

Capital structure under different macroeconomic conditions: Evidence from South Africa

Research by: Moeketsi Mokuoane (767677)

Supervisor: James Britten

A research report submitted to the School of Economics and Business Science, Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment (50%) of the requirements for degree of Master of Commerce in Finance

Johannesburg, South Africa

May 2016

DECLARATION

I, the undersigned, Moeketsi M. Mokuoane, hereby declare that this research is my own, unaided work. It is being submitted in partial fulfilment of the requirements for the degree of Masters in Finance at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

I further declare that:

I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.

I have followed the required conventions in referencing the thoughts and ideas of others. I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or in writing.

SIGNED AT _____ ON THIS _____ DAY OF _____ 2016

Signature

ACKNOWLEDGEMENTS

I would like to thank the following people for their immense support:

James Britten, my supervisor

Teboho Tsoetsi for his assistance with the VBA code and MATLAB programme

Definition of Terms and Abbreviations

Balance sheet channel: a theory, which states that the size of the external finance premium should be inversely related to the borrower's net worth.

Bank lending channel: a theory which states that changes in monetary policy will shift the supply of intermediated credit, especially credit through commercial banks.

Basel I, II and III: a set of standards and practises created to ensure that international banks maintain adequate capital to sustain themselves during periods of economic strain.

BESA: Bond Exchange of South Africa is the South African Bond exchange based in Johannesburg and the entity is responsible for operating and regulating the debt securities and interest rate derivatives markets in South Africa.

Consumer Price Index or CPI: a measure which examines the weighted average price of a basket of consumer goods and services, such a transportation, food and medical care. The Consumer Price Index is calculated by taking price changes for each item in the predetermined basket of goods and averaging them; the goods are weighted according to their importance.

Credit Channel Mechanism of Monetary Policy: a theory that explains how the central bank's policy changes affect the amount of credit that banks issue to firms and consumers for purchases, which in turn affects the real economy.

EBITDA: earnings before interest, taxation, depreciation and amortisation.

EBIT: earnings before interest and taxation.

Gross Domestic Product or Real Gross Domestic Product: is a macroeconomic measure of the value of economic output adjusted for price changes (i.e. inflation or deflation). This adjustment transforms the money value measure, nominal GDP, into an index for quantity of total output.

JIBAR: Johannesburg Interbank Agreed Rate is the money market rate that is used in South Africa. It is calculated as the average interest rate at which banks buy and sell money.

Net Present Value: the sum of the future values of incoming and outgoing cash flows over a period of time which are discounted using a specified rate of return.

Risk-based Capital Credit Crunch Hypothesis: a theory which explores whether during a credit crunch, risky banks, constrained by low capital ratios, tend to reduce lending more than others, during a credit crunch.

IPO: Initial Public Offering.

SARB: South African Reserve Bank.

Weighted Average Costs of Capital: is the rate that a corporate is expected to pay on average to all its security holders to finance its assets.

Tobin's Q: the sum of the market value of equity and the book value of debt, divided by the book value of assets, at the end of the event quarter should be greater than one.

Capital structure under different macroeconomic conditions: Evidence from South Africa

ABSTRACT

The empirical literature provides conflicting assessments about how firms choose their capital structure and how macroeconomic variables influence capital structure decision making. There has been a minimal research of the impact of macroeconomic conditions on the adjustment of capital structure towards target, specifically in the context of South Africa. This study employs a sample of South African companies listed on JSE Limited stock exchange from 2000 - 2014 to investigate: (1) the relationship between corporate leverage and firm characteristics as well as macroeconomic variables; (2) the impact of extreme capital market frictions on capital structure decisions; and (3) the relation between macroeconomic conditions and capital structure adjustment speed using an integrated partial adjustment dynamic capital structure model. The research results find evidence that certain firm characteristics and macroeconomic factors have pronounced influence on the capital structure of the sample of listed companies. The empirical results are compared to previous international evidence from developed markets and are in line with the international evidence. Results show that profitability, size and tangibility are significant determinants of firms' capital structure in the pre- extreme capital market friction periods. The rand crisis of 2001 – 2002 and the global financial crisis period of 2007 – 2009 are considered extreme capital market friction periods. The findings highlights that profitability and size have a different relation to leverage during these extreme capital market friction periods. The extreme capital market friction dummy is significant which means that capital supply conditions are also amongst important factors that need to be considered while determining the financing mix during periods where the supply of capital is disrupted. The findings highlight that demand-side and supply-side factors need to be considered in firms' financial decision making processes, especially during periods where there is extreme capital markets friction. The research also finds evidence supporting the prediction of theoretical framework that firms adjust to target leverage slower in good states than in bad states, where states are defined by real GDP growth rate and inflation rate.

Table of contents

| | |
|---|----|
| 1. Introduction | 1 |
| 1.1. Background to the study..... | 1 |
| 1.2. Contribution of the study..... | 5 |
| 1.3. Dissertation outline..... | 6 |
| 2. Literature review..... | 7 |
| 2.1. The progression of capital structure debate..... | 7 |
| 2.2. Capital structure theories | 10 |
| 2.2.1. Modigliani and Miller Theorem | 10 |
| 2.2.2. Agency costs theory | 11 |
| 2.2.3. Trade – off theory | 15 |
| 2.2.4. Pecking order theory..... | 17 |
| 2.2.5. Market timing | 18 |
| 2.3. Review of empirical studies of capital structure..... | 22 |
| 2.3.1. Empirical definitions of leverage | 22 |
| 2.3.2. Firm characteristics and basic capital structure | 23 |
| 2.3.3. Macroeconomic variables and basic capital structure | 26 |
| 2.3.4. Capital markets friction and basic capital structure | 30 |
| 2.3.4.1. Characteristics of capital markets friction | 39 |
| 2.3.4.1.1. Credit spreads | 39 |
| 2.3.4.1.2. Sudden decline in debt issuance..... | 39 |
| 2.3.4.1.3. Currency volatility | 41 |
| 2.3.5. Macroeconomic conditions and capital structure adjustment speed..... | 42 |
| 3. Description of variables | 45 |
| 3.1. Firm-specific variables..... | 45 |
| 3.1.1. Tangibility..... | 46 |
| 3.1.2. Size | 47 |
| 3.1.3. Profitability..... | 47 |
| 3.2. Macroeconomic variables..... | 47 |
| 3.2.1. Economic growth | 48 |
| 3.2.2. Inflation rate | 49 |
| 3.2.3. Interest rates..... | 52 |
| 3.2.4. Summary of the three key economic indicators..... | 53 |
| 4. Data..... | 54 |

| | | |
|----------|--|----|
| 5. | Model specification..... | 55 |
| 5.1. | The model specification – macroeconomic variables..... | 55 |
| 5.2. | The model specification – capital markets friction..... | 56 |
| 5.3. | The model specification - integrated dynamic partial adjustment capital structure model | 58 |
| 5.3.1. | Defining good and bad states of macroeconomic conditions | 59 |
| 6. | Empirical analysis..... | 60 |
| 6.1. | Summary statistics..... | 60 |
| 6.2. | Results and discussion | 64 |
| 6.2.1. | Regression results | 64 |
| 6.2.2. | Discussion..... | 65 |
| 6.2.2.1. | GDP growth..... | 65 |
| 6.2.2.2. | Prime rate | 66 |
| 6.2.2.3. | CPI | 67 |
| 6.2.2.4. | Tangibility..... | 68 |
| 6.2.2.5. | Size | 69 |
| 6.2.2.6. | Profitability..... | 69 |
| 6.2.3. | Capital markets friction and leverage ratios..... | 70 |
| 6.2.4. | Macroeconomic condition and capital structure speed adjustment..... | 71 |
| 6.2.4.1. | Regression results for adjustment speed estimates..... | 73 |
| 7. | Summary and conclusion..... | 76 |
| 7.1. | Contributions | 78 |
| 7.2. | Limitations..... | 79 |
| 7.3. | Recommendations | 79 |

List of figures

| | |
|---|----|
| Figure 1 - South African Total Listed Debt Issuance (2005 - 2015) | 3 |
| Figure 2 - Debt cost - benefit balance | 16 |
| Figure 3 - Total loans and advances: South African corporates (1995 - 2014) | 32 |
| Figure 4 - Historical credit spreads (2003 – 2014) | 39 |
| Figure 5 – South African corporate historical debt issuance (2005 – 2015)..... | 40 |
| Figure 6 - USDZAR exchange rate (1995 – 2014) | 41 |
| Figure 7 - Real GDP growth rate (1970 – 2014) | 49 |
| Figure 8 - Consumer Price Index (1970 - 2014)..... | 51 |
| Figure 9 - South African Prime rate (1970 – 2014) | 53 |
| Figure 10 - Summary of the three selected economic indicators (1999 – 2014) | 54 |
| Figure 11 - Market value leverage vs. book value leverage..... | 61 |
| Figure 12 - Relative proportion of different categories of leveraged firms - market value basis | 62 |
| Figure 13 - Relative proportion of different categories of leveraged firms - book value basis | 63 |

List of tables

| | |
|--|----|
| Table 1 - Summary of agency models | 14 |
| Table 2 - Summary of Mokhova and Zinecker (2014) results | 28 |
| Table 3 - Relationship between firm-specific characteristics and corporate leverage..... | 45 |
| Table 4 - Definition of good and bad states..... | 60 |
| Table 5 - Annual mean, median and standard deviation of leverage..... | 61 |
| Table 6 - Sample statistics..... | 62 |
| Table 7 - Correlation matrix: Book value leverage..... | 63 |
| Table 8 - Correlation matrix: Market value leverage..... | 64 |
| Table 9 - Regression results | 65 |
| Table 10 - Effects of extreme capital markets' frictions and leverage ratio | 71 |
| Table 11 - Summary statistics of leverage across states..... | 72 |
| Table 12 - Good vs. Bad states when states are determined by inflation rate..... | 74 |
| Table 13 - Good vs. Bad states when states are determined by real GDP growth rate | 75 |

1. Introduction

1.1. Background to the study

The relevance of the composition of the corporate capital structure has been the subject of debate since the publication of the seminal paper by Modigliani and Miller (1958) that argued that a firm's value is independent of the relative proportions of debt or equity in its "capital stack". It is almost five decades since the publication of the aforementioned paper, and the debate around the relevance of a firm's capital structure wages on. A number of theories have been developed, some of a polemic nature, and others in support of Modigliani and Miller (1958). Considerable empirical research and analysis has also been conducted to support or refute the Modigliani and Miller (1958) position.

The decision-making process concerning the financing choice of a company is an important matter as far as financial stability and going concern matters are concern. It is therefore important that one develops a better understanding of the determinants of firms' preferred leverage (the demand side) and the variables that measure the constraints on a firm's ability to increase its leverage (the supply side), if one is to develop improved levels of understanding funding patterns and their adjustment through economic cycles. The capital structure and its adjustment to achieve a specific target can be influenced by both the demand and supply side factors, collectively the so-called determinants of capital structure (Mokhova and Zinecker, 2014).

Corporate executives typically have a degree of control over demand-side factors (traditionally known as internal determinants); however external factors such as macroeconomic conditions and the ability of banks and/or other financial institutions (i.e. asset management companies, life offices and bilateral institutions) to make credit available cannot be controlled by these executives. Developing an understanding of how the demand-side and supply-side factors influence a corporate capital structure and the speed of adjustment towards target is therefore vitally important in assisting corporate executives to make appropriate decisions about their firms' capital structures.

There are a number of capital structure theories (Modigliani and Miller, 1958; Kraus and Litzenberger, 1973; Donaldson, 1961; Myers and Majluf, 1984) that have attempted to explain a firm's preferences and behaviour according to the financing choice of that firm. Kraus and Litzenberger (1973) suggested that the selection of a firm's capital structure reflects some trade-off between the tax benefits and the expected costs of bankruptcy. This trade-off theory argues that corporate executives find the optimal capital structure by taking into account the relative tax benefits, bankruptcy costs and agency costs of debt versus equity. An alternative, known as the pecking order theory, was espoused by Myers and Majluf (1984), and is premised on the information asymmetry between a company's corporate executives and its external investors (i.e. debt or equity investors). Put differently, pecking order theory postulates that the costs of financing increases with asymmetric information. Therefore,

pecking order theory assumes a certain sequence in funding: internal financing through profits first, then debt and lastly raising equity as a “last resort”.

Empirical studies have tried to shed light on the determinants of a firm’s capital structure and to provide support for the existing capital structure theories. A literature review reveals that there are some key internal factors that have a significant effect on the financing choices made by a company, including: profitability, asset tangibility, growth opportunities and tax shields (Mokhova and Zinecker, 2014). Marsh (1982) was one of the pioneers in conducting exploratory studies that looked at the determinants of corporates’ target debt levels. He concluded that the results were consistent with other empirical studies by Martin and Scott (1977) that found that a firm’s targeted debt levels were a function of the company’s size, bankruptcy risk, and asset portfolio composition. These key determinants in some instances corroborate various capital structure theories (i.e. pecking order theory; trade-off theory and agency costs theory, etc.).

Other empirical studies of corporate capital structures have also attempted to show how financing choices by firms are influenced by macroeconomic factors and the state of the economy. For example, Bokpin (2009) investigated the effect of macroeconomic factors on the capital structure decisions of emerging market firms. Another study by Korajczyk and Levy (2003) investigated the role of macroeconomic conditions and financial constraints in determining a firm’s capital structure choice. Levy and Hennessy (2007) developed a computable general equilibrium model explaining financing over the business cycle.

Intuitively, positive gross domestic product (‘GDP’) growth rates might be expected to offer growth opportunities for firms and hence impact on their financial performance. Growth opportunities need to be funded either from internal or external sources of funding, and corporate executives need to make important elections in this regard. For example, if a firm’s fortune depends on current macroeconomic conditions, it would be prudent for corporate executives to adjust their firms’ funding policies based on the macroeconomic conditions prevailing from time to time (Hackbarth, Miao and Morellec, 2006). In other empirical studies, inflation rate has been found to have a significant effect on firms’ choice of external financing; whilst GDP growth rates have been found to have a negative correlation with a firm’s capital structure choice (Bokpin, 2009; Mokhova and Zinecker, 2014).

The foregoing discussion on leverage implicitly assumes that capital availability depends solely on firm characteristics and the performance of macroeconomic variables. However, capital market frictions that make capital structure relevant may be associated with a firm’s source of capital (Faulkender and Petersen, 2006). Following the global financial crisis, banks and other financial institutions tightened their lending criteria after suffering losses, and curtailed lending to the corporate sector (Ivashina and Scharfstein, 2009; Puri, Rocholl and Steffen, 2011). The historic magnitude of the financial crisis emphasizes the importance of understanding how shocks to the supply of external capital affect the real economy and capital structure of firms (Duchin, Ozbas and Sensoy, 2010).

Leary (2009) asked the question: Are capital markets supply frictions relevant for corporate capital structure decisions? Based on assumptions made by Modigliani and Miller (1958), the supply of different forms of capital is infinitely elastic; the theoretical answer to the question should therefore be a simple “no”. However, recent research literature, which has looked at the supply of credit and the relevance of capital market frictions on capital structure decisions, seems to agree that capital markets are relevant to the determination of capital structures and funding policy formulations.

The “credit supply” or “supply-side” literature suggests that market frictions can impact capital supply to corporates depending on the credit quality of borrowers and the extent of information asymmetry e.g. investment grade vs. non-investment and large firms vs small firms. Whether the credit supply impacts a firm’s financing decisions is still debatable. An examination of the findings of the academic literature on the subject, shows that majority of these studies provide mixed or inconclusive results (Leary, 2009; Duchin *et al.*, 2010; Lemmon and Roberts, 2010), highlighting the need for more research in this area.

Figure 1 shows the total listed debt loan issuance on JSE Bond Exchange in South Africa during the period 2005 to 2014.

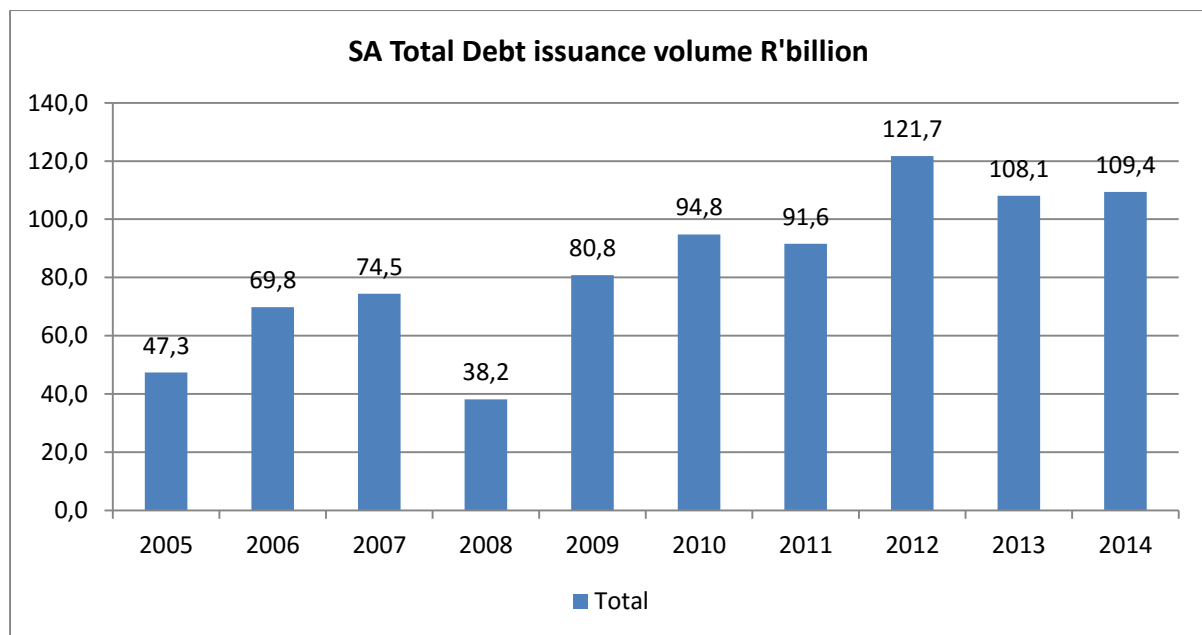


Figure 1 - South African Total Listed Debt Issuance (2005 - 2015)

Source: BESA (2015)

The onset of the global financial crisis led to tighter domestic debt capital markets. Tighter liquidity in these capital markets led to a rapid decline in private sector access to credit. Debt issuance in South Africa slowed from 2007 when debt issuance increased by 4.9% year-on-year, compared to 47.5% year-on-year increase in 2006. In 2008, the following year, debt issuance was severely impacted declining by 47.9% year-on-year, marking the beginning of a tight credit cycle. Corporate (i.e. non-banking and non-financial corporates) debt issuance declined by 9%, 69% and 54% during 2007, 2008 and 2009 respectively.

There has also been a number of studies completed of the basic determinants of capital structure and the impact thereof on a firm's adjustment speed (Harris and Raviv, 1991; Rajan and Zingales 1995; Deesomsak, Paudyal and Pescetto, 2004; Banerjee, Heshmati and Wihlborg, 2000; Drobetz and Wanzenried, 2006). Some studies have suggested that a firm's financing decisions and the adjustment of its capital structure towards a target leverage, may not depend entirely on firm-specific characteristics but also on macroeconomic conditions, economic development and business cycles (Drobetz and Wanzenried, 2006; Cook and Tang, 2010; Camara, 2012; Chipeta and Mbululu, 2013).

Although there are corporate capital structure theories aimed at explaining firms' financing decisions, little is known about how macroeconomic conditions affect the adjustment speed of capital structure towards target leverage (Cook and Tang, 2010). The primary existing theories of corporate capital structure that attempt to explain firms' financing decisions can be categorised as the trade-off theory, pecking order theory, and market timing theory (all discussed more fully in Section 2.2 hereof). These theories provide some insight on how firms adjust their leverage by looking at the cost and the benefits of each strategy. In the absence of any adjustment costs, firms would continuously offset deviations from target (Cook and Tang, 2010). The magnitude of the cost related to any adjustment will determine how quickly firms adjust to their target levels.

The studies on firm-specific determinants of capital structure and the impact of macroeconomic variables on capital structures have not been conclusive. Different researchers have reached different conclusions whilst investigating the same factors. This is probably because these variables explain only one side of the equation, the demand side. Gaud, Hoesli and Bender (2007) concluded that, after 40 years of research on capital structure theories, there is no single theory that can fully explain how corporate managers formulate their borrowing policies. All these disagreements provide scope for further research on whether capital structure decisions are impacted only by demand side factors or by combination of both demand side and supply side factors. The supply side mainly focuses on identification of exogenous variations in the supply of credit and how this affects capital structure decisions.

Against the backdrop of the aforementioned academic studies, this research investigates both firm-specific factors' and macroeconomic factors' impact on corporate capital structures in South Africa. In addition, this study investigates the financing behaviour of corporates during the time of rand crisis (2001 – 2002) and global financial crisis (2007 - 2009) in response to shocks to the supply of credit in South Africa. This research also reviews how a sample of South African corporates have adjusted their leverage targets given prevailing macroeconomic conditions reflected in the South African inflation rate and in its GDP growth rate.

1.2. Contribution of the study

The debate regarding basic capital structure determinants (i.e. both demand-side and supply-side) and the adjustment speed towards achieving the optimal capital structure has been primarily focused on firms operating in developed economies. Very little has been written on this subject in the context of firms domiciled in developing countries, especially in Africa. There have been a few studies of capital structure choices in some African countries (Gwatidzo and Ojah, 2009; Bokpin, 2009; Doku, Adjasi and Sarpong-Kumanjuma, 2011; Moyo, Wolmarans and Brümmer, 2013), although these have not focused specifically on the impact of prevailing macroeconomic conditions. Also, the emerging literature of supply-side determinants of capital structure choices presents an opportunity in contributing to the capital structure choice debate and research.

The studies conducted in an African context have also produced results, which are inconsistent with the empirical findings of studies conducted of firms in developed economies. For instance, Gwatidzo and Ojah (2009) found that tangibility of assets in most sampled African countries in their study were negatively correlated to leverage. This was however attributed to the apparent lack of contract-enforceability within sample countries, and the inability to provide accurate asset valuations.

The aim of this research is to take into consideration the aforementioned studies and test these theoretical formulations on Africa's largest capital market. Due to the volatility in capital markets over the last 10 years, the South African capital markets present an attractive testing ground.

The ongoing debate and the lack of consensus within the capital structure decision theories also provide an opportunity for further research, specifically in a developing markets context and to further understand both supply and demand side factors. In addition, an interesting area of research is the investigation on how quickly do corporates adjust their capital structure given the macroeconomic conditions.

In this regard, this research hopes to contribute to the understanding of capital structures in several ways. Firstly, starting with a selected list of firm-specific factors and macroeconomic factors from prior literature the research examines which factors are reliably signed, and reliably important, for predicting leverage. Secondly, there is a good reason to surmise that the factors influencing corporate financing decisions may have changed significantly over the past few decades. During the 1980s many firms took-on more leverage apparently due to pressure from the market for corporate control. During the late 1980s and 1990s, many smaller firms made use of publicly traded equity (Frank and Goyal; 2009). Other factors may also have changed and it is important to examine the effects of these changes on firms' capital structures over time.

Thirdly, as far as the supply-side effects on capital structure are concerned, this research also attempts to make a contribution in the South African context. To the best of the author's knowledge and belief it may be the first of its kind.

Finally, studies on the adjustment speed of capital structure derived from analysing traditional capital structure theories as well as studies on the role of macroeconomic factors in capital structure choice have largely ignored the impact of macroeconomic conditions on the adjustment speed of capital structure towards targets. This research also tests the relationship between macroeconomic conditions and capital structure adjustment speed using an integrated partial adjustment dynamic capital structure model during good and bad economic conditions as defined using the parameters set by this research and guided by previous literature studies (Cook and Tang, 2010).

With regard to the aforementioned, the aims of this research are:

- To determine the influence of macroeconomic factors on the capital structures of selected companies listed on Johannesburg Stock Exchange.
- To explore the relevance of extreme capital market frictions on corporate capital structure decisions.
- To analyse the impact that macroeconomic factors have on the speed of adjustment to attempt to achieve the optimal capital structure (i.e. the targeted capital structure) and to explore how quickly firms adjust their capital structure during both good and bad times.

1.3. Dissertation outline

The research is made up of seven related sections. Section 1 introduces the research by giving an overview of the three related topics of capital structure, objectives and the significance of the research. Section 2 looks at the theoretical and empirical determinants of capital structure. It explores the different firm-specific characteristics and macroeconomic variables and their impact on capital structure decision making. The theories of capital structure, from Modigliani and Miller's (1958 and 1963) propositions to the more recent trade-off theories like Kraus and Litzenberger (1973) and agency theory of Jensen and Meckling (1976) are reviewed. These theories argue that firms' characteristics impact how capital structure decisions are made. Section 2 also discusses empirical studies relating to capital markets' frictions and their impact on capital structure choices. In addition, the empirical studies relating to the relationship between macroeconomic conditions and the capital structure adjustment speed are reviewed.

Section 3 discusses the selected firm-specific and macroeconomic variables and evidence from international studies. Section 4 and Section 5 discuss data and three models specification respectively. Section 6 provides the empirical analysis and a comparison of the results to international evidence is also included. Section 7 concludes.

2. Literature review

This section begins with the review of how the capital structure debates have evolved during the 20th and 21st century. Thereafter the capital structure theories (with specific focus on Modigliani and Miller Theorem, Agency costs theory, Trade-off theory, Pecking order theory and Market timing theory) are analyzed and reviewed. An extensive analysis of empirical studies supporting and refuting these theories is reviewed. The empirical studies relating to a new strand of corporate finance literature that demonstrates that the supply of capital, particular debt capital has an impact on corporate leverage is reviewed. Finally, the examination of empirical studies investigating macroeconomic conditions and capital structure adjustment speed are reviewed.

2.1. The progression of capital structure debate

Making the correct capital structure decisions is a crucial task for the financial wellbeing of any firm. Failure to make the right decisions could ultimately result in financial distress, bankruptcy and liquidation in certain circumstances. Corporate executives need to decide which form of capital they require given the firm's financial circumstances, long term funding strategies and value creation strategies for its stakeholders.

From an empirical study perspective, two questions have to be addressed in order to tackle the capital structure decisions: How do firms fund their capital structure to finance their operations and how does the choice of capital structure affect the value of the firm (Haron, 2014). Modigliani and Miller (1958) were the first to attempt to address these questions from a theoretical perspective.

Despite the extensive research done in the area of capital structure since Modigliani and Miller (1958) and notwithstanding Myers' (1977) research papers on the determinants of corporate borrowings, the understanding of the determinants of corporate borrowings remains inconclusive (Haron, 2014). According to Titman and Wessels (1988), empirical work in the area of capital structure decisions has lagged behind the theoretical research, perhaps because the relevant firm attributes are expressed in terms of fairly abstract concepts that are not directly observable. Al-Najjar and Taylor (2008) also point out that theoretical explanation is still lacking and empirical results are not yet sufficiently consistent to resolve the capital structure issues on how firms choose between the different methods of financing available to them.

Corporate financing decisions are the end-result of a complex process and existing theories can at best explain only certain facets of the diversity and complexity of financing choices (Haron, 2014). Myers (2001) suggests that there is no universal theory of debt-equity choice, and no reason to expect one. Myers (2001) however suggests that there are several useful conditional theories. For example, the *trade-off theory* says that firms seek debt levels that balance the tax advantages of additional debt against the costs of possible financial distress that come with raising capital in this form. The trade-off theory predicts moderate borrowings by tax-paying firms. The *pecking order theory* argues that the firm will borrow, rather than

issue equity, when internal cash flow is not sufficient to fund capital expenditure. Thus the amount debt raised will reflect the firm's cumulative need for external funds. The *free cash flow theory* postulates that dangerously high debt levels will increase value, despite the threat of financial distress, when a firm's operating cash flow significantly exceeds its profitable investment opportunities. The free cash flow theory is more applicable to mature firms that are prone to over-invest.

When corporations decide on the use of debt finance, they are reallocating some expected future cash flows away from equity claimants in exchange for cash up front. Also, when corporations decide to use equity in funding growth opportunities, equity capital providers require higher return compared to debt capital providers. The factors that drive decisions on whether to raise debt or equity capital remain elusive despite a vast body of theoretical literature and decades of empirical testing (Frank and Goyal, 2009; Titman and Wessels, 1988). For Frank and Goyal (2009) the inclusive results stems in part from the fact that many of the empirical studies are aimed at providing support for a particular theory. Due to the different time periods being investigated, different definitions of leverage and the variation of determinants of capital structure it is often all too easy to provide some empirical support for almost any idea. Most references about the contrasting nature of the capital structure research are made to the survey by Harris and Raviv (1991) or to the empirical study by Titman and Wessels (1988). These two classic papers (Harris and Raviv, 1991; Titman and Wessels, 1988) illustrate a serious empirical problem, and disagree over basic facts (Frank and Goyal, 2009).

The Titman and Wessels (1988) paper analyses the explanatory power of some theories of the optimal capital structure. Titman and Wessels (1988) study uses a factor-analytic technique that mitigates the measurement problems encountered when working with proxy variables. Although Titman and Wessels (1988) model results suggests that firms with unique or specialised products have low debt ratios, they find no evidence to support theoretical work that predicts that debt ratios are related to a firm's expected growth, non-debt tax shields, volatility, or collateral value of its assets. These findings are in sharp contrast with those of Harris and Raviv (1991). In this regard, advocates of particular theories are offered a choice of diametrically opposing well-known summaries of "what we all know" from the previous literature (Frank and Goyal, 2009). This contradiction provides scope and opportunity for further research.

The Harris and Raviv (1991) paper surveys capital structure theories based on agency costs, asymmetric information, product/input market interactions, and corporate control considerations (but excluding tax-based theories). According to Harris and Raviv (1991) research, studies generally agree that leverage increases with fixed assets, non-debt tax shields, growth opportunities, firm size; and leverage decreases with volatility, advertising expenditures, research and development expenditure, bankruptcy probability, profitability and uniqueness of the product.

Other researchers (Gertler and Gilchrist, 1993; Korajczyk and Levy, 2003; Levy and Hennessey, 2007; Bokpin, 2009) also try to investigate how macroeconomic conditions influence corporate capital structure decision-making. Gertler and Gilchrist (1993) show that subsequent to recessions induced by monetary contractions, aggregate debt issues increase for large firms but remain stable for small firms. During expansions, stock prices go up, expected bankruptcy costs go down, taxable income goes up, and cash increases. Thus, firms borrow more during expansions. Collateral values are likely to be pro-cyclical too. If firms borrow against collateral, leverage should again be procyclical (Frank and Goyal, 2009). However, agency problems are likely to be more severe during downturns as managers' wealth is reduced relative to that of shareholders. If debt aligns managers' incentives with those of shareholders, leverage should be counter-cyclical (Frank and Goyal, 2009).

Frank and Goyal (2003) found that approximately 30% of differences in the capital structure of publicly traded North American firms over the 1971 to 1998 period could be explained by firm-specific characteristics. According to Bokpin (2009), this finding shows that there are other factors that are affecting capital structure decisions, which are not accounted for by internal determinants. If firms' cash flow patterns are sensitive to movements in the economy, the firms will either have to issue less debt overall (reduce interest payments) or add special features to the issue of the debt probably by way of variable interest rate (Bokpin, 2009). The credit channel literature has given considerable attention to the link between firms' access to capital and macroeconomic development. This literature principally focuses on firms' reliance on debt financing and the related agency in assessing external financing (Bokpin, 2009).

