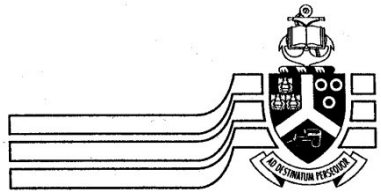

THE IMPLICATIONS OF CAPITAL STRUCTURE THEORY AND REGULATION FOR SOUTH AFRICAN BANKING INSTITUTIONS

By

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ABSTRACT

The topic of capital structure has been one that has plagued the academic world for a number of years. There have been numerous works published on the subject which have presented such theories as the Modigliani and Miller Propositions, the Trade-off Theory, Pecking Order Theory, Signalling Theory and Agency Cost Theory to name a few. However, little research has been done on the application of these and other theories to banking institutions located in Southern Africa. This adds increased complexity to the determining of a local bank's capital structure policy and the difficulty is further exacerbated by the increased application of regulatory control.

In the wake of the recent global financial crisis, banking institutions have been placed under the spotlight and their capital adequacy levels come into question. A need was identified to investigate the impact that capital adequacy has on a bank's performance and whether it achieves its purpose of increasing stability amongst banks.

This study analysed the determinants of the capital structure of banks in South Africa based on secondary financial data and by performing this analysis attempted to establish trends in capital structure policy and regulatory compliance. The study also attempted to identify best practices that contribute to the overall value and performance of the banking institution. The expectation is that the correct application of capital structure theory and compliance with regulations will decrease a bank's risk profile and in turn result in a more stable monetary system and economy.

Overall, the results of the analysis were inconclusive, but lay the basis for potential future research. Conclusions drawn from the results and literature create greater understanding of the dynamics of capital structure and its implications to South African Banks.

KEYWORDS

Capital Structure, Trade-off Theory, Pecking Order Theory, Signalling Theory, Basel Accord, Capital Adequacy.

DECLARATION

I declare that this dissertation, which I hereby submit for the degree Magister Commercii in Financial Management Sciences at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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Wesley Naidu

November 2011

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To my wife Vanessa, son Tejendran and daughter Tanishka, thank you for your endless love, understanding, support, patience and sacrifice during my long journey. Without you this study would not have been possible.

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LIST OF ABBREVIATIONS

This study involves a number of key terms and concepts, the definitions of which are outlined below.

Capital Structure: Refers to the long term financing decision of a firm. That is the level of borrowings or equity that is used as finance for operations.

Market Risk: The Basel II Accord (2006:157) defines market risk as "... the risk of losses in on and off-balance-sheet positions arising from movements in market prices."

Operational Risk: The Basel II Accord (2006:144) defines operational risk as "... the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk."

Working Capital: Refers to the net current assets of a firm. That is current assets less current liabilities.

Table 1: Abbreviations used in this document

Abbreviation	Meaning
ABSA	Amalgamated Banks of South Africa
AMA	Advanced Measurement Approaches
BFA	Bureau of Financial Analysis
CFO	Chief Financial Officer
CV	Coefficient of Variation
D/E	Debt to Equity Ratio
EBIT	Earnings Before Interest and Taxation
EPS	Earnings Per Share

EVA	Economic Value Added
FirstRand	FirstRand Bank Limited
G10	Group of Ten Countries
LCR	Liquidity Coverage Ratio
MM I	Modigliani and Miller Proposition I
MM II	Modigliani and Miller Proposition II
Nedbank	Nedbank Limited
NPV	Net Present Value
NSFR	Net Stable Funding Ratio
P/E	Price to Earnings Ratio
ROA	Return On Assets Ratio
ROE	Return On Equity Ratio
RWA	Risk Weighted Assets
SARB	South African Reserve Bank
SBSA	Standard Bank of South African Limited
WACC	Weighted Average Cost of Capital

1 CHAPTER ONE - INTRODUCTION

1.1 RESEARCH TITLE

The implications of capital structure theory and regulation for South African banking institutions.

1.2 BACKGROUND

What determines how a banking institution funds its activities? To the management of most banking institutions the decision regarding the choice of alternative funding sources and the resultant mix of debt to equity is a matter of utmost importance. Management is constantly in search of an optimal mix of debt to equity, or capital structure that maximises the value of the firm and decreases its risk profile.

The value of the bank and its risk profile are the two drivers to the capital structure decision that reflects the different interests of those who, on the one hand, are primarily interested in the banking institution as a business, and those who, on the other hand, are primarily interested in the banking institution, because bank operations affect the money supply, which influences the total level of economic activity (Alhadeff & Alhadeff, 1957:24).

The topic of capital structure has been one that has plagued the academic world for a number of years. Although there has been many published works on the subject, these works have predominantly considered the topic from a unilateral perspective and has not provided the answer that management requires for our dynamic environment.

At the genesis of capital structure theory is the work by Modigliani and Miller, (Modigliani & Miller, 1958:261-297). Modigliani and Miller's work sought to identify conditions under which capital structure decisions were irrelevant to a firm. They proposed that a firm's chosen capital structure was irrelevant to the value of the firm albeit in a perfect capital market (Modigliani & Miller, 1958:269). Most scholars and academics argue that our markets are imperfect and Modigliani and Miller's work has been the catalyst to numerous academic works thereafter to attempt to solve the puzzle of capital structure.

Some of the more prominent theories on capital structure post the work by Modigliani and Miller are (De Wet, 2006:4):

- the pecking order theory
- the signalling theory
- the managerial opportunism theory

Banking regulation has also been of special interest as the activities of banks influence an economies money supply (Alhadeff & Alhadeff, 1957:24). The recent global financial crisis, which began in the US subprime market, has ensured that the topic of banking regulation receives special focus and banks come under scrutiny (Drumond, 2009:799). The Capital Accord proposed by the Basel Committee on Banking Supervision in 1988 was initially intended for the bank of G-10 countries. The Basel Accord has since become the standard for national regulators worldwide and led to countries introducing minimum capital requirements on most banking institutions (Chiuri, Ferri & Majnoni, 2001:400).

Capital structure theory thus far has been derived from prior work and the capital structure of industrial firms. However, banks and their assets and functions are materially different to other industries (Diamond & Rajan, 2000:2431). Little research has been done on the application of this theory to banking institutions and even less with regard to banking institutions located in South Africa. This adds increased complexity to the determining of a bank's capital structure policy by management. The difficulty is further exacerbated by the increased application of regulatory control.

1.3 PROBLEM STATEMENT

For over five decades there has been enormous debate regarding the capital structure of firms and the determination of an optimal capital structure. Banking institutions in particular have received much criticism recently, especially as a result of the global credit crisis, with regards to capital inadequacy and the need for increased regulation. However, very little research and guidance is available on the application of capital structure theory in the banking sector which would assist bank management in appropriate decision making.

1.4 PURPOSE STATEMENT

The aim of this paper is to analyse the determinants of the capital structure of banks in South Africa. By performing this analysis the study shall attempt to establish trends in capital structure policy and regulatory compliance. Furthermore the study will attempt to identify best practice that contributes to the overall value and performance of the banking institution.

1.5 RESEARCH OBJECTIVES / RESEARCH QUESTIONS

The study will aim to achieve the following specific research objectives:

- To assess whether past capital structure theories developed with firms in developed countries in mind is applicable to South African Banks.
- To analyse the regulatory requirements imposed on South African banks by domestic regulatory bodies and international requirements.
- To compare current capital structures of South African banks with capital structure theory and regulatory requirements.
- To ascertain whether capital structure decisions and regulation has had an impact on the performance and value of South African banks.

1.6 IMPORTANCE AND BENEFITS OF THE PROPOSED STUDY

As mentioned earlier, capital structure theory has been covered by numerous academics albeit from a one-sided perspective. Furthermore, the application of this theory to banks has been limited and its application to banks within South Africa has been almost non-existent. A thorough search of Blackwell Synergy, EBSCOhost, Sabinet, ProQuest, and Wiley Interscience has revealed no comprehensive research on capital structure theory and regulation and its application to South African banks.

