face high competition from cheap imports thus manufacturing companies may fail to recoup production costs due to low sales.

2. Outmoded equipment: Low production due to old equipment and machinery, which in turn, cannot be serviced well or replaced, owing to lack of capital.

3. Low effective demand: Due to closure of many companies, there is a high rate of retrenchment and unemployment, hence low disposable income. More purchase of cheap imports in comparison to locally produced goods.

4. Shortage of raw materials: Key sectors such as agriculture and mining that provide raw materials are also struggling. Shortage of foreign currency for companies that import raw materials.

3.4 The Manufacturing Sector in South Africa

Schneider (2000) notes that through the 1960s, South Africa's growth in the manufacturing sector was predominantly outstanding, and that South Africa still stands as the most industrialised country in Sub-Saharan Africa. According to Mosai (undated), the manufacturing sector in South Africa recorded a positive marginal growth of 0.8% in 2016 and was expected to grow by 0.5% in 2017, and 1.2% in 2018. Furthermore, Lechela (2018) states that production in the sector increased by 2.5% in January 2018, from a 1.8% increase in December 2017.

According to Mosai (undated) the manufacturing sector in South Africa recorded a capacity utilisation rate of up to 80% in 2016, and is currently facing a problem of excess capacity- meaning that there is low demand to meet the potential supply that the sector can produce. Further, the sector has a hoard of government grants, debt financing sources and manufacturing sector incentives at their disposal through the Department of Trade and Industry (Crampton, 2015). These include (but are not limited to): The Manufacturing Competitiveness Enhancement Programme (MCEP), the Manufacturing Investment Programme (MIP), the Productive Incentive and the Automotive Investment Scheme (AIS).

3.5 A comparison between Zimbabwe and South Africa

To compare the manufacturing sectors of Zimbabwe and South Africa, the author utilised statistical graphs. Figure 3.2 below shows a comparison of the manufacturing sectors' contribution towards GDP in Zimbabwe and South Africa from 1960 to 2017. As seen in the graph, GDP contribution for the Zimbabwean manufacturing sector began to experience a sharp drop towards the beginning of the 21st century. The contribution further drops towards the global financial crisis, recovers during the multicurrency regime, only to drop again around 2013. Contribution of the sector continues to deteriorate.

Figure 3.2: Manufacturing sector value added (% of GDP)

Source: https://data.worldbank.org

Figure 3.3 below shows a comparison of the exports trend of Zimbabwe and South Africa, from 1960 to 2017. The sharp drops (for Zimbabwe) and peaks (for South Africa) from around 2007 to present may be accredited to the 2008 economic recession in Zimbabwe going forward:

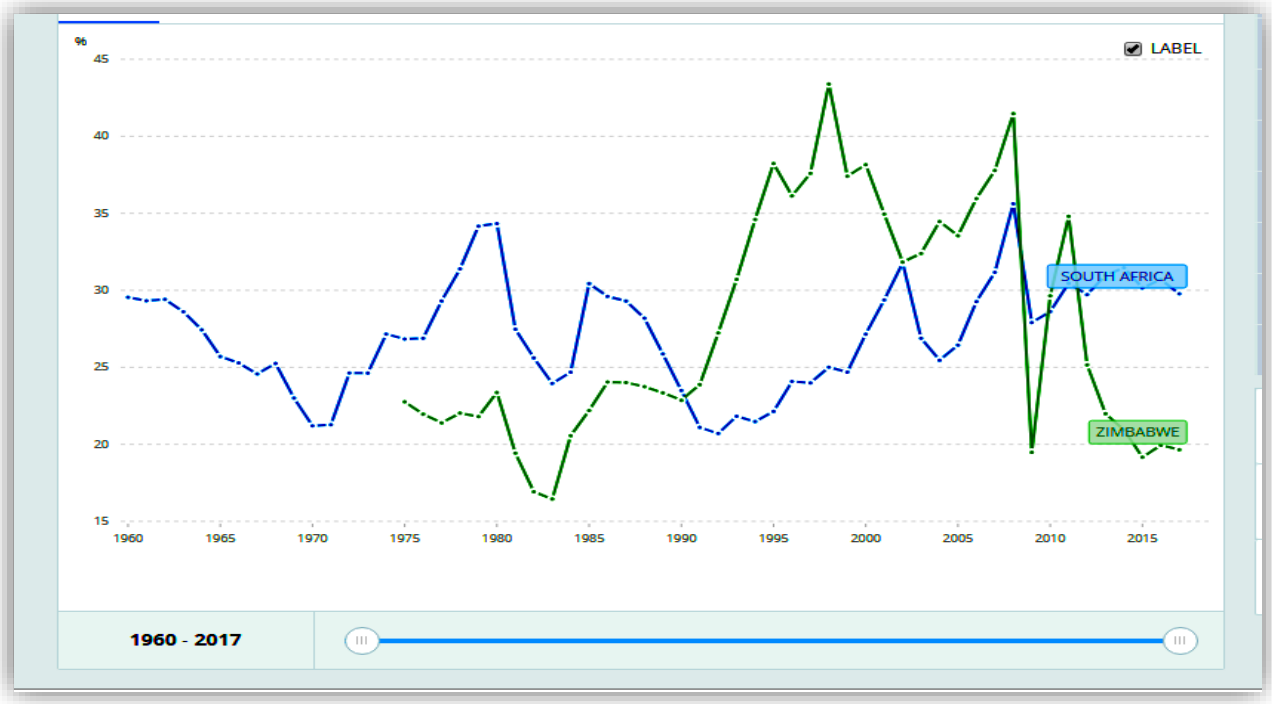

Figure 3.3: Exports of goods and services (% of GDP)

Source: https://data.worldbank.org

The manufacturing sector of South Africa is a well-developed and diversified sector and is the second largest sector in the economy following the finance, real estate and business sector. The sector has shown strong potential for competing globally, with sub-sectors such as the agro-business, automotive and chemical businesses topping the list.

Over the years, Zimbabwe has been highly dependent on South Africa for both products and employment. Fabricius (2017) states that according to statistics provided by the Trade Law Centre (TRALAC) in Stellenbosch, South Africa exported approximately USD$2-billion worth of merchandise to Zimbabwe in 2016 alone, making Zimbabwe the fifth largest destination for South African exports in Africa. This statistic alone supports the notion that South Africa has by far a much more functional and healthier manufacturing industry in comparison to Zimbabwe.

One of the major reasons why the South African manufacturing has been performing better than the Zimbabwean one is that of access to capital. Underpinning the South African manufacturing sector is the MCEP, which by 2016, had provided funding of up to R5.2 billion to approximately 890 manufacturing companies. Access to capital does not only answer the question of working capital needs, but also plays an important role towards the debt-to-equity structure of the firm. The

MCEP aims at improving the competitive advantage of the sector in a global setting (MCEP, undated).

Adding to the access to government funding, South Africa has a far healthier financial service sector compared to Zimbabwe. According to Brand South Africa (2017) the financial service sector is the country's strongest sector, branded by internationally recognised legal and regulatory frameworks, with both local and foreign institutions rendering a complete array of services which include commercial, retail and merchant banking, investment, and insurance. All these institutions are more than prepared to extend loans to companies in the manufacturing sector where they see fit at reasonable lending rates.

Finally, the capital market of South Africa is far more developed than that of Zimbabwe. In an ERSA working paper, Hassan (2013) states that South Africa's stock market is worth nearly double the country's output, and is substantially larger than the bourses of larger economies such as Indonesia, Mexico and Turkey. As such, companies in the manufacturing sector of South Africa experience more flexibility in terms of sources of financing, hence capital structure.

3.6 Chapter Summary

This chapter has provided an overview of the history and development of the manufacturing sectors in Zimbabwe and South Africa, and a comparison thereof. The author also provided a comparison of the two sectors in terms of the GDP contribution and export trend.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

This chapter addresses the research methodology that was employed in this study. Leedy and Ormrod (2015) described research methodology as the universal approach a researcher follows in undertaking a research project. As such, the chapter outlines the data and econometric procedures employed for estimation in this study.

4.2 Research Design

The researcher employed the descripto-explanatory research design that is described by Saunders, Lewis and Thornhill (2009) as a combination of a descriptive research design that has an explanatory end.

According to Saunders, Lewis and Thornhill (2009), a descriptive design is one that portrays an accurate profile of persons, events or situations. However, the data that is described should be a means to an end rather than the end itself. Researchers ought to be able to analyse the data described and therefore draw conclusions from it, and perhaps generate further questions. This is where the aspect of an explanatory design comes into play. Saunders, Lewis and Thornhill (2009) describe an explanatory design as one that seeks to establish a causal correlation between variables.

A quantitative research methodology was used in conducting his research. According to Apuke (2017), a quantitative research can be described as one that labels the methods of explaining an abstract issue or phenomena by way of gathering numerical data so as to answer the questions of how much, how many, who, where, when and how.

4.3 Data

Quantitative data was collected mainly from listed manufacturing companies in both Zimbabwe and South Africa, based on the condition that the company had been listed for the entire period under study (2009-2018). Secondary data was extracted from the JSE, the ZSE, the World Bank and the RBZ, which are highly dependable and credible sources.

The researcher analysed the validity capital structure theory under a specific macro-economic environment. Hence, the time period of 2009-2018 was meant to capture the major macro-economic changes unique to Zimbabwe which include the liquidity crisis (2008), the espousal of

the multicurrency system (2009), the introduction of bond notes (2016) and the shortage of foreign currency (2016).

4.4 Sampling Framework

This research particularly used the convenience non-probability sampling technique. This is basically when the sample is chosen based on convenience. Sekeran and Bougie (2009) describe it as collecting data from subjects of the population who are opportunely accessible to provide it. As such, the researcher collected data from firms which have been listed in the period under study (2009- 2018) for which all annual statements were available for that same time frame.

Bradley (2013) stated that an adequate sample size depends on the purpose of the study, the size and nature of the population, the time, budget, and resources available and the importance of the results of the study. The total number of listed manufacturing firms between 2009 and 2018 was estimated to be 27 for Zimbabwe (for which 23 were used) and 52 for South Africa (for which 24 were used). Both samples represent upward of 40% of the population by country and represent 60% of the combined population.

4.5 Estimation Procedure

The study utilised panel data, therefore econometric techniques for panel data analysis were employed. The estimation procedure started off with testing for data stationarity using the Harris-Tzavalis (HT) panel unit root test technique. The following step was to perform a correlation analysis using Pearson's Correlation matrix. Finally, the more appropriate estimation model to use between the Pooled OLS regression, Random Effects (RE) model and the Fixed Effects (FE) model was determined. For this purpose, the researcher made use of the Breusch and Pagan Lagrangian multiplier test and the Hausman test, respectively.

4.5.1 Unit root test

The unit root test is a test for stationarity or non-stationarity. According to Brooks (2008), stationarity series is one with a constant mean, variance and autocovariance for each interval. Stationarity of data is an especially important property because it strongly affects the behaviour and properties of a series, and non-stationarity can lead to bogus regressions (Brooks, 2008). For the purpose of testing for stationarity, the Harris-Tzavalis (HT) panel unit root test was applied. It is essential to assess that data is stationary or not before using it in a regression. The null hypothesis

of a unit root is rejected against the one-sided alternative if the t-statistic is less than (lies to the left of) the critical value.

H_0: Panels contain unit roots

H_1: Panels are stationary

4.5.2 Pearson's Correlation Matrix

Brooks (2008) described correlation as the degree of linear association between two variables. The presence of correlation entails that movements in the two correlated variables are not causal, but rather implies that a linear relationship exists between the two variables (Brooks, 2008). To measure correlation between variables, the researcher used the Pearson's Correlation Matrix. This correlation matrix assigns values (correlation coefficients) in the range +1 (i.e. perfect positive correlation) and -1 (i.e. perfect negative correlation). Therefore, correlation analysis was done to determine if any linear relationships existed among the variables used in this study.

4.5.3 Breusch and Pagan Lagrangian Multiplier Test

The next step was to test for the appropriateness of either Random effect model or Pooled Ordinary Least Square (OLS) regression model. For this purpose, the Breusch Pagan Lagrange Multiplier Test was applied. If results are significant, the researcher will reject the null hypothesis (H_0) (i.e. "no random effects") and conclude that the Random Effects model is more appropriate. If otherwise, the researcher will apply the Pooled Ordinary Least Square (OLS) regression model.

4.5.4 Hausman Test

For the purpose of determining which estimator will produce the most appropriate results between the Fixed Effects and Random Effects models, the Hausman Specification Test was applied. If results of this test are significant, the researcher will reject the null hypothesis (H_0) (i.e. difference in coefficients is not systematic) and conclude that the Fixed Effects model is appropriate. If otherwise, the researcher will accept the null hypothesis (H_0) and conclude that the Random Effects model is more appropriate

4.6 Advantages of Panel Data over Cross Sectional or Time Series Data

Hsiao (2007) described panel data as simply having both space and time dimensions. One of the major advantages of panel data analysis is that it captures both cross sectional and time series dimensions (Dougherty, 2011). In agreement, Gujarati and Porter (2009) stated that the

amalgamation of time series and cross-section dimensions provides more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency. Hsiao (2007) described this as a "more accurate inference of model parameters".

Further, panel data also allows us to analyse common characteristics amongst observations, at the same time controlling for cross sectional heterogeneity (Wooldridge, 2002). Panel data explicitly takes into account heterogeneity by permitting for "subject-specific" variables (Gujarati & Porter, 2009).

Lastly, by analysing cross sectional observations repeatedly, panel data is more appropriate to capture the dynamic of change (Gujarati & Porter, 2009). In agreement with such statement, Hsiao (2007) contends that panel data models expose dynamic relationships.