Korajczyk and Levy (2003) provide evidence of how macroeconomic conditions affect capital structure choices. According to Korajczyk and Levy (2003) capital structure choice varies over time and across firms. For example, aggregate equity issues vary pro-cyclically and aggregate debt issues vary counter-cyclically for firms that have access to public financial markets. In addition, firms are more likely to issue equity following an abnormal increase in their own price of equity (Korajczyk, Lucas, and McDonald, 1992). Such observations suggest that both macroeconomic conditions and firm-specific factors drive variations in financing choices and that these variations differ with the degree of financial markets access available to each firm.

Hackbarth *et al.* (2006) argue that macroeconomic conditions should have a large impact not only on credit risk but also on firms' financing decisions. Indeed, if one determines optimal leverage by balancing the tax benefit of debt and bankruptcy, then both the benefit and the costs of debt should depend on macroeconomic conditions. The tax benefit of debt obviously depends on the level of cash flows, which in turn should depend on whether the economy is in an expansion or in a contraction (Hackbarth *et al.*, 2006). In addition, Hackbarth *et al.* (2006) argue that, bankruptcy costs depends on the probability of default and the loss given default, both of which should depend on the current state of the economy. As a result, variations in macroeconomic conditions should induce variations in optimal structure.

Levy and Hennessy (2007) found that firms that exhibit low degrees of financial constraints have pronounced counter-cyclical leverage, with much of the variation attributed to changes in macroeconomic conditions. Levy and Hennessy (2007) also found that firms that exhibit higher degrees of financial constraints do not exhibit these highly pronounced counter-cyclical leverage or debt issuance patterns. This presupposes that financing choices vary systematically with macroeconomic conditions (Bokpin, 2009).

Research on capital structure decisions is complicated when it is conducted in an international context, particularly in developing countries where markets are characterised by regulatory controls and institutional constraints (Haron, 2014). Most of the well-developed literature has tended to concentrate on capital structure decisions in developed economies, and has provided varying conclusions. Empirical literature on capital structure decisions in emerging market economics is scant (Bokpin, 2009).

It is important to examine firm characteristics and macroeconomic factors impact on corporate leverage in emerging market economies given the differences in the levels of economic development. This study seeks to ascertain whether evidence from an emerging market economy will confirm or contradict existing literature from developed economies. Hopefully this will contribute to existing literature on the impact of macroeconomic factors and firm-specific variables on the capital structure decisions of firms. In addition, the research also contributes in understanding whether there is capital rationing in the capital markets in South Africa.

2.2. Capital structure theories

2.2.1. Modigliani and Miller Theorem

Modigliani and Miller's (1958) seminal paper forms the foundation of modern capital structure theories and studies. Before their paper was published in 1958, there was no generally accepted capital structure theory or a theory that at least provided some basis for a discussion on how firms make decisions concerning their capital structure. At the core of the theory, is the view that funding decisions shouldn't affect the value of the firm and its future performance, the so-called "irrelevance of capital structure theory". Based on the assumption of perfect markets, Modigliani and Miller (1958) postulated two propositions.

According to their first proposition ("**Proposition 1**"), the market value of a firm is independent of how it's funded (i.e. the mix of debt and equity in the capital structure is irrelevant). Under this proposition, the corporate executives of a firm need not worry about the composition of the firm's capital structure, as this doesn't affect the value of the firm. In addition, bonds and stocks are assumed to trade in a perfect market, which means that they should be regarded as a complete substitute of one another and yield the same return. Perfect markets also assume frictionless capital markets where there are no transaction costs, etc. Through the use of arbitrage theory, Modigliani and Miller (1958) show that investors can keep the value of the firm independent of its debt-equity structure.

Their second proposition (“**Proposition 2**”) postulates that the expected return on equity changes linearly with the firm’s leverage ratio (i.e. measured by its debt-to-equity ratio). The expected return on equity is equal to the expected return on the equity of an unlevered firm plus a premium related to the financial risk (which premium is equal to the debt-equity ratio times the spread between return on equity of an unlevered firm). This proposition suggests that any substitution of debt with equity or the other way around should not affect the firm’s cost of capital. The introduction of more debt in the capital structure to reduce the overall weighted average cost of capital (“**WACC**”) should increase the risk of financial distress and/or default risk. Therefore, the increased financial distress will lead to equity capital providers demanding a premium for their capital and hence there is no real reduction in the firm’s WACC as a consequence of it raising more (cheaper) debt. In essence, the use of leverage has no effect on the firm’s WACC and an investment decision can be isolated from the firm’s financing decision.

The foregoing propositions have been widely criticised and have also been shown not to be valid under certain circumstances. The irrelevance theorem is valid if the perfect market assumptions underlying the analysis are true. The real world is however characterised by various imperfections and frictions. For instance, the introduction of the deductibility of interest for income tax purposes, the impact of transaction costs, and the notion of non-frictionless markets (i.e. the friction that arises from asymmetric information in financial markets) makes the ability to test these propositions complicated and the proofs are far from tidy.

The contribution of Modigliani and Miller (1958) has nonetheless provided the basis for further debate, which has resulted in other theories emerging and advancing this very important discussion. Today the Modigliani and Miller (1958) propositions are no longer controversial as a matter of theory and the economic intuition is simple; it is equivalent to asserting that in a so-called “perfect-market supermarket” the value of a pizza does not depend on how it is sliced (Myers, 2001).

2.2.2. Agency costs theory

A significant portion of the research conducted in the 1980s was devoted to models in which capital structure is determined by agency costs, i.e. costs due to conflicts of interest (Harris and Raviv, 1991). The theoretical debate in this regard was initiated by Jensen and Meckling (1976), based on the work that was done earlier by Fama and Miller (1972). Jensen and Meckling (1976) identified two types of conflicts. Firstly, the conflict between shareholders and managers that arise because managers hold less than 100% of the residual claim. Secondly, the conflicts between debt investors and equity investors that arise because the debt contract gives equity investors an incentive to invest sub-optimally.

The first conflict has the consequence that managers do not capture the entire gain from their profit enhancement activities, but they do bear the entire costs of these activities. For example, managers can invest less effort in managing firm resources and may be able to

transfer firm resources for their own, personal benefit, e.g., by consuming “perquisites” such as corporate jets, plush offices, exorbitant team building initiatives, etc. (Harris and Raviv, 1991). The managers bear the entire costs of refraining from these activities but capture only a fraction of the gain. As a result, managers overindulge in these pursuits relative to the level that would maximise firm value. A mechanism to curb this type of conflict is to ensure that managers have some “skin in the game” by having them hold some of the firm’s equity as well.

According to the Jensen and Meckling (1976) model, holding constant the manager’s absolute investment in the firm, increases in the fraction of the firm financing through debt increases the manager’s share of the equity and mitigate the loss from the conflict between the manager and shareholders. Moreover, as pointed out by Jensen (1986), since debt commits the firm to pay out cash, it reduces the amount of free cash available to managers. Debt creation, without retention of the proceeds of the issue, enables managers effectively to bond their promise to pay out future cash flows (Jensen, 1986). By issuing debt in exchange for equity, managers bond their promise to pay out future cash flows in a way that a simple dividend increase does not. In doing so, they give debt providers the right to take the firm into bankruptcy court in the event of default of debt repayment. Thus, debt reduces the agency costs of free cash flow by reducing the cash flow available for spending at the discretion of the managers (Jensen, 1986). Jensen (1986) asserts that these control effects of debt are a potential determinant of capital structure.

The second conflict materialises because debt contracts provide that if an investment yields large returns, significantly in excess of the costs of debt, the equity investors capture the full value of most of the gain. If however, the investment fails, because of limited liability, the debt investors will bear the full brunt of the consequences. Although Jensen and Meckling (1976) do not discuss this in their paper, the full consequences will depend on loss given default, the probability of default and the exposure at default. According to Jensen (1986), equity holders may benefit from the bankruptcy resulting from investing in very risky projects, even if they are not value-enhancing. Risky projects can reduce the value of the debt when the actual cash flows from the projects are significantly lower than the forecast cash flows at the outset. Debt investors prefer the primary source of the debt repayments to come from internally generated cash as compared to debt repayments being funded by the perfection of security and/or refinancing arrangements.

Following from the above, the loss in value of the equity from the poor investment can be more than offset by the gain in the equity value captured at the expense of debt holders. Equity investors bear this cost to debt investors, however, if the debt investors correctly anticipate equity investors’ future behaviour when the debt is issued (Jensen and Meckling, 1976; Harris and Raviv, 1991). In this case, the equity investors receive less for the debt than they otherwise would. Thus, the cost of the incentive to invest in value-decreasing projects funded by debt is borne by the equity investors in the firm which issues the debt. This effect is generally called the “asset substitution effect”, and is an agency cost of debt financing

(Harris and Raviv, 1991). Obviously, conflicts between security holders do not arise if each investor holds all securities in proportion to their values, i.e., if each investor holds a “strip”.

Jensen and Meckling (1976) argue that an optimal capital structure can be obtained by trading off the agency cost of debt against the benefit of debt. A number of implications follow. First, one would expect bond contracts to include features that attempt to prevent asset substitution, such as interest coverage requirements, prohibitions against investments in new unrelated lines of business, prohibitions of certain types of distribution and governed gearing going forward (Harris and Raviv, 1991). Second, industries in which the opportunities for asset substitution are more limited will have higher debt levels, *ceteris paribus*. Thus, for example, the theory predicts that regulated public utilities, banks and firms in mature industries with few growth opportunities, will be more highly levered (Harris and Raviv, 1991). Thirdly, firms for which slow or even negative growth is optimal and that have large cash inflows from operations, should carry more debt.

Jensen (1986) asserts that conflicts of interest between shareholders and managers over dividend payout policies are especially severe when the organisation generates substantial free cash flow. The problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organisation inefficiencies. Jensen (1986) develops a theory that explains: (1) the benefits of debt in reducing costs of free cash flows; and (2) how debt can substitute for dividends. According to Jensen (1986), the benefit of debt in motivating managers and their organisations to be efficient has been ignored. He calls these effects the “control hypothesis” for debt creation.

The previous paragraphs have already pointed out the positive effects of introducing debt to curtail agency costs and hence the capital structure. Issuing large amounts of debt to buy back stock also sets up the required organisational incentives to motivate managers and to help them overcome normal organisational resistance to retrenchment, which the pay-out of free cash flow requires (Jensen, 1986). The threat caused by failure to make debt service payments serves as an effective motivating force to make such organisations more efficient.

Stock repurchases using debt or cash also has tax advantages. Interest payments are tax deductible to the corporation, and that part of the repurchase proceeds equal to the firm’s tax basis in the stock is not taxed at all. Jensen (1986) recognises that increases in leverage also have costs. As leverage increases, the usual agency costs of debt rise, including bankruptcy costs. The optimal debt-equity ratio is the point at which firm value is maximised, the point where the marginal costs of debt just offset the marginal benefits.

The control hypothesis does not imply that debt issues will always have positive control effects (Jensen, 1986). For example, these effects will not be as important for rapidly growing organisations with large and highly profitable investment projects but no free cash flow. Such organisations will have to go regularly to the financial markets to raise capital. At these times the capital markets participants have an opportunity to evaluate the company, its management, and its proposed projects. The control function of debt is more important in

organisations that generate large cash flows but have low growth prospects, and even more important in organisations that must shrink. In these organisations the pressures to waste cash flows by investing them in uneconomic projects is most serious (Jensen, 1986).

Harris and Raviv (1990a) provide a theory of capital structure based on the impact on investors' information about the firm and on their ability to oversee management. The authors postulate that managers are reluctant to relinquish control and unwilling to provide information that could result in such an outcome. According to Harris and Raviv (1990a) debt can become a disciplining device because default allows creditors the option to force the firm into liquidation and generates information useful to investors. Harris and Raviv (1990a) argue that informational consequences of debt are twofold: (1) the mere ability of the firm to make its contractual payments to debt holders provides information; and (2) in default, management must placate creditors to avoid liquidation, either through informal negotiations or through formal bankruptcy proceedings. This process, although costly, disseminates considerable information to investors (Harris and Raviv, 1990a). Due to the information that becomes available through the above process, management can change operating policies and funding model.

Stulz (1990) argues that financing policy matters because it reduces the agency costs of managerial discretion. According to Stulz (1990), these costs exist when management values investment more than shareholders do and has information that shareholders do not have. Stulz (1990) argues that managerial discretion has two costs: an overinvestment cost that arises because management invests too much in some circumstances and an underinvestment caused by management's lack of credibility when it claims it cannot fund positive net present value projects with internal resources. A debt issue that requires management to pay out funds when cash flows accrue reduces the overinvestment costs but exacerbates the underinvestment cost (Stulz, 1990). Also, when resources under management's control increases due to equity capital rising, the risk of overinvestment increases vs. the decline in underinvestment.

Table 1 provides a summary of the comparison of agency models based on manager-shareholders conflicts.

Table 1 - Summary of agency models

| Model | Conflict | Benefit of Debt | Cost of Debt |
|----------------------------|------------------------|--------------------------------------|---------------------|
| Jensen and Meckling (1976) | Managerial perquisites | Increase managerial ownership | Asset substitution |
| Jensen (1986) | Overinvestment | Reduce free cash | Unspecified |
| Harris and Raviv (1990a) | Failure to liquidate | Allows investors option to liquidate | Investigation costs |
| Stulz (1990) | Overinvestment | Reduce free cash | Underinvestment |

Source: Harris and Raviv (1991)

2.2.3. Trade – off theory

The trade-off theory developed as a consequence of the recognition that taxation of corporate profits and the existence of bankruptcy penalties are market imperfections that are central to a positive theory of the effect of capital structure on firm valuation (Kraus and Litzenberger, 1973). This theory recognizes that an introduction of debt within the company capital structure enhances the firm's after-tax earnings (where interest is deductible in calculating the corporation's taxable income); however, this advantage is also offset by the company's actual ability to generate profits and cash to service its debt obligation, since a failure to service the debt obligation will result in a default.

Kraus and Litzenberger (1973) investigated how the deductibility of interest in calculating the income tax liability, and the potential for firm bankruptcy, influence the value of a firm. Their paper formally introduced the tax advantage of debt and bankruptcy penalties into a state preference framework. The market value of a levered firm is shown to be equal to the unlevered market value, plus the corporate tax rate times the market value of the firm's debt, less the complement of the corporate tax rate times the present value of bankruptcy costs (Kraus and Litzenberger, 1973). The value of the firm enhanced by the introduction of debt into the capital structure was earlier introduced by Modigliani and Miller (1963), when they made a correction to their paper published in 1958. However, this theory's shortcomings were that it assumed that companies could be financed by 100% debt. It failed to recognise that debt providers would always want some equity cushion (i.e. the "credit enhancement" afforded by a so-called "equity buffer") to rank behind their debt exposures.

Modigliani and Miller (1966) investigated the relative importance of factors contributing to the market value of a typical firm in the utility industry and found that tax subsidy was ranked second amongst the factors they investigated. Graham (1996) found that the deduction of interest payments from a firm's taxable income does in fact contribute to the decision to raise capital in debt form. The results were consistent with the trade-off theory and earlier studies (Mackie – Mason, 1990). Whilst trade-off theory appears plausible in theory, there are some notable exceptions, which occur in practise. If the theory is right, a value-maximizing firm that is mature and significantly profitable should never pass up interest tax shields when the probability of financial distress is remotely low (Myers, 2001). There are nonetheless a number of large of companies that are profitable with very strong growth fundamentals that have very low levels leverage.

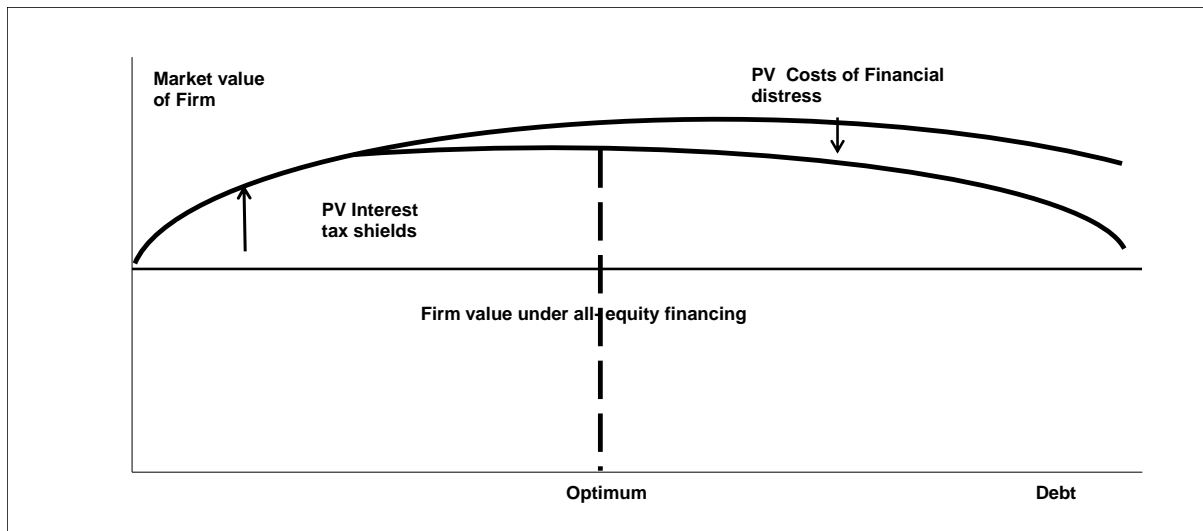


Figure 2 - Debt cost - benefit balance

Source: Shyam-Sunder and Myers (1999).

The trade-off theory of optimal capital structure assumes that firm's balance marginal present values of interest tax shields against the costs of financial distress. Graham (1996) investigates whether the incremental use of debt is positively correlated to simulated firm-specific marginal tax rates that account for net operating losses, investment tax credits, and the alternative minimum tax. The simulated marginal tax rates exhibited substantial variation due to the dynamics of the tax code, tax regime shifts, business cycle effects, and the progressive nature of the statutory tax schedule. Using annual data from more than 10,000 firms for the years 1980-1992, he provides evidence which indicates that high-tax-rate firms issue more debt than their low-tax-rate counterparts. All else equal, Graham (1996) postulates that a hypothetical firm with a tax rate of 46% would annually issue 1.52% more debt, measured as a percent of capital structure, than an identical firm with a tax rate of 24.0%.

In contrast to the aforementioned studies, Graham (2000) found that firms that use debt conservatively are large, profitable, liquid, in stable industries, and face low *ex ante* costs of distress; however, these firms also had growth options and relatively few tangible assets. It is also reasonable to infer that firms with fewer tangible assets might serve as deterrent for debt capital market investors to lend aggressively to the companies in his sample. Companies that cannot provide tangible security usually have their debt securities priced much higher than those that do, or they may be forced to issue equity to raise funding instead of debt (Scott, 1977). Graham (2000) concluded that the companies in his sample were not taking full advantage of the benefits of debt in order to maximise the value of the firm. Graham (2000) investigated an equilibrium point of tax benefit and bankruptcy costs, and found that a typical firm in his study could add 15.7% to the firm's value if it increased its leverage to the equilibrium point. Andrade and Kaplan's (1998) study of thirty one highly leveraged transactions that ultimately became financially distressed, estimated the financial distress costs to be between 10% to 20% of a firm's value.

The above studies (Modigliani and Miller, 1966; Graham, 1996; Andrade and Kaplan, 1998; Graham, 2000) all showed that there is a certain balance between the benefit derived from the deductibility of interest expense and the potential bankruptcy costs; and that these factors need to be weighed against each other in order to manage the company's capital structure and ultimately enhance the value of the firm. The trade-off theory has very high practical appeal to it. It rationalises moderate debt ratios and is consistent with certain obvious facts, for example, that companies with relatively safe, tangible assets tend to borrow more than companies with more risky, intangible assets (Myers, 2001).

2.2.4. Pecking order theory

Another theory was developed by Donaldson (1961), who argued that companies follow a certain preferential order when it comes to funding i.e. internally generated funds are preferred to debt as the first call for funding; debt is preferred over equity; and companies utilise equity funding as their last option. Donaldson's (1961) work was augmented by Myers and Majluf (1984), when they argued that firms should issue debt when raising external capital, and the issue of equity capital should only be resorted to in very rare circumstances or as a last option. It would be reasonable to infer that, in the world of the pecking order theory, the optimal capital structure doesn't exist, as the capital structure is merely determined by the sequence followed by the firm in fulfilling its capital needs.

Myers and Majluf (1984) assert that equity investors naturally discount the equity value of a company when it issues equity instead of debt due to information asymmetry and accordingly corporate executives will only issue equity as a last resort in order to avoid incurring these costs. Equity is subject to a serious adverse selection while debt has only minor adverse selection (Frank and Goyal, 2003). According to this view, equity investors always have a view that the corporate executives have more information about the true value of the firm's equity or potential new opportunities available to the company. The possibility that corporate executives may have more information compared to outside investors is possible due to the limitation that corporate management teams place on the information they disclose (as some information may be regarded as providing the company with a competitive edge). Also, regulatory disclosure limitations/requirements in respect of price sensitive information have an impact of how much information gets disclosed during a capital raising process.

Myers and Majluf's (1984) model assumes that the capital markets are perfect except that investors do not have all the information that managers have about the value of the stock and the new investment opportunity being considered by the firm's managers. The perceived disparity about the true value of the firm equity leads to investors discounting the price of the equity issuance. Asquith and Mullins' (1986) study related to equity issuance and its effect on share prices, found that 80% of issuances reviewed in their sample were associated with excess negative announcement day returns. The average negative announcement day return for all industries was 2.7% and statistically significant. The 2.7% is also significant in monetary terms as it represents about 38% of the proceeds from the issuance. Therefore, it is

understandable that if an optimal capital structure exists, the cost of deviating from it is insignificant in comparison to the cost of raising external finance.

Frank and Goyal (2003) tested the pecking order theory of corporate leverage on a broad cross-section of publicly traded firms for 1971 to 1998. In contrast to what is often suggested, internal financing was found on average, not to be sufficient to cover investment spending requirements. According to Frank and Goyal (2003) findings, external financing is widely used with debt financing not dominating equity financing to a significant extent. This is largely contrary to the pecking order theory prediction. Frank and Goyal (2003) found that net equity issuances track the financing deficit quite closely, while net debt did not do so.

However, when Frank and Goyal (2003) considered a narrower sample of firms, the greatest support for the pecking order theory was found among large firms during the earlier years in the survey data. Over time, support for the pecking order theory declines because more small firms were publicly traded during the 1980s and 1990s than during the 1970s; and since small firms do not follow the pecking order theory, the overall average moves further from that predicted by the pecking order theory. However, the time period effect is not entirely attributable to more small firms being publicly traded during the 1990s; even when the data is restricted to the largest quartile firms, support for the pecking order theory declines over time, and equity funding becomes more important (Frank and Goyal, 2003).

Since the pecking order theory is based on a difference of information between corporate insiders and the market, its driving force is adverse selection. The evidence from Frank and Goyal (2003) shows that firm size is critical. There is a monotonic improvement of the performance of the pecking order predictions as the firm size increases. Overall, Frank and Goyal (2003) results show that the smallest firms do not follow the pecking order, but the largest firms do, and the medium-size categories are somewhat pecking order-like over the same time period. There is strong evidence that at least some aspects of firms' financing patterns have changed over time (Frank and Goyal, 2003).

2.2.5. Market timing

The trade-off theory and the pecking order theory discussed above implicitly assume semi-strong form market efficiency. However, there is a large volume of literature that suggests market inefficiency at the firm level (Loughran and Ritter, 1995; Ikenberry, Lakonishok and Vermaelen, 1995; Loughran and Vihj, 1997). Moreover, there are studies that suggest market inefficiency at both an industry and market level (Loughran, Ritter and Rydqvist, 1994; Pagano, Panette and Zingales, 1998; Baker and Wurgler, 2000; Lowry, 2003). The market timing theory does not depend on the postulation of semi-strong form market place effectiveness (Jahanzeb, Rehman, Bajuri, Karami and Ahmadimousaabad, 2014). Market timing theory assumes that market inefficiency and company leverage reflect an executive management team's ability to time markets. In terms of this theory, managers implement capital raising strategies when markets are most receptive to them after weighing the relative costs.

In corporate finance, “equity market timing” refers to the practise of issuing shares at high prices and repurchasing at low prices (Baker and Wurgler, 2002). According to Baker and Wulger (2002), the intention is to exploit temporary fluctuations in the cost of equity relative to the costs of other forms of capital. This can be contrasted to the Modigliani and Miller (1958) theory, where funding instruments have the required return and there is no benefit from substituting debt with equity or *vice versa*. The market timing theory recognises that capital markets are inefficient and are not strong-form efficient in the sense of Fama (1970), and consequently a firm’s managers can time the issue of debt or equity depending on the different pricing of the different instruments.

Earlier studies (Taggart, 1977; Marsh, 1982; Jalilvand and Harris, 1984; Asquith and Mullins, 1986) used past stock returns to detect equity market timing. More recent studies such as Rajan and Zingales (1995), Graham and Harvey (2001), Hovakimian, Opler and Titman (2001) and Baker and Wurgler (2002) have used market to book values to detected market timing. Some empirical evidence supports market timing theory in the sense that managers wait for general market conditions to improve before they execute a new issuance. The reality is, the studies in this area still lack theoretical models. Consequently, different opinions have been explained by different authors while interpreting market timing (Johanzeb *et al.*, 2014). For instance Hovakimian, Hovakimian and Tehranian (2004), Alti (2006) and Kayhan and Titman (2007) have confirmed the existence of market timing for securities issuance, though they disagree with Baker and Wurgler (2002) on the persistence of the effect of market timing on capital structure.

The earliest studies on equity market timing use debt-equity ratios as an indicator of long-term debt capacity, and find that firms base their stock and bond issuance decisions on the need for permanent capital and on their long-term debt capacity. The market timing theory has in the past been investigated on the basis that firms tend to issue equity when their market valuations are high relative to book values or past market values. However, proper interpretation of the findings is made difficult by the confounding effects of other determinants of financing decisions (Alti, 2006).

Taggart (1977) uses debt-equity ratios as a determinant of long-term debt capacity, and uses an estimation technique that explicitly accounts for balance sheet interrelationships. Taggart (1977) finds that firms base their equity and bond issuance decisions on the need for permanent capital and on their long-term debt capacity. Firms can rely on permanent capital increases to the extent that they can retain earnings, while any shortfall may be made up through bond and equity issues. Firms also watch their debt capacity however, and if bond issues lead to excessive debt levels, equity issues will be stimulated as a countermeasure. Since the rebalancing to the permanent capital targets are shown to be relatively slow, liquid assets and short-term debt play an important role in absorbing short-run fluctuations in the external financing deficit. Taggart (1977) found some evidence that timing strategies may speed up or postpone firms’ adjustments to their targeted capital structure.

Baker and Wurgler (2002) investigated how equity market timing affects the capital structure. Baker and Wurgler (2002) attempt to capture market timing by focusing on the historical market-to-book time series. The idea is to identify as market timers those firms that raise most of their capital at high market valuations. Their main sample is the COMPUSTAT firms that they can determine an IPO date for during the period between 1968 and 1998. Baker and Wurgler (2002) found that the net effect of high market-to-book value is to lower leverage. At IPO + 3 (i.e. IPO +1 denotes the change in leverage from the end of the IPO year to the end of the IPO + 1 year), a one standard deviation increase in market-to-book was associated with a 1.14 percentage point decrease in leverage.

In addition, Baker and Wurgler (2002) determined whether market-to-book affects leverage through net equity issues, as market timing implies. By dividing changes in leverage ratio into equity issues, retained earnings and the residual change in leverage, and regressing these three components of changes in leverage on the mark-to-market ratio and other independent variables (i.e. tangible assets, profitability and size) their results indicate that the effect of market-to-book on changes in leverage does indeed come through net equity issues. These results are consistent with Marsh (1982) that found that higher market-to-book is associated with higher net equity issues. Baker and Wurgler (2002) found that low-leverage firms tend to be those that raised funds when their valuations were high, and conversely high-leverage firms tend to be those that raised funds when their valuations were low.

Also, another question of interest for Baker and Wurgler (2002) was whether market timing has a short-run or a long-run impact. The question is relevant because market timing could be just an opportunistic phenomenon whose effect is quickly rebalanced away. Baker and Wurgler (2002) found that fluctuations in market valuations have large effects on capital structure that persist for at least a decade. Baker and Wurgler (2002) document this persistence in three separate ways. First, they use the leverage regressions that control for the current market-to-book. This leaves the weighted average to pick up only the within-firm time series variation. The variation helps to explain capital structure outcomes and this implies that temporary fluctuations in market valuations. A second test for persistence is in regressions that control for initial capital structure level and look at how subsequent fluctuations in market valuations move capital structure away from this initial level. A third test for persistence is to look at the power of lagged values of the weighted average market-to-book variable.

Baker and Wurgler (2002) found that the impact of past market values turns out to have a half-life of well over 10 years. For example, capital structure as for the year 2000 depends strongly upon variation in the market-to-book ratio from 1990 and before, even controlling for the 1999 value of market-to-book. These results are hard to understand within traditional theories of capital structure. According to Baker and Wurgler (2002) the most realistic explanation for the results is that capital structure is largely the cumulative outcome of past attempts to time the equity market. In this theory, there is no optimal capital structure, so market timing financing decisions just accumulate over time into the capital structure

outcome. Baker and Wurgler (2002) argue that this simple market timing theory of capital structure appears to have substantial explanatory power, challenging both the static trade-off and pecking order theories.

Baker and Wurgler (2002) measure is subject to the same criticism that applies to previous studies. A history of concurrent increases in external funding needs and the market-to-book value ratio is likely to proxy for underlying firm characteristics, most notably the long-term growth traits that dictate low optimal leverage ratios (Alti, 2006). To the extent that contemporaneous control variables are noisy proxies for these characteristics, a spurious relation between history and capital structure may obtain. Therefore, Alti (2006) argues that there is need to isolate market timing when analysing its long term effects on leverage and hence he proposes to measure market timing during a single financing event window by focusing on initial public offering in order to attempt to capture market timing and its impact on capital structure in the long term.

Kayhan and Titman (2007) have also been sceptical whether the significance of the historical market-to-book in leverage regressions may just be as result of the noise market-to-book ratio. Kayhan and Titman (2007) decompose the external finance weighted average market-to-book ratio into the mean market-to-book ratio and the covariance between the market-to-book ratio and the refinancing deficit. They show that the persistence result of Baker and Wurgler (2002) is mainly driven by the persistence of the average market-to-book ratio rather than the covariance between the market-to-book ratio and the financing deficit.

In contrast to Kayhan and Titman (2007), Hennessey and Whited (2005) question the interpretation, rather than the robustness of history effects on capital structure. Hennessey and Whited (2005) show that a dynamic trade-off model with no market timing opportunities is able to replicate the empirically observed link between the historical market-to-book series and current leverage (Alti, 2006). In their model, a high market-to-book firm finances growth with equity to avoid financial distress. Once profitable, such a firm finds a leverage increase unattractive for personal tax reasons, as issuing debt necessitates increasing payout to equity holders (Alti, 2006).