Currently, enormous focus is being placed on bank practices and risk profiles. This is due to the recent global financial crisis which has led to the collapse of some of the largest banking institutions in the world (Drumond, 2009:799). This critical focus on banks is being

applied in an attempt to identify risk factors that contributed to the global financial crisis and to implement regulatory controls that will mitigate those risks. The capital structure of banks in particular is an area which can be readily scrutinised and controlled by regulation.

From a theoretical perspective, the proposed study aims to contribute to the existing body of knowledge on the topic of capital structure and regulation amongst banks in numerous ways. The study aims to apply a more holistic view on the topic of optimal capital structure for banks, where previous studies were one-dimensional. As far as could be ascertained, this study will be the first to consider the impact of capital structure theory and regulatory influences on South African banks. The study aims to make a unique contribution by comparing the various funding mechanisms and funding mix adopted by banks in South Africa in an attempt to identify best practices.

From a practical perspective, the findings of the study should be of invaluable assistance to management of South African banks in their decision making process and their attempts to maximise their firms' value and performance. Also, correct application of capital structure theory and compliance with regulations will decrease a bank's risk profile and in turn result in a more stable monetary system and economy.

The study shall be divided into the chapters below:

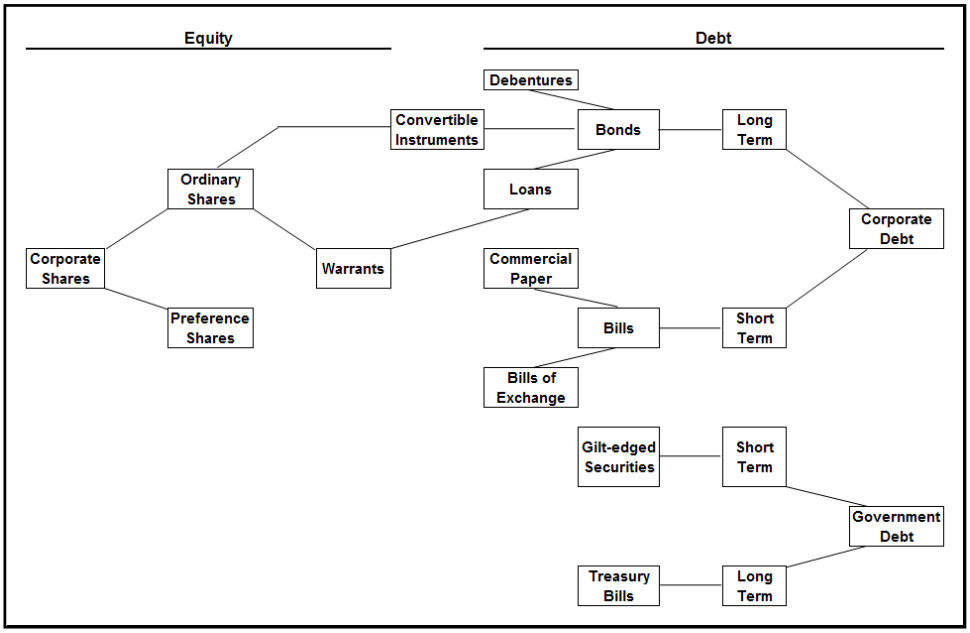
- Chapter 2 will provide an overview of relevant theories in capital structure of firms.
- Chapter 3 will review the current legislation and international standards/regulations that apply to banks capital requirements.
- Chapter 4 puts forward the research propositions and the methodology followed in carrying out the research.
- Chapter 5 presents the results of the analysis of secondary data.
- Chapter 6 provides an interpretation of the results of the analysis carried out will conclude the study.

2 LITERATURE AND THEORY REVIEW

A topic that has attracted considerable research in the field of financial management is that of capital structure. Following the seminal work of Modigliani and Miller in 1958 (Modigliani & Miller, 1958:261-297), for which they won the Nobel Prize, capital structure has been the topic of rigorous debate in corporate finance theory. Professor Myers (2001:81) said it best when he stated that there is no universal theory of capital structure or a 'one-size-fits-all' approach, but rather guidelines from established theory that is available to the financial manager to interpret, which should then enable them to make an optimal decision for the firm under their stewardship, given its circumstances.

The term capital structure refers to the long term financing of a company and one of the key reasons for attracting such focus is the possible relationship it may have with a company's value. Essentially, the choices of financing that a company has available to it are either from an internal source, external source or a combination of the two. Internal sources of finance primarily refer to the retained earnings of a company and its working capital. External finance consists of debt and equity in very broad terms. There are a myriad sources or instruments of debt and equity, examples of which are depicted in Figure 1 below.

Figure 1: Sources of External Finance



Source: (Davies, Boczko & Chen, 2008:231)

Valuation theory tells us that the value of an asset is calculated by the sum of all future cash flows that will be derived from that asset, discounted at an appropriate discount rate (Moyer, McGuigan, & Rao, 2005:37). For a company, this can be stated in the following formula:

Equation 1: Value of the Firm

$$V = \frac{EBIT}{Ke}$$

Where:

- V = the value of the firm;
- EBIT = the earnings of the firm per annum in perpetuity;
- k_a = the cost of capital of the firm as discount rate.

From the formula above, one can conclude that the lower the discount rate/cost of capital, the greater the value of the firm and vice versa. The capital of a firm is merely a pool of the various sources of funding and as such the cost associated thereof is a weighted average of the costs of each component of the capital pool (WACC). It follows then that any variation in the cost of debt or equity that a firm uses would impact the firm's cost of capital and hence the overall value of that firm. Capital structure theory attempts to answer the question of whether a company's level of debt in relation to its equity does have any impact on company value. The decision that management is then faced with is what capital structure will yield the best result for the company. What follows is a review of the current theories of capital structure and legislation that would impact the financing decision making process for a bank's management.

2.1 CAPITAL STRUCTURE THEORY

An understanding of capital structure theory will aid management in their endeavours to make the best decision on the financing of the firm. There are numerous theories on the

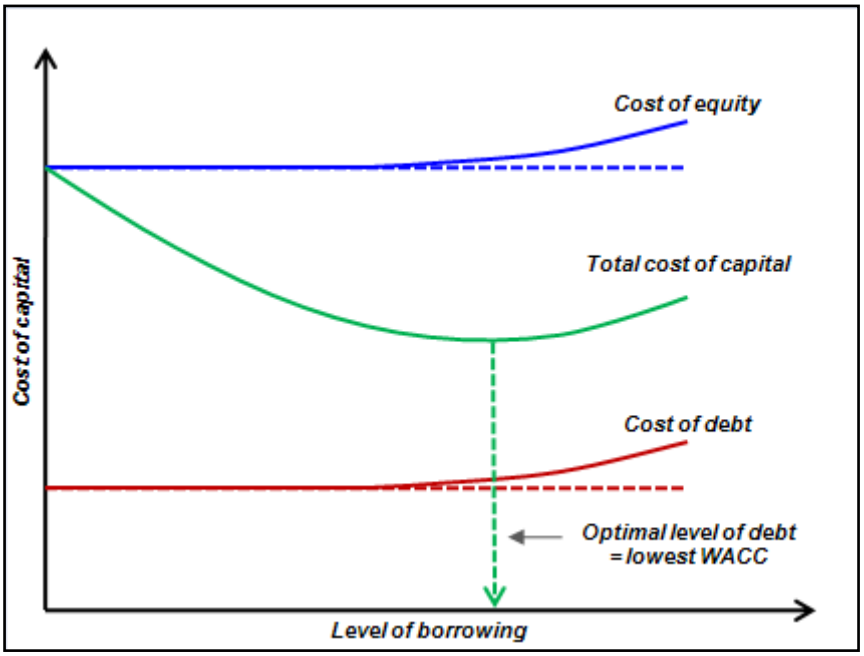
subject and although the theory does not provide all of the answers, it does provide useful insights which will aid management in their decision making process. The following is a brief review of the existing theories of capital structure in their chronological order of development.

2.1.1 Traditional Theory of Capital Structure

In the traditionalist view the cost of debt capital is cheaper than the cost of equity finance due to the tax benefits of debt (Atrill, 2009:342). These benefits, which make the real cost of debt lower than equity, result in a firm reducing its overall cost of capital if it were to increase its levels of borrowing.