4.7 Econometric Model

The explanatory variables that are expected to explain the financial leverage (BVL) of the listed manufacturing firms in the regression model are profitability (Pro), company size (CS), asset tangibility of (AT), non-debt tax shields (NDTS), growth opportunities (GO), earnings volatility (EV), firm's liquidity (FL), inflation (INF) and gross domestic product growth (GDP). The general equation is given by:

$$BVL = \beta_0 + \beta_1 Pro_{it} + \beta_2 CS_{it} + \beta_3 AT_{it} + \beta_4 NDTS_{it} + \beta_5 GO_{it} + \beta_6 EV_{it} + \beta_7 FL_{it} + \beta_8 INF_t + \beta_9 GDP_t + \acute{\varepsilon}_{it}$$

……..Equation 4.1

To capture the effect of the major macroeconomic changes[5] that have affected the way in which manufacturing firms raise capital in Zimbabwe, dummy variables, which are Multicurrency regime, Liquidity crisis, Bond notes introduction and Foreign currency shortages were added to the model for Zimbabwe under the periods concerned. According to Hsiao (2007) , dummy variables are denoted by 1 if present and 0 if otherwise. The general regression equation is given as hereunder, where D_t denotes the dummy variables:

[5] The major macroeconomic changes referred to in this instance are the liquidity crisis (2008), the espousal of the multicurrency system (2009), the introduction of bond notes (2016) and the shortage of foreign currency (2016) as discussed in section 3.3.

$$BVL = \beta_0 + \beta_1 Pro_{it} + \beta_2 CS_{it} + \beta_3 AT_{it} + \beta_4 NDTS_{it} + \beta_5 GO_{it} + \beta_6 EV_{it} + \beta_7 FL_{it} + \beta_8 INF_t + \beta_9 GDP_t + \beta_{10} D_t + \acute{\varepsilon}_{it} \quad \text{.....Equation 4.2}$$

4.8 Definition of Variables

The variables used in this study and their proxies for measurement are shown in Table 4.1:

Table 4.1: Variable Proxies

VARIABLE	PROXY	EMPIRICAL SOURCE
Book value of financial leverage	$Total\ Debt / (Total\ Debt + Book\ Value\ of\ Equity)$	**(Frank & Goyal, 2009)**
Profitability	$EBIT / Total\ Assets$	**(Titman & Wessels, 1988)**
Company Size	*Ln (Total Assets)*	**(Titman & Wessels, 1988)**
Asset Tangibility	$Fixed\ Assets / Total\ Assets$	**(Rajan & Zingales, 1995)**
NDTS	$Depreciation / Total\ Assets$	**(Titman & Wessels, 1988)**
Growth Opportunities	*Percentage change of Total Assets*	**(Titman & Wessels, 1988)**
Earnings Volatility	$(EBIT / TOTAL\ ASSETS - AVE.EBIT / TOTAL\ ASSETS)^2$	**(Awan & Amin, 2014)**
Firm's Liquidity	$current\ assets / current\ liabilities$	**(Rajan & Zingales, 1995)**
Inflation	*GDP deflator at time "t"*	**(Fan, Titman & Twite, 2012)**
GDP	*GDP growth rate at time 't'*	**(Jong, Kabir & Nguyen, 2008)**

Source: Author's Contribution

4.9 Methodological Limitations

The major limitation for this was the availability of data. Due to the unavailability of financial statements for some firms in the period under study (2009-2018), the study sample was limited to 47 listed manufacturing companies with 23 from Zimbabwe and 24 from South Africa. To counter this problem, credible data sources such as the JSE and the ZSE were utilised as the main sources of data.

4.10 Ethical considerations

According to Fouka and Mantzorou (2011), research ethics refer to the protection of the dignity and reputation of the participants involved in a research. This entails that ethics guide the researcher in what is wrong or right in conducting the research, hence the protection of the subjects is a prime issue.

To ensure that the protection of the subjects' privacy and dignity, an ethical clearance addressing the issues regarding the authenticity and confidentiality of the data used, protection of participants and the risk therefrom was obtained from the Research Ethics Review Committee of the College of Economic and Management Sciences at the University of South Africa.

4.11 Chapter Summary

This chapter addressed the methodological procedures that the researcher followed in undertaking the study. The time horizon has been justified and the sampling method and size have been determined. The sources from which data was acquired were also acknowledged.

The chapter also addressed the econometric techniques or models applied in this study which are the Pooled OLS, the Fixed Effects and the Random Effects Model. The chapter rounded up with the methodological limitations and how they will be curbed, as well as ethical considerations that were observed in the collection of data.

CHAPTER 5: RESULTS AND DATA ANALYSIS

5.1 Introduction

The aim of this study was to empirically test the validity of theoretic determinants of capital structure in an abnormal economic environment, particularly Zimbabwe. In order to achieve this, the researcher tested the hypotheses that there is a statistically significant relationship between leverage and profitability, company size, growth opportunities, earnings volatility, asset tangibility, non-debt tax shields, firm's liquidity, inflation, and GDP growth.

This chapter presents results showing the impacts of these variables on leverage for panels of listed manufacturing companies operating in Zimbabwe and South Africa. Results are organised in two major sections in relation to each country. Broadly, section 5.2 presents the results for Zimbabwe, while section 5.3 presents the results for South Africa.

Results for each country are presented in sub-sections under their respective main sections. Both sections present results on unit root or stationarity tests, descriptive statistics, correlations, and econometric results. Section 5.4 provides the conclusion to the chapter.

5.2 Estimates for Zimbabwe

Unit root tests results are presented in subsection 5.2.1, descriptive statistics in subsection 5.2.2, correlations in subsection 5.2.3 and final econometric estimates in subsection 5.2.4.

5.2.1 Unit root tests

Stationarity tests were conducted using the Harris-Tzavalis (HT) panel unit root test technique. The selection and use of the HT technique was based on the rationale that the panel dataset was balanced and the number of panels (N) relative to time periods (T), which define the asymptotic distribution of the panel unit root test statistic (Hlouskova & Wagner, 2006). In line with the sequential limit theorem, the HT unit root test method used holds the number of the time periods (T) fixed, while the number of panels is assumed to approach infinity (Harris & Tzavalis, 1999).

The HT test is based on the following hypotheses:

$\mathbf{H_0}$: Panels contain unit roots

$\mathbf{H_1}$: Panels are stationery

The results of the test are shown in Table 5.1 below

Table 5.1: Harris-Tzavalis (HT) panel unit root statistics

Variable	z-statistic	p-value	Decision	Decision
Book value of leverage	-2.873	0.002	Reject H_0	Panels are stationary
Profitability	-2.156	0.015	Reject H_0	Panels are stationary
Company size	0.495	0.690	Do not reject H_0	Panels contain unit roots
D.Company size	-1.705	0.044	Reject H_0	Panels are stationary
Asset tangibility	-2.951	0.006	Reject H_0	Panels are stationary
Non-debt tax shields	-4.733	0.000	Reject H_0	Panels are stationary
Growth opportunities	-6.784	0.000	Reject H_0	Panels are stationary
Earnings volatility	-6.581	0.000	Reject H_0	Panels are stationary
Firms liquidity	-4.703	0.000	Reject H_0	Panels are stationary
Inflation	-3.932	0.000	Reject H_0	Panels are stationary
GDP growth	-2.973	0.001	Reject H_0	Panels are stationary

Unit root tests were conducted with trend included.

The stationarity statistics presented in Table 5.1 show that panels of all variables are stationary, with the exception of the panel of the variable "company size" which is stationary at first difference (D.Company size). These unit root test results therefore confirm that the data series can be used for estimation purposes.

5.2.2 Descriptive statistics

The arithmetic means, standard deviations, minimum and maximum values, and panel observations of the variables used in the analysis are presented in Table 5.2 below.

Table 5.2: Summary of Descriptive Statistics

	BVL	PRO	CS	AT	NDTS	GO	EV	FL	INF	GDP
Mean	0.548	0.0541	17.990	0.596	0.032	0.177	0.014	1.399	0.152	0.080
Minimum	0.106	-0.734	14.795	0.132	0.003	0	0.000000855	0.092	-0.002	0.007
Maximum	2.054	0.796	23.615	0.990	0.258	2.461	0.557	12.390	0.954	0.196
Std. Dev	0.304	0.161	1.543	0.219	0.219	0.304	0.049	1.271	0.278	0.066
Observations	230	230	230	230	230	230	230	230	230	230

BVL is book value of leverage; Pro is Profitability; CS is Company size; AT is Asset tangibility; NTDS is Non-debt tax shields; GO is Growth opportunities; EV is Earnings volatility; FL is Firms liquidity; INF is Inflation; and GDP is GDP growth

Descriptive statistics presented in Table 5.2 indicate that, relative to arithmetic means, substantial variations are observed in profitability (sd = 0.161; mean = 0.0541), growth opportunities (sd = 0.304; mean = 0.177), earnings volatility (sd = 0.049; mean = 0.014), and inflation (sd = 0.278; mean = 0.152). The computed mean statistics of all the variable panels remained positive during the sample period under review. However, substantial ranges from the minimum and maximum values were observed on profitability, growth opportunities, earnings volatility, firms' liquidity and inflation.

5.2.2.1 ***Book Value of Leverage***

The sample shows that on average, 54.8% of the firms' total assets are debt financed for listed manufacturing companies in Zimbabwe. The proxy for financial leverage was calculated as the book value of leverage provided by Frank and Goyal (2009). Frank and Goyal (2009) estimated a mean of 29% for a sample of listed non-financial US firms, which shows that firms in this sample are significantly more leveraged. The standard deviation of 30.4% compared to the mean shows a moderate variation amongst the financial leverages of the companies in the sample.

5.2.2.2 ***Profitability***

Profitability has a mean of 5.41%. This implies that, on average, a return of 5.41% is attributable to the total assets of listed manufacturing companies in Zimbabwe. This statistic concurs with the macroeconomic strife in Zimbabwe, in general, the sector is struggling significantly. The standard deviation of 0.161 also shows moderate variation amongst the profitability values.

5.2.2.3 ***Company Size***

The company size was measured as the natural logarithm of total assets. As such, the mean, maximum and minimum values may not make any arithmetic or economic sense. However, the standard deviation of 1.543 indicates a large variation in size amongst listed companies in the manufacturing sector of Zimbabwe. Size is essential in the context of the Zimbabwean economy as it attracts more capital since it signifies stability. This may imply that the smaller companies may not have the same access to capital as the relatively larger ones do.

5.2.2.4 *Asset Tangibility*

This variable has a mean of 59.6%, which implies that, on average, 59.6% of the companies' assets is made up of fixed or tangible assets. This statistic corresponds with the comparatively high financial leverage average in this sector, intangible assets can be used as collateral to acquire debt financing. Frank and Goyal (2009) estimate a mean of 34% for firms in the US, which is significantly lower than the estimation for Zimbabwe. This may also explain Frank and Goyal's (2009) low leverage estimation.

5.2.2.5 *Non-Debt Tax Shields*

This sample estimates a mean of 3.2% for non-debt tax shields. This implies that on average, companies in the sector are benefitting from a tax shield of only 3.2% from non-debt related expenses, particularly depreciation. The maximum is 25.8% and the minimum is 0.3%, which shows a large variation amongst firms.

5.2.2.6 *Growth Opportunities*

Growth opportunities show that, on average, firms in the manufacturing sector have grown by approximately 17% between 2009 and 2018. The minimum of 0% is mostly seen between 2008 and 2009, which was a hyper-inflationary period. However, the maximum growth rate is 246.1% which implies a very large variation between the minimum and maximum growth rates.

5.2.2.7 *Earnings Volatility*

Earnings volatility has a mean of 1.4%, which signifies a business risk of 1.4%. The maximum business in this sector goes up to 55.7% while the minimum is close to 0%. The standard deviation of 4.9% shows a large variation from the mean.

5.2.2.8 *Firm Liquidity*

The mean for firm liquidity is 1.399, which shows that firms in this sector are highly solvent and are able to cover their short-term debt obligations as they fall due 1.399 times. However, this may also signify that a lot of working capital is tied up in current assets. It would make sense in the economic realities of Zimbabwe as locally manufactured products are facing steep competition from imports hence companies have working capital tied up in the form of inventory. The standard deviation of 1.271 shows low variation from the mean.

5.2.2.9 *Inflation*

Inflation (measured by the GDP deflator) has a mean of 15.2 %. The maximum value of 95.4% may be attributed to the 2009 hyper-inflationary period whereas the minimum of -0.2% can be attributed to the dollarisation period. A standard deviation of 27.8% shows a large variation from the mean.

5.2.2.10 *Gross Domestic Product*

The mean for the annual GDP growth shows that the economy of Zimbabwe has grown by an average of 8% in the period under review. The standard deviation of 6% shows minimal variation from the mean. The maximum growth rate is given as 19.6% whereas the minimum is 0.7%.

5.2.3 Correlation

The correlations between all the variables used in the analysis are presented in Table 5.3 below

Table 5.3: Correlation Matrix

	BVL	Pro	CS	AT	NDTS	GO	EV	FL	INF	GDP
BVL	1.000									
Pro	-0.230	1.000								
CS	-0.230	0.212	1.000							
AT	0.120	-0.369	0.234	1.000						
NTDS	0.043	-0.148	0.133	0.037	1.000					
GO	-0.048	-0.041	0.008	-0.089	0.005	1.000				
EV	0.111	0.119	-0.102	-0.133	0.335	0.046	1.000			
FL	-0.443	0.271	-0.062	-0.523	-0.119	-0.008	-0.043	1.000		
INF	-0.153	-0.019	-0.081	0.089	0.121	0.111	0.176	0.065	1.000	
GDP	-0.124	-0.032	-0.094	0.027	0.016	0.159	0.014	-0.041	0.180	1.000

BVL is book value of leverage; Pro is Profitability; CS is Company size; AT is Asset tangibility; NTDS is Non-debt tax shields; GO is Growth opportunities; EV is Earnings volatility; FL is Firms liquidity; INF is Inflation; and GDP is GDP growth

The correlation statistics presented in Table 5.3 indicate that there were lowest negative correlations between growth opportunities and firms' liquidity (r = -0.008), gross domestic product and firms' liquidity (r = -0.041), earnings volatility and firms' liquidity (r = -0.043), profitability

and inflation (r = -0.019), firms' liquidity and company size (r = -0.062), company size and inflation (r = -0.081), gross domestic product and company size (r = -0.094), book value of leverage and gross domestic product (r = -0.124), inflation and book value leverage (r = -0.153). Comparatively highest negative correlations occurred between asset tangibility and firms' liquidity (r = -0.523), and firms' liquidity and book value leverage (r = -0.443).

Conversely, the highest positive correlations occurred between earnings volatility and non-debt tax shields (r = 0.335), profitability and firms' liquidity (r = 0.271), and asset tangibility and company size (r = 0.234).

In absolute terms, the generally low correlations between all variables suggests the possibility of the absence of multicollinearity among regressors, hence the set of exogenous variables can appropriately be used for econometric estimation.

5.2.4 Econometric Estimates

This subsection presents the computed econometric estimates of the Random Effects (RE) model, which was estimated to determine suitable selection between RE model and the Pooled Ordinary Least Squares (Pooled-OLS) model based on the Breusch-Pagan test procedure. Moreover, results are presented for comparison and appropriate selection between the RE model and Fixed Effects (FE) model conducted based on the Hausman test procedure.

5.2.4.1 ***Random Effects Model Vs Pooled Ordinary Least Squares Model***

The Breusch and Pagan Lagrangian Multiplier test was conducted to determine whether the random effects model estimates (presented in Table 5.4), would be suitable versus the pooled ordinary least squares model estimates.