Alti (2006) paper examines the capital structure implications of market timing. Alti (2006) isolate timing attempts in a single major financing event, the initial public offering, by identifying market timers as firms that go public in hot issue markets. According to Alti (2006) hot issue markets are characterized by high IPO volume in terms of the number of issuers and cold issue market is characterised by low IPO volume. The paper finds that hot-market IPO firms issue substantially more equity, and lower their leverage ratios by more, than cold-market firms. The Alti (2006) sample consists of all IPOs between 01 January 1971 and 31 December 1999, reported by Securities Depository Company (“SDC”).

Alti (2006) found that hot-market IPO firms issue substantially more equity, and lower their leverage ratios by more, than cold-market firms do. The average cold-market firm’s IPO proceeds amount to 54% of its pre-IPO asset value. According to Alti (2006), the same ratio

for the average hot-market firm is 76%, a 40% increase over cold markets. The critical question is the understanding whether the impact persists as documented by Baker and Wurgler (2002) and that the timing effects on leverage extend well beyond 10 years. Alti (2006) found that market timing depresses leverage in the very short run and hot-market firms tend to reduce their leverage more than the cold-market firms (i.e. leverage ratios decline substantially at the time of an IPO in both hot and cold markets, and the decline is significantly larger for hot-market firms).

Alti (2006) found that, after controlling for firm and industry characteristics, hot-market firms appear to be about 3.7 percentage points more underleveraged than cold-market firms as of the end of the IPO year. However, the Alti (2006) results are contrary to the findings of Baker and Wurgler (2002) who found that the timing effects on leverage extend beyond 10 years and therefore make the capital structure to be largely the cumulative outcome of past attempts to time the equity market. Alti (2006) found that negative impact of market timing on leverage has very low persistence (i.e. one year after an IPO, less than one-half of the effect remains) and two years after the IPO, the hot-market effect is completely reversed.

The analysis by Alti (2006) seems to support the view that market timing appears to have only a short-term impact on capital structure. The analysis following the two years after the IPO reveals that hot-market firms follow active policy of reversing the timing effect on leverage, whereas cold-market issuers are more content with the leverage ratios they attain at the IPO, not significantly changing leverage thereafter. Overall, the results are consistent with a modified version of the traditional trade-off view on capital structure, one that includes market timing as short-term factor (Alti, 2006).

2.3. Review of empirical studies of capital structure

2.3.1. Empirical definitions of leverage

Many empirical definitions of leverage have been used, and opinions differ as to what constitutes a better measure of leverage (Haron, 2014). Ever since Myers (1984) referred to a firm's capital structure as a puzzle, the puzzle remains unsolved (Haron, 2014, Al-Najjar and Hussainey, 2011). Various issues have been put forward to explain this phenomenon. Among the issues discussed are the various definitions of leverage used in capital structure studies and the different models employed in the studies (Haron, 2014). Rajan and Zingales (1995) argue that the definition of leverage should depend on the objective of the analysis being carried out. This observation is supported by Bevan and Danbolt (2002) and they find that the results are highly dependent upon the precise definition of leverage being examined (Haron, 2014). Although it may be appropriate to have a clear definition of what constitutes leverage, Haron (2014) argues that an appropriate measure of leverage in one country may not be appropriate in another country due to institutional and accounting differences between countries, and some leverage measures may be more appropriate than others for evaluating particular capital structure theories.

Rajan and Zingales (1995) argue that the debt relative to firm value would be the relevant measure of leverage for studies on agency theory relating to conflicts based on how a firm has been previously financed. Studies related to the agency problem would use the debt to firm value definition of leverage, and studies on leverage and financial distress would prefer the interest-coverage ratio as a proxy for leverage (Haron, 2014). Other definitions of leverage include total liabilities-to-total assets, debt-to-total assets, debt-to-net assets and debt-to-market capitalisation. This research does not investigate which definition is the best measure directly; however, it has taken the leverage measure that has been used in similar studies globally.

Depending on what is being defined as leverage, studies tend to produce different results. There is no consensus on whether book or market value debt ratios should be used in capital structure studies (Cook and Tang, 2010). Some argue that leverage should be computed using the book value of capital because book ratios are independent of factors that are not under the direct control of firms (Fama and French, 2002; Thies and Klock, 1992; Cook and Tang, 2010). Other empirical studies prefer market debt ratios. For example, Welch (2004) provides evidence that market leverage better reflects the agency problems between creditors and equity holders and can serve as indispensable input into WACC computations (Cook and Tang, 2010).

Book value and market value of leverage have their own proponents. Being unaffected by volatility of market prices, book-value leverage offers a better reflection of management debt ratio (Haron, 2014). Market-value leverage, on the other hand, is unable to reflect the underlying alterations initiated by a firm's decision makers because it is dependent on several factors, which are not in the firm's direct control (Haron, 2014). Book-value leverage is referred to as a "plug number" (Frank and Goyal, 2009) by those who are in favour of market value leverage because it is used to balance the left hand and right hand sides of the balance sheet rather than a managerially relevant number. Welch (2004) also argues that book-value leverage can take negative values. It is backward looking and it measures what has already taken place (Haron, 2014). Market-value leverage, on the other hand is forward looking.

Realising the different nature of these two concepts (book value leverage and market value leverage), Frank and Goyal (2009) feel that there is no reason for these two concepts to match thus these differences make it more infeasible to solve the puzzle. Since it is highly possible that some firms have book value rather than market value targets and vice versa, this research uses both book and market leverage measures. The definition of book value leverage and market value leverage used in this research is discussed in Section 6.

2.3.2. Firm characteristics and basic capital structure

Moving away from the theoretical base and despite decades of intensive research, there is a surprising lack of consensus even about many of basic empirical facts. Over the years some direction in consensus has been developed that an increase in a firm's leverage ratio is positively correlated with the firm's fixed assets, non-debt tax shield, investment

opportunities and firm size, whilst a decrease in a firm's leverage ratio is negatively correlated with volatility, profitability, advertising expenses, bankruptcy risk and uniqueness of the product (Harris and Raviv, 1991).

Bradley, Jarrell and Kim (1984) took a more direct approach, looking at firm-specific data in testing for the existence of an optimal capital structure. Bradley *et al.* (1984) found the existence of certain idiosyncratic factors such as the industry in which the company operates in and its expenditure on research and development (amongst others) all had a significant impact on a firm's capital structure choices. Titman and Wessels (1988) conducted a more comprehensive study, extending the range of theoretical determinants of capital structure by analysing the importance of the value of a firm's tangible assets, the existence of non-debt tax shields, growth prospects, business uniqueness, industry classification, size, volatility and profitability as key determinants of corporate capital structure choices. Although Titman and Wessels' (1988) results were not conclusive, they served to document empirical regularities that are consistent with existing theory. In particular, they found that debt levels are negatively correlated to the "uniqueness" of a firm's line of business.

Signh and Hamid (1992) conducted the first large scale research on this subject for firms in developing countries, and it yielded quite unexpected results. The authors found that corporations in developing countries in general rely very heavily on: (1) external funds and (2) new issues of shares, to finance growth of their net assets. Signh and Hamid's (1992) empirical research results were in contrast with the pecking order theory. They suggested almost the reverse of the "pecking order" pattern of finance found in developed countries economies (where firms mostly use retained profits first to finance their investment needs); if more finance is required, they have recourse to bank loans or long term debt issued in debt capital markets, and only as a last resort, will they go to the equity markets.

Rajan and Zingales (1995) decided to test some factors across the G-7 countries as the previous studies had been focused mainly on the United States. In their empirical study, the authors focused mainly on four factors i.e. tangibility of assets (the ratio of non-current assets to total assets), the market-to-book ratio, firm size, and profitability. Rajan and Zingales (1995) zoomed in on these factors as they had provided consistent results in other studies (Bradly *et al.*, 1984; Harris and Ravin, 1991). Rajan and Zingales' (1995) research was the earliest study of cross-country capital structures. Since their research, a number of cross-country studies have been conducted (Singh, 1995; Deesomsak *et al.*, 2004; Bokpin, 2009; Gwatidzo and Ojah, 2009; Lemma and Negash, 2013).

Rajan and Zingales (1995) found that firm leverage was more similar across the G-7 countries than had been previously thought. The factors that were previously identified as related to the firm leverage in the US were found to be the same across the G -7 countries. However, the authors also concluded that the potential underpin of the observed correlation remains unresolved due to the institutional environmental differences between the US and other G-7 member countries. More specifically, the authors were concerned about the institutional environment role in capital structure determinants and the observed correlation with firm

leverage, as they believed that institutional differences have some explanatory power in explaining the difference in the aggregate capital structure. The institutional environmental differences investigated by Rajan and Zingales (1995) were: (1) taxation regimes, (2) bankruptcy law, (3) market based economies vs bank based economies; and (4) ownership and control structures.

This cross-country empirical work was a significant contribution to empirical studies, as it moved away from the previous single-country studies. Other studies have also encouraged contributions on cross-country empirical work of the basic determinants of capital structure and the role that local country institutions (i.e. regulatory and financial institution) have on leverage. Deesomsak *et al.*'s (2004) empirical study in the Asia-Pacific region involving four countries (i.e. Thailand, Malaysia, Singapore and Australia), found that capital structure choices were also influenced by the nationality of a country that the sample firms operated in, as well as firm-specific characteristics in line with the prior empirical studies conducted in developed countries.

Booth, Aivazian, Demirguc-Kunt and Maksimovi (2001) conducted the cross-country empirical work focusing on developing countries. They analysed capital structure choices in 10 developing countries, as previous empirical studies (Bradley *et al.*, 1984; Harris and Raviv, 1991; Rajan and Zingales, 1995) had focused mainly on developed economies, which have similar institutional environments. Booth *et al.* (2001) found that the same factors that affected the capital structure decision in developed economies (i.e. United States and European countries) were also prevalent in the developing countries (India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea) despite the profound differences in institutional factors across these developing countries. According to Booth *et al.* (2001), knowing these factors helps predict the financial structure of a firm better than knowing its nationality.

A consistent result that was found by Booth *et al.* (2001) in both the country and pooled data results is that the more profitable the firm, the lower the debt ratio, regardless of how the debt ratio is defined. This particular finding by Booth *et al.* (2001) is consistent with the pecking order theory. This also supports the existence of the significant information asymmetries. This result suggests that external financing is costly and therefore avoided by firms. However, a more direct explanation is that profitable firms have less demand for external financing as discussed by Donaldson (1963) and Higgins (1977).

Frank and Goyal (2009) examine the relative importance of many factors in capital structure decisions of publicly traded American firms from 1950 to 2003. Starting from a large set of factors that have been used in previous studies, Frank and Goyal (2009) found that a set of six factors provide a solid basic account of the patterns in their data. According to Frank and Goyal (2009), the most reliable factors for explaining market leverage are: median industry leverage (positive relationship), market-to-book assets ratio (negative relationship), tangibility (positive relationship), profits (negative relationship), log of assets (positive relationship), and expected inflation (positive relationship). In addition to these six factors,

Frank and Goyal (2009) find that an indicator variable indicating whether the firm pays a dividend is also reliably associated with leverage. Firms that pay dividends have less leverage than non-payers.

Moyo *et al.* (2013) use a sample of 49 manufacturing, 24 mining and 23 retail firms listed on the JSE Limited exchange during the period 2005 – 2010 to investigate the relationship between leverage and the firm's key financial performance variables. The Moyo *et al.* (2013) study documents that the most significant firm-specific determinants of firm leverage are liquidity, capital expenditure, ordinary share price and financial distress. Leverage is directly proportional to cash flow. This is consistent with both the trade-off and agency theories. Capital expenditure is positively correlated to leverage, while asset tangibility and retention rate are negatively correlated to leverage. These findings confirm the validity of the pecking order theory. Liquidity and financial distress are negatively correlated to corporate leverage. Consistent with the trade-off theory, corporate leverage increases with profitability. Share price is positively correlated to corporate leverage and this finding validates the market timing theory.

2.3.3. Macroeconomic variables and basic capital structure

Studies of the relationship between economic conditions and capital structure decisions have also produced some interesting research. The firm that is well positioned in a growing economy is expected to grow and generate profits. As profits grow and are converted into cash, the firm will be expected to fund itself from internally generated cash rather than raising external capital. This assumption supports the pecking order theory. Understanding of the impact of macroeconomic conditions on the firm's basic capital structure decisions and analysing the impact of macroeconomic factors on the speed of adjustment to the firm's targeted capital structure is an important area of empirical study, as companies are not isolated from the macroeconomic conditions that they operate in.

Macroeconomic factors have been found to have a significant influence on the basic decision of how to layer a firm's capital structure and the speed with which that structure can be adjusted towards achieving a target capital structure. Some researchers have found that firms issue equity during times when they believe their equity is overvalued. In the study conducted by Korajczyk *et al.* (1992) they found the clustering of equity issuances in certain periods of the economic cycle. According to the study, firms often issue equity in good times, as their own price of equity has enjoyed an abnormal increase, and this leads to equity recapitalisation that reduces leverage in the firms. In another related study, Choe, Masulis and Nanda (1993) provide evidence that firms' issuance of equity follows business cycles. Choe *et al.* (1993) found that firms issue more equity during the growth phase of the business cycle. Similarly, Korajczyk and Levy (2003) also show that firms issue a type of security when the pricing is favourable. Firms issue equity when the equity markets have experienced large up-runs and the economic prospects are viewed as favourable.

Korajczyk and Levy (2003) investigated the influence of macroeconomic conditions on financially constrained and unconstrained firms during the period between 1984 and 1998. The authors modelled firms' target capital structure as a function of macroeconomic conditions and firm-specific variables. Their sample was split based on a measure of financial constraints. Theoretically, firms are defined as financially constrained if they do not have sufficient cash to undertake investment opportunities and face severe agency costs when accessing financial markets. For Korajczyk and Levy (2003), the specific criteria for a firm-event window to be labelled financially constrained was: (1) the firm does not have a net repurchase of debt or equity and does not pay dividends within the event window, and (2) the firms Tobin's Q, defined as the sum of the market value of equity and the book value of debt, divided by the book value of assets, at the end of the event quarter should be greater than one. Firms were labelled unconstrained if they didn't meet these two criteria.

Mokhova and Zinecker (2014) investigated the influence of macroeconomic factors on corporate capital structures in different European countries. Their sample consisted of corporates from seven European countries as Czech Republic, Slovakia, Poland, Hungary, France, Germany and Greece. Their sample is of interest as it includes both emerging and developed markets firms. The authors analyse the influence of external determinants on the corporate capital structure of non-financial manufacturing companies based on their mixed sample for the period 2006 – 2010, in order to compare the level of the impact on the capital structure according to the countries' specifics. For the authors, managers make their financial decisions according to the source of financing and capital structure based on the company's advantages and disadvantages, i.e. its internal characteristics, and doubtless on the macroeconomic conditions and country specifics, i.e. external factors.

The results obtained by Mokhova and Zinecker (2014) vary across countries and depend on corporate debt structure. Thus, in Czech Republic there is a negative significant relation between inflation and total debt ratio and short-term debt ratio. The GDP growth has non-significant weak relation with all proxies of capital structure in all investigated countries, except Greece, where it has significant positive influence on short-term debt ratio. In Slovakia the inflation rate has weak non-significant relation with corporate capital structure, as well as in other countries except France, where relations are significant but depends on debt structure, and Hungary, where its influence negative but non-significant (Mokhova and Zinecker, 2014).

Mokhova and Zinecker (2014) found Poland, Hungary and Greece have a weak relation between long-term interest rate and capital structure; furthermore, its direction depends on corporate debt structure. At the same time in Germany and France both the long-term and short-term interest rates have positive significant influence on total leverage (Mokhova and Zinecker, 2014)

Summary of Mokhova and Zinecker (2014) results are shown in table 2 and illustrates the direction, strength and significance of investigated relations. The variables of monetary policy are long-term interest rate (LTIR), short-term-interest rate (STIR), inflation rate as GDP

deflator (IR) and money and quasi money (M2) as percentage of GDP, which indicate monetary conditions in general. Fiscal policy is represented by proxies such as central government debt to GDP (CGD), tax revenue as a percentage of GDP (TR) and income taxes as a percentage of revenue (IT). The variables unemployment rate (UR) and GDP growth (GDPg) feature macroeconomic development and stability.

Table 2 - Summary of Mokhova and Zinecker (2014) results

| Total leverage | LTIR | STIR | IR | CGD | TR | IT | M2 | UR | GDP |
|----------------|------|------|-----|------|----|-----|-----|-----|-----|
| Czech Republic | ↓ | ↓ | ↓ * | ↑ * | ↓ | ↓ | ↑ | ↑ | ↓ |
| Slovakia | ↓ ** | ↓ | ↓ | ↑ * | ↓ | ↓ | ↓ | ↑ * | ↓ |
| Poland | ↓ | ↑ | ↓ | ↓ | ↑ | ↑ | ↓ | ↓ | ↑ |
| Hungary | ↑ | ↓ | ↓ | ↑ | ↓ | ↓ * | ↑ | ↑ | ↑ |
| Germany | ↑ ** | ↑ * | ↓ | ↓ ** | ↓ | ↑ * | ↑ | ↑ | ↑ |
| France | ↑ | ↑ * | ↑ * | ↓ ** | ↑ | ↑ * | ↓ * | ↓ | ↑ |
| Greece | ↓ | ↑ | ↑ | ↑ | ↑ | ↑ | ↓ | ↓ | ↑ |

Arrow meaning and significance level of table 2 results.

| |
|---|
| ↑ Indicates a positive correlation |
| ↓ Indicates a negative correlation |
| * Correlation is significant at the 0.05 level |
| ** Correlation is significant at the 0.01 level |

Korajczyk and Levy (2003) found that target leverage is counter cyclical (i.e. there is a negative relationship between macroeconomic factors and the target capital structure) depending on the type of sample (i.e. constrained firms vs. unconstrained firms). Leveraged firms in the financially unconstrained sample vary counter-cyclically with macroeconomic conditions. Moreover, macroeconomic conditions account for 12% to 51% of the time-series variation in these firms' leverage. Also, Korajczyk and Levy (2003) found that firms in the financially constrained sample have pro-cyclical leverage with macroeconomic conditions accounting for 4% to 41% of the time series variation. This is consistent with balance sheet credit channel models in which constrained firms borrow more when collateral values are highest, that is, following high returns in the equity market or high corporate profits corporates turned to be more attractive to lenders and hence they can take advantage of this window opportunity for borrowing more (Kiyotaki and More, 1997; Suarez and Sussman, 1999).

Korajczyk and Levy (2003) findings support both the pecking order and trade-off theories discussed in section 2.2.3 and section 2.2.4 respectively. The deviations from target leverage explain issue choice is consistent with the trade-off theory while the negative relation between profitability and target leverage is consistent with the pecking order theory. According to Korajczyk and Levy (2003) indicate that constrained firms fit the pecking order theory less well than do unconstrained firms: (1) deviations from target leverage explain a larger fraction of the issue choice for constrained firms; (2) constrained firms have pro-cyclical leverage, but unconstrained firms have countercyclical leverage; and (3) macroeconomic conditions play a smaller role in both target leverage and issue choice for constrained firms than for unconstrained firms.

Muthama, Mbaluka and Kalunda (2013) analysed the influence of macroeconomic factors on the capital structure of selected Nairobi Stock Exchange (“NSE”) companies. Their research was aimed at determining the magnitude and direction of the relationship between macroeconomic variables on corporate capital structures of listed companies in Kenya. The macroeconomic variables of interest in their study were GDP growth rate, inflation and interest rates. The study revealed that macro-economic factors have a pronounced influence on the capital structure of listed entities. The Muthama *et al.* (2013) sample size consisted of 39 firms in the industrial and allied, agricultural, commercial and allied as well as service sectors. The sample was comprised of firms that have a clear capital structure consisting of both debt and equity that were listed on the NSE for the period 2004 to 2008.

Muthama *et al.* (2013) found 51.2% of the assets in these corporates are funded through debt. The study further found that when interest rates and inflation are held constant, an increase in annual GDP growth rate would lead to a 0.1% decrease in debt ratio/leverage. This is consistent with Gajurel (2006) findings that the GDP growth rate is negatively correlated to total debt ratio for Nepalese firms. The study also found that with the GDP growth rate and inflation held constant, a unit increase in interest rates will lead to a 0.6% increase in total debt ratio while the inflation rate does not influence the total debt ratio. The value of R^2 was 0.932, which means there was a strong positive correlation between the observed and predicted values of the dependent variable. Moreover, the regression model explained c.87.2% of the variations in the dependent variable.

In the African context, studies have mainly focused on firm-specific characteristics in understanding the determinants of capital structure decisions (Ramjee and Gwatidzo, 2012; Moyo *et al.*, 2013). The inclusion of macroeconomic factors in the dynamic capital structure setting have only recently gained some attention (Bokpin, 2009; Chipeta and Mbululu, 2013; Muthama *et al.*, 2013). It is important to examine macroeconomic factors and capital structure decisions from the perspective of emerging market economies given the differences in the levels of economic development. This study seeks to ascertain whether evidence from emerging markets economies will confirm or contradict existing literature from the developed economies. This study also aims to make a contribution by including three macroeconomic variables in the regression model.

2.3.4. Capital markets friction and basic capital structure

“When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you have got to get up and dance. We’re still dancing”

- Chuck Price, the former CEO of Citigroup (Financial Times, 9 July 2007).

The finance literature shows that, extreme market frictions and the types of capital available influence a firm’s choices regarding its capital structure. This impact comes through the firm’s ability to access capital and/or the ability of banks to continue supplying capital during capital markets’ disruptions. The financial crisis of 2007 – 2009 provided strong anecdotal evidence that capital supply constraints and the stability of capital markets matter to firms. Recent empirical findings in Duchin *et al.*, (2010) and Almeida, Campello, Laranjeira and Weisbenner (2012) support this view. There is also a significant literature that shows that the regulation of banks and the adoption of capital requirements in the banking sector have had an impact on credit supply, which has in turn indirectly impacted on the leverage available to corporates (Peek and Rosengren, 1995; Lown and Peristiani, 1995; Brinkmann and Horvitz, 1995; Faulkender and Petersen, 2006; Leary 2009).

There is an emergence of capital structure literature that recognises the relevance of credit supply (Faulkender and Petersen, 2006; Leary, 2009; Duchin *et al.*, 2010) and the financial friction in capital markets in explaining the leverage levels of corporates. Leary’s (2009) research explores the relevance of capital supply frictions for corporate capital structure decisions. Leary (2009) found that, following an expansion (contraction) in the availability of bank loans; leverage ratios of bank-dependent firms significantly increase (decrease) relative to firms with bond market access. The research provides some direction regarding the role played by the supply-side or the role of credit supply in capital structure policy formulation by corporate managers. Korajczyk and Levy (2003), Kiyotaki and Moore (1997) and Suarez and Sussman (1999) have provided evidence that companies do face the challenges of financial constraints. In addition, Faulkender and Petersen (2006) and Leary (2009) recognised the importance of financial constraints and incorporated the availability of credit into their research.

The South African corporate debt capital market is relatively new in the context of the history of global debt capital markets. The long-term debt capital market reforms in South Africa lasted nearly two decades starting in the early 1980s. The reforms started with the repealing of the Prescribed Asset Act in 1989, which prescribed that pension funds should invest 53% of their “book value” assets in either public sector or cash, and long-term insurers had to invest the equivalent of 33% of their liabilities, at an actuarial valuation, into government debt. This resulted in corporate bond issuance being “crowded out” of the domestic debt capital market, and it was only when this law was repealed that there was an increase in the supply of debt capital available for corporates through this channel. The first corporate bond issue in South Africa was by South African Breweries in 1992.

Given the short history of the debt capital market and the limited suppliers of capital, it is insightful to understand whether there is a measure of debt rationing in the South African debt capital market, and the South African rand crisis of 2001 – 2002 as well as the 2007 – 2009 global financial crisis provides an opportunity for research.

The end of apartheid also enabled South Africa to become part of the global economy and the global banking system. As consequence, South African Banks were expected to be compliant with the minimum 8% capital adequacy ratio proposed by Basel I by 1995. Further, the implementation of Basel II in South Africa from January 2008 imposed an additional 1.5% on banks' capital adequacy ratio compared to that imposed by Basel Committee of Banking Supervision on international banks and/or the G20 member country banks. The introduction of Basel I and Basel II led to the so called "risk-based capital crunch hypothesis" which argued that commercial lending slowed down because banks invested in governments bonds in order to diversify away from 100% risk-weighted assets to 0% risk-weighted assets.

The risk-based capital crunch hypothesis is based on the argument that as banks faced challenges to raise Common Equity Tier 1 ("CET 1") and Tier 2, they cut back on their corporate lending in order to comply with the regulatory requirements under Basel II. Studies (Peek and Rosengren, 1995; Brinkmann and Horvitz, 1995; Lown and Peristiani, 1995; Thakor, 1996) based on the capital crunch hypothesis have found evidence that undercapitalised banks tend slow down lending during the period in which they are trying to build capital to meet regulatory capital requirements. Thakor (1996) found evidence that a small increase in capital requirements could make it harder for potential borrowers to access loans, and documented declining risk appetite amongst banks during the credit crunch, and a rush to stock up on lower yielding and less risky government bonds. The risk-based capital crunch theory supports external factor impact, although not investigated specifically in this study.

The global financial crisis of 2007-2009 also provided strong anecdotal evidence that the supply of capital can be disrupted and this should matter to firms as they always look to capital markets and the banking sector for the supply of capital. The study conducted by Fosberg (2012) shows that global equity issuance declined from \$ 876 billion in 2007 to \$ 471 billion in 2008 (a 46.2% decline). Moreover, debt issuance declined from \$ 6.6 billion in 2007 to \$4.1 billion in 2008 (a 36.0% decline). The research done by Duchin *et al.* (2010) support the view that negative shocks to the supply of capital impacts how firms fund themselves. Specifically, firms that have greater costs of raising external finance or have the greater need to do so (i.e. firms that are financially constrained or dependent on external financing) consider the state of capital markets before embarking on capital raising, and are therefore affected by shocks to capital markets.

An understanding of the effect of capital supply on firms is relevant for three reasons. Firstly, variations in the supply of credit may affect the financial and investment behaviour of firms in a manner that is independent of shifts in monetary policy (Leary, 2009; Rehman, Akbar and Ormand, 2013). Secondly, there are differences in views about whether the firm's financing decision tends to be governed by users' demand for capital or preferences of the suppliers of

capital or driven by outside factors (Rehman *et al.*, 2013). Finally, and interestingly, surveys of corporate managers and financial intermediaries suggest a dichotomy in the way in which academics and practitioners view corporate financing decisions: the former perceive corporate financing decisions to be governed by the demands of the users of capital, whilst the latter perceive decisions to be governed by the preferences of the suppliers of capital (Graham and Harvey, 2001; Lemmon and Roberts, 2010).

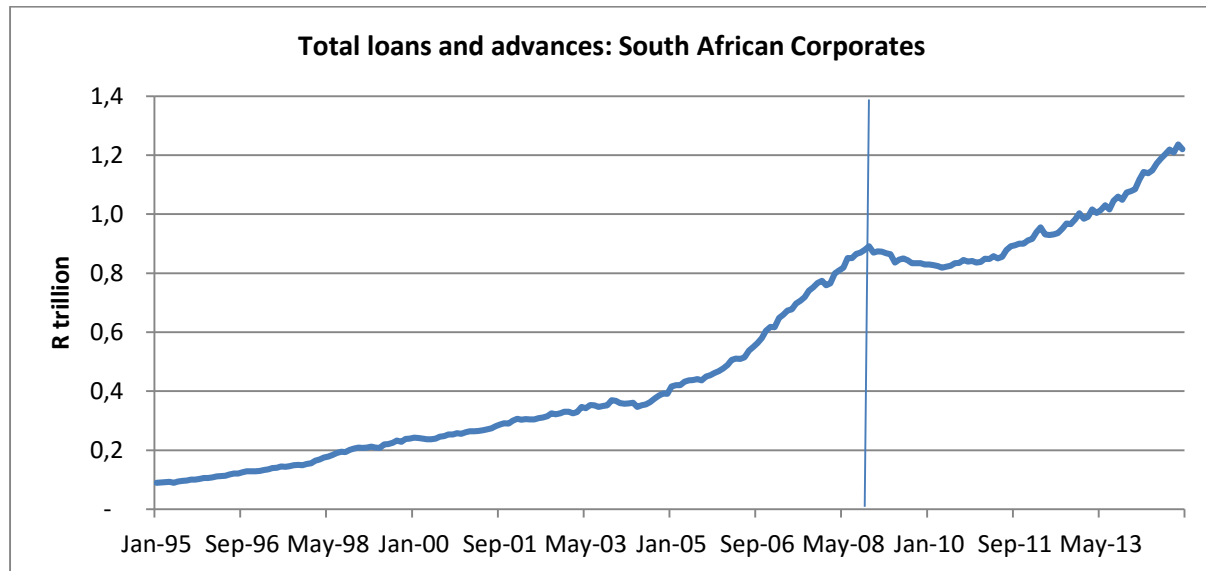


Figure 3 - Total loans and advances: South African corporates (1995 - 2014)

Source: SARB (2015)

Figure 3 shows the phenomenal growth in corporate loans in South Africa from January 1995 to December 2014. As can be seen from the graph above, corporate lending declined subsequent to the sub-prime crisis. From November 2008 – April 2010, the corporate lending rate decline by 8%, which whilst probably not that significant in the global context (especially at that time), was nonetheless a significant shock to credit supply in South Africa.

In his paper, Graham (2000) argues that firms appear to be significantly under levered and not maximising value that can be derived from the tax shield stemming from interest deductibility. This interpretation assumes that firms have the opportunity to increase their leverage and are choosing to leave money on the table (Faulkender and Petersen, 2006). However, this view doesn't take into account the role of financial intermediaries (banks and financial institutions) that evaluate the credit quality of corporates and provide the debt capital. The literature has often described banks or lenders as being particularly good at investigating opaque firms and deciding which creditworthy borrowers are. This suggests that the source of capital may be intimately related to a firm's ability to access debt markets (Faulkender and Petersen, 2006).

Faulkender and Petersen (2006) argue that the same market frictions that make capital structure choices relevant (information asymmetry and investment distortions) also imply that firms are sometimes rationed by suppliers of debt capital. This implies that debt levels

within corporates cannot be dependent on the firm characteristics alone. Faulkender and Petersen (2006) investigated whether, firms that have access to the public bond markets, as measured by having an independent credit rating, have significantly different leverage ratios compared to those firms that don't have access to the public bond markets. The intuition is that firms that do not have access to the public debt capital markets are constrained in the amount of debt capital they may raise, and the manifestation of this should be reflected in lower debt levels on their balance sheets.

Faulkender and Petersen (2006) found that firms which have access to debt capital markets, determined by their independent credit ratings, have market debt leverage ratios (i.e. leverage calculated as debt to market value of assets) which are more than fifty percent higher than firms that do not have access to these debt capital markets (28.4% versus 17.9%(p-value,0.01)). Also, when investigating leverage based on book values, the authors found that the difference is slightly larger: 37.2% versus 23.5% (p-value<0.01). At first glance, this difference can possibly be attributed to demand or supply side considerations.

In order to determine whether the differences are driven by the underlying firm fundamentals, Faulkender and Petersen (2006) included firm characteristics to determine whether the observed leverage differences between firms with and without independent credit ratings arose solely due to their demand for leverage. Although the firm characteristics explain a significant fraction of the variability in debt ratios across firms, Faulkender and Petersen (2006) found that, even after the inclusion of the firm characteristics, firms with an independent credit rating are significantly more levered (p<0.01) with debt levels equivalent to between 7.8% and 8.3% of the market value of the firm higher than firms without access to public debt capital markets.