If the situation were to hold under all circumstances then it would be best for a firm to increase its debt capital to very high levels. However, as the level of borrowing increases so does the financial risk of the firm. Ordinary shareholders become aware of this increase in risk and will require a greater return to compensate them for it. Thus the cost of equity would start to increase. Similarly, debt providers would also notice the increased financial risk of the firm and require a greater return for additional levels of debt provided to compensate them for the risk. Thus the cost of debt would increase at higher levels of gearing. This phenomenon is illustrated in the figure below.

Figure 2: Traditional Theory of Capital Structure



Source: (Atrill, 2009:343)

As can be seen in Figure 2 above, at fairly low levels of debt financing the overall cost of capital of the firm is reduced. At high levels of debt financing as financial risk increases, the cost of debt and equity financing starts to increase causing the overall cost of capital to increase as well.

This scenario put forward by traditionalists gives rise to the concept of optimal capital structure. The logic put fairly simply is that there exists a mix of debt and equity for a firm that will result in the overall cost of capital of the firm being at a minimum. Firms should strive to achieve this optimum mix as it is at this level that the value of the firm is maximised.

2.1.2 The Modigliani and Miller Propositions

At the forefront of modern capital structure theory are the propositions put forth by Modigliani and Miller (Modigliani & Miller, 1958:261-297; Modigliani & Miller, 1963:433-443; Miller, 1988:99-120) who, using economic theory established the well-known

Modigliani and Miller propositions I and II (hereafter referred to as MM I and MM II, respectively).

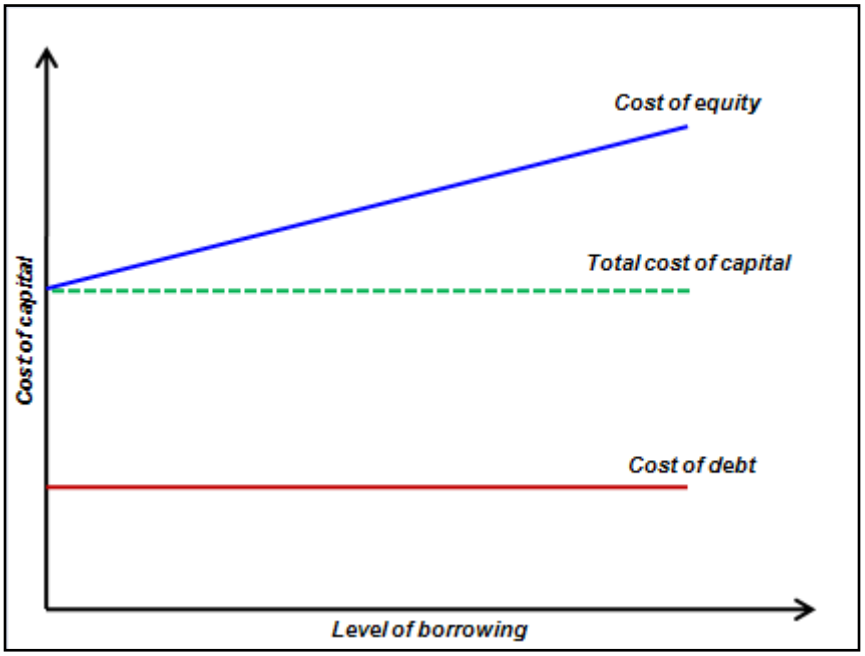
In developing their propositions the following assumptions were made:

- Capital markets are perfect;
    - No one person has the power to influence the price of goods. All assets are priced efficiently without the opportunity for arbitrage;
- There are no agency costs;
    - The incentives of managers, shareholders and creditors are appropriately aligned (Weston, 1989:30);
- There are no taxes;
    - There is no distinction between personal and corporate taxes. The effect of any taxation is minimal and does not influence the model put forward;
- There are no transaction and bankruptcy costs;
    - These are the legal and underwriting cost associated with equity issues. For debt issues, this can be the covenants imposed by creditors as well as the potential legal and administrative expenses that may be incurred during bankruptcy proceedings when financial risk is too high (Asaf, 2004:53);
- Ordinary investors can borrow at the same rate as firms;
    - No single market participant is of such size as to be able to influence the cost and availability of debt finance. Personal gearing is said to be a substitute for corporate gearing (Vigario, 2002:51);
- There is information symmetry between market participants;
    - All ordinary investors have the same information as a firm's management regarding the firm's future investment opportunities. Investors are said to act rationally and have the same expectations regarding future events and be indifferent to risk (Van Der Wijst, 1989:231).

According to the MM I (Modigliani & Miller, 1958:269), changes in a firm's capital structure have no long term effects on a firm's market value; hence the market value of a firm is

argued to be independent of its capital structure. This means that the choice of debt or equity sources of funding is irrelevant and can be considered to be perfect substitutes.

Figure 3: Modigliani and Miller Proposition I

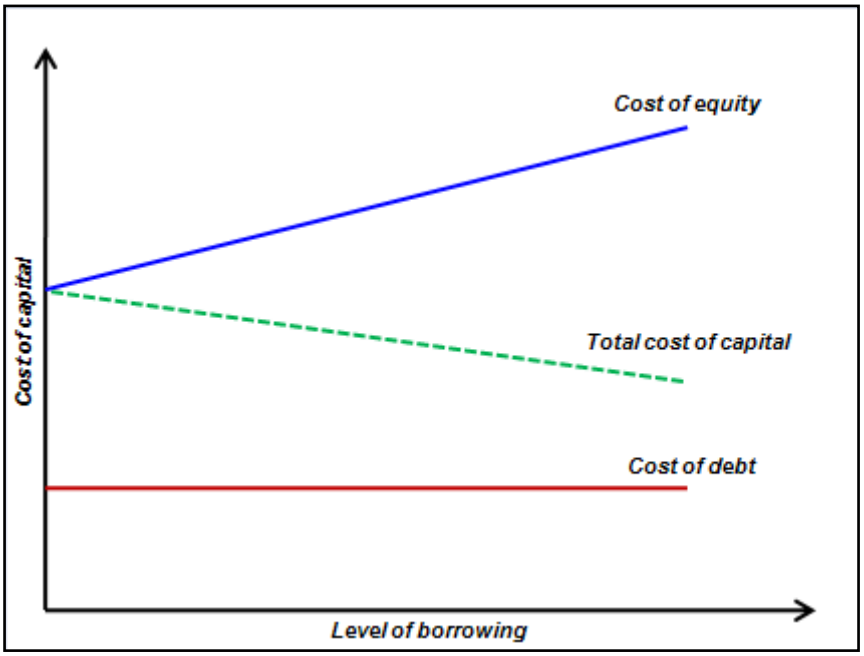


Source: (Atrill, 2009:344)

Figure 3 illustrates MM I which assumes that the overall cost of capital of a firm will remain constant at various levels of gearing. As the firm takes on larger amounts of cheaper debt financing, the financial risk of the firm increases. Ordinary shareholders would now require a greater return to compensate them for this increase in financial risk. The increased return that is required by ordinary shareholders negates the benefit of any cheaper debt financing and results in the average cost of capital staying constant.

After much criticism to their proposition I, Modigliani and Miller revised their thinking and put forth their second proposition in 1963. The second proposition (MM II) (Modigliani & Miller, 1963:433-443) relaxes the assumption of no taxes and also considers that interest payable on debt is tax deductible.

Figure 4: Modigliani and Miller Proposition II



Source: (Atrill, 2009:349)

Figure 4 illustrates MM II whereas debt financing increases the overall cost of capital decreases. Interest on debt is an allowable expense when determining a company's tax liability and lowers the tax burden. Thus it has an effect of shielding corporate profits which is a benefit to the ordinary shareholder. As the level of debt increases so too does the tax benefits which offsets some of the risk that the ordinary shareholder would require as per MM I. As the increases in the required return by ordinary shareholders is lower than the benefits of debt, the overall cost of capital decreases as the level of borrowing increases.