The Breusch and Pagan Lagrangian Multiplier test is based on the following hypotheses:

H_0: No random effects

H_1: Random effects present

Table 5.4: Random effects GLS regression

Independent Variables		Book Value of Leverage
Profitability		-0.3676393*** (0.1144088)
Company Size		-0.0784882*** (0.0245756)
Asset Tangibility		0.264759 (0.1412989)
Non-Debt Tax Shields		-1.662477* (0.8045749)
Growth Opportunities		0.003239 (0.0433422)
Earnings Volatility		0.3222879 (0.3212162)
Firms Liquidity		-0.0643873***(0.0157329)
Inflation		-1.350215 (0.8266985)
Gross Domestic Product		-1.618999 (1.024559)
Multicurrency regime		2.49102 (3.706786)
Liquidity crisis		-3.686653 (3.95939)
Bond notes introduction		-0.5375538 (0.7394947)
Foreign currency shortages		1.877023 (1.304472)
Where: p < 0.05 = *, p < 0.01 = ** and p < 0.001 = ***, std.errors in ( )		
	Within	0.2843
R- Squared	Between	0.1326
	Overall	0.1726
Obs		230
Wald chi2(9)		73.56
Prob> chi2		0.0000
Sigma_u		0.18045317
Sigma_e		0.17148935
Rho		0.52545304

The Breusch and Pagan Lagrangian multiplier test for the random effects results was conducted and the results are as shown in Table 5.5 below. The results of the test are significant (i.e. $p < 0.05$), therefore the null hypothesis that the pooled ordinary least square was the suitable model is rejected.

Table 5.5: Breusch and Pagan lagrangian multiplier test for the random effects model

Chibar2(01)	Prob > Chibar2
193.42	0.0000

5.2.4.2 *Fixed Effects Model Vs Random Effects Model*

Further, the FE model was estimated (presented in Table 5.6) for the purpose of determining a more suitable and appropriate model in comparison with the RE model estimates. For this purpose, the Hausman specification test was used.

The Hausman test is based on the following hypotheses:

H_0: Ui are not correlated with Xit

H_1: Ui are correlated with Xit

Table 5.6: Fixed Effects (within) Regression

Independent Variables		Book Value of Leverage
Profitability		-0.4375824*** (0.1104851)
Company Size		-0.2953198*** (0.0458002)
Asset Tangibility		-0.1714093 (0.1684741)
Non-Debt Tax Shields		-2.110824** (0.7725495)
Growth Opportunities		0.0595504 (0.0414695)
Earnings Volatility		0.2980582 (0.302948)
Firms Liquidity		-0.0668156***(0.0153634)
Inflation		-1.935 135* (0.7739447)
Gross Domestic Product		-2.533707 **(0.9642273)
Multicurrency regime		3.539435 (3.44011)
Liquidity crisis		-5.498405 (3.685324)
Bond notes introduction		-0.7733669 (0.6871097)
Foreign currency shortages		2.88844* (1.222556)
Where: p < 0.05 = *, p < 0.01 = ** and p < 0.001 = ***, std.errors in ( )		
	Within	0.3593
R- Squared	Between	0.0329
	Overall	0.0515
Obs		230
F(15,192)		7.18
Prob> F		0.0000
Sigma_u		0.50255051
Sigma_e		0.17148935
Rho		0.89570147

The Hausman specification test was conducted and the results are shown in Table 5.7 below.

Table 5.7: Hausman test results

Chi(7)	Prob > Chi2
36.13	0.0000

The Hausman test estimates confirm rejection of the null hypothesis that the random effects model was the suitable model, signifying that the differences between the fixed effects model and the random effects model were indeed systematic. For that reason, coefficient estimates of the fixed effects model were deemed statistically efficient relative to estimates of the random effects model.

5.2.5 Interpretation of Regression Results

The computed R-squared statistic shows that overall, merely 5.15% of the total variation in book value of leverage was explained by the exogenous variables used over the period under review. The F (15,192) statistic (=7.18; $p < 0.05$) shows statistical significance of the model; and the interclass correlation shows that about 89.6% of the variance was attributed to the differences across panels.

In line with the estimates of the appropriately selected fixed effects model, the bulk (six out of nine) of the regressors had statistically significant and negative impacts on book value of leverage. The regressors include company size (t-statistic = -6.45), gross domestic product (t-statistic = -2.63), firms' liquidity (t-statistic = -4.35), inflation (t-statistic = -2.50), profitability (t-statistic = -3.96), and non-debt tax shields (t-statistic = -2.73).

5.2.5.1 ***Profitability***

The results of the fixed effects estimate show that profitability demonstrated a significant negative impact on the book value of leverage (t-statistic= -3.96), which indicates that firms with high levels of return will generally hold less debt. The results suggest that a rise in profitability (coefficient = -0.438; $p < 0.05$) by 1% was associated with about 0.43% reduction in book value of leverage.

In terms of theory, this finding is consistent with the pecking order theory, which predicts an inverse relationship between profitability and leverage. The theory states that firms prefer internal funding as opposed to external funding relative to the risk levels associated with each source of finance. This entails that more profitable firms will use retained earnings as a source of funding first before any other source of finance.

Early studies that show a consistent negative result include Titman and Wessels (1988), Harris and Raviv (1991) and Rajan and Zingales (1995). More recently, studies done in developing countries such as Zimbabwe, also confirm this inverse relationship between profitability and leverage. These studies include Booth, Aivazian and Demirguc-Kunt (2001) and Awan and Amin (2014). More

interestingly, Ezeoha (2011) and Pandey, Bhama and Singh (2019) studied capital structure determinants in recessionary periods in developing countries (particularly Nigeria and India respectively) and both confirm a negative result. Conversely Mutenheri and Munangagwa (2015) find a positive relationship between leverage and profitability for companies listed on the ZSE under the dollarization period (2010-2013).

5.2.5.2 *Company Size*

Company size demonstrated a significant relationship with book value of leverage (t-statistic = -6.45). This implies that larger firms employ less debt in their capital structures. Results showed that a rise in company size (coefficient = -0.295; p-value < 0.05) by 1% led to approximately 0.30% decline in book value of leverage.

This result confirms the prediction of the pecking order theory. The rationale behind this theory is that larger firms are more stable, and more profitable, therefore making use of retained earnings first as a source of financing. Pandey, Bhama and Singh (2019) studied the effects of recession on capital structure in India and found that company size had a negative effect on short-term debt. A study by Awan and Amin (2014) also confirms this negative relationship. Further , Mutenheri and Munangagwa (2015) confirm this negative result in the case of Zimbabwean firms during the period 2010 – 2013.

5.2.5.3 *Non-Debt Tax Shields*

The results of the estimation model indicate a negative relationship between non-debt tax shields and book value of leverage. This implies that firms with high non-debt tax shields will employ less debt. The coefficient estimates show that a 1% increase in non-debt tax shields (coefficient = -2.11; p < 0.05) led to about 2.11% decline in book value of leverage during the sample period 2009 to 2018.

This result is consistent with the trade-off theory which states that if non-debt tax shields are notably significant to the extent that the tax shields of debt are crowded out, then a company will have no incentive to employ more debt. As such, companies with significant non-debt tax shields have no need to offset tax using debt. Studies that support this result include Ali, Yadav and Islamia (2011), Gao (2016) and Nasution, Panggabean and Siregar (2017).

5.2.5.4 *Firm Liquidity*

Firm liquidity shows a significant negative relationship with book value of leverage (t-statistic = -4.35). In addition, an increase in firms' liquidity (coefficient = -0.067; p-value < 0.05) by 1% was associated with about 0.07% decrease in book value of leverage.

In relation with theory, this finding is consistent with the pecking order theory. Liquidity refers to the ease in which an asset can be converted into cash. The explanation therefrom is that holding highly liquid assets can convert them into cash easily and use the proceeds to finance investment.. Myers and Rajan (1998), Morellec (2001) and Pandey, Bhama and Singh (2019) also found a negative relationship between liquidity and leverage.

5.2.5.5 *Inflation*

Results exhibit a significant negative relationship between inflation and book value of leverage. Firms in a hyper inflationary environment generally keeps low levels of debt (t-statistic = -2.50). A rise in inflation by 1% (coefficient = -1.94; p-value < 0.05) caused about 1.94% decline in book value of leverage.

This result makes perfect sense in the context of the Zimbabwean macro-economic environment. High inflation rates also mean high interest rates hence the cost of borrowing becomes high. This entails that firms move away from borrowing to keep the cost of capital low. Studies that confirm this negative result include Booth, Aivazian and Demirguc-Kunt (2001), Fan, Titman and Twite (2012) and Yinusa, Alimi and Ilo (2016).

5.2.5.6 *Gross Domestic Product (GDP)*

Results of the estimation show a negative result between GDP growth and the book value of leverage. A rise in GDP by 1% (coefficient = -2.53; p-value < 0.05) resulted in about 2.53% decline in book value of leverage.

It is expected that as a country becomes wealthier, more funding becomes available for companies in the various sectors. Demirgüç-Kunt and Maksimovic (1998) found a negative relationship between GDP growth and leverage.

5.2.5.7 *Foreign Currency Shortages*

Foreign currency shortages had a significant (t-statistic = 2.888; p-value < 0.05) positive impact on the book value of leverage, possibly in attribution to the illicit foreign currency transactions some manufacturing firms performed as part of survival strategies (Gumbe and Kaseke, 2011).

5.2.5.8 *Asset Tangibility*

Though statistically insignificant (t-statistic = -1.02; p > 0.05), the negative nature of the impact of asset tangibility on book value of leverage was consistent with the pecking order theory and with findings by Bas, Muradoglu and Phylaktis (2009).

5.2.5.9 *Earnings Volatility*

Earnings volatility also had a statistically insignificant (t-statistic = 0.98; p-value > 0.05) and positive (coefficient = 0.298) impact on book value of leverage, and this results is contradictory to the underlying trade-off theory and empirical findings from past studies (Bradley, Jarrell & Kim, 1984; Booth, Aivazian & Demirguc-Kunt, 2001; Keefe & Yaghoubi, 2014).

5.2.5.10 *Growth Opportunities*

Growth opportunities had a statistically insignificant (t-statistic = 1.44; p > 0.05) positive impact (coefficient = 0.0596) on book value of leverage, and this result was consistent with the pecking order theory and empirical findings from a similar past research study conducted by Chen and Zhao (2006).

5.3 Estimates for South Africa

Unit root tests results are presented in subsection 5.3.1, descriptive statistics in subsection 5.3.2, correlations in subsection 5.3.3 and final econometric estimates in subsection 5.3.4.

5.3.1 Unit Root Tests

Just as the sample for Zimbabwe, stationarity tests were conducted using the Harris-Tzavalis (HT) panel unit root test selected based on the rationale that the dataset was balanced, and number of panels (N) relative to time periods (T) which define the asymptotic distribution of the unit root test statistic (Hlouskova & Wagner, 2006). Results of the test are shown in Table 5.8.

Table 5.8: Harris-Tzavalis (HT) panel unit root statistics

Variable	z-statistic	p-value	Decision	Decision
Book value of leverage	-4.515	0.000	Reject H_0	Panels are stationary
Profitability	-3.143	0.000	Reject H_0	Panels are stationary
Company size	1.362	0.913	Do not reject H_0	Panels contain unit roots
D.Company size	-2.534	0.005	Reject H_0	Panels are stationary
Asset tangibility	-3.049	0.001	Reject H_0	Panels are stationary
Non-debt tax shields	-0.052	0.479	Do not reject H_0	Panels contain unit roots
D. Non-debt tax shields	-3.771	0.000	Reject H_0	Panels are stationary
Growth opportunities	-8.446	0.000	Reject H_0	Panels are stationary
Earnings volatility	-5.467	0.000	Reject H_0	Panels are stationary
Firms liquidity	-6.561	0.000	Reject H_0	Panels are stationary
Inflation	-8.404	0.000	Reject H_0	Panels are stationary
GDP growth	-4.940	0.000	Reject H_0	Panels are stationary

Unit root tests were conducted with trend included.

Stationarity statistics show that panels of all variables are stationary level, with the exception of the variables “company size” and “non-debt tax shields” which are stationary at first difference. These unit root test results confirm that the panel dataset variables can be used for estimation purposes.

5.3.2 Descriptive Statistics

The arithmetic means, standard deviations, minimum and maximum values, and panel observations of the variables used in the analysis are presented in Table 5.9.

Table 5.9: Descriptive statistics

	BVL	PRO	CS	AT	NDTS	GO	EV	FL	INF	GDP
Mean	0.466	0.079	21.134	0.475	0.026	0.209	0.016	1.946	0.058	0.015
Minimum	0.032	-1.622	15.498	0	0	0.0000925	0.0000000574	0.289	-0.039	-0.015
Maximum	1.197	0.367	24.220	0.960	0.104	8.806	1.923	14.291	0.075	0.032
Std. Dev	0.171	0.163	2.413	0.197	0.015	0.615	0.125	1.391	0.010	0.013
Observations	240	240	240	240	240	240	240	240	240	240

BVL is book value of leverage; Pro is Profitability; CS is Company size; AT is Asset tangibility; NTDS is Non-debt tax shields; GO is Growth opportunities; EV is Earnings volatility; FL is Firms liquidity; INF is Inflation; and GDP is GDP growth

The descriptive statistics (Table 5.9) show that, relative to arithmetic means, substantial variations occurred in profitability (sd = 0.163; mean = 0.07), growth opportunities (sd = 0.615; mean = 0.21), and earnings volatility (sd = 0.125; mean = 0.016). The mean statistics of all the variable panels remained positive over the sample period 2009 to 2019 under review. However, substantial overall ranges from minimum and maximum values were observed on profitability, growth opportunities, earnings volatility, and firms' liquidity.

5.3.2.1 ***Book Value of Leverage***

Descriptive statistics shows that on average, 46.6% of a firm's total assets are debt financed in the manufacturing sector of South Africa. This average is a bit lower than that of Zimbabwe, which was over the 50% threshold. The minimum leverage level is 3.2% whereas the maximum is 119.7%, which shows a large variation amongst firms. The standard deviation of 17.1% shows a moderate deviation from the mean.

5.3.2.2 ***Profitability***

Profitability has a mean of 7.9%. This means that on average, firms in this sector generate a return of 7.9% from the total assets. This statistic is also higher than that of Zimbabwe (5.41%). The minimum -162.2% and the maximum value for profitability is 36.7%. The standard deviation shows a variation of 16.3% from the mean.