According to Flanner (1986) firms issue short-term debt if they expect their credit rating to improve. Graham and Harvey (2001) found that firms are very concerned about their credit rating when determining their capital structure. Approximately, 57.1% of the CFO's surveyed by Graham and Harvey (2001) said that credit ratings were important in how they formulated their leverage policies and deciding upon the amount of leverage to assume in the capital structure of their firms. Credit ratings provide a certain level of comfort around a borrower's ability to fulfil their financial commitments (i.e. ratings can act as a signal of a firm's credit quality) and also provide the borrower with a wider access to debt capital markets compared to unrated entities. Kisgen (2006) argues that corporate managers' concern around credit ratings are due to the discrete costs (benefits) associated with different ratings levels.

For instance, Kisgen (2006) states that several regulations on bond investments are based directly on credit ratings i.e. credit ratings levels affect whether particular investor groups such as banks, life insurance companies or pension funds are allowed to invest in a firm's bonds and to what extent such regulated entities (i.e. banks and life insurers) incur capital cost reserving requirements for investments in such bonds. A change in credit rating implies a change in credit risk, which usually filters through the pricing of credit instruments issued

by a particular corporate. Since credit ratings can either go up or down, this can result in discrete benefits or costs.

Credit rating can also impact the willingness of asset managers, banks and life insurers to invest in credit instrument issued by the issuing entities and hence the supply side of credit matters in the formulation of capital structure decision making. For instance, RMB Global Markets Research (2015) found that, during the 2014 calendar year, investors in the South African bond market opted for high quality names (i.e. AA – or better), although buyers could be found for lower-rated credits provided investors were comfortable with the names. This indicates that higher rated companies are more likely to be favoured compared to lower rated companies by the providers of debt capital. Also, there is a broader universe of investors willing to invest in investment grade than there is willing to invest in high yield credit.

Another research paper that provides evidence of the impact of the supply of credit on a firm's financing choices, is the research work done by Choi, Getmansky, Henderson & Tookes (2010). Choi *et al.* (2010) investigated the role of convertible bond arbitrageurs as suppliers of capital¹. The aim was to estimate the impact of changes in the amount of capital available to convertible bond arbitrageurs on observed convertible bond issuance, therefore establishing whether arbitrageurs determine the amount of convertible debt capital that corporates can obtain in the presence of market frictions. Choi *et al.* (2010) regressed convertible bond issuance on three proxies for the supply of capital: fund flows, returns and use of leverage, as well as lagged issuance and underpricing. Choi *et al.* (2010) found strong evidence that issuance is sensitive to the supply of capital, with positive, significant coefficients on all lagged supply measures. The authors found that, *ceteris paribus*, a one-standard deviation increase in fund flows resulted in a 16.8% increase in issuance. In support of the supply side view, Choi *et al.* (2010) provide evidence that the supply of capital is not frictionless. This is in contrast to the earlier assertions by Modigliani and Miller (1958).

Another theoretical explanation for the supply side factors is what is called the bank lending channel, which was practically illustrated by the major credit slowdown in the 1990s, particularly in the United States following the fall of Dow Jones index in the late 80s. The bank lending channel theorises that change in monetary policy will shift the supply of intermediated credit, especially credit extended through commercial banks. In the traditional "bank lending channel", a monetary tightening policy may impact on bank lending if the drop in deposits cannot be completely offset by issuing non-reservable liabilities (or liquidating some assets). Since the market for bank debt is not frictionless and non-receivable banks' liabilities are typically not insured, a "lemon's premium" has to be paid to investors. In this case, bank capital can affect banks' external ratings, providing investors with a signal regarding their creditworthiness (Gambacorta and Marques-Ibanez, 2011).

¹ A convertible bond is a bond that may, at the option of the holder, be converted into stock at a specified price for a given time period. Convertible bond arbitrageurs aim to exploit mispricing in convertible bonds, typically by buying an undervalued convertible bond and hedging equity price risk by taking simultaneously a short position in the equity (Choi *et al.* 2010)

In general, bank capital has an effect on lending if two conditions hold: (1) the first is where breaking the minimum capital requirement is costly and as a result banks want to limit the risk of future capital inadequacy (Van den Heuvel, 2002). As capital requirements are linked to the amount of credit outstanding, the latter would determine an immediate adjustment in lending. By contrast, if banks have an excess of capital, the drop in capital could easily be absorbed without any consequence for the lending portfolio. As equity is relatively costly in comparison to other forms of funding (deposits, senior unsecured debt and subordinated debt) banks tend to economise units of capital and usually aim to minimise the amount of capital in excess of what regulators (or the markets) require (Gambacorta and Marques-Ibanez, 2011); and (2) the second condition is an imperfect market for bank equity: banks cannot easily issue new equity, particularly in periods of crisis, because of the presence of tax disadvantages, adverse selection problems and agency costs.

The collapse of the Dow Jones on 19 October 1987, usually referred to as Black Monday, was a major systemic shock. Not only did the prices of many financial assets tumble, but market functioning was severely impaired. After this window-event, there was financial chaos around savings and loans as economic growth dropped off its recovery in the late 1980s to slump into a period of recession in the early 90s. A key component of this slowdown was the extremely weak level of bank lending around the world. The decline in loan demand during a recession is not counter intuitive, as banks face challenges of credit quality and there are potentially less borrowers during the slow expansion environment. But the unusually slow recovery of credit led to a debate on whether these demand-side explanations were adequate or whether supply-side problems were driving the credit-crunch.

Sceptics of the credit crunch argue that weak loan growth merely reflects the normal procyclical pattern of both loan demand and the creditworthiness of borrowers. Thus, the view that a downward shift in credit supply precipitated, or at least worsened during the 1990 – 91 recession remains a subject with no firm consensus. Because of the difficulty in determining whether the observed slow credit growth is a demand or supply phenomenon, convincing evidence of the practical importance of credit crunches remains elusive (Peek and Rosengren, 1995)

The introduction of Base I emerged as a potential explanation for the weak recovery in credit supply. There are number of hypothesis that were developed around the Basel I implementation in order to explain the weaker credit recovery. Berger and Udell (1994) identify the three different working hypotheses for the credit slowdown. Berger and Udell (1994) firstly identify the loan examination hypothesis, in terms of which the proponents argue that increased regulatory scrutiny triggered greater caution amongst commercial banks. Secondly, Berger and Udell (1994) identify the leverage credit crunch hypothesis, which argues that risk weighting encouraged banks to substitute risky commercial loans for safer government bonds, and hence bank lending activities slumped. Lastly, Berger and Udell (1994) identified the risk-based capital credit crunch hypothesis, which argued that lending

slowed down because banks struggled to raise well-priced equity, and hence cut back on their loan portfolio to meet Basel capital requirements.

The capital crunch model tries to explain recent problems with credit availability by emphasizing the importance of capital regulation. Banks suffering large losses of capital are required by regulators to quickly restore their capital ratios (Peek and Rosengren, 1992). With earnings reduced and investors resistant to purchasing new equity from a capital-depleted institution, banks satisfy capital-asset ratios by shrinking their assets. This shrinkage frequently requires the calling-up of loans and/or refusals to either extend credit or renew limits on existing lines of credit as agreements mature (Peek and Rosengren, 1992).

Peek and Rosengren (1995) looked specifically at New England banks during the crisis period of 1990 and 1991, and controlled for the impact of weak loan demand in the region, by comparing loan growth for local banks with different levels of capital. Peek and Rosengren (1995) found that two conditions necessary for a capital crunch were present: (1) widespread losses in the bank capital structure; and (2) the stringent application of capital regulation. The New England real estate bust led to large and widespread declines in bank capital just when capital requirements took on greater significance, as bank regulators began to enforce both risk-based capital ratios, adopted to satisfy the international Basel Accord, and the leverage ratio, adopted domestically (Peek and Rosengren, 1995). The capital crunch impaired the ability of banks to satisfy the credit demands of the economy during the economic recovery, limiting the access to credit of legitimate borrowers who happen to be bank-dependent. Peek and Rosengren (1995) found evidence that banks with lower capital ratios shrank loan supply or grew credit more slowly than better-capitalised banks, attributing this to an inability to raise capital in a depressed market.

Brinkmann and Horvitz (1995) support the more general idea that low-capital holding could have driven the capital crunch. They divide a sample of all US banks between 1987 and 1991 into three categories: (1) undercapitalised, (2) margin surpluses, and (3) large surpluses (when a surplus is the amount of capital above regulatory minimum). 1987 was the year immediately prior to the announcement of the risk-based requirements and the establishment of the timetable for the implementation of those requirements. According to Brinkmann and Horvitz (1995), after the announcement of the risk-based capital standards in 1988, many banks had capital that exceed the new requirements by more than it exceed the previously existing requirements. On the other hand, a fair number of (mostly) large banks failed the new standards, and a large number met the new standards, but with smaller surpluses than they had before.

Brinkmann and Horvitz (1995) argue that, if the change in capital requirements did not affect bank lending, then loan growth at these three groups of banks should not have been significantly different. However, Brinkmann and Horvitz (1995) found that banks with larger surpluses under the new standards grew at a faster rate than those with smaller surpluses or which failed the new standards, even after size and location differences are accounted for. Secondly, new capital brought into the banking system was used to grow loans at different

rates depending on the change in a bank's excess capital. Larger surplus banks used their new capital to grow loans at twice the rate that banks with smaller surpluses did. If the slow rate of loan growth in the early 90s was solely due to a decrease in demand, one would expect little difference in the growth rates of larger surplus and smaller surplus banks.

Brinkmann and Horvitz (1995) agree that, whether these differences in loan growth actually left loan demand unmet and created a "credit crunch" cannot be determined unequivocally without clear knowledge of the loan demand schedule. It is possible that loan demand was satisfied by growth shown by the larger-surplus banks. However, because the capital shortages were greatest among the larger banks, it is highly unlikely that the smaller banks were able to meet fully the credit needs of the larger bank customers. Finally, although not relevant for this research, Brinkmann and Horvitz (1995) argue that, whether one believes that the shock to the supply of bank credit caused by the 1988 risk-based capital standards was sufficient to cause the recession, exacerbate it, or delay the recovery from it, depends on one's view of the importance of the credit channel for the transmission of monetary policy.

It is important to note however, that the differences among the three groups of banks investigated by Brinkmann and Horvitz (1995) are not only statistically significant, they also involve very large dollar amounts. For example, if all banks had loans increases at a rate equal to that of the banks with larger surplus (46.2 percent), total bank loans would have grown by USD 581 billion from 1987 to 1991 instead of USD 370 billion. Despite the artificiality of this calculation, it does demonstrate that the impact of the regulatory changes in capital requirements was large enough to have had an impact on supply and a macroeconomic effect.

Lown and Peristiani (1995) also find evidence of capital requirements playing a role in the credit slowdown, but not through explicit loan rationing. Their sample of US banks between 1988 and 1992 rather indicates that banks raised interest rates, in an effort to pass on costs and discourage margin borrowers. Thokor (1996) examines the impact of "risk-based" capital requirements – namely those that link mandatory capital-to-asset ratios for bank to their loans - on aggregate bank lending. The rules initially required banks to maintain capital equal to 7.25 percent of business and most consumer loans, with the requirement increasing to 8 percent by the end of 1992. Thokor (1996) explored the impact of risk-based capital-requirements on credit rationing with multiple competing banks, emphasizing the role of the banks as a pre-lending screening agent and a post lending monitor. The analysis permits Thokor (1996) to distinguish between credit rationing by an individual bank and that by the entire banking system, and focus on the link between the announcement effects associated with a borrower acquiring a promise of credit and the lender's capital constraint.

Thokor (1996) main results are as follows. Every borrower approaches multiple banks for credit and stands a chance of being rationed by the entire banking system. Increases in risk-based capital requirements and regulatory subsidies stochastically reduce aggregate bank lending, and banking systems with higher costs of capital lend less and are more affected by increases in risk-based capital requirements. Also, two important testable predictions of the model are that the stock price of a borrower should experience an abnormal increase when

it is announced that a bank has agreed to lend to it, and this increase should be greater the more capital-constrained the bank. These predictions were confronted with data on 161 loan commitments. The empirical results support these predictions. Overall, Thakor (1996) found evidence that a small increase in capital requirements could make it harder for potential borrowers to access loans, and also documented a shift in risk appetite amongst banks during the credit crunch, and a rush to stock up on government bonds.

The method used in this research to examine how shocks to the supply of credit impact firm financing decisions is the same followed in the work done by Rehman *et al.* (2013). The study examined how shocks to the supply of credit during the financial crisis of 2007 – 2009 affected the financing and investment policies of private companies in the United Kingdom. Rehman *et al.* (2013) adopted a fixed effect model with dummy variable equal to one for the period 2007 – 2009 and 0 otherwise (2004 – 2006). Rehman *et al.* (2013) results highlighted that the financial crisis adversely affected the leverage ratio of the private firms in the sample. The effect was most significant on the short term financing channels such as short-term debt and trade credit. As a consequence, private firms held cash and issued equity to hedge the negative effect of credit contradictions.

For Rehman *et al.* (2013), the main variable of interest is the crisis dummy (i.e. its sign and significance). Their model highlighted that the coefficient on the crisis dummy is negative and significant at the level of 1% or better. The interpretation of the results is that, the financial crisis had a negative impact on firm's total debt ratio. This suggests that supply of credit is an important determinant of firm financing decisions (Rehman *et al.*, 2013). The results show that the disruption of credit supply has an impact on the financing of firms and hence their capital structure.

2.3.4.1. Characteristics of capital markets friction

2.3.4.1.1. Credit spreads

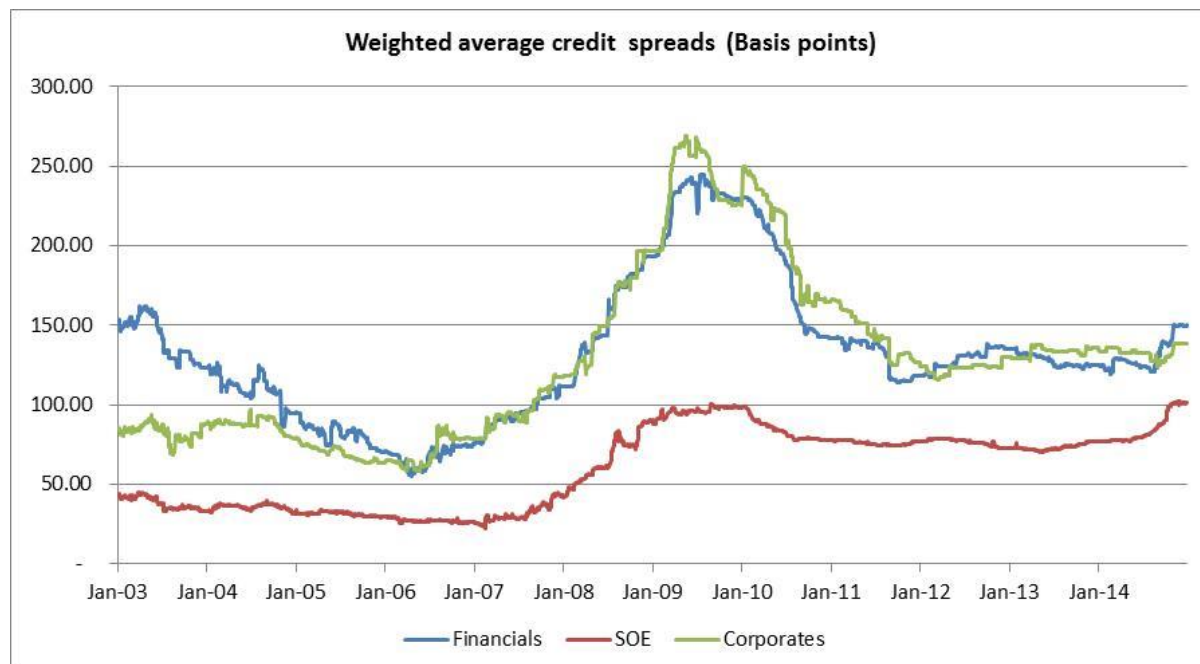


Figure 4 - Historical credit spreads (2003 – 2014)

Source: Standard Bank Financial Markets Research (2015)

One notable recurring characteristic of extreme capital supply friction in the debt capital markets is the phenomenon of large credit spreads. For certain, disruption to the financial markets in South Africa has been at the epicentre of the Global Financial Crisis (2007 – 2009) and the Rand crisis (2001 – 2002). The South African credit spreads increased significantly during the global financial crises. The increase was more severe for corporates and domestic banks that issue their debt instrument on BESA.

Quantifying the real effects of credit frictions requires identification of exogenous shifts in credit supply, which reflect financial stress, separately from shifts in credit demand, which can reflect other factors. Finding an appropriate variable that isolates shifts in credit supply – particularly for South Africa, is difficult. Credit spreads on corporate bonds have been identified in the literature as a reasonable proxy of the external finance premium and hence credit frictions (Bernanke and Gertler, 1995). However, the corporate bond market in South Africa has deepened only in the late 90s and remains highly dominated by highly rated institutions such as banks and few blue chip corporates. According to the credit channel theory, the external finance premium is the difference in cost between funds raised externally (by issuing equity or debt) and funds generated internally (by retaining earnings).

2.3.4.1.2. Sudden decline in debt issuance

The South African listed debt capital market is fairly new in the global context and it is still growing. In addition, the debt market is liquid and well developed in terms of the number of

participants and their daily activity. Since the first corporate bond issuance in 1992, the JSE Debt Board has had more than 1500 corporate debt instruments listing. Although data is very difficult to source for the period before 2005, the research below provides an analysis of debt market issuance post 2005 and the trend during the 2007 – 2009 periods. Figure 5 shows the South African corporate debt issuance on an annual basis for the calendar year 2005 to 2014. 2015 debt issuance is for the 3 months ended 31 March 2015.

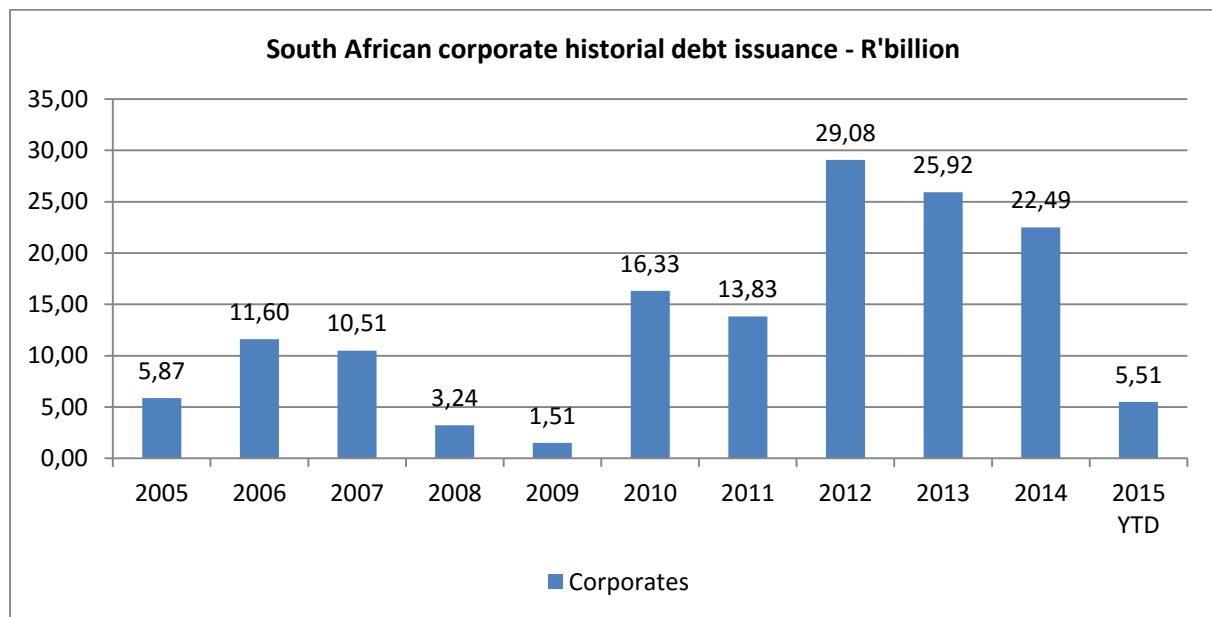


Figure 5 – South African corporate historical debt issuance (2005 – 2015)

Source: BESA (2015)

Corporate debt issuance declined by 9% year-on-year in the calendar year 2007 from the credit boom experienced in 2006 when debt issuance amounted to R 11.6 billion. The decline was more severe in 2009 when the market issuance was only R 1.5 billion and fell by 87.02% relative to the peak of R 11.6 billion during the 2005 – 2009 periods. Given that the vast majority of listed debt securities on JSE Debt Board are rated, and that some literature (Kisgen, 2006) argues that an independent credit rating gives firms better access to debt capital markets compared to firms that are not rated, the empirical question is what caused the decline in issuance. From a theoretical perspective, it's possible to argue that although companies with credit ratings can access capital from these markets there may be some other factors that caused the decline in corporate debt issuance at this time.

This research argues that there is a supply side effect in the market and that exogenous shocks on the supply of capital have varying impacts on capital structure selection regardless of the firm's abilities to raise capital (i.e. investment-grade vs. non-investment or large vs. small firms). These views are related to a new strand of corporate finance literature, that demonstrate that the supply of debt capital, whether in the form of bonds or loans, as well as factors from the demand side, determine corporate capital structure, due to market

segmentation or friction in substituting multiple sources of capital. Kahle and Stulz (2013) explore the impacts of supply (lending or credit) shock and demand shock on corporate policies during the 2007 credit crisis. The supply shock channels indicate that firms that rely on bank loans or credit would have had to reduce debt issuance and capital expenditure during the 2007 – 2009 credit crisis because this period resulted in a severe credit contraction and tighter lending criteria.

2.3.4.1.3. Currency volatility

Historically, capital flow bonanzas have often fuelled sharp credit expansion in advanced and emerging market economics alike. Focusing primarily on emerging markets, Magud, Reinhart and Vesperoni’s (2014) study analyses the impact of exchange rate flexibility on credit markets during periods of large capital inflows. Magud *et al.* (2014) show that banking credit accelerates during capital inflow booms, and the real growth rate of credit peaks a couple of years before capital flows reverse. During the reversal stage of the cycle, however, real credit growth markedly slows down. Magud *et al.* (2014) also note that real growth in banking credit to the private sector collapses during inflow reversals. In addition, real credit growth stabilises at a rate substantially lower than that of the boom phase after the capital flows reversal episodes. Figure 6 shows the monthly USDZAR exchange rate movement from 31 December 1995 to 31 December 2014.

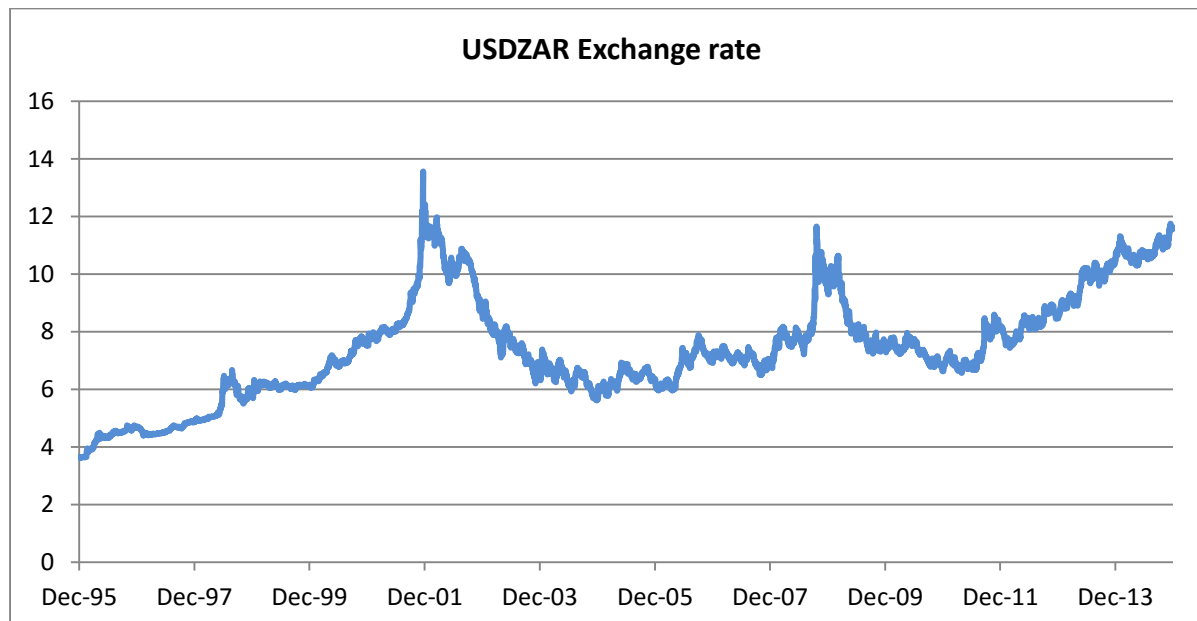


Figure 6 - USDZAR exchange rate (1995 – 2014)

Source: Bloomberg (2015)

South Africa is no stranger to currency crashes. Figure 6 has about 3 or 4 crashes in the USDZAR exchange rate. In 1998, the rand depreciated by 28%, the SARB raised interest rates by a panicked 700 basis points and it lost billions of dollars trying to prop up the rand. The result: the economy went into recession and share prices declined sharply. In 2001, the rand lost yet another 26% against the dollar on the back of South African’s policies and some ill-

considered technical changes in the implementation of exchange controls, than with external factors.

2.3.5. Macroeconomic conditions and capital structure adjustment speed

Although there are corporate capital structure theories aimed at explaining firms' financing decisions, little is known about how macroeconomic conditions affect the adjustment speed of capital structure towards target leverage (Cook and Tang, 2010). The primary existing theories of corporate capital structure attempt to explain firms' financing decisions and provide an insight on how firms adjust their leverage by looking at the cost and the benefits of each strategy.

Gertler and Gilchrist (1994) studied five periods of contractionary monetary policy (i.e. 1968, 1974, 1978, 1979, and 1988) to determine the effect of contractionary monetary stance on firms' financing decisions. The empirical results of their study indicate that during periods of monetary policy tightening, short-term borrowings deteriorate for smaller firms and commercial paper (i.e. short-term funding) financing rises for larger firms. Hence a period of contractionary monetary policy suggests good macroeconomic state, an increase in discount rate or a decrease in money supply directly affect long-term debt financing, which may influence firms' financing decisions and capital structure adjustment process (Camara, 2012).

Boyd and Smith (1996) argue that, in a developing economy, firms will finance with more equity due to higher efficiency in the financial intermediation of capital markets. This implies that the debt ratio of firms is negatively related to economic development due to the greater proportion of equity capital used in the course of the development of that economy. Despite the proliferation in capital structure literature, little attention has been paid to the effects of macroeconomic conditions on credit risk, capital structure choices and the adjustment to the target leverage (Hackbarth *et al.*, 2006). This is relatively surprising since economic intuition suggests that the economy's business cycle phase should be an important determinant of default risk, and thus, of financing decisions and the adjustment of these financing decisions. It is submitted that it is important to try and understand how corporates adjust their leverage given certain macroeconomic conditions.

Banerjee *et al.* (2000) (the pioneers of capital structure studies in this domain) stated the following: (1) the observed leverage in empirical studies need not necessarily be the optimal leverage; and (2) the empirical studies which are non-dynamic in nature are not able to provide information about the dynamic nature of capital structure adjustment by firms. Banerjee *et al.* (2000) found that firms with better growth prospects adjust their optimal structure much more slowly, whilst larger ex growth companies make these adjustments much faster.

Earlier studies on how macroeconomic conditions impact capital structure (Choe *et al.*, 1993; Korajczyk and Levy, 2003) found that macroeconomic states are non-trivial factors for firm's financing decisions. Since macroeconomic conditions vary over time (i.e. the economy experiences the natural business cycles of expansion and contraction), capital structure

decisions including the capital structure adjustment process also vary over time and across firms as macroeconomic conditions change (Camara, 2012). Hackbarth *et al.* (2006) study also shows that macroeconomic conditions have a significant effect on target capital structure; which also implies an effect of macroeconomic dynamics on the capital structure adjustment process, in the event of deviation from target.

Using two dynamic partial adjustment capital structure models, Cook and Tang (2010) estimated the impact of several macroeconomic factors on the speed of capital structure adjustment toward target leverage; they found evidence that firms adjust their leverage toward target faster in good macroeconomic conditions than they do in bad macroeconomic conditions. Cook and Tang's (2010) evidence holds whether or not firms are subject to financial constraints. These empirical findings of Cook and Tang (2010) support the findings of Hackbarth *et al.* (2006) that firms adjust to their target leverage faster in good macroeconomic conditions relative to how they do so under bad macroeconomics conditions.

Drobetz and Wanzenried (2006) stated that macroeconomic conditions affect a firm's adjustment speed in its capital structure. They found that firms adjust their capital structure faster in favourable macroeconomic conditions. However, Rubio and Sogorb (2011) have found that when they define either good or bad macroeconomic conditions as an additional explanatory variable in the model, then Spanish firms adjust their capital structure back to target leverage faster in a bad macroeconomic conditions than in good macroeconomic conditions. Rubio and Sogorb (2011) results contradict the previous international evidence (Tzang, Wnag and Rahim, 2013).

Related to agency problems, Levy and Hennessy (2007) find evidence of a tactical managerial activism, in which financial managers', actively substitute equity for debt during economic expansion, and debt for equity during economic contractions. Such tactical rebalancing of debt and equity in different macroeconomic conditions serves a signalling function, in terms of which managers during economic contraction deliberately increase their share of total equity holding, sending a confidence signal to market participants (Camara, 2012). This tactical managerial activism influences the adjustment of capital structure based on macroeconomic conditions effectively.

According to Camara (2012), one of the underlying economic and financial implications for faster adjustment in a good macroeconomic conditions relative to bad macroeconomic conditions is that equity investors (i.e. the true owners of the firm) that are holding 2 in 1 real options; they can either exercise their holdings in a good macroeconomic conditions or hold on for even better future returns as long as the firm moves closer to its target leverage level which optimises its weighted average cost of capital. However, caution is needed, because firms in a good macroeconomic conditions will likely move further away from the target due to a rise in market equity prices, in which case, firms may need to rebalance their capital structure accordingly. Nevertheless, as long as firms adjust faster in good macroeconomic states relative to bad macroeconomic conditions, the 2 in 1 real option assumption may be theoretically satisfied.

Cook and Tang (2010) employed both a two-stage and an integrated dynamic partial-adjustment structure model to test the relationship between macroeconomic conditions and capital structure adjustment speed. Their study defines good and bad states of macroeconomic conditions based on the term spread, gross domestic product (GDP) growth, default spread and dividend yield. Using data from 1977 to 2006, the authors conclude that U.S. firms adjust their debt ratios towards target faster in good macroeconomic states than in bad states. Cook & Tang's (2010) results also support the pecking order theory in that under-leveraged firms adjust their leverage towards target faster than firms that are over-leveraged. The authors also find evidence favouring the market timing theory implication that under-leveraged firms have less incentive to adjust towards target leverage when stock market performance is good, as measured by dividend yield on the market and price-output ratio.