In the absence of bankruptcy costs and financial distress implications MM II promotes high levels of debt financing due to the after tax cost of debt being lower that the cost of equity and its resultant decreasing of the overall cost of capital to the firm. One can conclude that to continue in this manner, the optimal level of is at a 100% level of gearing (Atrill, 2009:349).

MM II was said to be closer aligned to the traditional theory as it recognised the relationship between the value of the firm and its level of debt financing. The recognition

of this relationship alludes to the existence of an optimal level of gearing and capital structure (Atrill, 2009:349).

Almost 15 years later Professor Miller revised MM II (1977:261-275) to take into account the effects of personal taxes as well as corporate taxes. In essence Miller stated that due to returns on stocks being taxed at relatively lower rates to returns on bonds/debt, an investor would be willing to accept a lower pre-return from stocks relative to the pre-tax return on bonds/debt.

Miller pointed out two key findings:

- The deductibility of interest for tax purposes makes the use of debt financing favourable for a firm (1977:267);
- The lower tax rates on returns from equity for the investor lowers the cost of equity and makes equity financing more favourable for the firm. This is applicable in the United States as tax rates are based on a sliding scale, whereas in South Africa they are based on a flat rate (1977:268).

The above two statements are directly opposed to each other and leaves one with the question, which is a better method of financing to use, debt or equity? Miller went on to prove that although the presence of personal taxes lowers the cost of equity financing, it does not completely offset the savings from the lower cost of debt financing (Brigham & Ehrhardt, 2005:559).

2.1.3 The Trade-off Theory

The publications by Modigliani and Miller led to a surge in research where the primary focus was either to prove or disprove the Modigliani and Miller propositions. As MM I is based on a very restrictive set of assumptions, it is only logical that further tests would be conducted to determine if MM I would still hold if these assumptions were to change. The trade-off theory arose due to the relaxation of such assumptions. Kjellman and Hansén stated that “the static trade-off model states that value maximising firms chooses the target debt/equity ratio that maximises firm value by minimising the costs of prevailing market imperfections, such as taxes, bankruptcy costs, and agency costs” (1995:92).

MM I states that in a perfect capital market it is irrelevant how a firm chooses to raise finance as the financing decision has no impact on firm value. However, capital markets are imperfect and the existence of bankruptcy costs, taxes and agency costs imply that MM I does not apply in reality. Modigliani and Miller then followed up their article in 1963 and introduced corporate taxes and suggested that to achieve maximum value a firm should have 100% debt. The environment in which a firm operates, taxes, bankruptcy costs, agency costs, asymmetric information as well as non-debt tax credits restricts a firm from using 100% debt, thus the solution provided by MM II seems too extreme in reality.

In reality, bankruptcy costs can be quite onerous and can be incurred not only when bankruptcy proceedings are in process, but also when the threat of bankruptcy is imminent. Firms that are experiencing bankruptcy issues have high legal and accounting related expenses, costs of debt covenants as well as the potential loss of clients/suppliers, impaired ability to conduct business.

The trade-off theory attempts to incorporate the costs of financial distress into the capital structure decision. According to Myers the value of the firm per the trade-off theory is as follows (2003:221):

Equation 2: Trade-off Theory's Value of the Firm

$$V = Vu + PVt + PVfd$$

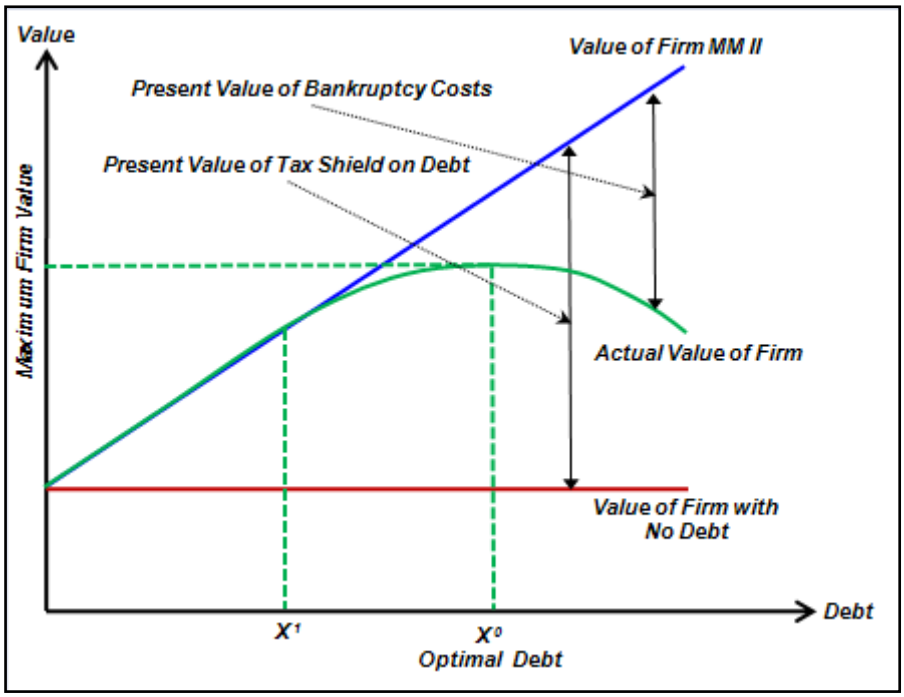
Where:

- V = value of the firm;
- V_u = value of an unlevered firm;
- PV_t = present value of interest tax shields;
- PV_{fd} = present value of the cost of financial distress.

According to the trade-off theory, a firm must decide on a target debt ratio which maximises its value and then slowly move towards that target debt ratio. The optimal

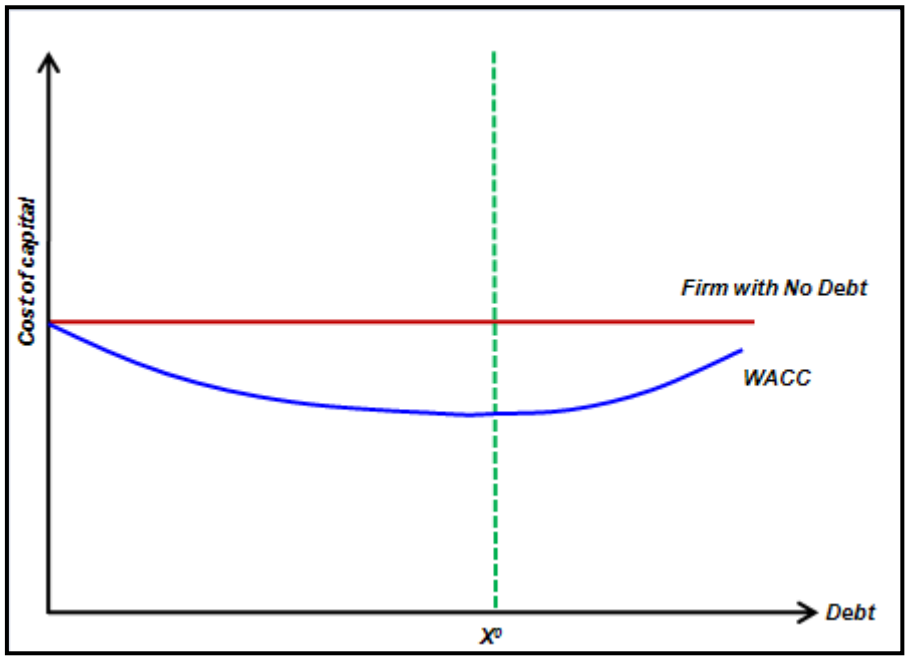
capital structure is found when the marginal benefit of each incremental unit of debt (i.e. interest tax shields) is equal to marginal cost of each incremental unit of debt (i.e. financial distress costs) (Gwatidzo, 2008:76). This phenomenon is displayed in Figure 5 below:

Figure 5: Trade of Theory's Value of the Firm



Source: (Ross, Westerfield, Jaffe & Jordan, 2008:465)

Figure 6: Trade of Theory's Cost of Capital



Source: (Ross *et al*., 2008:465)

Figure 6 above shows the flat value of an all equity financed firm in contrast with the sharply rising value of a firm with debt financing under MM II. The difference in value between the all equity financed firm and the firm that utilizes debt finance being the present value of the tax deductibility of interest payments. Trade-off theory however incorporates the effects of financial distress costs which MM II neglects. Trade-off theory show that at point X^1 financial distress costs become material for increasing levels of debt and start showing adverse impacts on the firm's rate of value growth. The value of the firm is maximised at point X^0 and it is at this point that the level of debt financing is at an optimum. For levels of debt financing beyond point X^0 the costs of financial distress become so onerous that the value of the firm starts to decline. Figure 6 shows the point X^0 as the level of debt where the value of the firm is maximised as also the level at which the WACC is minimised. Thus, per trade-off theory, a financial manager seeking to maximise the value of their firm should seek to minimise the WACC of that firm.