5.3.2.3 ***Company Size***

The company size was measured as the natural logarithm of total assets, as such the descriptive statistics may not make any arithmetic sense. The average for size is 21.134, which is significantly larger than that of Zimbabwe (17.990). The standard deviation of 2.413 however shows a large variation amongst the sizes of firms in the sector.

5.3.2.4 ***Asset Tangibility***

The sample estimates a mean of 47.5% for asset tangibility. This entails that on average, companies' assets are made up of 47.5% fixed or tangible assets in the manufacturing sector of South Africa. This average is notably lower than that of Zimbabwe (59.6%). This statistic also tallies with the average level of leverage in this sector, as tangible assets are used as collateral for debt financing. The maximum is 96% and the minimum is 0%. The 0% is attributable to a company for which Property, Plant and Equipment were fully depreciated and disposed.

5.3.2.5 *Non-Debt Tax Shields*

This variable has a mean of 2.6%. This implies that on average, companies in the sector are merely benefitting from a tax shield of 2.6% in relation to non-debt expenses. This average is lower than that of Zimbabwe (3.2%) but not significantly. The maximum is 10.4% whereas the minimum value is 0%. The 0% is attributable to a company for which Property, Plant and Equipment were fully depreciated and disposed. The Standard deviation shows a small variation of 1.5% from the mean.

5.3.2.6 *Growth Opportunities*

The sample shows an average of 20.9% for growth opportunities. This implies that firms in the manufacturing sector of South Africa have grown by an average of 20.9% in the period under review. As expected, this average is significantly higher than that of Zimbabwe (17.7%). The minimum value for growth opportunities is 0.00925% while the maximum is 880.6%, which shows a very large variation across firms. The standard deviation of 61.5% shows a significantly large deviation from the mean.

5.3.2.7 *Earnings Volatility*

Descriptive statistics signify an average of 1.6% business risk for South Africa, which is in the same range as Zimbabwe (1.4%). The minimum value for earnings volatility is 0.00000574% whereas the maximum is 192.3%. The standard deviation of 12.5% shows a substantial variation from the mean.

5.3.2.8 *Firm Liquidity*

The average liquidity ratio for South Africa is shown as 1.946 times and is significantly higher than that of Zimbabwe (1.399). This signifies that on average, manufacturing firms in South Africa are more prepared to meet their short-term debt obligations as they fall due compared to manufacturing firms in Zimbabwe. The maximum ratio for liquidity is given as 14.291 times and the minimum as 0.289 times. The standard deviation of 1.391 times shows a moderate variation from the mean.

5.3.2.9 *Inflation*

Inflation has a mean of 5.8%, which, as expected, is substantially lower than the average for inflation in Zimbabwe (15.2%). The maximum value is 7.5% (for which Zimbabwe has 95.4%)

and the minimum is -3.9%. The standard deviation of 1% shows a minimal deviation from the mean.

5.3.2.10 ***Gross Domestic Product***

The sample shows that, on average, the annual GDP of South Africa grew by 1.5% over the period 2009-2018. This average is lower than that of Zimbabwe (8%). This difference may be attributable to the extents to which the two economies are developed. Although both economies are classified as developing economies, the South African economy is more developed compared to Zimbabwe and hence will grow at a slower rate. The maximum growth rate is 3.2% and the minimum is -1.5%. The standard deviation of 1.3% shows a small difference from the mean.

5.3.3 Correlation

The correlations between all the variables used in the analysis are presented in Table 5.10.

Table 5.10: Correlation Matrix

	BVL	Pro	CS	AT	NDTS	GO	EV	FL	INF	GDP
BVL	1.000									
Pro	-0.013	1.000								
CS	0.139	0.038	1.000							
AT	0.212	0.070	-0.060	1.000						
NTDS	0.140	0.286	0.017	0.173	1.000					
GO	-0.110	-0.125	-0.029	0.190	-0.185	1.000				
EV	0.014	-0.721	-0.065	-0.147	-0.127	0.067	1.000			
FL	-0.609	0.070	-0.054	-0.283	-0.040	-0.005	-0.060	1.000		
INF	-0.135	-0.030	-0.082	-0.028	0.081	0.048	0.118	0.085	1.000	
GDP	-0.089	0.148	-0.001	0.028	0.004	0.085	-0.168	-0.023	-0.227	1.000

BVL is book value of leverage; Pro is Profitability; CS is Company size; AT is Asset tangibility; NTDS is Non-debt tax shields; GO is Growth opportunities; EV is Earnings volatility; FL is Firms liquidity; INF is Inflation; and GDP is GDP growth

The correlation statistics presented in Table 5.10 show that there were lowest negative correlations between company size and gross domestic product growth (r = -0.001), growth opportunities and firms' liquidity (r = -0.005), profitability and book value of leverage (r = -0.013), gross domestic product growth and firms' liquidity (r = -0.023), asset tangibility and inflation (r = -0.028), growth

opportunities and company size (r = -0.029), profitability and inflation (r = -0.030), non-debt tax shields and firms' liquidity (r = -0.040), company size and firms' liquidity (-0.054), and company size and earnings volatility (r = -0.065). Relatively highest negative correlations occurred between profitability and earnings volatility (r = -0.721), and firms' liquidity and book value of the leverage (r = -0.610).

Conversely, relatively highest positive correlations were observed between non-debt tax shields and profitability (r = 0.286), asset tangibility and book value of leverage (r = 0.212), and asset tangibility and growth opportunities (r = 0.190).

With the exception of the correlations between earnings volatility and profitability, and firms' liquidity and book value of leverage, generally low correlations between variables shows the chance of absence of multicollinearity among regressors.

5.3.4 Econometric estimates

This sub-section presents econometric estimates of the random effects model, which was estimated to determine suitable selection between the random effects model and pooled ordinary least squares model based on the Breusch-Pagan test procedure. Moreover, appropriate selection between the random effects model and fixed effects model was conducted based on the Hausman test procedure.

5.3.5 Random Effects Model Vs Pooled Ordinary Least Squares Model

The Breusch and Pagan Lagrangian multiplier test was conducted to determine whether the random effects model estimates (Table 5.11), would be suitable versus the pooled OLS model estimates.

Table 5.11: Random effects GLS regression

Independent Variables		Book Value of Leverage
Profitability		0.0029032 (0.0800626)
Company Size		0.0075457 (0.0067339)
Asset Tangibility		-0.1323877* (0.0589475)
Non-Debt Tax Shields		0.4300902 (0.6971765)
Growth Opportunities		-0.173492 (0.0122641)
Earnings Volatility		-0.865279 (0.0924184)
Firms Liquidity		-0.0507896***(0.0069867)
Inflation		-1.975259** (0.7197276)
Gross Domestic Product		-1.615141**(0.5308628)
Where: p < 0.05 = *, p < 0.01 = ** and p < 0.001 = ***, std.errors in ( )		
	Within	0.2308
R- Squared	Between	0.4598
	Overall	0.3420
Obs		240
Wald chi2(9)		80.53
Prob> chi2		0.0000
Sigma_u		0.07450772
Sigma_e		0.09954841
Rho		0.35905162

The Breusch and Pagan Lagrangian multiplier test of the random effects results (Table 5.12) rejected the null hypothesis that the pooled ordinary least square was the suitable model as hereunder:

Table 5.12: Breusch and Pagan lagrangian multiplier test for the random effects model

Chibar2(01)	Prob > Chibar2
84.71	0.0000

5.3.6 Fixed Effects Model Vs Random Effects Model

The fixed effects model was then estimated (Table 5.13) to determine whether it was the suitable model to use comparative to the fixed effects model estimates.

Table 5.13: Fixed effects (within) regression

Independent Variables		Book Value of Leverage
Profitability		0.208015 (0.805524)
Company Size		0.036027* (0.0171445)
Asset Tangibility		-3.3388853*** (0.0748461)
Non-Debt Tax Shields		-0.187328 (0.7762333)
Growth Opportunities		-0.0093979 (0.0117852)
Earnings Volatility		-0.1500311 (0.0910493)
Firms Liquidity		-0.0445471***(0.0072137)
Inflation		-1.43783 (0.7457929)
Gross Domestic Product		-1.578983**(0.5066521)
Where: p < 0.05 = *, p < 0.01 = ** and p < 0.001 = ***, std.errors in ( )		
	Within	0.2670
R- Squared	Between	0.0588
	Overall	0.0980
Obs		240
F(9,207)		8.38
Prob> chi2		0.0000
Sigma_u		0.15537366
Sigma_e		0.09954841
Rho		0.70896809

The Hausman test (Table 5.14) was conducted to determine suitable selection of a suitable model between the random effects model and fixed effects model as hereunder:

Table 5.14: Hausman test results

Chi(7)	Prob > Chi2
30.49	0.0001

The Hausman test estimates confirm rejection of the null hypothesis that the random effects model was the suitable model, signifying that the differences between the fixed effects model and the random effects model were certainly systematic. Therefore, coefficient estimates of the fixed effects model were deemed statistically efficient comparative to estimates of the random effects model.

5.3.7 Interpretation of Regression Results

The computed R-squared statistic indicates that overall, about 9.8% of the total variation in book value of leverage was explained by the exogenous variables used over the sample period under review. The F (9,207) statistic (= 8.38; $p < 0.05$) shows significance of the model; while the inter-class correlation shows that about 70.9% of the variance was attributed to the differences across panels.

Based on the estimates of the suitably selected fixed effects model, three of the exogenous variables had statistically significant and negative impacts on book value of leverage. The regressors include asset tangibility (t-statistic = -4.53), firms' liquidity (t-statistic = -6.18) and gross domestic product (t-statistic = -3.12). One of the regressors showed a significant positive impact on book value of leverage (t-statistic = 2.10).

5.3.7.1 ***Company Size***

The results of the fixed effects estimator demonstrated a positive relationship between company size and book value of leverage (t-statistic = 2.10). This implies that larger firms in the manufacturing sector of South Africa employ more debt in their capital structures. Therefore, an increase in the company size (coefficient = 0.036; p-value < 0.05) by 1% was associated with a 0.036% increase in leverage.

This finding is consistent with the predictions of the Trade-off theory. According to this theory, larger firms are more diversified and hence have less risk of bankruptcy. Large firms also have a stable cash flows and good credit ratings in the debt market, therefore can sustain large debt ratios compared to smaller firms. Studies by Drobetz *et al.*, (2003) and Daskalakis and Psillaki (2008)

also find a positive relationship between company size and leverage. Conversely, Mouton and Smith (2016) find that size was insignificant in explaining the capital structure of JSE listed firms in South Africa.

This result is contradictory to that of Zimbabwe, where a significant negative relationship between company size and leverage was found. Manufacturing companies in Zimbabwe showed consistency with the pecking order theory in terms of company size.

5.3.7.2 *Asset Tangibility*

Asset tangibility showed a significant negative relationship with book value of leverage (t-statistic = -4.53). This entails that the more tangible assets a firm holds, the less the debt. Results showed that a rise in asset tangibility (coefficient = -0.338; p-value < 0.05) by 1% was linked with a 0.338% decrease in leverage.

The results of the estimation are consistent with the pecking order theory. According to this theory, more tangible assets means more production, hence more sales and profits. A company with a large tangible assets base will use retained earnings as a source of finance. Bas, Muradoglu and Phylaktis (2009) also concur with this finding, however, Mouton and Smith (2016) prove a positive result for listed firms in South Africa.

Though insignificant, asset tangibility also demonstrated a negative relation with leverage in the sample for Zimbabwe.

5.3.7.3 *Firm Liquidity*

Results confirmed a significant negative relationship between firm liquidity and book value of leverage (t-statistic = -6.18). It follows that firms with high liquidity ratios employ less debt in their capital structure. An increase in firm liquidity (coefficient = -0.044; p-value < 0.05) by 1% was linked with a 0.044% decrease in leverage.

This finding is consistent with the predictions of the pecking order theory. Though statistically insignificant, Mouton and Smith (2016) also find a negative result in their study of listed South African firms.

The high liquidity ratio in the South African sector shows the ease of converting current assets into cash. The result also concurs with the findings from the sample for Zimbabwe but may not necessarily be for the same reasons.

5.3.7.4 *Gross Domestic Product*

GDP growth showed a significantly negative relationship with book value of leverage. A rise in GDP by 1% (coefficient = -1.578; p-value < 0.05) resulted in about 1.578% decline in book value of leverage. This result is also consistent with the findings from the sample for Zimbabwe manufacturing companies.

5.3.7.5 *Profitability*

Though statistically insignificant (t-statistic = 0.26; p < 0.05), profitability exhibited a positive impact on leverage, and this finding is consistent with the trade-off theory, agency cost theory, signaling theory and findings from similar preceding studies by Jensen and Meckling (1976) and Chavali and Rosario (2018). This result is however contradictory in Zimbabwe, which demonstrated a significant negative relationship between profitability and leverage.

5.3.7.6 *Non-Debt Tax Shields*

Non-Debt tax shields exhibit an insignificant negative relation with leverage (t-statistic = -0.24; p > 0.05). This finding is consistent with the Trade-Off theory and findings from past studies by Ali, Yadav and Islamia (2011); Gao (2016); Nasution, Panggabean and Siregar (2017). The sample for Zimbabwe also showed a similar negative relation, though statistically significant.

5.3.7.7 *Growth Opportunities*

Growth opportunities showed a negative relationship with book value of leverage, though statistically insignificant (t-statistic = -0.80; p > 0.05). This finding is consistent with the predictions of the Trade-Off and Agency Cost theories. However, the findings are contradictory in Zimbabwe, which showed an insignificant positive impact in line with the Pecking Order theory.

5.3.7.8 *Earnings Volatility*

Earnings volatility showed a statistically insignificant negative relation with leverage (t-statistic = -1.65; p > 0.05). This result is in line with the Trade-Off theory but contradicts with the sample for Zimbabwe which showed an insignificant positive relation.

5.3.7.9 *Inflation*

Inflation demonstrated an insignificant negative impact on leverage (t-statistic = -3.12; $p > 0.05$). This result is consistent with the findings for Zimbabwe, which however, showed a significant negative relationship between inflation and leverage.

5.4 Conclusion

This chapter presented findings from the econometric analysis conducted using panel datasets for two countries, namely, Zimbabwe and South Africa. The sample period of the panel dataset spans 2009 to 2018 for both countries studied. Procedurally, the econometric estimation commenced with testing for panel unit roots in the variables and proceeded to the analysis of descriptive statistics, correlations, and estimation of final estimates through appropriate selection between the random effects model and fixed effects model. Stationarity tests results show that for the bulk of the variables, the null hypothesis of the presence of panel unit roots at level was rejected at 5% level of significance, while merely one variable for Zimbabwe's and two variables for South Africa's regressors were integrated of order one at 5% significance level.