Hackbarth *et al.* (2006) earlier conducted a similar study to Cook & Tang (2010) and developed a contingent model for analysing the impact of macroeconomic conditions on dynamic capital structure choices. The Hackbarth *et al.* (2006) model predicts that firms should adjust their capital structure faster in the rapid growth phase of the economic cycle compared to the recession phases of the cycle (i.e. macroeconomic conditions influence the pace and the size of capital structure adjustment). Cook and Tang's (2010) findings are in support of the work by Hackbarth *et al.* (2006) as they found that firms adjust faster in good states compared to bad states.

Drobertz and Wanzenried (2006) analysed the impact of firm-specific characteristics as well as macroeconomic factors on the speed of adjustment of firms to their target debt ratio. Drobertz and Wanzenried (2006) found that faster growing firms and those that are further away from their target capital structure adjust more readily. In line with Hackbarth *et al.* (2006), they also found that macroeconomic conditions influence the speed of adjustment and that firms adjust much faster when economic prospects are good. In addition, when the term spreads are higher, firms tend to adjust their speed much faster. In contrast to Koracyk and Levy (2003), Drobertz and Wanzenried's (2006) study could not identify the differences in the speed of adjustment between financially constrained and unconstrained firms.

Camara (2012) also examined the effect of macroeconomic factors on the capital structure of US-based multinationals (hereafter, MNCs) relative to domestic firms (hereafter, DCs) and impact of macroeconomic conditions on capital structure adjustment speed of MNCs relative to DCs during the period between 1991 and 2009. The results showed that both macroeconomic factors and macroeconomic conditions have a significant effect on capital structure dynamics (i.e. capital structure decisions and capital structure speed of adjustment). The results also show that over-leveraged firms adjust faster in good macroeconomic conditions than under-leveraged firms do. Camara's (2012) study also finds support for market timing theory regarding the speed of adjustment.

Tzang *et al.* (2013) investigate the impact of macroeconomic conditions on the speed of adjustment of capital structure for non-financial firms listed on the Indonesian Stock

Exchange from 1992 to 2010. In addition, firms are divided into under- and over-leveraged firms and are researched to find the degree to which the firms' leverage affects the speed of adjustment and the relationship between leveraged firms and macroeconomic conditions. Based on a two-stage OLS and integrated partial adjustment approach, Tzang *et al.* (2013) found that Indonesian firms adjust their leverage faster in bad economic conditions and that the adjustment speed of over-leveraged firms is higher than the under-leveraged firms.

Tzang *et al.* (2013) results show that when the macroeconomic condition is defined by the inflation rate, the Indonesian firms adjust their capital structure faster in bad states when leverage is defined by book value. When the macroeconomic condition is defined by GDP growth rate, the adjustment speed is greater when leverage is defined by book value. Tzang *et al.* (2013) found that Indonesian firms adjust faster in bad states when leverage ratio is defined by either book value or market value; these results are similar to Rubio and Sogorb (2011).

According Tzang *et al.* (2013) results, when firms are grouped by over – and under-leveraged firm, the over-leverage firms adjust faster when leverage ratio is defined by either book or market value. However, Tzang *et al.* (2013) found that the relationship between macroeconomic conditions and over- and under-leverage firms is insignificant.

3. Description of variables

3.1. Firm-specific variables

Firm-specific variables in this research focus on the characteristics of the company that basically reflect the company's condition. The most reliable factors for explaining corporate leverage are: median industry leverage (positive effect on leverage), market-to-book assets ratio (negative effect on leverage), tangibility (positive effect on leverage), profits (negative effect on leverage), and log of assets (positive effect on leverage) (Frank and Goyal, 2009). In this research the characteristics of the company can also be regarded as internal determinants of capital structure that could affect capital structure decisions and adjustment towards the targeted capital structure. This research considers three main firm-specific characteristics, namely: (1) tangibility, (2) size and (3) profitability.

Table 3 shows the theories and expected relation between corporate factors chosen and firms leverage.

Table 3 - Relationship between firm-specific characteristics and corporate leverage

| Variables | Expected theoretical relation | Mostly reported in the empirical literature | Theories |
|-------------|-------------------------------|---|--|
| Tangibility | + | + | Agency theory: agency cost of debt. Trade-off theory: financial distress/business risk. |

| Variables | Expected theoretical relation | Mostly reported in the empirical literature | Theories |
|---------------|-------------------------------|---|--|
| Profitability | - | - | Pecking order theory. Trade –off theory: bankruptcy costs. Other theory: dilution of ownership structure. |
| | + | | Trade-off theory: tax. Free cash flow theory. Signalling theory. |
| Firm size | + | + | Trade-off theory: bankruptcy costs/tax. Agency theory: agency cost of debt. Other theories: access to the market, economy of scale. Other theory: information asymmetry. |

Source: Deesomsak *et al.*, (2004)

3.1.1. Tangibility

Tangibility infers higher liquidation value and lower incentive for asset substitution. Therefore, there is potential for a firm with more tangible assets to employ more debt since the assets can be used as collateral to reduce default risk (Wahab and Ramli, 2014). South African banks typically look to encumbering pools of tangible assets when making loans to corporate clients in order to increase their recovery rate and reduce their loss given default. Jensen and Meckling (1976) suggested that in order to mitigate the agency cost of debt, tangible assets can be provided as security and this is more relevant when the tangible assets' value is high.

Tangible assets form an important element of any corporate financing decision for both corporate executives and the providers of debt capital. Corporate executives can encumber the firm's tangible assets as security for its debt borrowings, and providers of capital can accept these types of assets as collateral since: (1) they are easier to value when compared to intangible assets, and (2) they are more likely to hold their value during times of financial distress. Most previous studies have found that tangibility has a significant positive relationship with the leverage ratio (Frank and Goyal, 2009; Wahab and Ramli, 2014; Deesomsak *et al.*, 2004). Accordingly, the trade-off theory predicts a positive relationship between measures of leverage and the proportion of tangible assets (Drobetz and Wanzenried, 2006).

In this study, tangibility is defined as tangible assets (tangible assets include both fixed assets, such as machinery, buildings and land, and current assets, such as inventory) ` divided by total assets in line with prior studies (De Jong, Kabir and Nguyen, 2008).

3.1.2. Size

The firm size generally influences the firm's ability to access funding from the banking sector and the debt capital markets in general. Large firms are likely to be diversified and less prone to bankruptcy since they have greater flexibility in designing their capital structure (Rajan and Zingales, 1995; Titman and Wessels, 1988; Ngugi, 2008). In addition, large firms have lower agency costs of debt, relatively smaller monitoring costs, less volatile cash flows, easier access to credit markets, and require more debt to fully benefit from the tax shield (Deesomsak *et al.*, 2004). Accordingly, the trade-off theory predicts an inverse relationship between size and the probability of bankruptcy, i.e., a positive relationship between size and leverage (Drobetz and Wanzenried, 2006).

Looking at the asymmetric information, the information asymmetry level in the market will be much lower for larger firms since more information is expected to be available for these firms (Haron, 2014). Thus, larger firms have better access to credit markets, as the information asymmetry is perceived to be low due to their superior qualitative and quantitative information availability in the market place. Larger firms turned to list on local equity exchanges and report financial results frequently.

In contrast to aforementioned, Suhaila and Wan Mahmood (2008) found that there is an inverse relationship between firm size and leverage. The results suggest that large firms have less demand for leverage than small firms (Wahab and Ramli, 2014). This study uses natural logarithm of total assets to represent firm size in line with prior studies (Haron, 2014; Deesomsak, Paudyal and Pescetto, 2009).

3.1.3. Profitability

There are no consistent theoretical predictions on the effects of profitability on leverage. Therefore, theoretically, the relationship between size and leverage is unclear. Based on the trade-off theory, it's possible to hypothesise that more profitable companies should have higher leverage because they have more income to shield taxes and have a lower probability of bankruptcy. However, from the point of view of the pecking order theory, firms prefer internal financing to external financing. Consistent with pecking order perspective, market timing implied a negative relationship between return-on-assets and leverage. So more profitable companies have a lower need for external financing and therefore should have lower leverage (Bauer, 2004). In this research, return on assets is used as a proxy for profitability and is defined as earnings before interest and taxes divided by total assets. This proxy is in line prior studies (Rajan and Zingales, 1995; Wahab and Ramli, 2014).

3.2. Macroeconomic variables

Macroeconomics is the movement and trends in the economy as a whole in any given country or region. The fiscal policy and monetary policy of a country are major macroeconomic determinants. Macroeconomic indicators are factors that are external to the company, but they significantly influence a company's performance either directly or indirectly. Due to this

direct or indirect influence, corporate executives consider macroeconomic conditions in making their financing choices for their firm (Choe *et al.*, 1993; Korajczyk and Levy, 2003).

Korajczyk and Levy (2003) argue that, at the issue-choice stage, firms consider how far they are from their target leverage as well as the marginal costs associated with issuing one security over another. In their study, they found that deviations from the target account for about 15% to 21% of their time-series variation in issue choice, and macroeconomic conditions account for approximately 38% to 48% of their time-series variation in issue choice. The macroeconomic factors discussed below have all been found to influence a firm's financing decisions and this study will endeavour to investigate these factors in the South African context.

3.2.1. Economic growth

Real GDP growth (hereafter referred to as GDP) is one of the primary indicators used to gauge the health of a country's economy and one of the most used external determinants in analysing capital structure decisions and capital structure adjustment speed towards target levels (Korajczyk and Levy, 2003; Drobetz and Wanzenried, 2006; Camara, 2012; Chipeta and Mbululu, 2013; Muthama *et al.*, 2013). These studies have found that there is a negative correlation between corporate leverage and the GDP growth rate.

Gajurel (2006) found that there is a negative correlation between GDP growth rate and both the total debt and short-term debt ratios. However, he found that the GDP growth rate had a positive impact on long-term debt ratios. Filips in economic performance and consequently in GDP growth typically lead to increases in companies' profits. According to the pecking order theory, companies prefer internal sources (such as retained earnings) to external debt (as sources of capital) as they become more profitable (Mokhova and Zinecker, 2014).

During expansions, stock prices go up, expected bankruptcy costs go down, taxable income goes up, and cash reserves increase. Thus, firms are expected to borrow more during expansion periods (Frank and Goyal, 2009). Also, prices of assets that can serve as security are likely to fare better during expansion periods and become more illiquid (and less valuable) during the periods of economic contraction. Since banks require company assets to be encumbered as collateral for the loans that they advance, leverage should be procyclical. Gertler and Gilchrist (1993) found that subsequent to recessions, aggregate net debt issues for large firms increase but remain stable for small firms.

De Jong *et al.* (2008) suggested that higher economic growth would be a sign that a country has favourable economic conditions and good prospects of economic development. Therefore, they believe that firms would tend to employ more debt during times when a country enjoys a higher economic growth rate. This research considers GDP growth rate as the measure of economic growth rate as it captures some elements of an economic activity.

Figure 7 illustrates the South African annual GDP growth rate for the period 1970 – 2014 measured on a quarterly basis (i.e. March, June, September and December). The graph below depicts a very “noisy” growth path over the period, with negative growth in certain periods.

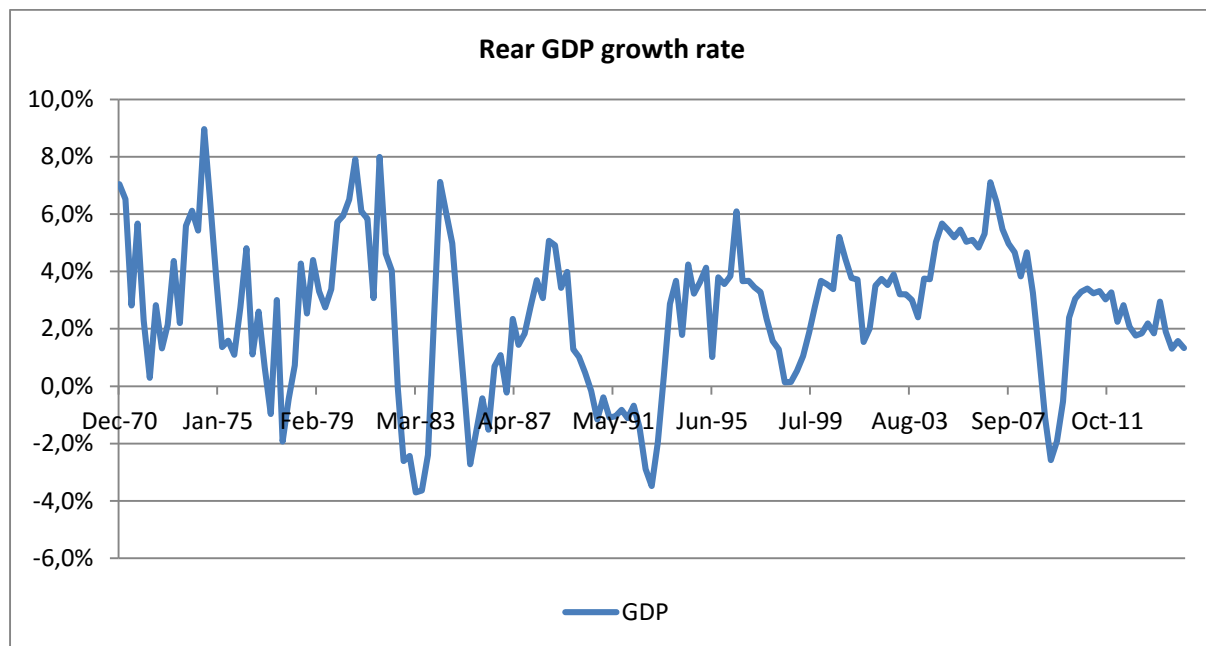


Figure 7 - Real GDP growth rate (1970 – 2014)

Source: SARB, I-NET Bridge (2015)

3.2.2. Inflation rate

In economics, inflation is a rise in the general level of prices of goods and services in an economy over a period of time. Each level of inflation has an effect on the general health of the economy and the companies that operate in that economy. For example, low or medium levels of inflation in a country can have a positive effect on the business sector, in that it can act as an incentive for increases in production. High levels of inflation however, can harm companies’ profitability by affecting the cost of inputs as well as reducing final demand for their outputs (Muthama *et al.*, 2013). The inflation rate is usually considered as a proxy for a government’s ability to manage the economy and it provides information about the stability of the currency in long-term contracting.

In addition, inflation’s impact on a firm’s capital structure is more prevalent in developing countries due to the significantly greater reliance on short-term debt as a form of funding by companies operating in those economies (Booth *et al.*, 2001). South Africa is classified as a developing country and the capital allocation in the country takes place through the demand and supply mechanism. The debt providers demand interest returns (i.e. typically, prime plus a margin or a JIBAR return plus a margin) for the capital they provide. Equity investors expect dividends or capital gains for their equity investments. Since real returns matter to the providers of capital, it’s reasonable to infer that inflation is taken into account in their decision-making and hence impacts on a firm’s capital structure.

There are number of theoretical models relating to inflation rate and capital structure: (1) the Miller Effect, (2) the Schall Effect and (3) DeAngelo-Masulis Effect. These models attempt to explain the effects of inflation on capital structure and makes the connection by investigating how inflation affects the yield on listed equities and bonds, and hence its impact on the demand and supply of corporate debt. Miller (1977) finds a positive relationship between the corporate debt level and the yield spread between corporate and municipal bonds. Given an income tax structure, an increase in the yield spread implies a higher marginal investor's income tax rate, which, in turn implies that additional investors are enticed to purchase corporate bonds. Consequently, the aggregate debt ratio will increase.

The relationship between the aggregate corporate debt level and the yield spread between corporate bonds and equities was shown to be positive by Schall (1984). Schall (1984) argued that a decrease in the net return on equity would induce investors to shift from equities to bonds. This is the substitution effect of corporate bonds for equities as the yield on bonds become relatively higher.

DeAngelo and Masulis (1980) explain that inflation leads to more debt capital raising, since inflation lowers the real cost debt, the demand for corporate credit increases during inflationary periods. On the other hand, if corporate bond returns increase relative to stock returns as inflation decreases, the aggregate demand of corporate credit will increase. However, there is also another view that higher inflation may lead investors to prefer investing in equities, as equities provide much better protection against inflation compared fixed income bonds during higher inflationary environment (Coates and Woolley, 1975).

Since a large number of corporate tax deductions are based on historical costs, such as depreciation, wear and tear allowances, and cost of goods sold, *ceteris paribus*, DeAngelo and Masulis (1980) argue that increases in inflation which increase nominal revenues, will decrease the real value of investment tax shields inducing firms to replace this tax shield loss by increasing their use of debt. During the period of this study, South African inflation remained low in comparison to the late 70s, the 80s and early 90s. However, South African inflation is high compared to developed markets. Over the last 15 years, South African inflation averaged 5.889% per annum, with 4 years in which the inflation significantly deviated from the target range of 3% - 6% set by the SARB. During the calendar years 2002, 2003, 2007 and 2008, inflation was 12.3%, 0.3%, 8.9% and 10.2% respectively.

Market timing theory suggests that a firm issues the debt when the interest on the debt is low as compared to the past and future expected interest rates. Frank and Goyal (2009) found that when firms expect that the inflation rate will be higher in the future or realising that the current inflation rate is low, they will raise more debt. However, future inflation trends depend on the local country economic performance as well as external factors (i.e. so-called imported inflation). If corporate executives expect more inflation in the future, they will issue more debt in order take advantage of the lower real cost of debt. However, this argument assumes that companies are raising fixed rate funding from banks or issuing bonds in the bond market, since variable interest rates tend to move around as macro fundamentals changes.

Based on Taggart (1985), the real value of tax deductions on debt is higher when inflation is expected to be high. Thus, the trade-off theory predicts leverage to be positively correlated to inflation (Frank and Goyal, 2009). In contrast, Schall (1984) stated that during periods of high inflation, the after-tax returns on shares are relatively higher than the returns on bonds. In periods of high inflation, investors will therefore tend to favour investments in equities compared to bonds, thus reducing the availability of debt funding. The effect of inflation on capital structures will persist through the reduction of debt financing.

Based on the literature mentioned above, this research investigates the impact of inflation on capital structure decisions. This research considers the general consumer price index (annual change) as the best measure of inflation. The SARB has set a CPI target band of 3% to 6%, and uses the repo rate to try and ensure that inflation stays within its targeted band. South Africa formally introduced inflation targeting in February 2000, after announcing the intention to adopt the framework in August 1999. The inflation variable has exogenous factors affecting it outside of the classic economics supply and demand eco-system.

In this research, CPI is the proxy for inflation; this has a conflicting financial implication for debt issuers relative to debt holders. Periods of rising inflation are considered to be good for borrowers' existing debt obligations but detrimental to existing debt holders (Camara, 2012). The opposite is true for new debt issuances made during periods of rising inflation. Similarly, inflation has an adverse effect on the overall wealth of equity holders through capital gains. Figure 8 illustrates the South African annual CPI for the period 1970 – 2014 measured on a quarterly basis (i.e. March, June, September and December). The South African inflation rate started declining from the late 80s as South Africa started the liberalisation of its economy towards the end of apartheid.

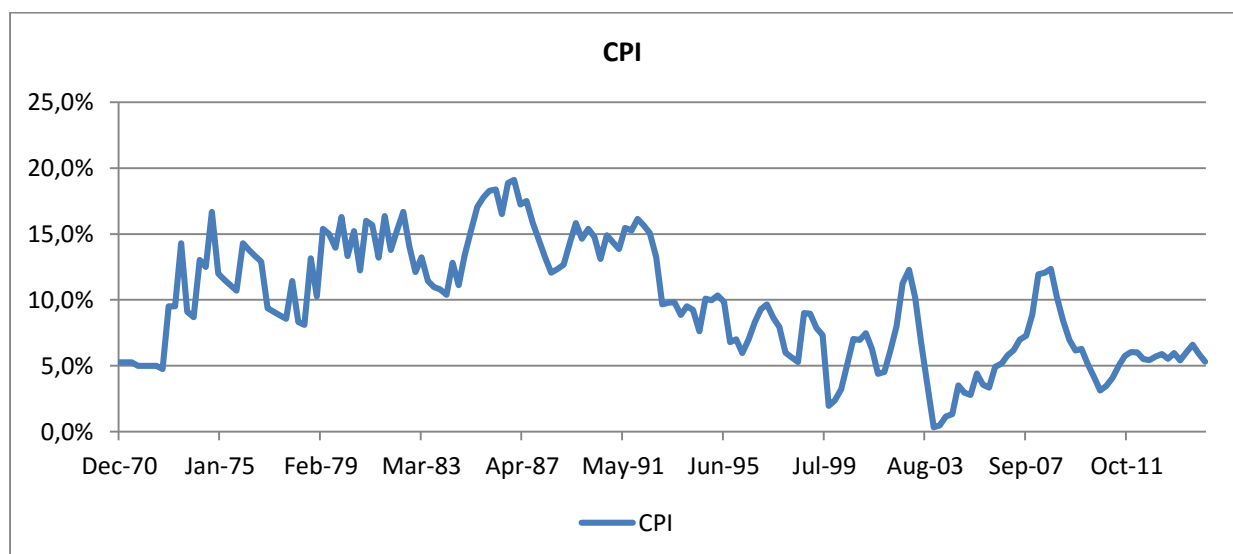


Figure 8 - Consumer Price Index (1970 - 2014)

Source: I-NET Bridge (2015)

3.2.3. Interest rates

According to Modigliani and Miller's (1958) paper, changes in interest rates should not affect management financing decisions, since the value of a firm is independent of its capital structure. However, several theories have developed since then to argue against their theory. Corporate executives should be concerned with the levels of interest rates as these directly affect their firms' borrowing costs and overall weighted average cost of capital. Studies in developed and developing economies show that interest rates affect capital structure decisions and the speed of adjustment towards target capital structure (Jalilvand and Harris, 1984; Mokhova and Zinecker, 2014).

According to trade-off theory, firms' capital structure decisions are made on the basis of the tax benefit and the costs (financial distress and bankruptcy) associated with such borrowings. An increase in interest rates will result in corporates paying much higher funding costs in the absence of hedging. This higher interest will result in corporates both accelerating the repayment and borrowing less. This implies a decline in leverage when interest rates go up and an increase when interest rates go down. The trade-off theory, therefore, suggest that there is a negative relationship between interest rates and leverage. There are number of studies that suggest a negative relationship between interest rates and leverage (Brigham and Houston, 1998; Henderson, Jegadeesh and Weisbach, 2006; Frank and Goyal, 2003).

Market timing also theory predicts a negative relationship between interest rates and leverage. According to market timing theory, corporate executives assess both equity and debt market conditions and use the capital market segment that's most favourable to raise capital; in at the time. Henderson *et al.* (2006) analyses whether firms' propensity to issue debt in a low interest rate environment allows them to time the market and raise more long-term debt prior to increases in interest rates. Using the Security Data Corporations new issuances for G7 countries, they found that firms issue more long-term debt when interest rates are lower, and prior to increases in interest rates.

In contrast to these aforementioned studies (Brigham and Houston, 1998; Henderson *et al.*, 2006; Frank and Goyal, 2003), Mokhova and Zinecker (2014) found a positive (and significant) influence on long term, short-term and total leverage in Germany and France. Bokpin's (2009) study also found interest rates to be positively (and significantly) correlated to capital structure.

Based on the study of firms listed on the Nairobi stock exchange for the period 1999 and 2008, Muthama *et al.* (2013) concludes that interest rates (as measured by yield on treasury bills as a proxy) have a positive influence on firms' long term debt ratios and total debt ratios, and a negative influence on their short debt ratios. Ooi's (1999) study involving 83 property companies listed in the UK found the relationship between prevailing market interest rates and the debt ratio is significantly negative. In contrast, the De Jong *et al.* (2008) study indicates that the relationship between leverage ratios and interest rates is not significant. In this research, the prime rate is used as a proxy for interest rates in understanding the correlation

between interest rates and capital structure decisions. South African banks tend to use it as the basis for pricing loans to their corporate clients.

Figure 9 illustrates the prime interest rate (a proxy for interest rates generally) in South Africa for the period 1970 – 2014 at the end of each quarter (i.e. March, June, September and December). The prime interest rate experienced many fluctuations from 1970 – 2014.

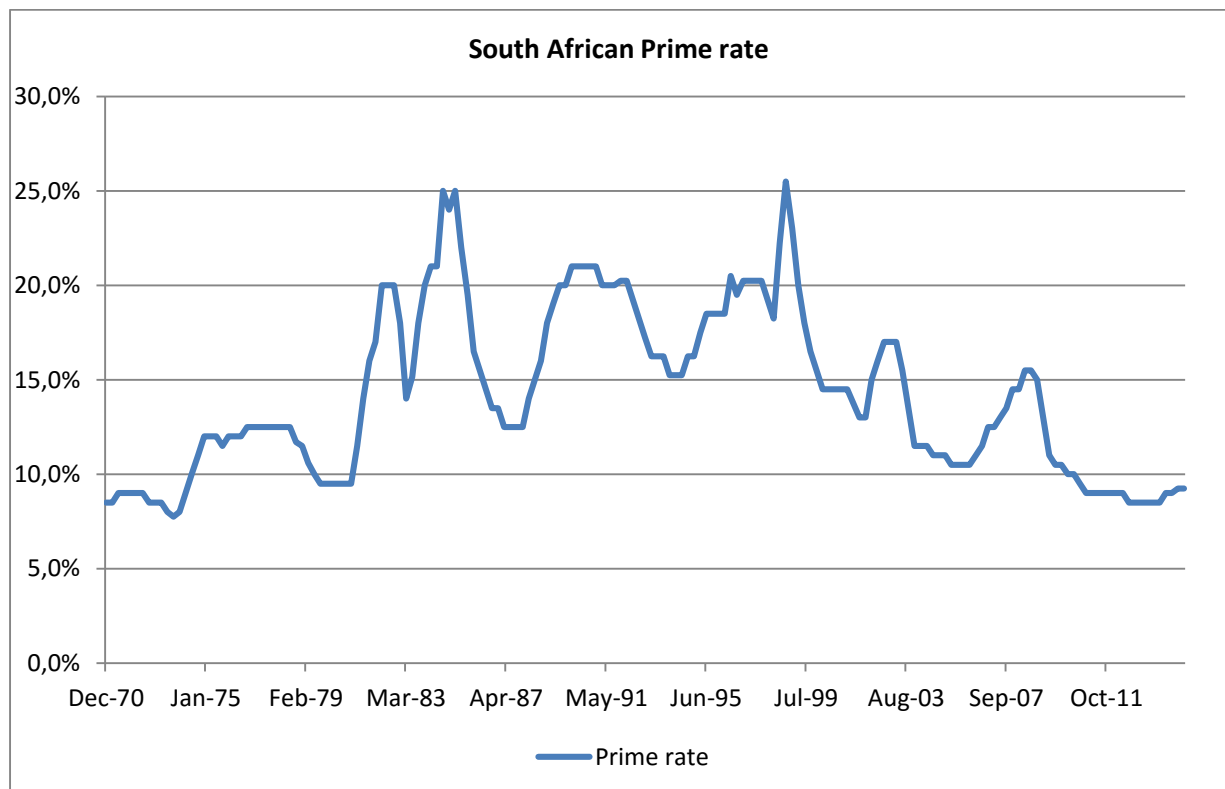


Figure 9 - South African Prime rate (1970 – 2014)

Source: SARB (2015)

3.2.4. Summary of the three key economic indicators

Figure 10 plots the course of three key economic indicators for the period 1999 – 2014:

- Interest rates – measured by the South African prime interest rate;
- Inflation – measured by South African CPI; and
- Economic growth – measured by the South African gross domestic product (GDP) growth rate.

The graph provides a good graphic illustration of the performance of the South African economy over the last 15 years.

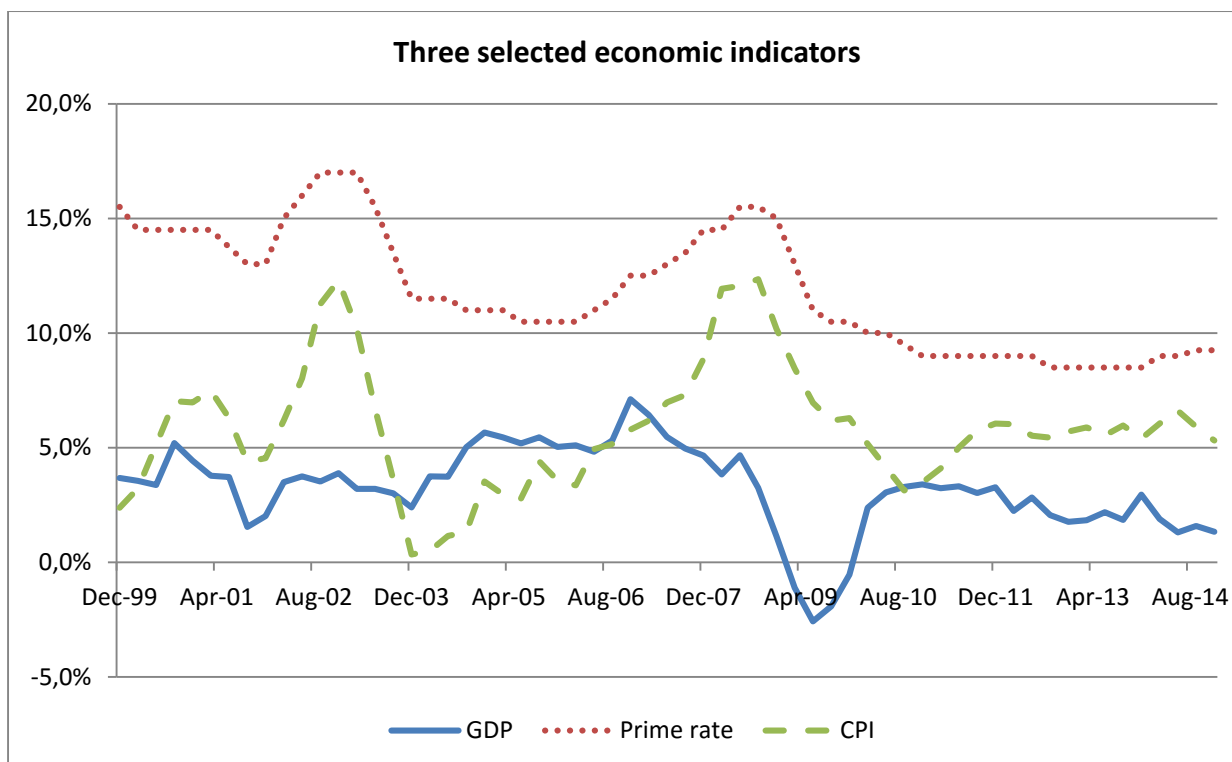


Figure 10 - Summary of the three selected economic indicators (1999 – 2014)

4. Data

This research is based on the sample of companies listed on the main board of the JSE Limited. The JSE All Share Index comprises c. 99% of companies listed on JSE (by market capitalisation) and includes a great number of financial institutions. Since banks and insurance companies are subject to industry-specific rules and regulations (i.e. bank regulations stemming from the Basel 2, and now moving to Basel 3 in 2016 and Solvency 2 insurance regulations embodied in the Solvency Assessment and Management Act), their leverage is severely affected by exogenous factors. Therefore, all firms that fall under the financial sector have been excluded from the sample, and this research has focused on non-financial firms only. The number of companies in the All Share Index is 167; and the exclusion of financial companies reduces the number of companies in the sample to 130.

Companies with less than three years data were excluded. Also, property stocks were excluded, as banks look at loan-to-value when assessing leverage capacity for property companies. This research uses a different definition of leverage and the loan-to-value principle wouldn't capture fully leverage impact with the different leverage principle.