The trade-off theory recognises that firms may have different capital structures and does not promote a one-size-fits-all approach. It does suggest that firms with fairly high profit income levels and safe fixed assets may have high target debt/equity ratios as they have

larger profits to service interest payments without incurring adverse financial distress costs, whereas firms that are experiencing losses or a slump in earnings and risky assets may choose to rely more heavily on equity funding (Myers, 2001:91).

Although some companies may have identical target debt/equity ratios, they may not be comparable in the short-term. This is primarily due to the fact that changing a firm's capital structure has a significant cost component attached to it and this prevents firms from making any immediate changes to its capital structure. The time lag that these costs would cause would make companies actual debt/equity ratios dissimilar but over the long-term these company's debt/equity ratios should tend towards their optimum.

2.1.4 The Pecking Order Theory

The theories discussed thus far assume that all investors have access to relevant information regarding a firm's future earnings prospect. In reality, this assumption may not be valid. It can be argued that managers and employees of a company, i.e. insiders, have access to information about a firm's earnings prospects and future cash flow that the ordinary investor does not. This situation is referred to as asymmetric information.

Myers and Majluf (1984:15) theorised that the equity of a firm will be mispriced by the market when the management of that firm holds more information about the future prospects of the firm and condition of its assets as compared to outside shareholders. According to Myers and Majluf (1984:47), the market tends to conclude that the shares of an issuing firm are overvalued, which in turn leads to lower proceeds for a share issuing firm. The important fact here is that managers will only issue shares when they are overvalued in order to protect the interests of existing shareholders. Issuing under-priced shares would actually result in the transfer of wealth from old to new shareholders. Since the market is aware of this, an issue of shares by a firm will thus be construed as a signal that the shares are overvalued, or as bad information about an issuing firms' quality. The result is that the price of shares tends to fall after a share issue. This can be so severe as to force the managers to pass-up positive NPV projects (Gwatidzo, 2008:80).

Internal funds or debt involve little or no undervaluation or information costs and therefore will be preferred to equity by firms in this situation. In other words, management prefer internal funds to external funds and if there is any need for external funds they will go for debt rather than equity. Myers refers to this behaviour as the "pecking order" theory of financing (1984:576). A firm will generally choose to finance an investment with internal funds such as retained earnings first, followed by new debt and finally with new equity.

According to the pecking order theory the following implications arise:

- A firm may not have a target capital structure. Rather a firm's capital structure is as a result of a series of short-term financing choices viewed over the long-term. The short-term financing choices are merely deciding which item on the pecking order is more desirable at a particular point in time.
- Highly profitable firms make less use of debt. As a profitable firm is most likely to have large retained earnings, its need for external financing is limited or minimal (Ross *et al*., 2008:474).
- Firms prefer financial capacity. As the pecking order theory is based on the costs of obtaining financing, it stands to reason that the marginal costs of financing of new projects does not become an issue if the financial capacity were available in advance to fund future projects. Firms will be able to make use of funds immediately available to pursue opportunities when they arise rather than waste time and cost in approaching the capital markets. However management must exercise caution as excess availability of cash can lead to temptation for investing in projects that do not necessarily add value to the firm.

The pecking order theory assumes that management behaviour and actions are in the best interests of existing shareholders and any equity issues are due to current equity being overvalued and such value is to be transferred to existing shareholders upon the new issue (Myers, 2001:95). But Myers and Majluf (1984:46) were unable to prove whether or not managers care if a new stock issue is over- or undervalued which brings the pecking order theory under scrutiny. Also, they make no mention of how management incentives schemes affect the choice between debt and equity issues as mentioned under signalling theory by Ross (1977b:28). Frank and Goyal (2003:217-248), performed a later study which tested the pecking order theory by analysing the financing patterns of American

firms for the period 1971 to 1998. In their findings Frank and Goyal found little evidence to support the pecking order theory and argued that equity issues are more closely correlated with financing deficits rather than debt (Frank & Goyal, 2003:241).

2.1.5 Signalling Theory

Another theory born out of the concept of asymmetric information is "signalling theory". This theory was made popular by Ross (1977a; 1977b). In order to understand signalling theory let us consider the following examples, one firm where management is very positive about the firm's future earnings prospects (Firm A) and another where management is very negative about the firm's future earnings prospects (Firm B).

Firm A, when faced with an investment decision will consider whether to proceed with equity or debt financing. New issues of equity can be considerably expensive with the issue costs involved and as outlined in the pecking order theory, is not favoured by management as it conveys to investors the notion that the shares are undervalued. Also, firm A's management is confident about the future earnings of the firm and its financial health and the servicing of increased debt is of little concern. If Firm A proceeds to make use of debt financing, it is likely that ordinary investors will interpret this as a signal from management that they believe that the share is undervalued and the future earnings prospects are favourable.

Conversely, Firm B when faced with the same investment decision may approach the matter in a different light. As the future earnings prospects are not promising and the likelihood of losses is high, taking on additional debt might be too much of a strain on cash flow. Rather, they might consider equity financing as the most viable option. A larger number of investors mean more people to apportion the losses to. Markets may read this as a signal from management that the shares are overvalued and as a result the share price may drop.

Investors view the actions of management as a signal regarding the status of the firm and a transfer of information. Ross argued that the value of a firm will increase with the addition of leverage as the increased leverage causes the market's perception of the firm's

value to improve (1977b:38). Ross also stated that the increasing of leverage can be a costly signal for a firm (1977b:38). A good firm would adopt a higher debt ratio than a poor firm as the manager of a good firm would be confident of the future prospects of the good firm due to insider information of the good firm's future prospects and its ability to safely service higher debt payments.

Tsai (2008:243) made an important criticism of Ross's model by stating that the main reason for the undervaluation arises as the market's valuation of future prospects is lower than the true value rather than the signalling of the equity issue as argued by Ross. Also, there is an incentive for managers of large corporate to convey signals such that the value of the firm would increase, but may not always convey the correct message to the market regarding the firms prospects, but rather convey messages to the managers' benefit. This growth via the signal would enable them to cash up their shares at a higher value (Gwatidzo, 2008:80).

The signalling theory is however a poor predictor of actual behaviour. It suggests that firms with increased leverage will realise an increase in value when studies have shown that too much debt can lead to decreases in value due to the high costs of financial distress. It also suggests that newer firms with high prospects should use more debt, but actually it is mature firms that make use of increased leverage (Ghosh, Cai, & Fosberg, 2008:9).

2.1.6 Agency Cost Theories

In modern corporations there is a separation of ownership and control where most firms are managed by managers who act as agents of shareholders. These managers do not necessarily own shares in the firm and as such this relationship is fraught with agency problems. The shareholders and managers, consciously or unconsciously, serve their own interests. While shareholders would want to see the maximisation of firm value, the management may want to maximize their own selfish interests. Examples of such interests may be to invest in certain projects which yield the best result on net profits in the short-term in order to inflate their bonuses. Also they may be inclined to misuse company funds by incurring huge on the job expenses (Gwatidzo, 2008:86).

The investors of a firm are aware of the managers' opportunistic behaviour and thus take it into account when valuing the firm's shares. They will offer a lower price than when there is no opportunistic behaviour. According to the agency theory, the observed capital structure of a firm should thus aim to minimize the potential for opportunistic behaviour in the firm. The extent of opportunistic behaviour depends on the environment in which the firm is operating. For example, an efficient legal system that protects investors' rights curbs opportunistic behaviour by management. In most developing economies the legal system is not efficient; therefore there are high chances for opportunistic behaviour by management.