For both countries, the econometric estimation procedures show that estimates of the fixed effects models were appropriate, relative to the random effects model. A greater number of exogenous variables had statistically significant impacts on book value of leverage in case of Zimbabwe relative to South Africa which had less variables that had significant impacts. The entire group of regressors accounted for only 5.2% of the overall variation in book value of leverage for companies in Zimbabwe, while the analogous group of regressors accounted for about 9.8% of the total variation in book value of leverage in respect of companies in South Africa. These results suggest the possibility of a stable and predictable operating environment in South Africa, while the opposite seems to be the case in respect of the environment in Zimbabwe. Therefore, there are potentially some other exogenous factors that influence the book value of leverage of companies in addition to the set of regressors analysed in this study.

CHAPTER 6: CONCLUSIONS AND DISCUSSIONS

6.1 Introduction

This chapter provides a conclusion to this study by presenting the major findings of the research, together with the results relating to the research objectives. The contributions and limitations of this study are discussed, and lastly, areas of further research are suggested.

6.2 Summary

A variety of studies have been done on the topic of capital structure in different countries, but none have focused on the application of capital structure theories in abnormal macroeconomic environments, such as Zimbabwe. The research sought to:

- Examine the variables that determine the capital structure of a number of manufacturing firms listed on the Zimbabwe Stock Exchange.
- Examine the variables that determine the capital structure of a number of manufacturing firms listed on the Johannesburg Stock Exchange
- Determine if existing theories of capital structure remain relevant in unstable economies like Zimbabwe.
- Determine if existing theories of capital structure remain constant across different economic environments, particularly that of Zimbabwe and South Africa.

6.3 Major findings, implications and concluding remarks

In the previous chapter, the author presented an analysis of the hypotheses and the results therefrom. The results of the analysis enabled an establishment of certain relationships between the nine (9) independent variables used in this study and leverage. The purpose of this section is to interpret and review the implications of these relationships in the context of Zimbabwe.

Six (6) determinants were found to be significant in explaining capital structure in the context of Zimbabwe (profitability, company size, non-debt tax shields, firm liquidity, inflation and GDP), and only four (4) in the context of South Africa (company size, asset tangibility, firm liquidity and inflation).

6.3.1 Profitability

Results showed a significant negative relationship between leverage and profitability in Zimbabwe. This finding implies that firms in the manufacturing sector of Zimbabwe follow a pecking order with regards to profitability, hence they prefer to utilise retained earnings compared to debt. The pecking order theory argues that more profitable firms have more retained earnings to use as a source of finance. However, in the case of Zimbabwe, firms might not be notably profitable but are forced to utilise retained earnings as a source of finance due to restricted access to debt finance. Kaseke (2015) highlights limited access to debt financing as one of the major challenges affecting the manufacturing sector in Zimbabwe. Amongst these challenges is also low profitability due to low capacity utilisation. While firms in this sector exhibit the predictions of the pecking order theory with regards to profitability, there is still evidence of survival mechanisms.

On the other hand, the sample for South Africa demonstrated an insignificant positive relationship between profitability and leverage. This is consistent with the trade-off theory which argues that more profitable firms are more able to take on more debt and take advantage of the tax benefits of debt. Though insignificant, this result makes perfect sense in the context of South Africa in relation to the ease of accessing debt financing.

6.3.2 Company Size

Company size demonstrated a significant negative relationship with leverage in the context of Zimbabwe. This finding was also consistent with the predictions of the pecking order theory. The rationale behind the theory is that larger companies are more stable and profitable, hence making use of internal funding. However, the interconnectedness of size and earnings stability in Zimbabwe is debatable. A company might be large in terms of the fixed assets it holds but might not necessarily be operating at a level of capacity that is adequate to induce a stable stream of cash flows. As evidence has shown in chapter 3 of this study, most of the annual capacity utilisation figures for the Zimbabwean manufacturing sector between 2009- 2018 are below the 50% threshold. This entails that most companies are only operating at below 50% of their potential capacity.

While the pecking order predicts that smaller firms will employ more debt, the issue of little to no access to debt finance still remains a prominent issue in the context of Zimbabwe. Mutambanengwe (2013) comments on how banks in Zimbabwe have resolved to lend the smallest amounts for the shortest time possible to the less risky borrower.

Conversely, the results for South Africa showed a positive relation between company size and leverage. This implies that firms in the manufacturing sector of South Africa follow the trade-off theory. This theory suggests that larger firms are more diversified, hence have less risk of bankruptcy and financial distress. Larger firms are more likely able to service their debt obligations with less trouble.

6.3.3 Non-Debt Tax Shields

Non-debt tax shields showed a negative impact on leverage in the context of Zimbabwe. This result confirms the predictions of the trade-off theory for firms in the manufacturing sector of Zimbabwe. The trade-off theory states that where other tax allowable expenses outweigh the tax shields of debt, then a company has no incentive of employing more debt. While the finding confirms a trade-off approach, the existence of non-debt tax shields may not be the only reason companies in this sector find no incentive in employing debt. High interest rates are a characteristic of economic recession, hence the manufacturing companies in Zimbabwe may avoid debt to also avoid the risk of financial distress. South Africa also showed a negative relation, though non-debt tax shields were not a significant factor in explaining capital structure.

6.3.4 Firm Liquidity

Both samples from South Africa and Zimbabwe provided evidence of a negative relationship between firm liquidity and leverage. In terms of theory, this result is consistent with the pecking order theory. The reasoning behind the predictions of this theory is that highly liquid firms can easily convert their current assets into cash to utilise as financing.

In the case of South Africa, the predictions of the pecking order with regards to liquidity make perfect sense. South Africa exports most of its locally produced goods to neighboring Zimbabwe, with Zimbabwe being the fifth largest destination for South African exports (Fabricius, 2017). This serves to show the ease in which manufacturing firms in South Africa can convert their inventory into cash.

This may not be the same case for Zimbabwean manufacturing firms. One of the major problems the sector is facing is low sales caused by stiff competition from cheap imports. Thus, the high liquidity ratio in Zimbabwe may only be a sign of large amounts of capital tied up in inventory.

6.3.5 Inflation

As expected, there was evidence that inflation had a negative impact on leverage in both economies. High inflation rates also mean high interest rates hence the cost of borrowing becomes high. This entails that firms move away from borrowing to keep the cost of capital low in periods of high inflation and make use of other sources of finance, such as retained earnings and equity.

6.3.6 Gross Domestic Product (GDP)

Results also showed a negative relation between GDP growth and leverage for Zimbabwe. This finding can be best explained by the GDP growth trajectory in the period under review. It is expected that as a country becomes wealthier, more funding becomes available for companies in the various sectors. However, the GDP output in Zimbabwe has been following a downward trend, with the lowest GDP growth rate of 0.756% in 2016.

On the other hand, GDP was found to be insignificant in explaining capital structure decisions in the context of South Africa.

6.3.7 Asset Tangibility

Asset tangibility showed a significantly negative impact on leverage for South Africa. This result confirms that firms in the manufacturing sector of South Africa follow a pecking order approach to capital structure. The theory suggests that firms with more tangible assets produce more, and hence have more profits, hence use retained earnings as a source of finance. The predictions of the pecking order with regards to asset tangibility perfectly fits the criteria of the South African manufacturing sector in relation to its massive production capacity.

However, asset tangibility was found to be insignificant in explaining capital structure decisions in the context of Zimbabwe.

6.4 How well do established theories explain capital structure in Zimbabwe?

According to the results gathered, only two capital structure theories out of the seven presented in this study were pivotal in explaining financing decisions in the case of Zimbabwe. These two theories are the pecking order and the trade-off theories. Other theories such as the MM irrelevancy proposition, MM under corporate taxes, agency cost, signaling and market timing theories were irrelevant in explaining capital structure in Zimbabwe.

Apart from non-debt tax shields, evidence from this study showed that most companies in the manufacturing sector of Zimbabwe follow the pecking order theory. This entails that firms in this sector prefer internal finance compared to external finance. Although consistent with the trade-off theory, the results for non-debt tax shields also concur with the use of internal funds.

The question of whether the use of internal funding is a pure application of capital structure theories with the goal of maximising firm value, or a survival skill fueled by the lack of external funding is a significant one. It can be argued that the pecking order theory is most suitable for firms operating in an abnormal macroeconomic environment, based on the evidence provided in this study, hence firms are benefitting from the application of this theory. Application of the pecking order theory in a hostile economy may prove beneficial to firms since the cost of capital may be relatively higher in economic downturns and the debt burden may also increase. The trade-off theory identifies costs associated with debt financing, which are, the obligation of interest payments and the risk of financial distress and bankruptcy. Therefore, the use of internal funding may serve the purpose of protecting the firm from the risk of financial distress and bankruptcy as.

On the other hand, it can be argued that the use of internal funds is unrelated to the application of any capital structure theory, but simply indicates a lack of choice (in terms of sources of finance) owing to harsh economic conditions. This argument ties into the discussion in section 1.1 above, where Wernerfelt (1984) contends that when the macroeconomic environment becomes hostile, resources become scarce. Hence, sources of financing become limited. Either way, both situations are motivated by the innate need to survive the reality of a hostile economic setting.

It can therefore be concluded that the manufacturing sector in Zimbabwe is operating in survival mode, with little to no access to external finance to support growth and development. As highlighted in section 1.1, the issue of flexibility in terms of the companies' ability to strategically manipulate their capital structures in a way that increases firm value, is largely diminished by the lack of sources of funding in the case of Zimbabwe.

Overall, Zimbabwean manufacturing firms utilise internal funding compared to external funding not only to benefit from the application of the pecking order theory, but to also adapt to the realities of abnormal macro-economic conditions. Application of the pecking order theory may be a case of endurance rather than it is preferential or tactical.

6.5 Capital structure variances between South Africa and Zimbabwe

In the case of South Africa, two of the four variables that were significant in explaining capital structure decisions, were consistent with the predictions of the trade-off theory. These variables are profitability and company size. This result signifies that, unlike in Zimbabwe, access to external funding is less restrictive in South Africa. As highlighted in Chapter 3, government funding is more available in South Africa, and the financial service sector is better prepared to extend debt financing on an institutional level, at reasonable lending rates.

The result for firm liquidity indicates consistency with the pecking order theory. However, this result makes perfect sense in the context of South Africa, based on the performance of its manufacturing sector. Due to the high volume of exports to neighboring Zimbabwe, the manufacturing companies in South Africa are able to convert inventory to cash with ease, hence, the availability of earnings to utilise as a source of finance. In this regard, use of internal funding cannot be deemed as a survival tactic, but rather as a beneficial application of the pecking order theory.

It can be concluded that the variance in capital structure decisions between South African and Zimbabwean manufacturing firms is attributable to the difference in the macroeconomic environments in which they operate. Evidence has shown that Zimbabwean manufacturing firms tend to utilise internal funding to adapt to unfavourable economic conditions, while South African firms are more flexible with capital structure decisions due to a relatively friendly economic setting.

6.6 Contributions of the Study

Salkind (2012) states that research generates new questions or is cyclical in manner. In this respect, this research was expected to contribute significantly to the already existing corpus of theory and empirical literature on the topic of capital structure, as well as probing new questions and discussions surrounding the issue.

While many studies have been done in the context of capital structure theory in various countries, none of these countries were undergoing unique macroeconomic conditions as with Zimbabwe. The results of this study provide the evidence of a pecking order approach being applied as a survival skill rather than a preference or tactical strategy.

Taking an intentional standpoint, this research will influence the way manufacturing companies in Zimbabwe make their financing decisions, particularly in line with what theory suggests will help improve the value of the firm. The research will also give light to what must be done by both government and economic policy makers to formulate conversant and strategic policies concerning the significance of capital structure decisions in the sector, particularly concerning the issue of access to capital.

6.7 Limitations of the study

The sample used in this study included 47 listed manufacturing firms from both the ZSE and the JSE. As such, it excluded firms in the sector that are not publicly listed but may also be relevant in explaining capital structure in the sector. However, the use of listed firms was based on the ease of access of financial statements in the public domain. More importantly, data from the public domain has an implied authenticity element to it.

The study only included firms that were listed throughout the review period, as such the research may have been open to survivorship bias. To circumvent this bias, the sample should have included delisted firms, though this would have led to an unbalanced panel. However, the sample sizes for both countries were sufficient to be considered a true representation of the overall population.

Further, this research isolated and made use of only nine (9) determinants of capital structure for the analysis. There are many other factors that are known to have a probable impact on leverage, however, it is highly impractical to number them all. Some of these variables may prove difficult to quantify and use in a regression model such as management preferences.

6.7.1 Recommendations for further research

As mentioned above, there are potentially some other exogenous factors that influence the book value of leverage of companies in addition to the set of regressors analysed in this study. These may include both observed macroeconomic fundamentals such as Real Exchange Rate Misalignment, Financial Development (arbitrarily Development Indicators and Global Competitiveness rankings around the Investment Climate), and relevant dummy variables such as the 2008/09 global financial crisis and episodes of political instability, etc. A study including these factors may be relevant.

A further area of research would be to study capital structure in the manufacturing sector of Zimbabwe pre, during and post economic strife so as to identify change in the capital structure decisions, if any, across the three macroeconomic environments.

Lastly, this study focused mainly on listed manufacturing firms in Zimbabwe. Thus, for future research there is a need to engage the sector, as a whole, including those firms that are not listed on the ZSE. It is also vital to look at various key sectors such as the agriculture, mining, commercial and allied sectors to identify the capital needs in these sectors as well.

REFERENCES

Abeywardhana, D. K. . (2017) ‘Capital Structure Theory: An Overview’, *Accounting and Finance Research*, 6(1), p. 133. doi: 10.5430/afr.v6n1p133.

Abor, J. (2008) ‘Determinants of the Capital Structure of Ghanaian Firms By’, *African Economic Research Consortium*, (176).

Akorsu, P. K. (2014) ‘Testing the Pecking Order and Signalling Theories for Financial Institutions in Ghana’, *Research Journal of Finance and Accounting*, 5(16), pp. 77–83.

Ali, M. S., Yadav, R. and Islamia, J. M. (2011) ‘Theories of Capital Structure : Analysis of Capital Structure Determinants’, *International Research Journal of Management Science & Technology*, 4(3), pp. 695–704.

Aljamaan, B. E. (2018) ‘CAPITAL STRUCTURE: DEFINITIONS, DETERMINANTS, THEORIES AND LINK WITH PERFORMANCE LITERATURE REVIEW’, *European Journal of Accounting, Auditing and Finance Research*, 6(2), pp. 49–72.