S&P Capital IQ and FactSet databases were used to source historical income statements, balance sheets and to calculate financial ratios for the chosen period. Financial ratios were calculated on the last twelve months (LTM) basis based on the S&P Capital IQ algorithms. Macroeconomic data variables were obtained from the I-Net Bridge database and the SARB. The sample period covered is between 01 January 2000 to 31 December 2014.

5. Model specification

5.1. The model specification – macroeconomic variables

In this research, the models and variables used were based on the theoretical foundations suggested by capital structure theories as well as other related studies. The models discussed below are used in the analysis. This sub-section discusses the models used in order to investigate demand factors (tangibility, size and profitability) and macroeconomic factors (GDP growth, inflation rate and interest rates) and their impact on capital structure.

Firstly, in line with other empirical analysis of this nature, a panel data regression model was used to test the effects of firm-specific factors and macroeconomic factors on the capital structure of the sample firms. The foundation of the model followed a similar model as Korajczyk and Levy (2003), Camara (2012) and Muthama *et al.* (2013) and is stated as follows:

$$LV_{it} = \alpha_{it} + \gamma \text{Macro}_{i,t-1} + \beta X_{i,t-1} + \mu_{it} \quad (1)$$

Where LV_{it} is the leverage for firm i at time t , α is the unobservable firm specific effect, and $\text{Macro}_{i,t-1}$ and $X_{i,t-1}$ are a vector of lagged macroeconomic variables (i.e. inflation rate, real GDP growth and prime rate) and a vector of lagged characteristics (i.e. tangibility, size and profitability) of firm i . The model specification is based on the following leverage definition (Camara, 2012):

$$LV_{it} = \frac{D_{it}}{(D_{it} + E_{it})} \quad (2)$$

Where (D = Long-term debt interest bearing borrowings + short-term interest bearing (i.e. this include drawn overdraft facilities); E = share price at close at time t * number shares in issue). This definition of leverage is based on market value leverage ratio. However, there is no consensus on whether book or market value leverage ratios should be used in capital structure studies. Some studies argue that leverage should be computed using the book value of capital because book ratios are independent of factors that are under the direct control of firms (Cook and Tang, 2010; Fama and French, 2002).

Other empirical studies prefer market leverage ratios, and argue that it is relevant to look at leverage using both book value and market leverage definitions (Cook and Tang, 2010). Welch (2004) found evidence that market leverage better reflects the agency problems between creditors and equity capital providers and serves as an indispensable input into WACC computations. Since it highly possible that some firms have book value rather than market value targets and *vice versa*, this research followed Cook and Tang (2010) and tested the regression model using both book and market value measures. This research defines the book value leverage ratio as follows:

$$BLV_{it} = \frac{D_{it}}{(D_{it} + BE_{it})} \quad (3)$$

Where D_{it} is the sum of firm i 's short-term and long term value of interest-bearing debt at time t , and BE_{it} denotes the equity book value as recorded in the firm's balance sheet as at 31 December for the calendar period being considered in this research.

The research also defines the market value leverage ratio as follows:

$$MLV_{it} = \frac{D_{it}}{(D_{it} + ME_{it})} \quad (4)$$

Where D_{it} is the sum of firm i 's short-term and long term value of interest-bearing debt at time t , and ME_{it} denotes the product of the number of ordinary shares issued and outstanding and the stock price per share at time t , which equals the market value of firm i 's equity.

In order to arrive at an equation to investigate the impact of macroeconomic factors and firm-specific characteristics on book value leverage, equation 2 is replaced by equation 3 and corporate leverage is modelled as follows

$$BLV_{i,t} = \alpha_{it} + \gamma Macro_{i,t-1} + \beta X_{i,t-1} + \mu_{it} \quad (5)$$

To arrive at market value leverage, the same procedure as above is followed and equation 2 is replaced by equation 4 in equation 1. For market value leverage, the following equation is followed:

$$MLV_{i,t} = \alpha_{it} + \gamma Macro_{i,t-1} + \beta X_{i,t-1} + \mu_{it} \quad (6)$$

Although previous studies obtain the fitted value of equation (5) and equation (6) as the proxy for target leverage using linear regression models, Papke and Wooldridge (1996) and Cook and Tang (2010) point out that there are methodological problems using linear models for fractional data. To manage such problems, Papke and Wooldridge (1996) developed a quasi-likelihood method with a fractional dependent variable. Thus, this research follows Papke and Wooldridge (1996) and Cook and Tang (2010) use of the quasi maximum likelihood estimation method ("QMLE") to estimate the fitted value of equation (5) and equation (6) as the proxy for target leverage.

5.2. The model specification – capital markets friction

Section 5.1 models investigate the demand side conditions and some exogenous variables and their impact on a firm's capital structure. The models implicitly assume that the supply of capital is frictionless in line with Modigliani and Miller (1958) assumptions. Recent literature on capital structure shows that the demand side factors do not fully explain the variations in leverage ratios and financing policies of corporates. Hence, if the supply of capital is uncertain then firm financing decisions will depend on both demand and supply side factors. In order to investigate the supply-side impact on capital structure choices, Rehman *et al.* (2013) modelled the firm financing and investment decisions as a function of both demand and supply side frictions as follows:

$$Y = \beta_0 + \beta_1 \theta + \beta_2 \delta + \mu \quad (7)$$

Where, θ represents demand shocks and δ represents supply shocks. Equation 7 models firm financing decisions as a function of both demand and supply. In order to understand better the effects of extreme capital market frictions on firm financing decisions, and equation 7 can also be expressed as follows in a general form:

$$Y = \beta_0 + \beta_1 f(\text{demand shocks})_{it} + \beta_2 f(\text{supply shocks})_{it} + \mu_{it} \quad (8)$$

The co-efficient of interest in equation 8 is β_2 which measures the effect of supply shocks on variable of interest. The challenge in investigating the capital supply shocks and their impact on corporate leverage comes from the identification problem with regard to the policies adopted by corporate executives vis-à-vis the supply side effects on the financing choices.

In order to address this challenge, the identification strategy is similar to that followed by the previous literature (Leary, 2009; Duchin *et al.*, 2010; Rehman *et al.*, 2013). This research identifies the exogenous variations in the supply of credit. The recent credit crisis 2007 – 2009 which led to the global recession from 2008 to 2012 provides an opportunity to study the potential impact of these events. Since the recent financial crisis originated from the events in the US subprime market, it is reasonably exogenous to corporate credit demand and hence this exogenous shock makes it possible to identify the effect of credit supply shocks on corporate capital structure (Rehman *et al.*, 2013). The rand crisis of 2001 and 2002 also presents a definable event on which to test the effects of exogenous effects on capital supply.

As this study identifies the supply channel, the fixed effect model can be regarded as the most appropriate for this investigation. This is because it allows identifying the supply effect by controlling for the unobserved firm specific effect (Rehman *et al.*, 2013). Fixed effect model allows the ability to control for time-invariant company/sector specific factors that may impact or bias leverage. For example, business practices and regulations may influence leverage, however, these practices and regulations are different across companies and are generally time invariant. Since these have the potential of impacting different companies differently and may therefore bias leverage there is a need to control for these.

In this regard, Love, Preve and Sarria-Allende (2007) argue that fixed effect model not only captures the unobserved time-invariant heterogeneous firm characteristic, but also allows researchers to disentangle the post-market friction effect from the precrisis effect (Rehman *et al.*, 2013). The fixed effects specification removes all firmspecific time-invariant omitted variables. Similarly, the fixed effect model can effectively account for both observable and unobservable firm characteristics and firm heterogeneity (Rehman *et al.*, 2013).

There is a potential concern of unobserved heterogeneity, since this study employs panel data. This is because the data contains multiple observations per firm. Minguex-Vera and Martin-Ugedo (2007) argued that unobservable heterogeneity might result in spurious correlations with dependent variables, which would bias the coefficients obtained. According to Rehman *et al.* (2013) it can therefore be argued that the fixed effect model will help to account for this concern. Jeon and Miller (2004) also support the view that when using panel data, the fixed-effect model produces unbiased and consistent estimates of the coefficients.

The fixed effect regression model used in this research is highlighted below:

$$Y_{it} = \alpha_{1t} + \Pi_1 * Friction_{it} + \delta_2 * \sum X_{it} + \delta_3 * Friction * \sum X_{it} + \mu_{it} \quad (9)$$

Where Y_{it} is a measure of firm leverage ratios, α_1 is the firm fixed effect; Π_1 is the differential slope coefficient and indicates how much is the slope coefficient of the capital markets' friction periods (2001 – 2002 and 2007 – 2009) differ from that of the non-capital markets' friction periods (2000, 2003-2006 and 2010 – 2014); friction is a dummy variable equal to one for the capital markets' friction periods (2001 – 2002 and 2007 – 2009) and 0 otherwise (2000, 2003-2006 and 2010 – 2014). The interactive term δ_3 represents the change in response relative to the pre-crisis period, and X_{it} is a set of firm specific characteristics as discussed in sub-Section 3.1. In light of the foregoing, the following model is constructed. The benchmark model for firm leverage ratio, which was regressed against firm demand and supply side factors, can be written as follows.

$$LV_{it} = \beta_0 + \beta_1 * SZ + \beta_2 * TAN + \beta_3 * PROF + \beta_4 * MF + \beta_1 * SZ * MF + \beta_2 * TAN * MF + \beta_3 * PROF * MF + \mu_{it} \quad (10)$$

Where SZ, TAN and PROF are size, tangibility and profitability respectively. Size, tangibility and profitability are defined as per Section 3.1: Firm-specific variables. MF is a dummy variable equal to one for the capital market friction periods (2001 – 2002 and 2007 – 2009) and 0 otherwise (2000, 2003 -2006 and 2010 – 2014). This model is tested using both book value and market value leverage resulting in the following two equations respectively:

$$BLV_{it} = \beta_0 + \beta_1 * SZ + \beta_2 * TAN + \beta_3 * PROF + \beta_4 * MF + \beta_1 * SZ * MF + \beta_2 * TAN * MF + \beta_3 * PROF * MF + \mu_{it} \quad (11)$$

$$MLV_{it} = \beta_0 + \beta_1 * SZ + \beta_2 * TAN + \beta_3 * PROF + \beta_4 * MF + \beta_1 * SZ * MF + \beta_2 * TAN * MF + \beta_3 * PROF * MF + \mu_{it} \quad (12)$$

5.3. The model specification - integrated dynamic partial adjustment capital structure model

In a perfect market, trade off theory predicts that, firms would instantaneously adjust back to target leverage. The perfect market assumes that there are no transaction costs (i.e. transaction costs could include early penalty fees and advisory fee in a non frictionless world) hence it is possible for firms to instantaneously revert to the target leverage. On the other hand, in imperfect capital markets, where recapitalisation costs are non-trivial, reversion to target leverage may only be visible during multiple periods (i.e. partial adjustment) (Camara, 2012).

This research does not follow a two-stage estimation procedure that is commonly used in the literature, since Flannery and Rangan (2006) shows that the partial adjustment speed reflected by the coefficient on target leverage from first-stage regressions is abnormally smaller than theory would predict and that the long-term elasticity of the observed debt ratio relative to its target is significantly different from unity. Thus, following prior studies (Flannery and Rangan, 2006; Cook and Tang, 2010), this research estimates the impact of

macroeconomic conditions on the capital structure adjustment speed by including the partial adjustment and firm fixed effects in one integrated capital structure model.

As per the literature, the standard partial adjustment mode followed is stated as follows:

$$LV_{it} - LV_{i,t-1} = \delta (LV_{i,t}^* - LV_{i,t-1}), 0 < \delta < 1 \quad (13)$$

The parameter δ is the speed of adjustment and explains the actual changes in capital structure from $t - 1$ to t ($LV_{it} - LV_{i,t-1}$) and it lies between 0 and 1, including multiple periods of adjustment. The parameter estimate for the lagged leverage represents the proportion of deviation closed in one period. If transaction costs are zero, then $\delta = 1$, meaning that firms will automatically adjust to their capital structure. If transaction costs are 1, then $\delta = 0$, meaning that transaction costs are so high that $LV_{it} = LV_{i,t-1}$ (Chipeta and Mbululu, 2012). Generally speaking, the parameter δ is expected to be more than zero but not more than 1 as per previous literature. From equation 13, the actual leverage level can be computed as:

$$LV_{it} = \delta LV_{i,t}^* + (1 - \delta) LV_{i,t-1} \quad (14)$$

Assume $LV_{i,t}^*$ is equal to equation 1, therefore by substituting equation 1 into equation 12 and rearranging yields the following:

$$LV_{it} = (1 - \delta) LV_{i,t-1} + \delta \alpha_i + \delta \gamma \text{Macro}_{i,t-1} + \delta \beta X_{i,t-1} + \mu_{it} \quad (15)$$

The speed of capital structure adjustment speed is estimated from equation 15 across good and bad macroeconomic states. The research estimate equation 15 using standard ordinary least squares ("OLS") with robust t-statistics from standard errors corrected for heteroskedasticity. This model is tested using both book value leverage and market value leverage resulting in the following two equations respectively:

$$\text{BLV}_{it} = (1 - \delta) LV_{i,t-1} + \delta \alpha_i + \delta \gamma \text{Macro}_{i,t-1} + \delta \beta X_{i,t-1} + \mu_{it} \quad (16)$$

$$\text{MLV}_{it} = (1 - \delta) LV_{i,t-1} + \delta \alpha_i + \delta \gamma \text{Macro}_{i,t-1} + \delta \beta X_{i,t-1} + \mu_{it} \quad (17)$$

5.3.1. Defining good and bad states of macroeconomic conditions

This study examines the impact of macroeconomic conditions on capital structure adjustment by estimating and comparing the adjustment speed across good and bad macroeconomic states. This research follows previous literature (Cook and Tang, 2010; Tzang *et al.*, 2013) in identifying the good and bad macroeconomic states based on the macro economic factors discussed in section 3.2. For this research, inflation and GDP growth rate are used. The interest rates have been fairly stable in South Africa and any classification based on this might not be meaningful, although this is not tested empirically. This study divides the 15-year sample period from 2000 to 2014 into quintiles based on the order of each economic factor.

This research followed Cook and Tang (2010) in dividing the states into the aforementioned quintiles. For divisions based on the GDP growth factor, the research equates good macroeconomic states with the highest quintile factor years, moderate macroeconomic

states with the mid-three quintiles factor years, and bad macroeconomic states with the lowest quintile factor years since, good states are defined as higher GDP growth rate. For division based on inflation rate, the research equate good macroeconomic states with the lowest quintile factor years, moderate macroeconomic states with the mid-three quintile factor years, and bad macroeconomic states with the highest quintile factor years because good states are defined in terms of lower inflation rate.

Table 4 - Definition of good and bad states

| | Inflation Rate | | | GDP Growth Rate | | |
|----|----------------|--------|-------|-----------------|--------|-------|
| | Year | Rate | State | Year | Rate | State |
| Q1 | 2003 | 0.34% | G | 2006 | 7.11% | G |
| | 2010 | 3.48% | G | 2004 | 5.67% | G |
| | 2004 | 3.52% | G | 2005 | 5.03% | G |
| Q2 | 2005 | 3.57% | M | 2007 | 4.66% | M |
| | 2001 | 4.55% | M | 2000 | 4.44% | M |
| | 2014 | 5.31% | M | 2002 | 3.89% | M |
| Q3 | 2013 | 5.40% | M | 2010 | 3.40% | M |
| | 2012 | 5.71% | M | 2011 | 3.27% | M |
| | 2006 | 5.79% | M | 2013 | 2.95% | M |
| Q4 | 2011 | 6.05% | M | 2003 | 2.40% | M |
| | 2009 | 6.29% | M | 2001 | 2.01% | M |
| | 2000 | 6.98% | M | 2012 | 1.76% | M |
| Q5 | 2007 | 8.88% | B | 2014 | 1.33% | B |
| | 2008 | 10.19% | B | 2008 | 1.14% | B |
| | 2002 | 12.29% | B | 2009 | -0.54% | B |

G: good state; M: moderate state; B: bad state

6. Empirical analysis

6.1. Summary statistics

Figure 11 shows the mean leverage of the sample for the period from 2000 to 2014. Consistent with the argument in the literature that book-valued debt ratios are less subject to non-controllable factors, the results show that the book debt ratio fluctuates less over the sample period than the market debt ratio. The market-based leverage is relatively low during the periods of stock market expansion in the early 21st century, increasing during the global financial crisis (2007 - 2009) as stock prices declined. The market based leverage then decreased as the stock market began to recover. The book value continued to increase during the expansion and then declined slightly after the global financial crisis (2007 – 2009). This is consistent with the view that firms time their equity issuance and have less incentive to issue debt when the stock market performs well (Cook and Tang, 2010).

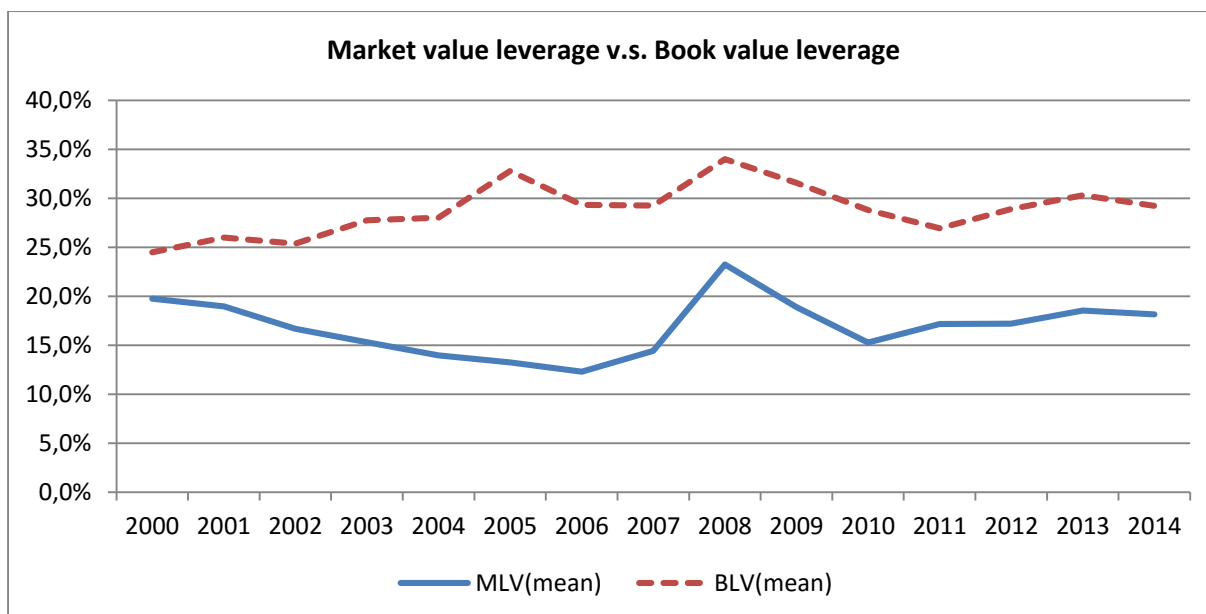


Figure 11 - Market value leverage vs. book value leverage

Table 5 presents the annual mean, median and standard deviation of leverage from 2000 to 2014. This research calculates target book value and market value leverage according to equation 5 and equation 6 respectively, and employs the quasi-maximum likelihood estimation method to fit values. The sample includes all companies listed on JSE Limited main board after the adjustment mentioned in section 4. The debt ratios are defined as follows: BVL is the book valued debt ratio computed by (long-term book debt + short-term book debt)/total book assets. MLV is the market valued debt ratio computed by (long-term book debt + short-term book debt)/(long-term book debt + short-term book debt + stock price* number of shares outstanding). Long and short-term debt and total assets numbers are in book values.

Table 5 - Annual mean, median and standard deviation of leverage

| | Book value Leverage | | | | Market Value Leverage | | | |
|------|---------------------|--------|-----|-----|-----------------------|--------|-----|-----|
| | Mean | Median | Std | Obs | Mean | Median | Std | Obs |
| 2000 | 24% | 22% | 20% | 79 | 20% | 19% | 18% | 59 |
| 2001 | 26% | 26% | 19% | 81 | 19% | 17% | 17% | 62 |
| 2002 | 25% | 22% | 20% | 82 | 17% | 12% | 15% | 68 |
| 2003 | 28% | 26% | 30% | 84 | 15% | 10% | 16% | 69 |
| 2004 | 28% | 24% | 40% | 88 | 14% | 10% | 16% | 74 |
| 2005 | 33% | 26% | 47% | 90 | 13% | 9% | 15% | 75 |
| 2006 | 29% | 24% | 26% | 91 | 12% | 8% | 14% | 78 |
| 2007 | 29% | 27% | 23% | 94 | 14% | 9% | 16% | 84 |
| 2008 | 34% | 32% | 24% | 97 | 23% | 17% | 21% | 90 |
| 2009 | 32% | 28% | 25% | 100 | 19% | 14% | 19% | 91 |
| 2010 | 29% | 23% | 23% | 101 | 15% | 10% | 15% | 94 |
| 2011 | 27% | 24% | 21% | 101 | 17% | 14% | 17% | 98 |
| 2012 | 29% | 27% | 19% | 101 | 17% | 13% | 16% | 100 |
| 2013 | 30% | 28% | 19% | 101 | 19% | 15% | 16% | 101 |
| 2014 | 29% | 26% | 20% | 101 | 18% | 14% | 16% | 101 |

Table 6 - Sample statistics

| Sample statistics (2000-2014) | | | | | |
|-------------------------------|------|------|------|-------|-------|
| Variable | Obs | Mean | SD | Min | Max |
| Book Leverage | 1391 | 29% | 26% | 0% | 365% |
| Market Leverage | 1244 | 17% | 16% | 0% | 99% |
| EBIT margin (Prof) | 1391 | 0,14 | 0,10 | -0,26 | 0,93 |
| Tangiability | 1391 | 0,80 | 0,16 | 0,16 | 1,00 |
| Size | 1391 | 9,03 | 1,67 | 4,12 | 14,34 |

Figure 12 shows the relative proportions of different categories of leveraged firms based on market value leverage definition. The leverage ratio of each firm was classified into the low leverage (0 - 0.25), medium leverage (0.25 – 0.499), or high leverage (0.5 and above) groups. The figure shows that the relative proportion of low leverage firms increased during the economic expansion and declined sharply between 2006 and 2008. The decline in the proportion of low leverage firms post 2006, is also an indication of the denominator effect as market values declined and leverage increased. Based on market value leverage definition, low leveraged firms and medium leveraged firms constituted approximately 77% and 17% of the sample companies respectively on average. High leveraged firms constituted c.5% of the sample companies on average.

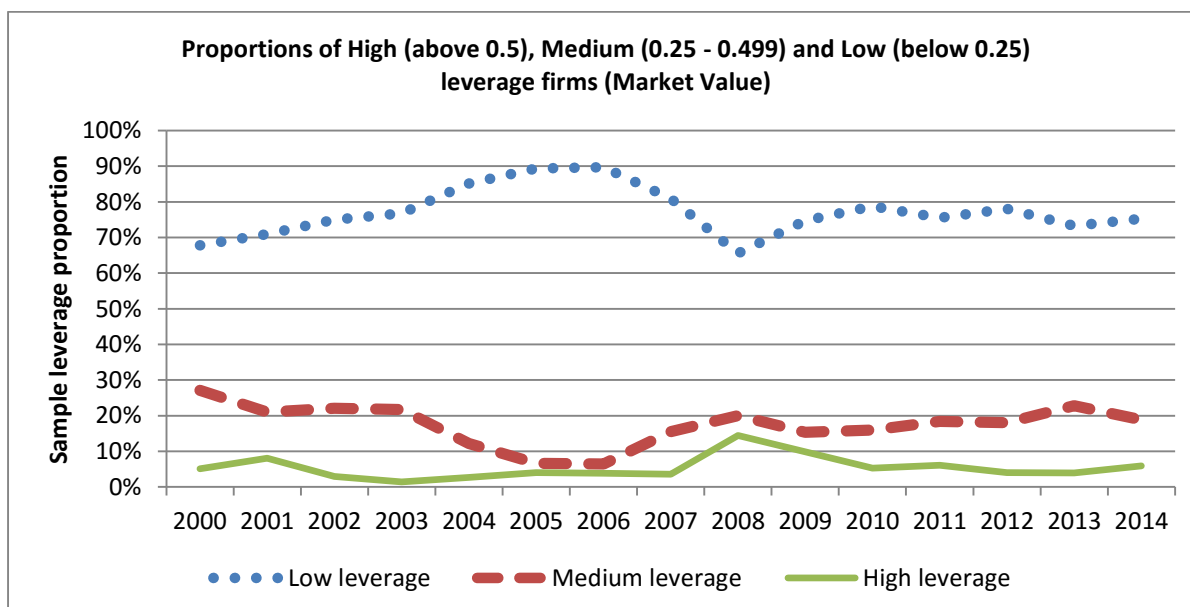


Figure 12 - Relative proportion of different categories of leveraged firms - market value basis

Figure 13 shows a stable spread of high, medium and low leveraged firms throughout the sample period, with a visible “noise” in the trend across all three categories during the 2007

– 2009 period. Book value leverage is usually unaffected by external movements in values other than exogenous factors affecting supply of capital (debt or equity) and this research shows in the research results in sub-section 6.2.3. Based on book value leverage definition, low leveraged firms and medium leveraged firms constituted approximately 49% and 37% of the sample companies respectively on average. High leveraged firms constituted c.14% of the sample companies on average.

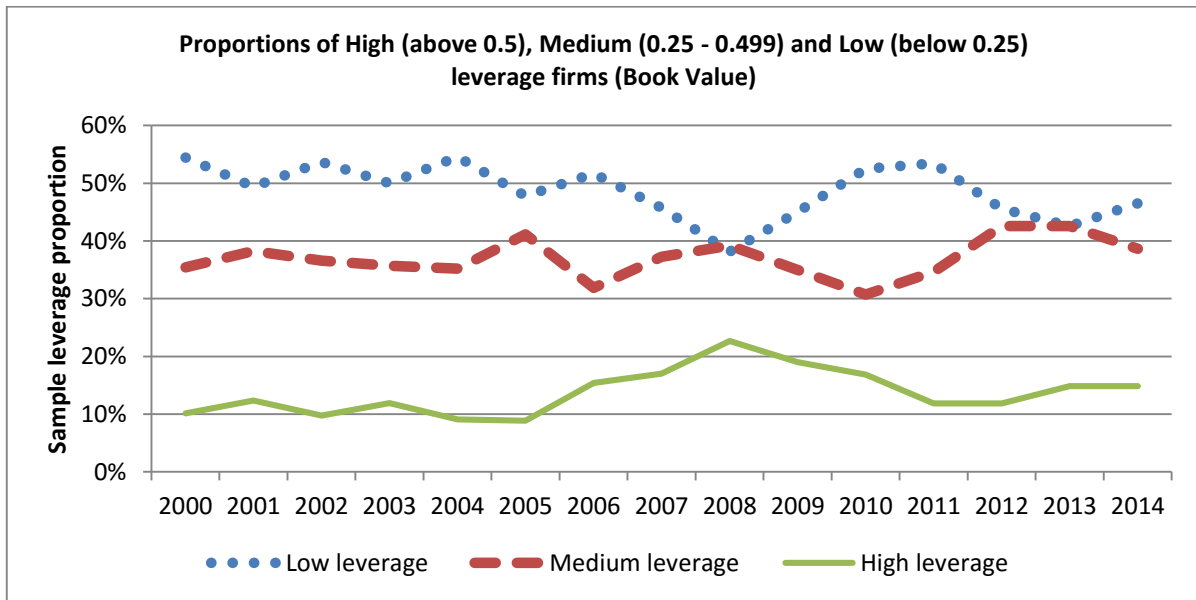


Figure 13 - Relative proportion of different categories of leveraged firms - book value basis

Table 7 - Correlation matrix: Book value leverage

| | <i>Book Leverage</i> | <i>GDP growth</i> | <i>Prime rate</i> | <i>CPI</i> | <i>EBIT</i> | <i>TAN</i> | <i>Size</i> |
|---------------|-------------------------|----------------------|------------------------|----------------------|----------------------|----------------------------|-------------|
| Book Leverage | 1 | | | | | | |
| GDP growth | -0.25 0.37 | 1 | | | | | |
| Prime rate | -0.24 0.4 | 0.22 0.44 | 1 | | | | |
| CPI | -0.01 0.97 | -0.05 0.87 | 0.66 0.01*** | 1 | | | |
| EBIT | 0.32 0.24 | 0.6 0.02** | 0.45 0.09* | 0.23 0.4 | 1 | | |
| Tangibility | -0.66 0.01*** | 0.39 0.16 | 0.51 0.05* | -0.05 0.87 | -0.06 0.83 | 1 | |
| Size | 0.51 0.05* | -0.41 0.12 | -0.64 0.01** | 0.04 0.89 | -0.24 0.39 | -0.85 0.00005*** | 1 |

Table 7 presents the correlation analysis between the dependent variable (i.e. book value leverage) and the independent variables. Table 7 also shows the correlation between the independent variables (i.e. GDP growth, Prime rate, CPI, EBIT, TAN and Size). The p-values are shown in bold. ***, ** and * denote statistical significance at the 1%, the 5% and the 10% level respectively.

Table 8 - Correlation matrix: Market value leverage

| | <i>Market Leverage</i> | <i>GDP</i> | <i>Prime rate</i> | <i>CPI</i> | <i>EBIT</i> | <i>TAN</i> | <i>Size</i> |
|-----------------|---------------------------|----------------------|------------------------|----------------------|----------------------|------------------------|-------------|
| Market Leverage | 1 | | | | | | |
| GDP | -0.72 0.0024*** | 1 | | | | | |
| Prime rate | 0.17 0.54 | 0.22 0.44 | 1 | | | | |
| CPI | 0.40 0.14 | -0.05 0.87 | 0.66 0.01*** | 1 | | | |
| EBIT | -0.40 0.14 | 0.50 0.06* | 0.37 0.17 | 0.30 0.28 | 1 | | |
| Tangibility | -0.19 0.5 | 0.43 0.11 | 0.52 0.05** | -0.08 0.77 | -0.19 0.49 | 1 | |
| Size | 0.13 0.65 | -0.39 0.16 | -0.63 0.01** | 0.03 0.91 | 0.02 0.96 | -0.91 0.0*** | 1 |

Table 8 presents the correlation analysis between the dependent variable (i.e. market value leverage) and the independent variables. Table 8 also shows the correlation between the independent variables (i.e. GDP growth, Prime rate, CPI, EBIT, TAN and Size). The p-values are shown in bold. ***, ** and * denote statistical significance at the 1%, the 5% and the 10% level respectively.

6.2. Results and discussion

6.2.1. Regression results

Table 9 shows the results of estimation equation 5 and equation 6 where the dependent variables are the book and market leverage respectively. R^2 is the correlation between the fitted value of the dependent variable from the regression and its actual value in the data. ***, ** and * denote statistical significance at the 1%, the 5% and the 10% level respectively. GDP is the annualised real GDP growth rate. Prime rate is a reference interest rate commercial banks use when issuing variable interest rate loans to their customers. CPI is the official measure of annual inflation that is used in South Africa. EBIT is the operating profit divided by the total assets. Tangibility is the ratio of tangible assets to the book value of total assets. Size is measured as the logarithm of total assets.