Some of the ways of mitigating the conflict between management and investors (Gwatidzo, 2008:90) are:

- Issuing debt - Issuing debt rather than equity forces management to contractually commit themselves to a given level of payment to investors (lenders), thus reducing opportunistic behaviour;
- Issuing short-term debt – Issuing short-term debt forces management to the negotiation table periodically, thus making the issuance and payment of debt more like a repeated game in which the management is punished by the creditors if they are seen to be behaving in any way detrimental to the creditors;
- In addition to the above, the conflict of interest between equity holders and debt holders can be mitigated by designing debt covenants that protect the interests of debt holders;
- In the event that long-term debt is issued, it may be secured with specific assets;
- Another way is to just increase debt levels in industries where the potential for opportunistic behaviour is high.

2.1.7 Market Timing Theory

The market timing theory is one of the more recent theories and is purported by Baker and Wurgler (2002:1-32). The theory as explained by Baker and Wurgler is simply that a firm's current capital structure is merely the result of all historical attempts to time the equity market (Baker & Wurgler, 2002:27). Managers would look at conditions in the debt and

equity markets and issue either debt or equity based on which was more favourable at the time. At times when conditions are favourable additional finance may be raised to exploit the favourable circumstances even if there were no immediate projects that warranted such finance (Frank & Goyal, 2009:7).

Baker and Wurgler (Baker & Wurgler, 2002:27) mention two instances where equity market timing may result in the dynamics of capital structure being similar:

- With rational investors or managers and unfavourable selection costs;
- With irrational investors or managers and perceived mispricing.

Baker and Wurgler (cited in Dreyer, 2010:34) outline some major findings of empirical studies that lend credibility to their theory:

- Management would tend to only issue shares when the prices of their shares are high, issue cost is low and the firm's cost of equity is relatively lower than debt. Conversely, when the value of a firm's equity is low, management may seek to raise finance with the issuance of debt and may seek to repurchase their equity;
- The timing of equity markets usually is successful when one analyses the long-term performance of share prices and share issues;
- It is more likely for firms to issue equity where there is confidence in the market with regard to its future prospects as this confidence is more likely to fetch a higher asking price on equities issued.
- Almost two-thirds of Chief Financial Officers (CFOs) that were interviewed admitted to some form of market timing.

2.1.8 Determinants of Capital Structure in Practice

From a practical perspective it is quite onerous to apply any of the above theories to a firm consistently in actual circumstances. The theories mentioned are based on some rigid assumptions and may not always hold when these assumptions are challenged as is in practice. These theories however are not meant to be exhaustive in their explanation of capital structure but rather provide a financial manager with a toolkit to utilize in their decision making.

One approach that is gaining wide acceptance is where a firm establishes a range of acceptable capital structures that over time lead to the WACC being minimized (Correia, Flynn, Uliana, & Wormald, 1993:590). As a whole range of capital structures are deemed to be optimal, the selection of a particular capital structure is made easier. If a firm deviates marginally from its target over time it will be acceptable provided that the new level is within the acceptable range.

In practice the following issues influence the capital structure decision and must be considered:

- Debt and debt capacity. The tax deductibility of interest payments makes debt comparatively cheaper than equity and as such all firms should make use of debt in their capital structure. However, too much debt increases financial risk and financial distress costs and as such debt levels should be kept below levels at which these distress cost become material;
- Flexibility and ease of raising capital. In some circumstances debt is easier and cheaper to issue that equity financing;
- Due to the effects of asymmetric information, low growth firms should follow a pecking order. They should utilise capital from internal sources first, then from debt and finally from issuing equity (Brigham & Ehrhardt, 2005:605);
- Firms should maintain some financial slack in order to invest in projects quickly as they arise instead of having to issue stock at unfavourable prices (Brigham & Ehrhardt, 2005:606).

3 CAPITAL REGULATION REVIEW

Although banks are profit-making institutions and managed with the aim of generating wealth for their shareholders, they play a crucial role in a country's economy. They are deposit-taking institutions and act as the custodians of the public's money. They provide loan finance to clients and trade in various types of assets. They are the transmission mechanism for monetary policy and providers of other specialised functions, such as trading in foreign currencies.

Bank regulators, concerned with the stability of the economy, face agency conflicts regarding the firms that they supervise. As mentioned earlier, agency problems occur when there are different goals and objectives, asymmetric information or dishonesty. Drummond (2009:808) makes reference to three important reasons for banking supervision by regulators:

- Banks provide certain services which are crucial to society, such as the payments system and the provision of loan finance to the public;
- Some activities by banks are naturally exposed to risks, such as interest rate risk, currency risk, liquidity risk and credit risk; and
- Any potential risks that impact a bank and its processes contribute to systemic risk and could jeopardise the financial stability of an economy.

Banking authorities use the process of regulatory interference in order to correct a perceived unsafe/unsound banking practice or to drive behaviour in a certain way to mitigate systemic risk. The major instrument of regulatory interference against banks is capital regulation. Other instruments used in bank regulation are deposit insurance, regulatory monitoring, merger restrictions, et cetera. Our focus shall now turn to the current regulations and standards of best practice that impact a bank's capital structure decision.

3.1 THE BANKS ACT

The Banks Act (94/1990) is an act of legislature enacted by parliament that regulates all companies within the borders of South Africa that continue the business of accepting deposits from the public. The primary function of the Banks Act is to outline the rules and procedures for regulating banking entities and to enable their on-going supervision.

Pursuant to this purpose it provides for the South African Reserve Bank (SARB) to elect an official who shall be the Registrar of banks and have special powers of office. The registrar shall be able to:

- Conduct inspections of banks;
- Set up a supervisory process and review of all banks;
- Be able to implement standards of best practice for banks to follow;
- Report back to the Minister of Finance annually.

The Act goings into great detail on ways in which a bank needs to conduct itself, but its most pertinent section is that of prudential requirements. The prudential requirements dictate the minimum level of share capital and reserves that a bank should maintain for certain activities, limitations on dealings to reduce concentration risk and possible actions to be taken against banks which do not comply with these requirements.

3.2 THE BASEL ACCORDS

The Basel Committee on Banking Supervision issued the second Basel Accord in 2004, which outlined the minimum capital requirements to be followed by the most significant banks worldwide and therefore has important financial stability implications.