Amaro, S. (2018) *Greece and euro zone agreed to further debt relief, CNBC*. Available at: https://www.cnbc.com/2018/06/25/greece-and-euro-zone-agreed-to-further-debt-relief.html (Accessed: 11 November 2019).

Antoniou, A., Guney, Y. and Paudyal, K. (2002) *The Determinants of Corporate Debt Maturity Structure The Determinants of Corporate Debt Maturity Structure Abstract*. University of Durham.

Apuke, O. D. (2017) ‘Arabian Journal of Business and Management Review (Kuwait Chapter)’, *Arabian Journal of Business and Management Review (Kuwait Chapter)*, 6(10), pp. 40–47. doi: 10.12816/0040336.

Awan, A. G. and Amin, M. S. (2014) ‘DETERMINANTS OF CAPITAL STRUCTURE’, *European Journal of Accounting Auditing and Finance Research*, 2(9), pp. 22–41.

Baker, M. and Wurgler, J. (2002) ‘Market Timing and Capital Structure’, *The Journal of Finance*, LVII(1), pp. 1–32.

Bas, T., Muradoglu, G. and Phylaktis, K. (2009) *Determinants of Capital Structure in Developing Countries*. Cass Business School.

Bereźnicka, J. K.- (2013) 'How Does Asset Structure Correlate with Capital Structure ? – Cross-Industry and Cross-Size Analysis of the EU Countries', *Universal Journal of Accounting and Finance*, 1(1), pp. 19–28. doi: 10.13189/ujaf.2013.010103.

Bhaduri, S. N. (2002) 'Determinants of Corporate Borrowing : Some Evidence from the Indian Corporate Structure', *Journal of Economics and Finance*, 26(2), pp. 200–216.

Booth, L., Aivazian, V. and Demirguc-kunt, A. (2001) 'Capital Structures in Developing Countries', *The Journal of Finance*, LVI(1).

Bradley, M., Jarrell, G. A. and Kim, E. H. (1984) 'On the Existence of an Optimal Capital Structure : Theory and Evidence', *Journal of Finance*, 39(3), pp. 857–878.

Bradley, N. (2013) *Marketing Research: Tools and Techniques*. Third Edit. Edited by N. Bradley. United Kingdom: Oxford University Press.

Brand South Africa (2017) *South Africa's financial sector*, *South Africa's financial sector*. Available at: https://www.brandsouthafrica.com/governance/south-africas-financial-sector.

Brealey, R. A., Myers, S. C. and Allen, F. (2011) *Principles of Corporate Finance*. 11th edn. Edited by B. Gordon and M. Janicek. Douglas Reiner.

Brealey, R. A., Myers, S. C. and Marcus, A. J. (2015) *Fundamentals of Corporate Finance*. 8th edn. Edited by R. Koos. New York: McGraw-Hill Education.

Brigham, E. F. and Daves, P. R. (2007) *INTERMEDIATE FINANCIAL MANAGEMENT*. Ninth. Edited by A. von Rosenberg and M. R. Reynolds. Ohio: Thomson South-Western.

Brooks, C. (2008) *Introductory Econometrics for Finance*. Second Edi. Edited by C. Brooks. New York: Cambridge University Press.

Cachanosky, N. (2009) 'THE DEFINITION OF INFLATION ACCORDING TO MISES : IMPLICATIONS FOR THE DEBATE ON FREE', *LIBERTARIAN PAPERS*, 1(43), pp. 1–7.

Chavali, K. and Rosario, S. (2018) 'RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND PROFITABILITY : A STUDY OF NON BANKING FINANCE COMPANIES IN INDIA', *Academy of Accounting and Financial Studies Journal*, 22(1), pp. 1–8.

Chen, A. H. and Boness, A. J. (1975) 'Effects of Uncertain Inflation on the Investment and Financing Decisions of a Firm', *Journal of Finance*, 30(2).

Chen, L. and Zhao, X. (2006) ‘On the relation between the market-to-book ratio , growth opportunity , and leverage ratio’, *Finance Research Letters*, 3, pp. 253–266. doi: 10.1016/j.frl.2006.06.003.

Choi, D. S. (2014) ‘DETERMINANTS OF THE CAPITAL STRUCTURE : EMPIRICAL STUDY FROM THE KOREAN MARKET’, *International Journal of Science Commerce and Humanities*, 2(7), pp. 116–125.

Coltart, D. (2007) *Understanding the Zimbabwean crisis A first step in planning its recovery, David Coltart*.

Confederation of Zimbabwe Industries (2017) *Manufacturing Sector Survey*. Harare.

Crampton Nicole (2015) *Manufacturing Sector Trends & Insights | Grants, funding and incentives for Manufacturing in South Africa | BizConnect, Standard Bank*. Available at: https://bizconnect.standardbank.co.za/sector-news/manufacturing/grants,-funding-and-incentives-for-manufacturing-in-south-africa.aspx (Accessed: 1 May 2019).

Daskalakis, N. and Psillaki, M. (2008) ‘Do country or firm factors explain capital structure ? Evidence from SMEs in France and Greece’, *Applied Financial Economics*, 8, pp. 87–9. doi: 10.1080/09603100601018864.

DeAngelo, H. and Masulis, R. W. (1980) ‘OPTIMAL CAPITAL STRUCTURE UNDER CORPORATE AND PERSONAL TAXATION’, *Journal of Financial Economics*, 8, pp. 3–27.

Demirgüç-Kunt, A. and Maksimovic, V. (1998) ‘Law , Finance , and Firm Growth’, *Journal of Finance*, 53(6), pp. 2107–2137.

Dougherty, C. (2011) *Introduction to Econometrics FOURTH EDITION*. 4th edn. Edited by C. Dougherty. New York: Oxford University Press.

Downs, T. W. (1993) ‘Corporate leverage and nondebt tax shields : Evidence on crowding-out’, *The Financial Review*, 28(4), pp. 549–583.

Drobetz, W. *et al*. (2003) *What are the Determinants of the Capital Structure ? Some Evidence for Switzerland What are the Determinants of the Capital Structure ? Some Evidence for Switzerland*. 4/03. Basel.

Ehrhardt, M. C. . and Brigham, E. F. . (2011) *Financial Management: Theory and Practice*.

THIRTEENTH. Edited by M. Reynolds. Ohio: Joe Sabatino.

Ezeoha, A. E. (2011) 'F INANCIAL LEVERAGE DECISIONS IN AN ERA OF CORPORATE EARNINGS DOWN - TURN AND FINANCIAL MARKET INSTABILITY - THE N IGERIAN EXPERIENCE', *Journal of Economic and Financial Sciences*, 4(2), pp. 333–350.

Fabricius, P. (2017) *Solidarity over Justice: The ties that bind South Afric..., Daily Maverick*. Available at: https://www.dailymaverick.co.za/article/2017-08-22-solidarity-over-justice-the-ties-that-bind-south-africa-and-zimbabwe/ (Accessed: 1 May 2019).

Fan, J. P. H., Titman, S. and Twite, G. (2012) 'An International Comparison of Capital Structure and Debt Maturity Choices', *The Journal of Financial and Quantitative Analysis*, 47(1), pp. 23–56.

Faris, M. A. M. (2011) 'The determinants of capital structure of Palestine-listed companies', *The Journal of Risk Finance*, 12(3), pp. 226–241. doi: 10.1108/15265941111136969.

Fouka, G. and Mantzorou, M. (2011) 'What are the Major Ethical Issues in Conducting Research?Is there a Conflict between the Research Ethics and the Nature of Nursing?', *HEALTH SCIENCE JOURNAL*, 5(1), pp. 3–14.

Frank, M. Z. and Goyal, V. K. (2008) 'TRADE-OFF AND PECKING ORDER THEORIES OF DEBT', *HANDBOOK of CORPORATE FINANCE: EMPERICAL CORPORATE FINANCE*, 2, pp. 136–197.

Frank, M. Z. and Goyal, V. K. (2009) 'Capital Structure Decisions: Which Factors Are Reliably important?', *Financial Management*, Spring, pp. 1–37. doi: 10.1111/j.1755-053X.2009.01026.x.

Gao, R. (2016) 'An Empirical Study on the Influence of Non-Debt Tax Shield on the Choice of Corporate Debt Levels----Based On the Tax Preference Policy', *International Journal of Business and Social Science*, 7(1), pp. 201–212.

Gujarati, D. N. and Porter, D. C. (2009) *Basic Econometrics: Fifth Edition*. Fifth Edit. Edited by A. E. Hilbert and N. Fox. New York: McGraw-Hill/Irwin.

Gumbe, S. and Kaseke, N. (2011) 'Manufacturing firms and hyperinflation- survival options : the case of Zimbabwe manufacturers (2005-2008)', *Journal of Management and Marketing Research*, pp. 1–22.

Harris, M. and Raviv, A. (1991) 'The Theory of Capital Structure', *Journal of Finance*, XLVI(1), pp. 297–354.

Harris, R. D. F. and Tzavalis, E. (1999) 'Inference for unit roots in dynamic panels where the time dimension is fixed', *Journal of Econometrics*, 91, pp. 201–226.

Hassan, S. (2013) *South African Capital Markets: An Overview, Ersa*. Available at: https://econrsa.org/system/files/publications/working_papers/working_paper_391.pdf.

Hlouskova, J. and Wagner, M. (2006) 'The performance of panel unit root and stationarity tests: results from a large scale simulation study', *Econometric Reviews*, 25(December 2005), pp. 85–116. doi: 10.1080/07474930500545504.

Hsiao, C. (2007) 'Panel data analysis-advantages and challenges', *Sociedad de Estad´ıstica e Investigaci´on Operativa*, 16, pp. 1–22. doi: 10.1007/s11749-007-0046-x.

Jensen, M. C. and Meckling, W. H. (1976) 'Theory of the Firm : Managerial Behavior , Agency Costs and Ownership Structure Theory of the Firm : Managerial Behavior , Agency Costs and Ownership Structure', *Journal of Financial Economics*, 3(4), pp. 305–360.

Jong, A. De, Kabir, R. and Nguyen, T. T. (2008) 'Capital structure around the world : The roles of firm- and country-specific determinants q', *Journal of Banking and Finance*, 32, pp. 1954–1969. doi: 10.1016/j.jbankfin.2007.12.034.

Kaldor, N. (1966) *Causes of the slow rate of economic growth of the United Kingdom: an inaugural lecture*. London: Cambridge University Press. Available at: https://www.worldcat.org/title/causes-of-the-slow-rate-of-economic-growth-of-the-united-kingdom-an-inaugural-lecture/oclc/3460806 (Accessed: 2 May 2019).

Kaseke, N. (2015) 'Financial distress and its repercussions on the manufacturing sector in Zimbabwe', *University of Zimbabwe Business Review*, 3(1/2), pp. 22–36.

Keefe, M. O. C. and Yaghoubi, M. (2014) *Does cash flow volatility affect firm capital structure ?, https://acfr.aut.ac.nz/__data/assets/pdf_file/0010/29890/486196-WP-Capital-structure-and-volatility.pdf*.

Korajczyk, R. A. and Levy, A. (2002) 'Capital structure choice : Macroeconomic conditions and financial constraints j', *Journal of Financial Economics*, (279).

Lechela, N. (2018) *Manufacturing production on the rise, Fin24*. Available at: https://www.fin24.com/Economy/manufacturing-production-on-the-rise-20180313 (Accessed: 7 May 2019).

Leedy, P. D. and Ormrod, J. E. (2015) *Practical Research: Planning and Design*. Eleventh E. Edited by J. W. Johnston. England: Pearson Education Limited.

Lim, T. C. (2012) 'Determinants of Capital Structure Empirical Evidence from Financial Services Listed Firms in China', *International Journal of Economics and Finance*, 4(3), pp. 191–203. doi: 10.5539/ijef.v4n3p191.

Mallisa, M. and Kusuma, H. (2017) 'CAPITAL STRUCTURE DETERMINANTS AND F IRMS ' PERFORMANCE : EMPIRICAL EVIDENCE FROM THAILAND , INDONESIA AND MALAYSIA', *Polish Journal of Management Studies*, 16(1), pp. 154–165. doi: 10.17512/pjms.2017.16.1.13.

MCEP (no date) *About - MCEP*. Available at: http://mcep.co.za/about/ (Accessed: 2 June 2021).

McKinsey Global Institute (2012) *Manufacturing the future : The next era of global growth and innovation*.

Miller, M. H. and Modigliani, F. (1958) 'The Cost of Capital, Corporation Finance and the Theory of Investment', *The American Economic Review*, 48(3), pp. 261–297.

Modigliani, F. and Miller, M. H. (1963) 'Corporate Income Taxes and the Cost of Capital : A Correction', *The American Economic Review*, 53(3), pp. 433–443.

Modugu, K. P. (2013) 'Capital Structure Decision : An Overview', *Journal of Finance and Bank Management*, 1(June), pp. 14–27.

Morellec, E. (2001) 'Asset liquidity , capital structure , and secured debt', *Journal of Financial Economics*, 61, pp. 173–206.

Mosai, S. (no date) 'The South African Manufacturing Landscape :2017-2020', in *Productivitysa*, pp. 2017–2020.

Mouton, M. and Smith, N. (2016) 'Company determinants of capital structure on the JSE Ltd and the influence of the 2008 financial crisis', *Journal of Economic and Financial Sciences*, 9(3), pp. 789–806. doi: 10.4102/jef.v9i3.71.

Mutambanengwe, F. (2013) *The liquidity crunch revisted - Zimbabwe Situation, Financial Gazette*. Available at: https://www.zimbabwesituation.com/news/zimsit_the-liquidity-crunch-revisted/ (Accessed: 1 May 2019).

Mutenheri, E. and Munangagwa, C. (2015) 'The Determinants of Capital Structure in Zimbabwe during the Multicurrency Regime', *Research Journal of Finance and Accounting*, 6(19), pp. 104–108.

Myers, S. C. (1984) 'The Capital Structure Puzzle', *The Journal of Finance*, XXXIX(3), pp. 575–592.

Myers, S. C. (2001) 'Capital Structure', *Journal of Economic Perspectives*, 15(2), pp. 81–102.

Myers, S. C. and Majluf, N. S. (1984) 'Corporate financing and investment decisions when firms have information that investors do not have', *Journal of Financial Economics*, 13, pp. 187–221.

Myers, S. C. and Rajan, R. G. (1998) 'The Paradox of Liquidity', *The Quareterly Journal of Economics*, pp. 773–771.

Nasution, A. A., Panggabean, R. and Siregar, I. (2017) 'The Effect of Profitability , Asset Tangibility , Corporate Tax , Non-debt Tax Shield and Inflation upon the Financial Capital Structure of the Manufacturing Companies listed on the Indonesian Stock Exchange', *Advances in Economics, Business and Management Research*, 36, pp. 65–74.