Table 9 - Regression results

| Regression results (Leverage as a function of lagged firm specific and macro variables) | | | | | |
|--|--------------------|-------------------|--------------------|----------------|---------------------|
| Variable name | Coefficient | Std. Error | T-statistic | p-value | Significance |
| Book value leverage - Equation 5 | | | | | |
| 'GDP' | 0,8297 | 0,2938 | 2,8241 | 0,0048 | *** |
| 'Prime' | 1,0316 | 0,4070 | 2,5345 | 0,0114 | ** |
| 'CPI' | -0,4225 | 0,3217 | -1,3135 | 0,1892 | |
| 'EBIT' | -0,2339 | 0,0748 | -3,1280 | 0,0018 | *** |
| 'Tangibility' | 0,2391 | 0,0660 | 3,6214 | 0,0003 | *** |
| 'Size' | 0,0608 | 0,0127 | 4,7886 | 0,0000 | *** |
| R-squared = 0.0363 | | Nobs | 1290 | | |
| Market value leverage - Equation 6 | | | | | |
| 'GDP' | 0,3201 | 0,1032 | 3,1000 | 0,0020 | *** |
| 'Prime' | 1,5335 | 0,2168 | 7,0718 | 0,0000 | *** |
| 'CPI' | -0,4711 | 0,1720 | -2,7388 | 0,0063 | *** |
| 'EBIT' | -0,3516 | 0,0410 | -8,5830 | 0,0000 | *** |
| 'Tangibility' | 0,0831 | 0,0378 | 2,2024 | 0,0278 | ** |
| 'Size' | 0,0709 | 0,0068 | 10,3790 | 0,0000 | *** |
| R-squared = 0.2368 | | Nobs | 1143 | | |
| p-value<0.01 | *** | | | | |
| p-value<0.05 | ** | | | | |
| p-value<0.1 | * | | | | |

The empirical evidence obtained has suggested that the coefficients of GDP, Prime, Inflation rate, Profitability, Tangibility and Size are significant for the total leverage regression (Table 9). The notable exception is that the coefficient of inflation rate, although still having the same sign, is not significant under the book value leverage regression. Having further corroborated the relationships between the significant explanatory variables and the dependent variables this research results are discussed in detail below.

6.2.2. Discussion

6.2.2.1. GDP growth

Intuitively, GDP growth impacts firms' financial performance and how they are funded. Empirical studies in this area are relatively new and there is no clear consensus as to whether the data supports the intuitive assertion (Mokhova and Zinecker, 2014). Gertler and Gilchrist (1993) show that subsequent to recessions induced by monetary contractions, aggregate net debt issues increase for large firms but remain stable for small firms. During expansions, stock prices go up, expected bankruptcy costs go down, taxable income goes up, and cash balances increase. Thus, firms borrow more during expansion and collateral values are likely to be procyclical (Frank and Goyal, 2009).

Agency problems are likely to be more severe during downturns/contractions since managers' wealth is reduced relative to that of shareholders. If debt aligns managers' incentives with those of shareholders, leverage should be countercyclical.

This research finds a positive relation between GDP growth and leverage in the sampled corporates. The results are significant for both book value leverage and market value leverage at a 1% confidence level. If the pecking order theory holds true, leverage should decline during expansions since internal funds increase during expansions, all else remaining equal (Frank and Goyal, 2009). However, expansion periods also present higher growth opportunities and firms trying to position themselves to take advantage of these opportunities would need more funding as internal profits may not be enough to finance their growth expansion projects. According to the pecking order theory, there will be stronger preference for external financing; with debt being the first external funding form. The positive relationship found in this research supports the assumptions of the pecking order theory and other similar previous studies (Rajan and Zingales, 1995; Booth *et al.*, 2001; Korajczyk and Levy, 2003; Muthama *et al.*, 2013; Mokhova and Zinecker, 2014; Chen, 2004).

According to the trade-off theory, firms with growth opportunities are likely to suffer from financial distress and debt overhang (Myers, 1977). Under the trade-off theory model, a negative relationship between GDP growth rate and leverage was expected and the results of this research do not support the theory. On the other hand, if corporates' profits have shown an increase in the recent past, agency problems between shareholders and managers are less severe. Consequently, firms should issue less debt (Frank and Goyal, 2009). The results of this research also seem to contradict thesis around the agency problem.

6.2.2.2. Prime rate

The influence of interest rates on capital structure is not yet conclusive, given that prior studies have contrasting results. Frank and Goyal (2004) argue that, when interest rates increase, the value of the equity and bonds will decrease. The decrease in the value of equity tends to be more than the decrease in the value of debt, which leaves the firm with a higher degree of leverage (Frank and Goyal, 2004). Based on their argument, a positive relation between interest rates and leverage is predicted, meaning that an increase in interest rates will lead to an increase in leverage. This study results agree with these views. The interest rate variable in this study is found to have a positive relationship with the total leverage, and the results are statistically significant for both book value leverage and market value leverage. Although these results are in contrast to some earlier studies related to interest rate impacts on capital structure (Brigham and Houston, 1998; Henderson *et al.*, 2006; Frank and Goyal, 2003), they confirm the results of Bokpin (2009) and Mokhova and Zinecker (2014). Also, Muthama *et al.* (2013) found that interest rates, as measured by the treasury bills, have a positive influence on the long-term debt ratio and the total debt ratio. This research results are also in support of Muthama *et al.* (2013).

6.2.2.3. CPI

Another factor, which is supposed to affect capital structure, is the inflation rate. The inflation rate has a negative sign for both definitions of leverage (book value leverage vs market value leverage). This research has found that, based on book value leverage, inflation has a very weak and non-significant influence on capital structure. However, the negative relationship is significant for market value leverage at 1% confidence level. The observed relationship goes against the expectation that firms use more debt financing than equity financing during inflationary periods. The proposed reasoning is that the cost of debt financing will decrease due to the Fisher Effect on interest rates, where inflation has a decreasing effect on the real costs of debt financing (DeAngelo & Masulis, 1980).

The tax benefit resulting from the deduction of interest incurred in the production of income from the firm's taxable income is most optimal when inflation rates are higher (Taggart, 1985). This is achieved because the allowed deduction is based on nominal interest rates not real interest rates. The trade-off theory predicts leverage to be positively related to expected inflation, however the research results do not support this prediction. Kim and Wu (1988) found supporting evidence for the view that a firm's debt will increase when inflation increases. In addition, market timing in debt markets also results in a positive correlation between expected inflation and leverage if managers issue debt when expected inflation is high relative to current interest rates (Frank and Goyal, 2009). This research does not agree with these prior findings (Kim and Wu, 1998; Frank and Goyal, 2009) or the theoretical explanations for the potential positive relationship.

On the other hand, Schall (1984) offers an opposing view to positive effect of inflation on debt financing and this view is in line with the findings of this study. Schall (1984) stated that, during periods of high inflation, the after-tax return on shares and thus equity financing is relatively higher than the return on bonds. Therefore, investors will make asset rotation by investing less in the debt asset class and more in equities; hence the firm's debt ratio will decrease. The negative relationship found in this study accords with this view. The negative influence of inflation suggests that an increase in inflation rate brings uncertainty in economic environment. This uncertainty theoretically increases the probability that firms will not have the ability to repay their debts. Higher inflation decreases the benefits of leverage because of higher bankruptcy costs of debt imposed on firms (Baltaci and Ayaydin, 2014). Also, elevated uncertainty around the future of an economy will most likely see debt investors requiring higher premiums for funding or limiting the debt capital availability.

Overall, during a high inflation environment, lenders will require higher interest rate returns and are more likely to tighten their funding terms, and as a consequence firms will more likely be compelled to fund themselves using internally generated cash or find shareholder support through rights issue. This implies a reduction in debt levels. This study results are therefore in line with international empirical evidence on the relationship between leverage and inflation (Muthama *et al.*, 2013; Baltaci and Ayaydan, 2014; Mokhova and Zinecker, 2014).

6.2.2.4. Tangibility

Tangible assets, such as property, plant and equipment, are easier for outsiders to value than intangible ones such as the value of goodwill; this lowers lenders' expected distress costs. In addition, tangibility makes it difficult for shareholders to substitute high-risk assets for low-risk ones (Frank and Goyal, 2009). The lower expected costs of distress and fewer debt-related agency problems predict a positive relation between tangibility and leverage. In the South African context, banks usually require some form of security when advancing short and long-term loans to a corporates. The security can be in a form of: (a) mortgage bonds over immovable property, (b) notarial bonds (special and general) over tangible movable property, and (c) security cessions or pledges over financial claims (i.e. cession of shares).

The ability to provide security provides lenders with "hard" assets to sell in the event of borrower default, making lending relatively easier and less riskier compared to a company that doesn't have tangible assets to offer as security. Therefore, in a South African context, companies with "hard" assets that can be collateralised as security are expected to have better / greater access to bank debt and hence higher leverage. From a theoretical point of view, trade-off theory, information asymmetry theory, and agency theory, all provide an intuitively corroborating explanation for the fact that companies with tangible assets are more likely to use debt in funding their operations. This research results support the theoretical models that predict that there is a positive relationship between leverage and tangibility.

Scott (1977) suggests that, by selling secured debt, firms increase the value of their equity by expropriating wealth from their existing unsecured creditors. Providing security to debt funders is advantageous for corporates also, as it may reduce the funding costs whilst allowing for more leverage. Myers and Majluf (1984) model demonstrate that there may be costs associated with issuing securities about which the firms' managers have better information than shareholders. Issuing debt secured by property with known values avoids these costs. For this reason, firms with assets that can be used as collateral are expected to issue more debt to take advantage of this opportunity (Titman and Wessels, 1988). The research results support this view.

Much research examining the correlation between leverage and tangibility in developing countries has proved that a positive relationship exists because tangible assets are easy to collateralise for debt (Harris and Raviv, 1991; Chen, 2004; Frank and Goyal, 2009; Haron, 2014). This study also confirms this positive relationship between a firm's leverage and the tangibility of its assets. In particular, the results show the significance at 1% and 5% for book value leverage and market value leverage respectively. The empirical research conducted indicates that South African lenders require tangible assets as security in order to provide debt capital and such security forms an important part of lending policy. This result is also consistent with both the trade-off theory (in terms of financial distress and bankruptcy) and the pecking order theory hypothesis (in terms of asset mispricing) (Chen, 2004).

6.2.2.5. Size

Theoretically, the relationship between a firm's size and its leverage is not clear; however some empirical studies in capital structure have found a positive relation between firm size and leverage (Chen, 2004). According to the trade-off theory, large firms are expected to have a higher debt capacity and are able to be more highly geared (Frank and Goyal, 2009). Large firms tend to be more diversified in terms product offering and operational revenue streams, thus, less exposed to adverse economic performance and the risk of bankruptcy. They may also be able to reduce transaction costs associated with long-term debt issuance and hence the ease of raising debt capital. This research results confirms the trade-off theory prediction that firm size has a positive relationship with leverage.

This research results also confirms the results of Rajan and Zingales (1995) and Wald (1999) that suggested that size was positively correlated with debt based on the data from developed countries. Larger companies in South Africa are less risky borrowers as they are less likely to default and hence lenders (financial institutions and "Big 5" banks) are more likely to supply them with more debt at better funding rates. Larger companies have better chances of surviving economic downturns and hence theoretically a lower risk of bankruptcy. This research results confirm the trade-off theory model and they are consistent with prior studies (Frank and Goyal, 2009; Drobetz and Wanzenried, 2006; Harris and Raviv, 1991; Graham, 2000).

However, when size is used as a proxy for the (inverse) probability of default, it should not be strongly positively correlated with leverage in countries where costs of financial distress are low (Chen, 2004). Furthermore, according to the pecking order hypothesis, informational asymmetries between insiders within a firm and capital markets are expected to be lower for large firms, so large firms should be more capable of issuing informationally sensitive securities like equity (Chen, 2004) or listed bonds. Titman and Wessels (1988) both found evidence to support the negative hypothesis between size and leverage. This research results do not support the pecking order hypothesis but rather the trade-off theory model.

6.2.2.6. Profitability

There is no consistent theoretical prediction on the influence of profitability on corporate leverage. However, in the majority of empirical studies, a negative correlation between profitability and leverage is observed. This research has confirmed the same result in respect of the sample analysed. Myers and Majluf (1984) predict a negative relationship, because firms prefer to finance with internal funds rather than debt. Their view is in support of the pecking order theory. The negative influence of profitability on leverage becomes stronger as a firm's size increases (Rajan and Zingales, 1995). Rajan and Zingales (1995) found that for firms in the smallest size quintile in their study, a unit increase in profitability decreases leverage by -0.26. For firms in the largest quintile, a unit increase in profitability decreases leverage by -1.09; over 4 times the effect as that for the smallest quintile (and significantly different). Firms listed on JSE and that form part of the All Share Index tends to be large in

their sectors, and these are the firms that form part of the sample used for the purposes of this research.

This research results do not support the predictions of Jensen (1986) that, if the market for corporate control is effective and it forces firms to commit to paying out cash by leveraging up or dividend payout there should be a positive relationship between profitability and corporate leverage. This research results indicate an ineffective corporate control since managers of profitable firms may prefer to avoid the disciplinary role of debt, which leads to a negative correlation between profitability and debt (Rajan and Zingales, 1995). This research found a negative relation between profitability and leverage for the sample companies listed on JSE Limited stock exchange. This is as expected, since profitable companies are more likely to be cash generative and more likely to have the ability to repay their debt faster. The results are also statistically significant at a 1% confidence level for both market value leverage and book value leverage.

6.2.3. Capital markets friction and leverage ratios

In order to examine the effects of extreme capital markets disruption on the leverage ratios of South African corporates, this research ran the fixed effect regression on total debt ratio. This study did not divide the total debt ratio into its components (such as short term debt, long term debt and trade credit) in order to examine each component structure individually and gain an understanding on the exact channel through which supply shocks travel. Although this helps understand the substitution across credit sources, this has been left for further research (since time and length constraints didn't allow for it in this research)

MF represents the capital markets friction dummy for the disruption period in equation 10, equation 11 and equation 12. The impact of the dependent variable during the friction period is given by the sum of the coefficient associated with the given variable and variable interacted with the friction dummy. The friction dummy is interacted with control variable to determine the change in response relative to the pre-friction period and the net response during the friction period is found by adding the coefficients. The coefficient referring to the pre-friction period is given by the non-interacted variables. SZ is the measure of size, TAN is the measure of tangibility and PROF is measure of profitability given by EBIT divided by total assets. ***, **, * representing 1%, 5% and 10% levels of significance respectively.

Table 10 - Effects of extreme capital markets' frictions and leverage ratio

| Regression results - Capital Markets' Frictions (2001 - 2002, 2007 - 2009) | | | | | |
|---|--------------------|-------------------|--------------------|----------------|---------------------|
| Variable name | Coefficient | Std. Error | T-statistic | p-value | Significance |
| Book value leverage - Equation 11 | | | | | |
| 'EBIT' | -0,3469 | 0,0896 | -3,8727 | 0,0001 | *** |
| 'Tangibility' | 0,2132 | 0,0726 | 2,9381 | 0,0034 | *** |
| 'Size' | 0,0252 | 0,0094 | 2,6983 | 0,0071 | *** |
| 'CR' | -0,2321 | 0,0845 | -2,7476 | 0,0061 | *** |
| 'CR*EBIT' | 0,2586 | 0,1122 | 2,3043 | 0,0214 | ** |
| 'CR*Tangibility' | 0,0330 | 0,0722 | 0,4564 | 0,6482 | |
| 'CR*Size' | 0,0210 | 0,0068 | 3,0715 | 0,0022 | *** |
| R-squared = 0.0354 | | | | | |
| Market value leverage - Equation 12 | | | | | |
| 'EBIT' | -0,3037 | 0,0454 | -6,6886 | 0,0000 | *** |
| 'Tangibility' | 0,1115 | 0,0413 | 2,6996 | 0,0070 | *** |
| 'Size' | 0,0212 | 0,0049 | 4,2934 | 0,0000 | *** |
| 'CR' | -0,0048 | 0,0475 | -0,1018 | 0,9190 | |
| 'CR*EBIT' | 0,2761 | 0,0585 | 4,7166 | 0,0000 | *** |
| 'CR*Tangibility' | 0,0887 | 0,0401 | 2,2141 | 0,0270 | ** |
| 'CR*Size' | -0,0087 | 0,0037 | -2,3238 | 0,0203 | ** |
| R-squared = 0.0863 | | | | | |

Results from the estimation from equation 11 and equation 12 are represented in table 10. The dependent variable is the leverage ratio. The results show that all independent variables have the expected signs and are highly significant at 1% level. This study is more focused on MF (i.e. the friction dummy variable), which was the variable of interest for the purposes of the regression model. This research was interested in the sign and significance of this variable MF.

The results in table 10 highlight that the coefficient of the friction dummy is negative and significance at 1% confidence level under the book value leverage and only showing the expected sign under market value leverage definition and not significant. This implies that the capital markets friction has a negative impact on corporate leverage. Interpreted differently, the flow of credit to these firms was reduced during these two isolated friction periods. This suggests that supply of debt capital is an important determinant of corporate financing.

6.2.4. Macroeconomic condition and capital structure speed adjustment

The table below presents differences in means and medians of leverage variables across various macroeconomic states over the sample period 2000 – 2014. This study determines states using two macroeconomic factors. The two macroeconomic factor indicators are: GDP growth rate and Inflation rate. This research divides the 15 years in the sample periods into quintiles based on each macroeconomic factor. Sorting by GDP growth factors years in the highest macroeconomic quintile – good state (lowest macroeconomic quintile – bad state) and GDP growth rate are in the highest (lowest) quintile. Sorting by inflation rate places years

in the highest macroeconomic quintile – good state (lowest quintile – bad state) when inflation rate in the lowest (highest) quintile. This research reports p-values for the means.

Table 11 - Summary statistics of leverage across states

| | Leverage statistics | | | |
|------------------------------|---------------------|--------|-----------------|--------|
| | Inflation Rate | | GDP Growth Rate | |
| | Mean | Median | Mean | Median |
| Book value leverage | | | | |
| G | 28% | 24% | 30% | 25% |
| B | 30% | 28% | 32% | 29% |
| G vs. B | -2% | -5% | -2% | -4% |
| p-value | 0.509 | | 0.565 | |
| Market value leverage | | | | |
| G | 15% | 10% | 13% | 9% |
| B | 18% | 13% | 20% | 15% |
| G vs. B | -3% | -3% | -7% | -6% |
| p-value | 0.027 | | 0.000 | |

Table 11 present the univariate tests of leverage across good and bad states of macroeconomic conditions defined by different macroeconomic factors. For each factor (i.e. the criteria dividing macroeconomic conditions into states including inflation rate and GDP growth rate), this research reports the mean and medians in good and bad states, and the differences in means and median between good and bad states. The P-values are reported assuming unequal variances in variables between good and bad state sub-samples.

The results are in line with previous literature studies (Cook and Tang, 2010; Hackbarth *et al.*, 2006; Choe *et al.*, 1993; Bayless and Chaplinsky, 1996; Korajczyk and Levy, 2003) and shows that leverage ratios are generally significantly higher in bad states than in good states, regardless of how leverage is measured (i.e. book value leverage vs. market-value leverage ratio). Korajczyk and Levy's (2003) agency model shows that optimal amount of leverage is increased to realign manager's incentives with those of shareholders during recessions and this research results support this view.

Hackbarth *et al.*'s (2006) framework for analysing the impact of macroeconomic conditions on dynamic capital structure choice predicts that leverage should be countercyclical. Empirically, Choe *et al.* (1993) and Bayless and Chaplinsky (1996) present evidence that equity issuance increases during expansions due to the countercyclical variation in adverse selection costs. Korajczyk and Levy (2003) also provides evidence of the counter-cyclical feature of corporate leverage. In light of the foregoing, the counter-cyclicity of the leverage results as evidenced from table 11 is consistent with theories developed and provided in literature. The median leverage (i.e. both book value leverage and market value leverage) across good and bad states exhibit the same pattern as the mean debt ratios.

6.2.4.1. Regression results for adjustment speed estimates

Table 12 presents the regression results for adjustment speed estimates from the integrated dynamic partial adjustment capital structure model. This table reports the results of general estimating equation (15) after substituting $LV_{i,t}$ for $BLV_{i,t}$ and $MLV_{i,t}$ where applicable: $LV_{i,t} = (1 - \delta)LV_{i,t-1} + \delta\alpha_i + \delta\gamma\text{Macro}_{i,t-1} + \delta\beta X_{i,t-1} + \mu_{it}$ by controlling for firm fixed effects across good and bad macroeconomic states. Substituting $LV_{i,t}$ for $BLV_{i,t}$ and $MLV_{i,t}$ results in equation 16 and equation 17 respectively. Columns 2, 3 and 4 in Panel A present the estimation results when the book-value leverage ratio is used, computed as (long term debt + short-term book debt)/(long term debt + short-term book debt + equity book value). Column 5, 6 and 7 in Panel A report the estimation results when market-value leverage is used, computed by (long term debt + short-term book debt)/(long term debt + short-term book debt + share price*number of shares outstanding). The independent variables are as follows: GDP is the annualised real GDP growth rate. Prime rate is a reference interest rate commercial banks use when issuing variable interest rate loans to their customers. CPI is the official measure of annual inflation that is used in South Africa. EBIT is the operating profit divided by the total assets. Tangibility is the ratio of tangible assets to the book value of total assets. Size is measured as the logarithm of total assets. GoodDummy takes the value of 1 if the firm year observation belongs to a good state and the value of 0, if otherwise. The research creates interaction terms between the lagged leverage ratio, and the good state dummy variable. Panel A and Panel B report the estimation results for the good, bad and pooled-state sub-samples are defined by inflation rate and GDP growth rate. These two macroeconomic indicators define good and bad states as follows: (1) GDP is the annualised real GDP growth rate and (2) CPI is the official measure of annual inflation that is used in South Africa. Sorting by inflation rate places years in the highest macroeconomic quintile – good state (lowest quintile – bad state) when inflation rate in the lowest (highest) quintile. Sorting by GDP growth factors years in the highest macroeconomic quintile – good state (lowest macroeconomic quintile – bad state) and GDP growth rate are in the highest (lowest) quintile. This research reports coefficient estimates in the tables (t-statistics are in parenthesis) with ***, **, and * indicating significance at the 1%, 5% and 10% levels, respectively.

Integrated dynamic partial adjustment capital structure model results analysis

In order to compare the difference in the speed of capital structure adjustment towards target between good and bad states, the research includes an interaction term, computed by the product of the lagged leverage and the good state dummy variable, which takes the value of 1 if the firm-year observation belongs to a good state and takes the value 0 if otherwise. Panel A presents estimation results for equation (16), when the states of macroeconomic conditions are defined by inflation rate.

Table 12 - Good vs. Bad states when states are determined by inflation rate

| | Book Leverage - Equation 16 | | | Market Value - Equation 17 | | |
|--|-----------------------------|---------------------|-----------------------|----------------------------|---------------------|----------------------|
| | Good | Bad | G vs. B | Good | Bad | G vs. B |
| Panel A. Results from regression when states are determined by inflation rate | | | | | | |
| 'LagLev' | 0,834 (16,71) *** | 0,416 (9,38) *** | 0,515 (22,25) *** | 0,652 (16,99) *** | 0,499 (8,5) *** | 0,568 (22,42) *** |
| 'GDP' | -0,876 (-1,21) | -0,02 (-0,07) | 0,9 (3,24) *** | 0,129 (0,41) | -0,464 (-1,95) * | 0,29 (2,93) *** |
| 'Prime' | 1,741 (1,36) | -0,723 (-0,67) | 0,206 (0,61) | 0,818 (1,47) | -1,574 (-1,72) * | 0,659 (3,46) *** |
| 'CPI' | -0,504 (-1) | 1,049 (1,11) | 0,098 (0,37) | -0,364 (-1,61) | 2,636 (3,31) *** | -0,245 (-1,74) * |
| 'EBIT' | -0,049 (-0,54) | 0,167 (1,21) | -0,087 (-1,43) | -0,003 (-0,06) | -0,161 (-1,27) | -0,077 (-2,16) ** |
| 'Tangibility' | 0,137 (1,3) | 0,05 (0,57) | -0,004 (-0,08) | 0,058 (1,29) | -0,021 (-0,25) | 0,05 (1,6) |
| 'Size' | 0,019 (0,79) | 0,031 (1,47) | 0,02 (1,91) * | 0,04 (3,44) *** | 0,026 (1,46) | 0,035 (5,9) *** |
| 'GoodDummy' | | | -0,084 (-4,82) *** | | | -0,012 (-1,34) |
| 'GoodDummy*LagLev' | | | 0,318 (7,58) *** | | | -0,041 (-1,21) |
| R-square | 0,81 | 0,53 | 0,38 | 0,98 | 0,82 | 0,46 |
| Nobs | 266 | 266 | 1290 | 228 | 224 | 1143 |

The results show that, for both book value leverage and market value leverage, firms adjust their capital structure back to target leverage slower in good states than in bad states. Specifically, column 2 and 3 show that when the leverage ratio is based on book value leverage definition, firms adjust slower in good states as reported in LagLev (16.6% = 1 - 83.4%) in column 2 than in bad state (58.4% = 1 - 41.6%) in column 3. Interpreted differently, for the book value leverage ratio, firms close in one year about 16.6% (since $1 - \delta = 83.4\%$) of the gap between the actual and target leverage ratio in good states, while they correct about 58.4% of the deviation away from target in bad states. The positive coefficient estimate on the interaction term between the lagged book value leverage and the good state dummy (GoodDummy*LagLev) in the pooled regression is further evidence that adjustment is faster in bad state than in good state. GoodDummy*LagLev is significantly positive under the book value leverage.

Column 5 through to 7 in Panel A show the results when the leverage ratio is based on market value leverage definition. This research results are consistent with the results under book value leverage with the exception of the interaction term (GoodDummy*LagLev). Specifically, column 5 and 6 show that when the leverage ratio is defined by market value leverage, firms adjust slower in good states as reported in LagLev (34.8% = 1 - 65.2%) in column 5 than in bad state (50.1% = 1 - 49.9%) in column 6. Interpreted differently, for the book value leverage

ratio, firms close in one year about 34.8% (since $1 - \delta = 65.2\%$) of the gap between the actual and target leverage ratio in good states, while they correct about 50.1% of the deviation away from target in bad states.

Table 13 - Good vs. Bad states when states are determined by real GDP growth rate

| | Book Leverage - Equation 16 | | | Market Value - Equation 17 | | |
|--|-----------------------------|-----------------------|----------------------|----------------------------|-----------------------|-----------------------|
| | Good | Bad | G vs. B | Good | Bad | G vs. B |
| Panel B. Results from regression when states are determined by real GDP growth rate | | | | | | |
| 'LagLev' | -0,03 (-0,41) | 0,392 (7,53) *** | 0,528 (16,44) *** | 0,132 (1,56) | 0,679 (15,24) *** | 0,567 (22,65) *** |
| 'GDP' | 7,287 (1,43) | 0,863 (4,09) *** | 0,729 (2,98) *** | 1,029 (0,68) | 1,593 (10,18) *** | 0,549 (5,63) *** |
| 'Prime' | 1,719 (1,51) | 2,158 (3,15) *** | 0,231 (0,67) | 1,339 (3,25) *** | 4,142 (8,39) *** | 0,722 (3,79) *** |
| 'CPI' | -5,917 (-1,21) | -2,565 (-3,51) *** | 0,241 (0,75) | -1,128 (-0,77) | -5,245 (-9,39) *** | -0,569 (-3,44) *** |
| 'EBIT' | -0,63 (-2,77) *** | 0,143 (2,5) ** | -0,124 (-1,99) ** | -0,05 (-0,52) | -0,001 (-0,02) | -0,068 (-1,9) * |
| 'Tangibility' | 0,214 (0,91) | -0,006 (-0,08) | 0,018 (0,33) | -0,054 (-0,78) | 0,036 (0,59) | 0,052 (1,65) * |
| 'Size' | 0,249 (2,56) ** | 0,022 (1,06) | 0,026 (2,45) ** | 0,048 (1,47) | 0,024 (1,71) * | 0,035 (5,92) *** |
| 'GoodDummy' | | | 0,007 (0,36) | | | -0,028 (-2,85) *** |
| 'GoodDummy*LagLev' | | | 0,055 (1,45) | | | -0,024 (-0,64) |
| R-square | 0,17 | 0,66 | 0,35 | 0,52 | 0,94 | 0,46 |
| Nobs | 262 | 292 | 1290 | 218 | 275 | 1143 |

The results show that, for both book value leverage and market value leverage, firms adjust their capital structure back to target leverage faster in good states than in bad states, and even turn to over adjust on book value leverage basis. Specifically, column 2 and 3 show that when the leverage ratio is defined by book value leverage, firms adjust faster in good states as reported in LagLev ($103.0\% = 1 - (-3.0\%)$) in column 2 than in bad state ($60.8\% = 1 - 39.2\%$) in column 3. Interpreted differently, for the book value leverage ratio, firms close in one year about 103.0% (since $1 - \delta = -3.0\%$) of the gap between the actual and target leverage ratio in good states, while they correct about 60.8% of the deviation away from target in bad states. The negative coefficient estimate on the interaction (GoodDummy*LagLev) term between the lagged leverage ratio in column 7 and the good state dummy in the pooled regression is further evidence that adjustment is faster in good states than in bad states. Also, the interaction term is smaller (closer to 0) under the book value leverage providing evidence that adjustment is faster in good states than in bad states.

The results of: (1) the reported book value LagLev under good states; (2) the reported market value LagLev under good states; and (3) the interaction term between the lagged leverage ratio and the good state dummy under both book value leverage and market value leverage,

all need to be qualified. These results are all insignificant even though they are intuitively of the right magnitude and in the right direction. This provides scope for further research.

In light of the results in table 12 and table 13, it can be concluded that firms adjust faster in bad state when leverage ratio is measured by the book value leverage and market value leverage when the states are determined by inflation rate. The results support an intuition that firms adjust their leverage faster in bad state than in good state. However, the results when the states are determined in relation to GDP growth rate are not in support of the results when the states are determined by inflation rate. Table 4 indicates that the good states and bad states using GDP growth and inflation only overlap twice (i.e. 2004 and 2008) and intuitively there is an expectation that one definition results may not confirm the other. The results under the GDP growth rate states are in line with Cook and Tang (2010) and consistent with the prediction of Hackbarth *et al.*'s (2006) model. However, the results of adjustment speed are inconclusive across macroeconomic condition as defined by GDP growth rate for both book value leverage and market value leverage.

7. Summary and conclusion

This study looked at how a sample of JSE Limited companies fund their investments and general corporate activities. This research looked at three related issues that impact corporate leverage in South Africa. Firstly, this research investigated the importance of firm specific characteristics and macroeconomic factors on corporate capital structure decision making in South Africa. The analysis is based on firm-level data from 2000 – 2014 and macroeconomic data (GDP growth rate, inflation rate and prime interest rate) for the same period.

Secondly, this research investigated the effects of extreme capital markets friction on credit supply and financing decisions of corporates in South Africa. This research does not investigate how corporates switch within funding channels through disruption periods. In addition, this research does not investigate how the decline in leverage comes about. Whether this is through equity issuance or internally generated cash flows, the research does not investigate these possible reasons for the decline in leverage. However, the results suggest that extreme capital market frictions do affect credit supply and corporate financing decisions.

Thirdly, this study investigated the impact of macroeconomic condition on the speed of capital structure adjustment by analysing South African data over the sample period from 2000 to 2014. Cook and Tang (2010), Korajczyk and Levy (2003) and Camara (2012) agree that macroeconomic conditions play an important role in determining the adjustment speed and firms financing choices because capital structure choices are quite diverse and much dependent on the time and the firms leverage type (Tzang *et al.*, 2013).