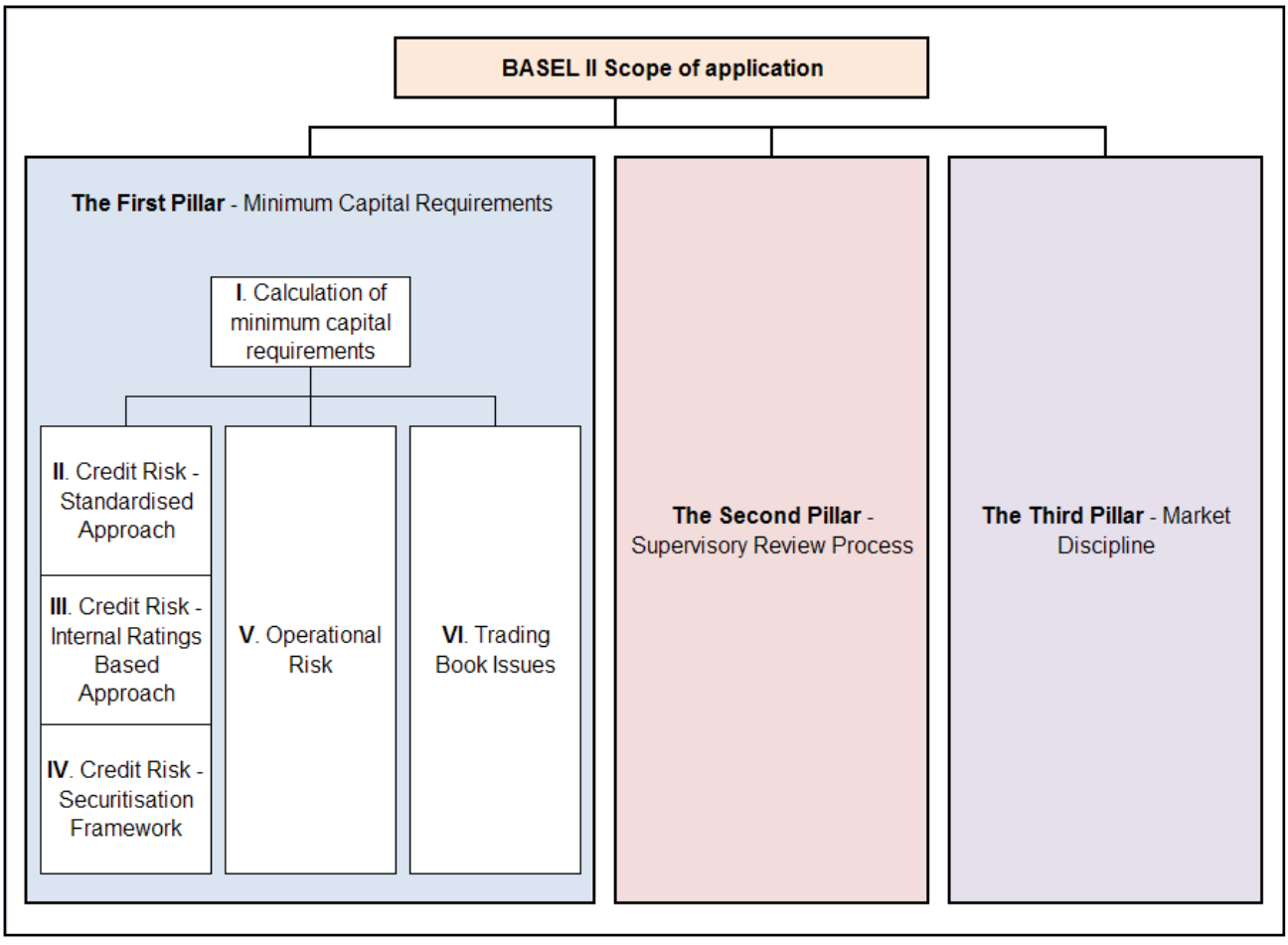
The original Accord was introduced to the G10 in 1988 and has to date been adopted by over 100 countries (Jackson & Emblow, 2001:118).The original Basel Accord was based on broad credit risk requirements and has over the years been amended to introduce trading book requirements as well. The original Basel Accord put forward a requirement of a total risk-weighted capital ratio of 8% that each bank should adhere to (Basel Committee on Banking Supervision, 1988:28). This ratio was calculated as the ratio of a bank's capital

to that bank's total risk-weighted assets. Failure to adhere to this minimum would result in the shareholders being able to recapitalise the bank in question. Regulatory authorities could thereafter step in and proceed with the liquidation of the bank if the shareholders failed to act. Banks could achieve this regulatory minimum in various ways; either by issuing new equity, decrease the amount of their assets, or they could merely change the portfolio mix of their assets by switching to lower risk assets while keeping their overall asset level constant (Cumming & Nel, 2005:641).

The original Basel Accord succeeded in raising international capital levels but came under considerable criticism. Due to this criticism the second accord was drafted which sought to improve on the imperfections of the first.

The second version of the Accord as illustrated in Figure 7 below has three pillars.

Figure 7: Structure of the Basel II Accord



Source: (Basel Committee on Banking Supervision, 2005:6)

Pillar 1 relates to the minimum capital requirements and prescribes the appropriate minimum capital requirements to cater for market risk, operational risk and credit risk (Basel Committee on Banking Supervision, 2005:12).

Pillar 2 relates to the supervisory review process and defines the roles of banking supervisors and describes the powers conferred unto them (Basel Committee on Banking Supervision, 2005:204). Pillar 2 also details how a bank's management should go about in its management of the risks as defined in Pillar 1. Basel II was an improvement over Basel I as it created the framework for supervisors to have greater involvement n the review and regulation of banks.

Pillar 3 relates to market discipline and sets out the policies of best practice that a bank should follow to adequately disclose information to the public regarding their risk exposures, risk profile and risk mitigation practises (Basel Committee on Banking Supervision, 2005:226).

Before we delve into the details of each pillar of Basel II, we must first consider what the accord describes capital to be.

The Committee recommends that capital be divided into tiers, with Tier 1 making up 50% of the capital base and the remaining 50% being a combination of Tier 2 and tier 3 capital.

- Tier 1 Capital (Core capital): This type of capital comprises of mainly equity and disclosed reserves. These are the only items of capital that are readily disclosed in financial statements and are common items in the majority of countries banks;
- Tier 2 Capital (Supplementary capital): The following items would constitute supplementary capital:
    - Undisclosed or hidden reserves;
    - General provisions;
    - Revaluation reserves;

- Hybrid instruments; and
- Subordinated debt

- Tier 3 Capital (Short-term to cover market risk): A third tier of capital may be employed. This tier of capital may only consist of the short-term subordinated debt which was used for the purposes of mitigating exposure to market risks.

3.2.1 Pillar 1: Minimum Capital Requirements

The definition of risk-weighted assets and regulatory capital is used to calculate the capital ratio. The capital ratio should not fall below 8% for either operational, market or credit risk (Basel Committee on Banking Supervision, 2005:12). Tier 2 capital cannot exceed 100% of Tier 1 capital (Basel Committee on Banking Supervision, 2005:12) and Tier 3 capital cannot exceed 250% of Tier 1 capital (Basel Committee on Banking Supervision, 2006:16).

The Basel Committee prescribes two broad approaches, which a bank must choose between, to calculate their capital requirements for credit risk. The Standardised Approach promotes the use of external credit ratings and assessments to measure credit risk and the Internal Ratings-Based Approach allows a bank to devise an internal rating system to measure credit risk (the public regarding their risk exposures, risk profile and risk mitigation practises (Basel Committee on Banking Supervision, 2005:19).

The Basel II Accord also outlines three methods for calculating capital charges related to operational risk (Basel Committee on Banking Supervision, 2005:144), each of which is of increasing complexity:

- The Basic Indicator Approach,
- the Standardised Approach,
- Advanced Measurement Approaches (AMA).

Lastly, the Basel II Accord outlines two broad approaches to measure market risks of which a bank made adopt only one. A bank may adopt a standardised approach,

which makes use of external assessments, or make use of an internal risk management model.

3.2.2 Pillar 2: Supervisory Review Process

The purpose of the supervisory review process is promote the development of improved risk monitoring processes and risk mitigation techniques adopted by banks and to ensure that through this process bank's maintain sufficient capital to address all the risks that they face. These processes are to be evaluated by regulatory bodies and corrections put forward where necessary..

The Basel Committee identifies four key principles of supervisory review:

- Principle 1: A bank must maintain a process that assesses their capital adequacy relative to their risk profile and formulate strategies in order to maintain their capital adequacy levels (Basel Committee on Banking Supervision, 2005:205);
- Principle 2: Supervisory authorities should review a bank's capital adequacy levels with regard to regulatory capital ratios and evaluate the bank's processes and strategies for calculating these capital adequacy ratios and adhering to regulatory standards. Where a supervisory body is not satisfied with their evaluation, they are encouraged to take disciplinary action against the offending bank (Basel Committee on Banking Supervision, 2005:209);
- Principle 3: A supervisory body may expect a bank to hold capital in excess of the minimum requirements (Basel Committee on Banking Supervision, 2005:211); and
- Principle 4: Supervisors are encouraged not only to intervene and act quickly when the capital adequacy of a bank falls below the regulatory minimum levels, but also to intervene before a bank's capital adequacy levels drop below levels that are necessary to support its individual risk profile (Basel Committee on Banking Supervision, 2005:212).

3.2.3 Pillar 3: Market Discipline

The main aim of Pillar 3 is to prescribe the disclosure requirements that a bank should adhere to in order to enable market participants to assess the bank's capital adequacy for themselves. This would ensure better market discipline and will complement Pillar 1 (minimum capital requirements) and Pillar 2 (supervisory review process).