Naudé, W. and Szirmai, A. (2012) *The importance of manufacturing in economic development: Past, present and future perspectives*. 2012–041. Maastricht.

Nilssen, C. M. (2014) *Determinants of Capital Structure in Listed Norwegian Firms*. Norges Handelshøyskole and Lancaster University.

Nyarota, S. *et al.* (2015) *INTEREST RATE DETERMINATION UNDER A MULTIPLE CURRENCY ENVIRONMENT: THE CASE OF ZIMBABWE*. Harare. Available at: https://www.rbz.co.zw/documents/working_papers/interest-rate-determination-under-a-multiple-currency-envoronment--the-case-for-zimbabwe.pdf (Accessed: 1 May 2019).

Pandey, A., Bhama, V. and Singh, M. (2019) 'Recession Impact on Capital Structure Determinants', *Journal of Management Research*, 19(3), pp. 205–218.

Pandey, I. M. (2013) *Financial Management*. 10th edn. New Dehli: Vikas Publishing House Pvt

Ltd.

Rajan, R. G. and Zingales, L. (1995) 'What Do We Know about Capital Structure ? Some Evidence from International Data', *The Journal of Finance*, 50(5), pp. 1421–1460.

Rajan, R. and Tokatlidis, I. (2005) 'Dollar Shortages and Crises', *International Journal of Central Banking*, Volume(Number 2), pp. 177–220. doi: 10.3386/w10845.

Ramadan, I. Z. (2015) 'An Empirical Investigation of the Trade-Off Theory : Evidence from Jordan', *International Business Research*, 8(4), pp. 19–24. doi: 10.5539/ibr.v8n4p19.

Raniszewski, E. A. (1959) 'Financing Small Corporations : Debt or Equity', *Marquette Law Review*, 42(3), pp. 387–402.

Ross, S. A. (1977) 'The determination of financial structure : the incentive-signalling approach', *The Bell Journal of Economics*, 8(1), pp. 23–40.

Salkind, N. J. (2012) *Exploring Research Eighth Edition*. 8th edn. Edited by S. Frail and M. Schricker. New Jersey: Pearson Education Inc. Available at: http://dinus.ac.id/repository/docs/ajar/Neil_J._Salkind_2012_-_Exploring_Research_.pdf.

Samuelson, P. A. and Nordhaus, W. D. (2010) *Economics*. Nineteenth. Edited by N. Fox. New York: McGraw-Hill/Irwin.

Sanchez, V. (2019) *Venezuela inflation at 10 million percent*, *CNBC*. Available at: https://www.cnbc.com/2019/08/02/venezuela-inflation-at-10-million-percent-its-time-for-shock-therapy.html (Accessed: 11 November 2019).

Sanyal, P. and Mann, C. L. (2010) *The Financial Structure of Startup Firms : The Role of Assets , Information , and Entrepreneur Characteristics*. 10. Boston.

Šarlija, N. and Harc, M. (2016) 'Capital Structure Determinants of Small and Medium Enterprises in Croatia', *Managing Global Transitions*, 14(3), pp. 251–266.

Saunders, M., Lewis, P. and Thornhill, A. (2009) *Research Methods for Business Students Fifth Edition*. Fifth Edit. Edited by M. Saunders, P. Lewis, and A. Thornhill. England: Pearson Education Limited.

Saungweme, T. (2013) 'TRADE DYNAMICS IN ZIMBABWE : 1980-2012', *International Journal Of Economics and Research*, 4(5), pp. 29–38.

Sayılgan, G., Karabacak, H. and Küçükkocaoğlu, G. (2006) *The Firm-Specific Determinants of Corporate Capital Structure : Evidence from Turkish Panel Data*, *http://www.baskent.edu.tr/~gurayk/kisiselcapstrpaper.pdf*. Ankara.

Schneider, G. E. (2000) 'The Development of the Manufacturing Sector in South Africa', *Journal of Economic Issues*. Taylor & Francis, Ltd., pp. 413–424. doi: 10.2307/4227570.

Sekeran, U. and Bougie, R. (2009) *Research Methods for Business: A Skill Building Approach*. Fifth Edit. Edited by U. Sekeran and R. Bougie. United Kingdom: John Wiley & Sons Ltd.

Shleifer, A. and Vishny, R. W. (1992) 'Liquidation Values and Debt Capacity : A Market Equilibrium Approach', *The Journal of Finance*, 47(4), pp. 1343–1366. doi: 10.1111/j.1540-6261.1992.tb04661.x.

Shubita, M. F. and Alsawalhah, J. M. (2012) 'The Relationship between Capital Structure and Profitability', *International Journal of Business and Social Science*, 3(16), pp. 104–112.

Sibilkov, V. (2009) 'Asset Liquidity and Capital Structure', *Journal of Financial and Quantitative Analysis*, 44(5), pp. 1173–1196. doi: 10.1017/S0022109009990354.

Suarez, P. (2016) 'Determinants of Capital Structure for Listed Companies in the Colombian Industrial Sector', *Catalyst*, 13(2), pp. 33–46.

Szirmai, A. and Verspagen, B. (2011) *Manufacturing and Economic Growth in Developing Countries, 1950-2005*. 2011–069. Maastricht.

Titman, S. and Wessels, R. (1988) 'The Determinants of Capital Structure Choice', *The Journal of Finance*, 43(1), pp. 1–19. doi: 10.1111/j.1540-6261.1988.tb02585.x.

Velnampy, P. T. and Niresh, J. A. (2012) 'The Relationship between Capital Structure & Profitability The Relationship between Capital Structure & Profitability', *Global Journal of Management and Business Research*, 12(13), pp. 66–74.

Veugelers, R. (2013) *Manufacturing Europe ' s future*. XXI. Edited by R. Veugelers. Brussels: BRUEGEL BLUEPRINT SERIES.

Wahome, M. N., Memba, F. and Muturi, W. (2015) 'The effects of firm size and risk on Capital Structure decisions of Insurance Industry in Kenya', *International Journal of Scientific and Research Publications*, 5(8), pp. 1–12.

Wernerfelt, B. (1984) ‘A Resource-based View of the Firm’, *Strategic Management Journal*, 5(2), pp. 171–180.

Williamson, O. E. (1988) ‘Corporate Finance and Corporate Governance’, *The Journal of Finance*, XLIII(3), pp. 567–592.

Wooldridge, J. M. (2002) *Econometric Analysis of Cross Section and Panel Data*. Edited by J. M. Wooldridge. London: The MIT Press.

Yinusa, O. G., Alimi, O. Y. and Ilo, B. M. (2016) ‘Macroeconomic Determinants of Capital Structure of Firms : Evidence from Nigeria’, *Journal of Knowledge Globalization*, 9(2), pp. 1–23.

APPENDICES

APPENDIX 1: ETHICAL CLEARANCE CERTIFICATE

UNISA university of south africa

UNISA DEPARTMENT OF FINANCE, RISK MANAGEMENT AND BANKING ETHICS REVIEW COMMITTEE

Date: 31 August 2020

ERC Ref #2020/CEMS/FRMB/011
Name : Ms NT Magomo
Student #: 66413931

Dear Ms NT Magomo

Decision: Ethics Approval from 01 September 2020 to 31 October 2026

Researcher(s): Name Ms NT Magomo

E-mail address 66413931@mylife.unisa.ac.za, telephone 0619246730

Supervisor (s): Name Dr C Nyoka
E-mail address nyokac@unisa.ac.za, telephone 012 429 4650

Working title of research:

Does capital structure theory remain under abnormal economic macro environment: the case of Zimbabwean manufacturing firms during the period 2009-2018

Qualification: MCOM: Business Management

Thank you for the application for research ethics clearance by the Unisa DFRB Ethics Review Committee for the above-mentioned research. Ethics approval is granted for the period 01 September 2020 to 31 October 2026

*The Negligible **risk application** was **reviewed** by the DFRB Ethics Review Committee 31 August 2020 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment*

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APPENDIX 2: UNIT ROOT TESTS – ZIMBABWE

```
. xtunitroot ht Bookvalueofleverage, trend

Harris-Tzavalis unit-root test for Bookvalueofleverage
------------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1610       -2.8733       0.0020
--------------------------------------------------------------------------
```

```
. xtunitroot ht Profitability, trend

Harris-Tzavalis unit-root test for Profitability
------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.2144       -2.1568       0.0155
--------------------------------------------------------------------------
```

```
. xtunitroot ht D.Companysize, trend

Harris-Tzavalis unit-root test for D.Companysize
------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =      9

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1819       -1.7050       0.0441
--------------------------------------------------------------------------
```

```
. xtunitroot ht Assettangibility, trend

Harris-Tzavalis unit-root test for Assettangibility
---------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1552       -2.9518       0.0016
--------------------------------------------------------------------------
```

```
. xtunitroot ht Ndts, trend

Harris-Tzavalis unit-root test for Ndts
---------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.0225       -4.7333       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Growthopportunities, trend

Harris-Tzavalis unit-root test for Growthopportunities
------------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                 -0.1302       -6.7843       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Earningsvolatility, trend

Harris-Tzavalis unit-root test for Earningsvolatility
-----------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                 -0.1152       -6.5818       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Firmsliquidity, trend

Harris-Tzavalis unit-root test for Firmsliquidity
---------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.0247       -4.7031       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Inflation, trend

Harris-Tzavalis unit-root test for Inflation
--------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.0816       -3.9392       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht GDP, trend

Harris-Tzavalis unit-root test for GDP
--------------------------------------
Ho: Panels contain unit roots               Number of panels  =     23
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1535       -2.9739       0.0015
--------------------------------------------------------------------------
```

APPENDIX 3: DESCRIPTIVE STATISTICS – ZIMBABWE

Variable		Mean	Std. Dev.	Min	Max	Observations
Bookva~e	overall	.5486385	.3045475	.1061646	2.0542	N = 230
	between		.2376711	.2660371	1.228404	n = 23
	within		.1961675	-.1777323	1.773673	T = 10
Profit~y	overall	.0541319	.1610197	-.7347721	.7965432	N = 230
	between		.1086254	-.1349063	.3707137	n = 23
	within		.1207958	-.5659161	.8009745	T = 10
Compan~e	overall	17.99001	1.543237	14.7955	23.61558	N = 230
	between		1.535959	15.67327	23.00857	n = 23
	within		.3393042	16.9507	19.03868	T = 10
Assett~y	overall	.5963865	.2193478	.1328503	.9909305	N = 230
	between		.206812	.1933109	.9115484	n = 23
	within		.0838049	.3534437	.898127	T = 10
Ndts	overall	.0329754	.0219424	.0034592	.2584622	N = 230
	between		.0125031	.013149	.0631876	n = 23
	within		.0182013	-.0022622	.2526535	T = 10
Growth~s	overall	.1772422	.3040144	0	2.461235	N = 230
	between		.0727913	.0573291	.3267357	n = 23
	within		.295524	-.1494935	2.321403	T = 10
Earnin~y	overall	.0145282	.0495547	8.55e-07	.5577739	N = 230
	between		.0206591	.0003446	.0749584	n = 23
	within		.0452288	-.0604039	.5075822	T = 10
Firmsl~y	overall	1.399437	1.271596	.0927537	12.3903	N = 230
	between		.9736089	.3131621	4.478409	n = 23
	within		.8404144	-.9898937	9.311326	T = 10
Inflat~n	overall	.152015	.2789091	-.00252	.95409	N = 230
	between		0	.152015	.152015	n = 23
	within		.2789091	-.00252	.95409	T = 10
GDP	overall	.080355	.0663968	.00756	.19675	N = 230
	between		0	.080355	.080355	n = 23
	within		.0663968	.00756	.19675	T = 10

APENDIX 4: CORRELATION MATRIX – ZIMBABWE

	Bookva~e	Profit~y	Compan~e	Assett~y	Ndts	Growth~s	Earnin~y	Firmsl~y	Inflat~n	GDP
Bookvalueo~e	1.0000									
Profitabil~y	-0.2308	1.0000								
Companysize	-0.0906	0.2125	1.0000							
Assettangi~y	0.1203	-0.3696	0.2349	1.0000						
Ndts	0.0437	-0.1488	0.1331	0.0375	1.0000					
Growthoppo~s	-0.0485	-0.0417	0.0082	-0.0892	0.0053	1.0000				
Earningsvo~y	0.1114	0.1191	-0.1022	-0.1330	0.3354	0.0463	1.0000			
Firmsliqui~y	-0.4438	0.2711	-0.0622	-0.5234	-0.1196	-0.0081	-0.0437	1.0000		
Inflation	-0.1530	-0.0195	-0.0818	0.0891	0.1216	0.1115	0.1763	0.0659	1.0000	
GDP	-0.1248	-0.0323	-0.0947	0.0273	0.0164	0.1598	0.0140	-0.0419	0.1800	1.0000

APPENDIX 5: RANDOM EFFECTS MODEL – ZIMBABWE

```
Random-effects GLS regression                   Number of obs     =        230
Group variable: Firm                            Number of groups  =         23

R-sq:                                           Obs per group:
     within  = 0.2843                                         min =         10
     between = 0.1326                                         avg =       10.0
     overall = 0.1726                                         max =         10

                                                Wald chi2(15)     =      73.56
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

Bookvalueofleverage	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Profitability	-.3676393	.1144088	-3.21	0.001	-.5918764	-.1434022
Companysize	-.0784882	.0245756	-3.19	0.001	-.1266555	-.030321
Assettangibility	.0264759	.1412989	0.19	0.851	-.2504649	.3034166
Ndts	-1.662477	.8045749	-2.07	0.039	-3.239415	-.0855392
Growthopportunities	.003239	.0433422	0.07	0.940	-.08171	.0881881
Earningsvolatility	.3222879	.3212162	1.00	0.316	-.3072843	.9518601
Firmsliquidity	-.0643873	.0157329	-4.09	0.000	-.0952231	-.0335515
Inflation	-1.350215	.8266985	-1.63	0.102	-2.970514	.2700841
GDP	-1.618999	1.024559	-1.58	0.114	-3.627099	.3891002
Multicurrencyregime	2.459102	3.706786	0.66	0.507	-4.806064	9.724269
Liquiditycrisis	-3.686653	3.95939	-0.93	0.352	-11.44691	4.073609
Bondnotesintroduction	-.5375538	.7394947	-0.73	0.467	-1.986937	.9118291
Foreigncurrencyshortages	1.877023	1.304472	1.44	0.150	-.6796947	4.43374
Inf_GDP	35.00246	28.35676	1.23	0.217	-20.57577	90.58069
MCR_GDP	-13.00773	18.9956	-0.68	0.493	-50.23842	24.22296
_cons	2.195669	.4537446	4.84	0.000	1.306346	3.084992
sigma_u	.18045317					
sigma_e	.17148935					
rho	.52545304	(fraction of variance due to u_i)				

APPENDIX 6: BREUSCH AND PAGAN LAGRANGIAN MULTIPLIER TEST- ZIMBABWE