This research presents some interesting findings regarding the impact of macroeconomic factors on capital structure of firms. The empirical results show that macroeconomic conditions have a significant effect on capital structure dynamics and financing patterns. This

research finds a positive relationship between GDP growth rate and leverage. This finding indicates that corporates do lever themselves up in order to take advantage of perceived growth opportunities. Consistent with Shleifer and Vishny (1992) and Hackbarth *et al.* (2006) firm's debt capacity depends on current economic conditions. Firms can typically borrow more funds in an economic boom, even assuming a constant loss given default. Hackbarth *et al.* (2006) also find that if the recovery rate is procyclical, then the debt capacity of a firm in a boom can be up to 40% larger than the debt capacity of the same firm in a contraction. This research's results are in line with these prior studies regarding the effects of GDP growth on the ability for corporates to leverage themselves. These findings are also in line with evidence found in other international studies (Korajczyk and Levy, 2003; Hackbarth *et al.*, 2006; Muthama *et al.*, 2013; Mokhova and Zinecker, 2014)

This study also finds a negative relation between inflation and leverage. Intuitively, these results are in line with expectation that higher inflationary periods represent more uncertainty in the economy. From the borrower's point of view, it wouldn't be prudent to take on more debt to invest further in projects when the purchasing power of its functional currency is declining and its clients' purchasing power is also declining. Moreover, uncertain economic environments present a higher probability of default (and potentially bankruptcy) and the suppliers of capital (i.e. banks and financial institutions) are more likely not be aggressively lending during these periods. This research's results in this regard are in line with the international evidence on the relationship between leverage and inflation (Muthama *et al.*, 2013; Baltaci and Ayaydan, 2014; Mokhova and Zinecker, 2014).

A surprising result from this research is the relation between leverage and interest rates. This research found a positive relationship between interest rates and leverage. This expectation is more a demand-side assumption. As interest rates increase, firms are less willing to finance new investments due to the increase in the cost of borrowings. Therefore, the research expectation was that interest rates would be inversely correlated to leverage. This research results are in contrast to Barnea, Haugen and Senbet (1981) predictions that firms would be more willing to issue more debt if the yield on debt is low enough to compensate for any additional costs such as agency costs. Furthermore, the supply of corporate bonds is positively related to equity yields.

The results are however in line with the theoretical model of Kim and Wu (1988) that indicate that the aggregate demand for corporate bonds is positively correlated to corporate bond yields, *ceteris paribus*. Put differently, given a certain level of corporate bond yield, the demand for corporate bonds will be higher if the yields on equities are smaller or, equivalently, if the yield spread between corporate bonds and the competing securities become larger. These arguments are in line with the supply-side effect on leverage.

At a high level, the supply-side effect assumes that the suppliers of capital tend to ration capital based on the asset class that's providing the best risk-adjusted return. Therefore, in a high interest rate environment the supply of equity will decline due to the increase in supply of debt capital in pursuit of high return. Corporates looking for funding are more likely to raise

debt funding after considering the tax-shield and default probability. These findings are indeed in line with theoretical assumptions (Schall, 1984; Kim and Wu, 1988).

Another interesting observation relates to extreme capital market frictions and capital supply. The results suggest that the exchange rate volatility and the financial crisis adversely affected the total debt ratio of the sample firms. The results of equation 11 highlight that the coefficient on the crisis dummy is negative and significant at the level of 1% or better. This implies that during two window events (i.e. rand crisis and financial crisis), the flow of credit slowed to the sample firms which implies that it is not only the supply side that matters in making corporate financing decisions however executives need to consider the conditions of capital markets. This also suggests that the supply of debt capital is an important determinant of a firm's financing decisions, which means that aggregate external financing activities of the sample firms contracted in response to credit supply shocks.

These findings are, however, in contrast with Nilsen (2002), Peterson and Rajan (1997) and Atanasova and Wilson (2003, 2004) who argue that when the supply of term debt is squeezed, firms increase the use of working capital facilities in order to supplement long term debt. If corporates are able to switch between forms of funding, move from long term debt funding to short term funding during extreme capital market frictions periods, leverage should be stable or continue to increase. The findings of this study are in contrast to this literature (Nilsen, 2002; Peterson and Rajan, 1997; Atanasova and Wilson, 2003; Atanasova and Wilson, 2004) by suggesting that during extreme capital market frictions, supply of funding from financial institutions to corporates declines. Thus, working capital facilities drawings do not compensate for the reduction in long term funding from financial institutions, which has clear corporate funding policy implications (Rehman *et al.*, 2013).

Another contrast to this research results is the findings by Ivashina and Scharfstein (2008) that found that, after the failure of Lehman Brothers in September 2008, there was a run by short-term bank creditors, making it difficult for banks to roll over their short term debt.

Finally, the results show that when the macroeconomic conditions are defined by reference to the inflation rate, South African firms adjust their capital structure faster in bad states (when leverage ratio is defined by both book value leverage and market value leverage). When the macroeconomic conditions are defined by reference to the GDP growth rate, the adjustment speed is greater during good states than it is during bad states (when leverage ratio is defined by both book value leverage and market value leverage). The results when macroeconomic conditions are defined with reference to GDP growth rate are inconclusive due to the statistical insignificance of the coefficient.

7.1. Contributions

Firstly, this research aims to contribute to the knowledge of capital structure: (1) by examining the determinants of capital structure across a sample of non-financial corporates that constitute the majority of All Share Index; and (2) by focusing on both the characteristics of the corporates and macroeconomic factors. This research has found a positive correlation

between leverage on the one hand and size and tangibility on the other; while profitability has a negative correlation with leverage using both book value leverage and market value leverage. These results are in line with the well-documented international evidence on the relation between leverage and firm-specific determinants.

Secondly, this research contribute to the existing literature by first suggesting that both demand and supply factors are crucial in understanding firms' financing decisions. Thirdly, the study extends the previous literature (Lemmon and Roberts, 2010; Rehman *et al.*, 2013; Faulkender and Peterson, 2006; Kisgen, 2006) on the implications of the financial crisis and access to capital on firms' behaviour. Finally, this research results contribute to the existing literature that indicate that firm level characteristics have differing effects on the adjustments and macroeconomic conditions play a significant role in influencing variations in capital structure adjustments speeds (Cook and Tang, 2010; Chipeta and Mbululu, 2013; Hackbarth *et al.*, 2006; Tzang *et al.*, 2013).

7.2. Limitations

The findings of this research are subject to some limitations. Firstly, there are several other economic and institutional factors in the South African economy that potentially influence corporate leverage and this research was limited to considering only three firm specific characteristics and three key economic variables and their impact on corporate leverage.

Secondly, another limitation is the use of annual data (Rehman *et al.*, 2013). Due to the non-availability of quarterly data from the available database this research uses annual data in the analysis. The frequency of using of quarterly data would however add new insights into research findings and contributions. Thirdly, this research covered two isolated periods being: (1) the 2001 – 2002 ZAR currency crisis and (2) the 2007 – 2009 global financial crises, and South Africa has been part of the global economy since the late 90s, a longer period might enhance the robustness of the results in this research.

Finally, patterns of firms financing decisions might not be observed clearly within 15 years. The financing decisions and the effect of macroeconomic condition may be more completely portrayed if the observed period could be extended. The macroeconomic condition defined by the research only includes inflation rate and GDP growth rate. This may also deliver inconsistent results delivered by both measures.

7.3. Recommendations

This study recommends a number of further research ideas around capital supply and accessibility. In particular, investigating the financing decisions of firms during the disruption period and comparing them with the pre-disruption and post-disruption period could be an interesting area for future research. In addition, this research does not investigate whether corporates switch from long-term funding to short-term funding during extreme capital market disruption period and whether the reduction in leverage is through equity issuance or

internally generated cash flows. It would be very interesting to find answers to these questions.

Future research should also consider the role of relationship lending during the friction periods. In this regard, existing evidence suggests that establishing relationship with lenders enhances the availability of financing during the friction period (Peterson and Rajan, 1997). In addition, it has also been argued in the literature that a longer relationship with the lender helps firms pay lower interest rates and pledge little or no collateral for loan capital borrowed by them (Boot and Thakor, 1994). Therefore, investigating the role of relationship lending during the disruption period could be an area for future research.

As far as economic conditions and corporate leverage is concerned, this research results raises a number of interesting issues that can be addressed in the future research. Firstly, as with other empirical studies (Cook and Tang, 2010; Korajczyk and Levy, 2003), the results suggests that financing decisions reflect the state of the economy. Since information regarding security issues is contemporaneous, it may be more useful in describing economic conditions than, for example, infrequently reported information in – a firm’s earnings update (Korajczyk and Levy, 2003). Korajczyk and Levy (2003) argue that such results are of interest to policy makers as well as to the research literature on asset pricing literature. Secondly, this research only focused on how macroeconomic conditions impact the speed of adjustment or the level of debt in the capital structure, it would also be very interesting to understand how macroeconomic conditions impact the maturity structure of debt chosen by firms.

References

- Al - Najjar, B., & Taylor, P. (2008). The relationship between capital structure and ownership structure: New evidence from Jordanian panel data. *Managerial Finance Journal*, 34 (12), 919 - 933.
- Almeida, H., Campello, M., Laranjeira, B., & Weisbenner. (2012). Corporate debt maturity and the real effects of the 2007 credit crisis. *Critical Finance Review*, 1(1), 3 - 58.
- Al-Najjar, B., & Hussainey, K. (2011). Revisiting the capita-structure puzzle: UK evidence. *The Journal of Risk Finance*, 12(4), 329 - 338.
- Alti, A. (2006). How persistent is the impact of market timing on capital structure. *The Journal of Finance*, 61(4), 1681 - 1710.
- Andrade, G., & Kaplan, S. (1998). How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. *The Journal of Finance*, 56(5), 1443 - 1493.
- Asquith, P., & Mullins, D. (1986). Equity issues and offering dilution. *Journal of Financial Economics*, 15(2), 61 - 89.
- Atanasova, C., & Wilson, N. (2003). Bank borrowing constraints and the demand for trade credit: evidence from panel data. *Managerial and decision economics*, 24(6), 503 - 514.
- Atanasova, C., & Wislon, N. (2004). Disequilibrium in the UK corporate loan market. *Journal of Banking & Finance*, 28(3), 595 - 614.
- Baker, M., & Wurgler, J. (2000). The equity share in new issues and aggregate stock returns. *The Journal of Finance*, 55(5), 2219 - 2257.
- Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The Journal of Finance*, 57(1), 1 - 32.
- Baltaci, N., & Ayaydin, H. (2014). Firm, country and macroeconomic determinants of capital structure: Evidence from Turkish banking sector. *Emerging Markets Journal*, 3(3), ISSN 2158 - 8708 (online).
- Banerjee, S., Heshmati, A., & Wihlborg, C. (2000). *The dynamics of capital structure*. New York: SSE/EFI Working Paper Series in Economics and Finance No. 333.
- Barnea, A., Haugen, R., & Senbet, L. (1981). An equilibrium analysis of debt financing under costly tax arbitrage and agency problems. *Journal of Finance*, 36(3), 569 - 581.
- Bauer, P. (2004). Determinants of capital structure emperical evidence from the Czech Republic. *Czech Journal of Economics and Finance*, 54, ä. 1-2.
- Bayless, M., & Chaplinsky, S. (1996). Is there a window of opportunity for seasoned equity issuance? *The Journal of Finance*, 51(1), 253 - 278.
- Berger, A., & Udell, G. (1994). Did risk-based capital allocate bank credit and cause a 'Credit Crunch' in the U.S.? *Journal of Money, Credit and Banking*, 26(3), 585 - 628.

- Bernanke, B., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4), 27 - 48.
- Bevan, A., & Danbolt, J. (2002). Capital structure and its determinants in the UK - a decompositional analysis. *Applied Financial Economics*, 12(3), 159 - 170.
- Bokpin, G. (2009). Macroeconomic development and capital structure decisions of firms: Evidence from emerging market economics. *Studies in Economics and Finance*, 26(2), 129 - 142.
- Boot, A., & Thakor, A. (1994). Moral hazard and secured lending in an infinitely repeated credit market game. *International Economic Review*, 35(4), 899 - 920.
- Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance*, 56(1), 87 - 130.
- Boyd, J., & Smith, B. (n.d.). The co-evolution of the real and financial sectors in the growth process. *Working Paper 541, World Bank Conference on Stock Markets, Corporate Finance, and Economic Growth*. Retrieved 19 July 2015.
- Bradley, M., Jarrell, G., & Kim, H. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance*, 39(3), 857 - 878.
- Brigham, E., & Houston, J. (1998). *Fundamentals of Financial Management, 8th Edition*. Chicago: The Dryden Press.
- Brinkmann, E., & Horvitz, P. (1995). Risk-based capital standards and the credit crunch. *Journal of Money, Credit and Banking*, 27(3), 848 - 863.
- Camara, O. (2012). Capital structure adjustment speed and macroeconomics conditions: U.S MNCs and DCs. *Journal of Multinational Financial Management*, 22(5), 278 - 301.
- Chava, S., & Purnanandam, A. (2011). The effect of banking crisis on bank-dependent borrowers. *Journal of Financial Economics*, 99(1), 116 - 135.
- Chen, J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research*, 57(12), 1341 - 1351.
- Chipeta, C., & Mbululu, D. (2013). Firm heterogeneity, macroeconomic conditions and capital structure adjustment speeds: Evidence from the JSE. *Investment Analysts Journal*, 77, 69 - 80.
- Choe, H., Masulis, R., & Nanda, V. (1993). Common stock offerings across the business cycle: Theory and evidence. *Journal of Empirical Finance*, 1(1), 3 - 31.
- Choi, D., Getmansky, M., Henderson, B., & Tookes, H. (2010). Convertible bond arbitrageurs as suppliers of capital. *The Review of Financial Studies*, 23(1), 2492 - 2522.
- Coates, J. H., & Woolley, P. K. (1975). Corporate gearing in the EEC. *Journal of Business Finance & Accounting*, 2(1), 1 - 18.

- Cook, D., & Tang, T. (2010). Macroeconomic conditions and capital structure adjustment. *Journal of Corporate Finance*, 16(1), 73 - 87.
- Damijan, J. P. (2014). Corporate financial soundness and its impact on firm performance: Implications for corporate debt restructuring in Slovenia . *Debt Restructuring and Insolvency: Reviving Corporate Growth in Slovenia* (p. Working Paper No. 168). Ljubljana: European Bank for Reconstruction and Development.
- DeAngelo, H., & Masulis, R. (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*, 8(1), 3 - 27.
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14, 387 - 405.
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2009). Debt maturity structure and the 1997 Asian financial crisis. *Journal of Multinational Financial Management*, 19(1), 26 - 42.
- DeJong, A., Nguyen, T., & Kabir, R. (2008). Capital structure around the world: The roles of firm and country-specific determinants. *Journal of Banking and Finance*, 32(9), 1954 - 1969.
- Doku, J., Adjasi, C., & Sarpong-Kumankuma, E. (2011). Financial market development and capital structure of listed firms - Empirical evidence from Ghana. *Serbian Journal of Management*, 6(2), 155 - 168.
- Donaldson, G. (1961). *Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity*. Boston: Division of research, Harvard Graduate School of Business Administration.
- Donaldson, G. (1963). Financial goals: management vs. stockholders. *Harvard Business Review*, 41(3), 116 - 129.
- Drobetz, W., & Wanzenried, G. (2006). What determines the speed of adjustment to the target capital structure. *Applied Financial Economics*, 16(13), 941 - 958.
- Duchin, R., Ozbas, O., & Sensoy, B. (2010). Costly external finance, corporate investment, and the subprime mortgage financial crisis. *Journal of Financial Economics*, 97(3), 418 - 435.
- Fama, E. (1970). Efficient capital markets: A review of theory and an empirical work. *Journal of Finance*, 25(2), 383 - 417.
- Fama, E., & French, K. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, 15(1), 1 - 33.
- Fama, E., & Miller, M. (1972). *The Theory of Finance*. Hinsdale, Illinois: Dryden Press.
- Faulkender, M., & Petersen, M. (2006). Does the source of capital affect capital structure. *The Review of Financial Studies*, 19(1), 45 - 79.
- Flannery, M. (1986). Asymmetric Information and Risky Debt Maturity Choice. *The Journal of Finance*, 41(1), 19 - 37.

- Flannery, M., & Hankins, K. (2007). *A theory of capital structure adjustment speed. (Working Paper)*. United States: University of Florida.
- Flannery, M., & Rangan, K. (2006). Partial adjustment toward target capital structure. *Journal of Financial Economics*, 79(3), 469 - 506.
- Fosberg, R. (2012). Capital structure and the Financial Crisis. *Journal of Finance and Accountancy*, 11, 46 - 55.
- Frank, M., & Goyal, V. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(1), 217 - 248.
- Frank, M., & Goyal, V. (2004). The effect of market conditions of capital structure adjustment. *Finance Research Letters*, 1(1), 47 - 55.
- Frank, M., & Goyal, V. (2009). Capital structure decisions: Which factors are reliably important. *Financial Management*, 38(1), 1 -37.
- Gajurel, D. (n.d.). Macroeconomic influences on corporate capital structure. Available at SSRN: <http://ssrn.com/abstract=899049>, Retrieved 19 July 2015.
- Gambacorta, L., & Marques-Ibanez, D. (2011). The bank lending channel: lessons from the crisis. *Bank for International Settlements Working Papers No. 345, Basel, Switzerland* .
- Gaud, P., Hoesli, M., & Bender, A. (2007). Debt-equity choice in Europe. *International Review of Financial Analysis*, 16(3), 201 - 222.
- Gertler, M., & Gilchrist, S. (1993). The role of credit market imperfections in the transmission of monetary policy: Arguments and evidence. *Scandinavian Journal of Economics*, 95(1), 43 - 64.
- Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Journal of Economics*, 109 (2), 309 - 340.
- Graham, J. (1996). Debt and the marginal tax rate. *Journal of Financial Economics*, 41(1), 41 - 73.
- Graham, J. (2000). How big are the tax benefits of debt? *The Journal of Finance*, 55(5), 1901 - 1940.
- Graham, J., & Harvey, C. (2001). The theory and practise of corporate finance: evidence from the field. *Journal of Financial Economics*, 60, 187 - 243.
- Grossman, S., & Hart, O. (1982). Corporate financial structure and managerial incentives. In J. McCall, *The economics of information and uncertainty* (pp. 107 - 140). Chigago: University of Chicago Press.
- Gwatidzo, T., & Ojah, K. (2009). Corporate capital structure determinants - Evidence from five African countries. *The African Finance Journal*, 11(1), 1-23.
- Hackbarth, D., Miao, J., & Morellec, E. (2006). Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics*, 82, 519–550.

- Haron, R. (2014). Capital structure inconclusiveness: evidence from Malaysia, Thailand and Singapore. *International Journal of Managerial Finance*, 10(1), 23 - 38.
- Harris, M., & Raviv, A. (1990a). Capital structure and the informational role of debt. *The Journal of Finance*, 45(2), 321 - 349.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 46(1), 297-355.
- Henderson, B., Jegadeesh, N., & Weisbach, M. (2006). World markets for raising new capital. *Journal of Financial Economics*, 82(1), 63 - 101.
- Hennessy, C., & Whited, T. (2005). Debt dynamics. *The Journal of Finance*, 60(3), 1129 - 1165.
- Higgins, R. (1977). How much growth can a firm afford. *Financial management*, Fall, 7 - 16.
- Hovakimian, A., Hovakimian, G., & Tehranian, H. (2004). Determinants of target capital structure: The case of dual debt and equity issues. *Journal of Financial Economics*, 71(3), 517 - 540.
- Hovakimian, A., Opler, T., & Titman, S. (2001). The debt equity choice. *The Journal of Financial and Quantitative Analysis*, 36(1), 1 - 24.
- Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open share repurchases. *Journal of Financial Economics*, 39 (2), 181 - 208.
- Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics*, 97(3), 319 - 338.
- Jahanzeb, A., Rehman, S.-U., Bajuri, N., Karami, M., & Ahmadimousaabab, A. (2014). Trade-off, perking order theory and market timing theory: A comprehensive review of capital structure theories. *International Journal of Management and Commerce Innovations*, 1(1), 11 - 18.
- Jalilvand, A., & Harris, R. (1984). Corporate behavior in adjusting to capital structure and dividend targets: An econometric study. *The Journal of Finance*, 39(1), 127 - 145.
- Jensen, M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2), 323 - 329.
- Jensen, M. (1989). The eclipse of the public corporation. *Harvard Business Review*, 67(5), 61 - 74.
- Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305 - 360.
- Jeon, Y., & Miller, M. (2004). The effect of the Asian financial crisis on the performance of Korean nationwide banks. *Applied Financial Economics*, 14, 351 - 360.
- Kahle, K., & Stulz, R. (2013). Access to capital, investment, and financial crisis. *Journal of Financial Economics*, 110(2), 280 - 299.
- Kayhan, A., & Titman, S. (2007). Firms' histories and thier capital structure. *Journal of Financial Economics*, 83(1), 1 - 32.

- Kim, M., & Wu, C. (1988). Effects of inflation on capital structure. *The Financial Review*, 23(2), 183 - 200.
- Kisgen, D. (2006). Credit ratings and capital structure. *The Journal of Finance*, 61(3), 1035 - 1072.
- Kiyotaki, N., & Moore, J. (1997). Credit cycles. *Journal of Political Economy*, 105(2), 211 - 248.
- Korajczyk, R., & Levy, A. (2001, Working Paper #279). *Capital structure choice: Macroeconomic conditions and financial constraints*. Illinois: Kellogg Graduate School of Management, Northwestern University.
- Korajczyk, R., & Levy, A. (2003). Capital structure choice: macroeconomic conditions and financial constraints. *Journal of Financial Economics*, 68(1), 75 - 109.
- Korajczyk, R., Lucas, D., & McDonald, R. (1992). Equity issues with time-varying asymmetric information. *Journal of Financial and Quantitative Analysis*, 27(3), 397 - 417.
- Leary, M. (2009). Bank loan supply, lender choice, and corporate capital structure. *The Journal of Finance*, 64(3), 1143 - 1185.
- Lemma, T., & Negash, M. (2013). Institutional, macroeconomic and firm-specific determinants of capital structure: The African evidence. *Management Research Review*, 36(11), 1081 - 1122.
- Lemmon, M., & Roberts, M. (2010). The response of corporate financing and investment to change in the supply of credit: A natural experiment. *Journal of Financial and Quantitative Analysis*, 45(3), 555 - 587.
- Lemmon, M., Roberts, M., & Zender, J. (2008). Back to the beginning: Persistence and the cross-section of corporate capital structure. *The Journal of Finance*, 63(4), 1575 - 1608.
- Levy, A., & Hennessy, C. (2007). Why does capital structure choice vary with macroeconomic conditions. *Journal of Monetary Economics*, 54(6), 1545 - 1564.
- Litzenberger, R., & Kraus, A. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911-922.
- Loughran, T., & Ritter, J. (1995). The new issues puzzle. *The Journal of Finance*, 50(1), 23 - 51.
- Loughran, T., & Vijh, A. (1997). Do long term shareholders benefit from corporate acquisitions. *The Journal of Finance*, 52(5), 1765 - 1790.
- Loughran, T., Ritter, J., & Rydqvist, K. (1994). Initial public offerings: international insights. *Pacific-Basin Finance Journal*, 2(2), 165 - 199.
- Love, I., Preve, L., & Sarria-Allende, V. (2007). Trade credit and bank credit: Evidence from recent financial crises. *Journal of Financial Economics*, 83(2), 453 - 469.
- Lown, C., & Peristiani, S. (1995). The behavior of consumer loan rates during the 1990 credit slowdown. *Journal of Banking and Finance*, 20(10), 1673 - 1694.

- Lowry, M. (2003). Why does IPO volume fluctuate so much? *Journal of Financial Economics*, 67(1), 3 - 40.
- Mackie-Mason, J. (1990). Do taxes affect corporate financing decisions. *Journal of Finance*, 45(5), 1471 - 1493.
- Magud, N., Reinhart, C., & Vesperoni, E. (2014). Capital inflows, exchange rate flexibility and credit booms. *Review of Development Economics*, 18(3), 415 - 430.
- Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of Finance*, 37(1), 121-144.
- Martin, J., & Scott, D. (1974). A discriminant analysis of the corporate debt-equity decision. *Financial Management*, 3(4), 71-79.
- Miller, M. (1977). Debt and taxes. *The Journal of Finance*, 32(2), 261 - 275.
- Miller, M., & Modigliani, F. (1963). Corporation income taxes and the cost of capital: A correction. *The American Economic Review*, 53(3), 433 - 443.
- Mínguez-Vera, A., & Martín-Ugedo, J. F. (2007). Does ownership structure affect value? A panel data analysis for Spanish market. *International Review of Financial Analysis*, 16(1), 81 - 98.
- Modigliani, F. (1980). The collected papers of Franco Modigliani. *Cambridge, Massachusetts: MIT Press*, 3, 11- 19.
- Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261 - 297.
- Modigliani, F., & Miller, M. (1966). Some estimates of the cost of capital to the electricity industry. *The American Economic Review*, 56(3), 333 - 391.
- Mokhova, N., & Zinecker, M. (2014). Macroeconomic factors and corporate structure. *Procedia - Social and Behavioral Sciences*, 110, 530 - 540.
- Morellec, E. (2010). Credit supply and corporate policies. *Ecole Polytechnique Federale de Lausanne; Swiss Finance Institute*.
- Moyo, V., Wolmarans, H., & Brummer, L. (2013). Dynamic capital structure determinants: Some evidence from South African firms. *Journal of Economics and Financial Sciences*, 6(3), 661 - 682.
- Muthama, C., Mbaluka, P., & Kalunda, E. (2013). An empirical analysis of macro-economic influences on corporate structure of listed companies in Kenya. *Journal of Finance and Investment Analysis*, 2(2), 41 - 62.
- Myers, S. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147 - 175.
- Myers, S. (1984). The capital structure puzzle. *The Journal of Finance*, 39(3), 574 - 592.

- Myers, S. (2001). Capital structure. *The Journal of Economic Perspectives*, 15(2), 81 - 102.
- Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187 - 221.
- Nakamoto, M. (2007, July 9). <http://www.ft.com/cms/s/0/80e2987a-2e50-11dc-821c-0000779fd2ac.html#axzz3pwndhJv4>. Retrieved from Financial Times: www.ft.com
- Ngugi, R. (2008). Capital financing behaviour: evidence from firms listed on the Nairobi Stock Exchange. *The European Journal of Finance*, 14(7), 609 - 624.
- Nilsen, J. (2002,). Trade credit and the banking lending channel. *Journal of Money, Credit and Banking*, 34(1), 226 - 253.
- Ooi, J. (1999). The determinants of capital structure evidence on UK property companies. *Journal of Property Investments & Finance*, 17(5), 464 - 480.
- Pagano, M., Panetta, F., & Zingales, L. (1998). Why do companies go public? An empirical analysis. *The Journal of Finance*, 53(1), 27 - 64.
- Papke, L., & Wooldridge, J. (1996). Econometric methods for fractional response variables with an application to 401(k) plan participation rates. *Journal of Applied Economics*, 11, 619-632.
- Peek, J., & Rosengren, E. (1992). The capital crunch in New England. *New England Economic Review*, May/June, 21 - 31.
- Peek, J., & Rosengren, E. (1995). The capital crunch: Neither a borrower nor a lender be. *Journal of Money, Credit, and Banking*, 27(3), 625 - 638.
- Peterson, M., & Rajan, R. (1997). Trade credit: Theories and evidence. *Review of Financial Studies*, 10(3), 661 - 691.
- Puri, M., Rocholl, J., & Steffen, S. (2011). Global retail lending in the aftermath of the US financial crisis: Distinguishing between supply and demand. *Journal of Financial Economics*, 100(3), 556 - 578.
- Rajan, R., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421 - 1460.
- Ramjee, A., & Gwatidzo, T. (2012). Dynamics in capital structure determinants in South Africa. *Meditari Accountancy Research*, 20(1), 52 - 67.
- Rehman, S., Akbar, S., & Ormrod, P. (2013). The impact of recent financial shocks on the financing and investment policies of UK private firms. *International Review of Financial Analysis*, 26, 59 - 70.
- Rubio, G., & Sogorb, F. (2011). The adjustment to target leverage of Spanish public firms: Macroeconomic conditions and distance from target. *Revista Economia Aplicada*, 19(57), 35 - 63.
- Schall, L. (1984). Taxes, inflation and corporate financial policy. *The Journal of Finance*, 39(1), 105 - 126.

- Scott, J. (1977). Bankruptcy, secured debt and optimal capital structure. *The Journal of Finance*, 32(1), 1 - 19.
- Shleifer, A., & Vishny, R. (1992). Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance*, 47(4), 1343 - 1366.
- Shyam-Sunder, L., & Myers, S. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics*, 51(2), 219 - 244.
- Singh, A. (1995). Corporate financial patterns in industrializing economies: A comparative international study. *International Finance Corporation, Working Paper No.2, The World Bank, Washington, D.C.*
- Singh, A., & Hamid, J. (1992). Corporate financial structures in developing countries. *International Finance Corporation, 1(1), Washington DC.*
- Stulz, R. (1990). Managerial discretion and optimal financing policies. *Journal of Finance Economics*, 26(1), 3 - 27.
- Suarez, J., & Sussman, O. (1999). Financial distress and the business cycle. *Oxford Review of Economic Policy*, 15(3), 39 - 51.
- Suhaila, M. K., & Wan Mahmood, W. M. (n.d.). Capital structure and firm characteristics: Some evidence from Malaysian companies. Retrieved 19 July 2015 from <http://mpira.uib.unimuenchen.de/14616/> MPRA Paper No. 14616.
- Taggart, R. (1977). A model of corporate financing decisions. *The Journal of Finance*, 32(5), 1467 - 1484.
- Taggart, R. (1985). *Secular patterns in the financing of U.S. corporations. In corporate capital structure in the United States.* Chicago: The University of Chicago Press.
- Thakor, A. (1996). Capital requirements, monetary policy, and aggregate bank lending: Theory and empirical evidence. *The Journal of Finance*, 51(1), 279 - 324.
- Thies, C., & Klock, M. (1992). Determinants of capital structure. *Review of Financial Economics*, 1(2), 40 - 53.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure. *The Journal of Finance*, 43(1), 1 -19.
- Tzang, S.-W., Wnag, K.-Y., & Rahim, R. N. (2013). Macroeconomic condition and capital structure adjustment speed - evidence from Indonesian stock market. *Innovative Mobile and Internet Services, IEEE Computer Society*, 784 - 789.
- Van den Heuvel, S. (2002). Does bank capital matter for monetary transmission. *Economic Policy Review*, 8(1), 259 - 265.
- Voutsinas, K., & Werner, R. (2011). Credit supply and corporate capital structure: Evidence from Japan. *International Review of Financial Analysis*, 20(5), 320 -334.

- Wahab, S., & Ramli, N. (2014). The determinants of capital structure: An empirical investigation of Malaysian listed government linked companies. *International Journal of Economics and Financial Issues*, 4(4), 930 - 945.
- Wald, J. (1999). How firm characteristics affect capital structure: An international comparison. *Journal of Financial Research*, 22(2), 161 - 187.
- Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy*, 112(1), 106 - 131.