```
. estimates store re1

.
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        Bookvalueofleverage[Firm,t] = Xb + u[Firm] + e[Firm,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                Bookval~e |   .0927492       .3045475
                        e |   .0294086       .1714894
                        u |   .0325633       .1804532

        Test:   Var(u) = 0
                             chibar2(01) =   193.42
                          Prob > chibar2 =   0.0000
```

APPENDIX 7: FIXED EFFECTS MODEL – ZIMBABWE

```
Fixed-effects (within) regression               Number of obs     =        230
Group variable: Firm                            Number of groups  =         23

R-sq:                                           Obs per group:
     within  = 0.3593                                         min =         10
     between = 0.0329                                         avg =       10.0
     overall = 0.0515                                         max =         10

                                                F(15,192)         =       7.18
corr(u_i, Xb)  = -0.8597                        Prob > F          =     0.0000
```

Bookvalueofleverage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Profitability	-.4375824	.1104851	-3.96	0.000	-.6555028	-.2196621
Companysize	-.2953198	.0458002	-6.45	0.000	-.385656	-.2049835
Assettangibility	-.1714093	.1684741	-1.02	0.310	-.503707	.1608885
Ndts	-2.110824	.7725495	-2.73	0.007	-3.634598	-.5870502
Growthopportunities	.0595504	.0414695	1.44	0.153	-.022244	.1413448
Earningsvolatility	.2980582	.302948	0.98	0.326	-.2994754	.8955917
Firmsliquidity	-.0668156	.0153634	-4.35	0.000	-.0971184	-.0365128
Inflation	-1.935135	.7739447	-2.50	0.013	-3.461661	-.408609
GDP	-2.533707	.9642273	-2.63	0.009	-4.435545	-.6318681
Multicurrencyregime	3.539435	3.444011	1.03	0.305	-3.253519	10.33239
Liquiditycrisis	-5.498405	3.685324	-1.49	0.137	-12.76733	1.770516
Bondnotesintroduction	-.7733669	.6871097	-1.13	0.262	-2.12862	.5818859
Foreigncurrencyshortages	2.88844	1.222556	2.36	0.019	.4770754	5.299805
Inf_GDP	52.01498	26.46643	1.97	0.051	-.1873018	104.2173
MCR_GDP	-18.72409	17.65069	-1.06	0.290	-53.53824	16.09006
_cons	6.277456	.8690354	7.22	0.000	4.563374	7.991539
sigma_u	.50255051					
sigma_e	.17148935					
rho	.89570147	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(22, 192) = 14.45                    Prob > F = 0.0000

.
. estimates store fe1
```

APPENDIX 8: HAUSMAN SPECIFICATION TEST – ZIMBABWE

```
. hausman fe1 re1, sigmamore

Note: the rank of the differenced variance matrix (7) does not equal the number of coefficients being tested
        (15); be sure this is what you expect, or there may be problems computing the test.  Examine the output
        of your estimators for anything unexpected and possibly consider scaling your variables so that the
        coefficients are on a similar scale.

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |      fe1          re1         Difference          S.E.
-------------+----------------------------------------------------------------
Profitabil~y |   -.4375824    -.3676393       -.0699432        .0334139
 Companysize |   -.2953198    -.0784882       -.2168315        .0428626
Assettangi~y |   -.1714093     .0264759       -.1978851        .1143065
        Ndts |   -2.110824    -1.662477       -.4483471        .2173113
Growthoppo~s |    .0595504      .003239        .0563114         .011081
Earningsvo~y |    .2980582     .3222879       -.0242297         .060219
Firmsliqui~y |   -.0668156    -.0643873       -.0024283        .0052119
   Inflation |   -1.935135    -1.350215       -.5849196         .116814
         GDP |   -2.533707    -1.618999       -.9147074        .1796043
Multicurre~e |    3.539435     2.459102        1.080333        .2514721
Liquidityc~s |   -5.498405    -3.686653       -1.811752        .3589616
Bondnotesi~n |   -.7733669    -.5375538       -.2358131        .0507699
Foreigncur~s |     2.88844     1.877023        1.011417         .194284
     Inf_GDP |    52.01498     35.00246        17.01252        3.327026
     MCR_GDP |   -18.72409    -13.00773       -5.716359        1.315334
----------------------------------------------------------------------------
                           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(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       36.13
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

APPENDIX 9: UNIT ROOT TESTS – SOUTH AFRICA

```
. xtunitroot ht Bookvalueofleverage, trend

Harris-Tzavalis unit-root test for Bookvalueofleverage
------------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.0458       -4.5157       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Profitability, trend

Harris-Tzavalis unit-root test for Profitability
------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1458       -3.1433       0.0008
--------------------------------------------------------------------------
```

```
. xtunitroot ht D.Companysize, trend

Harris-Tzavalis unit-root test for D.Companysize
------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =      9

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1198       -2.5342       0.0056
--------------------------------------------------------------------------
```

```
. xtunitroot ht Assettangibility, trend

Harris-Tzavalis unit-root test for Assettangibility
---------------------------------------------------
Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.1527       -3.0496       0.0011
--------------------------------------------------------------------------
```

```
. xtunitroot ht D.Ndts, trend

Harris-Tzavalis unit-root test for D.Ndts
------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =      9

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                  0.0230       -3.7719       0.0001
--------------------------------------------------------------------------
```

```
. xtunitroot ht Growthopportunities, trend

Harris-Tzavalis unit-root test for Growthopportunities
------------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                 -0.2408       -8.4467       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Earningsvolatility, trend

Harris-Tzavalis unit-root test for Earningsvolatility
-----------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                 -0.0236       -5.4679       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Firmsliquidity, trend

Harris-Tzavalis unit-root test for Firmsliquidity
-------------------------------------------------

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
--------------------------------------------------------------------------
                    Statistic         z         p-value
--------------------------------------------------------------------------
 rho                 -0.1034       -6.5618       0.0000
--------------------------------------------------------------------------
```

```
. xtunitroot ht Inflation, trend

Harris-Tzavalis unit-root test for Inflation
____________________________________________

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
____________________________________________________________________________
                    Statistic         z         p-value
____________________________________________________________________________
 rho                 -0.2378       -8.4049       0.0000
____________________________________________________________________________
```

```
. xtunitroot ht GDP, trend

Harris-Tzavalis unit-root test for GDP
______________________________________

Ho: Panels contain unit roots               Number of panels  =     24
Ha: Panels are stationary                   Number of periods =     10

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
____________________________________________________________________________
                    Statistic         z         p-value
____________________________________________________________________________
 rho                  0.0148       -4.9404       0.0000
____________________________________________________________________________
```

APPENDIX 10: DESCRIPTIVE STATISTICS – SOUTH AFRICA

Variable		Mean	Std. Dev.	Min	Max	Observations	
Bookva~e	overall	.4660248	.1715199	.0322183	1.197738	N =	240
	between		.1356569	.1647296	.7664334	n =	24
	within		.1082095	.1011806	1.049453	T =	10
Profit~y	overall	.0792595	.1637419	-1.62297	.3679326	N =	240
	between		.1039409	-.2361583	.2320343	n =	24
	within		.1281193	-1.307552	.3761579	T =	10
Compan~e	overall	21.13471	2.413976	15.49879	24.22056	N =	240
	between		2.408918	15.76044	24.16588	n =	24
	within		.4928604	18.80529	22.15526	T =	10
Assett~y	overall	.4753731	.1974566	0	.960968	N =	240
	between		.1634002	.1260645	.7771482	n =	24
	within		.1153036	-.1690244	.8193115	T =	10
Ndts	overall	.0266709	.0158784	0	.1045914	N =	240
	between		.013282	.0040853	.0538742	n =	24
	within		.0090749	-.0132776	.0773882	T =	10
Growth~s	overall	.2092315	.6154062	.0000925	8.806913	N =	240
	between		.2156058	.0520669	1.126809	n =	24
	within		.5779182	-.8884835	7.889335	T =	10
Earnin~y	overall	.0169884	.1255056	5.74e-08	1.923247	N =	240
	between		.0486437	.0001947	.240988	n =	24
	within		.1160799	-.197046	1.699247	T =	10
Firmsl~y	overall	1.946433	1.391933	.2897905	14.291	N =	240
	between		1.038214	.8460564	5.421348	n =	24
	within		.9487774	-1.633292	12.24842	T =	10
Inflat~n	overall	.058934	.0101794	.03917	.07505	N =	240
	between		0	.058934	.058934	n =	24
	within		.0101794	.03917	.07505	T =	10
GDP	overall	.015126	.0135199	-.01538	.03284	N =	240
	between		1.77e-18	.015126	.015126	n =	24
	within		.0135199	-.01538	.03284	T =	10

APPENDIX 11: CORRELATION MATRIX- SOUTH AFRICA

	Bookva~e	Profit~y	Compan~e	Assett~y	Ndts	Growth~s	Earnin~y	Firmsl~y	Inflat~n	GDP
Bookvalueo~e	1.0000									
Profitabil~y	-0.0131	1.0000								
Companysize	0.1394	0.0380	1.0000							
Assettangi~y	0.2122	0.0708	-0.0606	1.0000						
Ndts	0.1407	0.2864	0.1072	0.1736	1.0000					
Growthoppo~s	-0.1103	-0.1252	-0.0294	0.1909	-0.1851	1.0000				
Earningsvo~y	0.0142	-0.7214	-0.0658	-0.1473	-0.1279	0.0675	1.0000			
Firmsliqui~y	-0.6098	0.0702	-0.0540	-0.2834	-0.0406	-0.0059	-0.0607	1.0000		
Inflation	-0.1354	-0.0309	-0.0826	-0.0288	0.0817	0.0483	0.1185	0.0857	1.0000	
GDP	-0.0896	0.1488	-0.0008	0.0280	0.0049	0.0859	-0.1681	-0.0231	-0.2270	1.0000

APPENDIX 12: RANDOM EFFECTS MODEL- SOUTH AFRICA

```
Random-effects GLS regression                   Number of obs     =        240
Group variable: Firm                            Number of groups  =         24

R-sq:                                           Obs per group:
     within  = 0.2308                                         min =         10
     between = 0.4598                                         avg =       10.0
     overall = 0.3420                                         max =         10

                                                Wald chi2(9)      =      80.53
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

Bookvalueofleverage	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Profitability	.0029032	.0800626	0.04	0.971	-.1540167	.159823
Companysize	.0075457	.0067339	1.12	0.262	-.0056525	.0207439
Assettangibility	-.1323877	.0589475	-2.25	0.025	-.2479226	-.0168527
Ndts	.4300902	.6971765	0.62	0.537	-.9363507	1.796531
Growthopportunities	-.0173492	.0122641	-1.41	0.157	-.0413864	.006688
Earningsvolatility	-.0865279	.0924184	-0.94	0.349	-.2676646	.0946089
Firmsliquidity	-.0507896	.0069867	-7.27	0.000	-.0644832	-.0370959
Inflation	-1.975259	.7197276	-2.74	0.006	-3.3859	-.5646192
GDP	-1.615141	.5308628	-3.04	0.002	-2.655613	-.5746691
_cons	.6025795	.159127	3.79	0.000	.2906963	.9144627
sigma_u	.07450772					
sigma_e	.09954841					
rho	.35905162	(fraction of variance due to u_i)				

APPENDIX 13: BREUSCH AND PAGAN LAGRANGIAN MULTIPLIER TEST- SOUTH AFRICA

```
Breusch and Pagan Lagrangian multiplier test for random effects

        Bookvalueofleverage[Firm,t] = Xb + u[Firm] + e[Firm,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                Bookval~e |   .0294191       .1715199
                        e |   .0099099       .0995484
                        u |   .0055514       .0745077

        Test:   Var(u) = 0
                             chibar2(01) =    84.71
                          Prob > chibar2 =   0.0000
```

APPENDIX 14: FIXED EFFECTS MODEL – SOUTH AFRICA

```
Fixed-effects (within) regression               Number of obs     =        240
Group variable: Firm                            Number of groups  =         24

R-sq:                                           Obs per group:
     within  = 0.2670                                         min =         10
     between = 0.0588                                         avg =       10.0
     overall = 0.0980                                         max =         10

                                                F(9,207)          =       8.38
corr(u_i, Xb)  = -0.4766                        Prob > F          =     0.0000
```

Bookvalueofleverage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Profitability	.0208015	.0805524	0.26	0.796	-.1380069	.1796098
Companysize	.036027	.0171445	2.10	0.037	.0022268	.0698272
Assettangibility	-.3388853	.0748461	-4.53	0.000	-.4864436	-.191327
Ndts	-.187328	.7762333	-0.24	0.810	-1.717664	1.343008
Growthopportunities	-.0093979	.0117852	-0.80	0.426	-.0326324	.0138366
Earningsvolatility	-.1500311	.0910493	-1.65	0.101	-.3295338	.0294716
Firmsliquidity	-.0445471	.0072137	-6.18	0.000	-.0587689	-.0303252
Inflation	-1.43783	.7457929	-1.93	0.055	-2.908154	.032493
GDP	-1.578983	.5066521	-3.12	0.002	-2.577843	-.5801237
_cons	.0688935	.3728644	0.18	0.854	-.666205	.803992
sigma_u	.15537366					
sigma_e	.09954841					
rho	.70896809	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(23, 207) = 8.71                     Prob > F = 0.0000
```

APPENDIX 15: HAUSMAN SPECIFICATION TEST – SOUTH AFRICA

	Coefficients			
	(b) fe1	(B) re1	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Profitabil~y	.0208015	.0029032	.0178983	.0290294
Companysize	.036027	.0075457	.0284812	.0168285
Assettangi~y	-.3388853	-.1323877	-.2064976	.0527896
Ndts	-.187328	.4300902	-.6174182	.4329327
Growthoppo~s	-.0093979	-.0173492	.0079513	.0021995
Earningsvo~y	-.1500311	-.0865279	-.0635032	.0269246
Firmsliqui~y	-.0445471	-.0507896	.0062425	.0030581
Inflation	-1.43783	-1.975259	.5374289	.3220117
GDP	-1.578983	-1.615141	.0361576	.0714601

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(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
        =       30.49
Prob>chi2 =      0.0001
(V_b-V_B is not positive definite)
```