The medium and location used for the disclosure of the relevant information under Pillar 3 is left to the discretion of management (Basel Committee on Banking Supervision, 2005:227). Although management is encouraged to make the disclosure in one document and make it available is one source, the committee accepts that this may not always be feasible. The committee recognises that some disclosure will be made due to adherence to regulatory accounting standards or listing requirement, but this may not be as comprehensive as the requirements put forth by the Basel II Accord. In circumstances where the disclosure in the financial statements is not comprehensive, the committee recommends that management make the additional disclosures available to market participants via alternate reports or locations such as regulatory submissions or on the internet. In instances where management does not provide access to its full disclosure document, it should at least indicate where such information can be found.

The Basel committee's goal is to promote a more resilient banking sector and attempt to achieve this by establishing standards of best practice to strengthen global capital and liquidity regulations. The committee meets regularly to put forward enhancements to current standards and regulations. The committee identified that in the early stages of the financial crisis in 2007 (Basel Committee on Banking Supervision, 2010a:1), most banks were unable to meet their liquidity requirements due to less than optimal management of liquidity, despite adequate capital levels. The Basel committee then responded to these findings regarding the recent global financial crisis by issuing the third iteration of their accord in December 2010 (Basel Committee on Banking Supervision, 2010b:1-77). Basel III was revised in June 2011 and put forward numerous enhancements to the preceding Basel II Accord.

3.2.4 Basel III Enhancements

The enhancements put forward by the Basel committee as part of Basel III (Basel Committee on Banking Supervision, 2010a:2) relate mainly to the capital requirements of banks and the liquidity risk management processes adopted by banks.

Under Basel III, a bank's common-equity Tier 1 capital must be a minimum of 4.5% of its risk weighted assets (RWA) at all times (Basel Committee on Banking Supervision, 2011:12). The committee also requires banks to build up excess capital during periods when there is no stress as a 'capital conservation buffer'. This capital conservation buffer, which comprises solely of Tier 1 capital, is 2.5% of RWA (Basel Committee on Banking Supervision, 2011:55). Banks who meet the minimum capital adequacy requirements but have no capital conservation buffer would have restrictions placed on their capital distributions until such time that they were able to meet the require buffer level.

Basel II put forward a recommendation that banks must hold additional capital in the form of a countercyclical buffer to protect them in periods where there is a rapid growth in the risks of system wide stress. The appropriate level has not yet been set for the countercyclical buffer, but rather left to the regulatory body of each member country to determine.

Basel III aims to strengthen the practices of liquidity risk management and puts forward the standards of best practice as devised by the Basel committee. The new standards of liquidity funding have been designed to ensure that a bank has sufficient funding to meet its obligations during periods of stress in both the short and long-term.

- Liquidity Coverage Ratio (LCR)

Adherence to proper maintenance of this ratio should enable a bank to meet its liquidity needs for a period of 30 days during a severe liquidity stress scenario.

This ratio is calculated as follows:

Equation 3 Basel III Liquidity Coverage Ratio

$$\frac{\text{Stock of high quality assets}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

Source: (Basel Committee on Banking Supervision, 2010a:3)

Banks are expected to maintain this ratio at all times in order to protect themselves if a potential severe liquidity stress situation arises.

To be meet the definition of a high quality liquid asset, an instrument should meet the following criteria (Basel Committee on Banking Supervision, 2010a:5):

- Should have low credit and market risk;
- Should be easy to perform a reliable valuation;
- Should have a low correlation with risky assets;
- Should be listed on a developed and recognised exchange market;
- The sale and repurchase market for the asset should be active and of large size at all times;
- Quotes for the asset must be readily available;
- The assets trade market must have a diverse group of buyers and sellers;
- The assets market must have shown to be a place of convergence in a systemic crisis.

- Net Stable Funding Ratio (NSFR)

Adherence to proper maintenance of this ratio should enable a bank to meet its liquidity needs over a one year time horizon.

This ratio is calculated as follows:

Equation 4 Basel III Net Stable Funding Ratio

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

Source: (Basel Committee on Banking Supervision, 2010a:25)

Banks are expected to maintain this ratio with debt and equity instruments which are expected to be reliable sources of funding for a period of one year under a potential stress situation.

The Basel III Accord lists some sources of available stable funding as (Basel Committee on Banking Supervision, 2010a:26):

- A bank's capital;
- A bank's preferential stock due to mature in either a year or longer period;
- A bank's liabilities due to mature in either a year or longer period;
- The amount of non-maturity and/or term deposits which are due to mature in less than a year, but which would remain with the bank for a longer period during a stress situation;
- The amount of wholesale funding which is due to mature in less than a year, but which would remain with the bank for a longer period during a stress situation.

The above ratios, LCR and NSFR, are enhancements to Pillar I of the Basel Accord and the committee encourages regulatory bodies to ensure that these metrics as well as overall liquidity risk management be monitored regularly as part of Pillar II.

In summary the capital requirements as specified by the Basel Committee post Basel II is depicted in Table 2 as follows:

Table 2: Basel Capital Requirements

Capital Requirements			
	Common Equity Tier 1	**Tier 1 Capital**	**Total capital**
Minimum	4.5%	6.0%	8.0%
Conservation Buffer	2.5%		
Minimum plus conservation buffer	7.0%	8.5%	10.5%
Countercyclical Buffer range	0% - 2.5%		

Source: (Basel Committee on Banking Supervision, 2011:64)

The practice of banking regulation is purely to promote the soundness and stability of banking systems. Whether current regulations achieve this aim is debateable, however, it has been shown by the Basel Committee that improving the safety and soundness of the global financial system by increasing the minimum capital and liquidity requirements from their current levels, results in clear net long-term economic benefits (South African Reserve Bank, 2010:14). These benefits are mainly achieved via the lower probability of financial crises and the losses stemming from them.

The effect of banking supervision on the South African banks has yet to be established and shall form a part of the analysis later in this study.

In the next chapter the research propositions are discussed.

4 RESEARCH PROPOSITIONS AND METHODOLOGY

The scope of the literature and regulatory review was developed to create a theoretical foundation of knowledge about the factors that influence the capital structure decision in a bank. The purpose of this study is to assess the implications of that decision on South African banks.

4.1 RESEARCH PROPOSITIONS

To investigate and understand the implications of capital structure theory and regulation for South African banks, the following propositions are made:

4.1.1 Proposition 1: Increases in leverage increases a bank's profitability

The more debt that a bank uses, the less it needs equity to finance its activities. The additional debt financing will allow the bank greater opportunity to generate profits and has tax advantages as well.

4.1.2 Proposition 2: An increase in leverage increases a bank's market value

Both MM II and the trade-off theory referred to in chapter two states that a firm can increase its value by increasing its usage of debt finance. MM II states that the firm will continue to increase its value by increasing its usage of debt as debt is cheaper to tax advantages and will lower the firms WACC and in turn raise its value. The trade-off theory supports the use of debt to increase a firm's value but only in instances where the marginal benefits of tax deductible debt outweigh the marginal increases in bankruptcy costs. Firm value will be measured by Earnings Per Share (EPS), Price Earnings Ratio (P/E), Price to Book Value (Price/Book) and the Market to Book ratio.

4.1.3 Proposition 3: Larger banks borrow more than smaller banks

The reasoning is that larger banks have greater market presence and power and they are able to absorb the costs of financial distress better than a small bank would. Also, larger banks have greater ability to raise debt finance as they have larger volumes of assets to collateralize.

4.1.4 Proposition 4: An increase in leverage increases the volatility of a bank's earnings

An increase in the amount of debt a bank uses increases the cost to service that debt. Additional security may be sought by regulatory bodies in the form of insurances, guarantees and equity holdings which are very costly. The increased financial leverage may also cause a bank's management to be overly cautious when investing in high value projects which may hamper the bottom line. The proxy for a bank's risk is the standard deviation of each bank's ROE (Earnings/Capital) and Provisions for Loan Loss/Total Loans.

4.1.5 Proposition 5: An increase in leverage increases a bank's financial distress and probability of failure

Increased debt levels translate into increased costs to service that debt. This places addition stress on the bank's cash flow and as such raises the level of financial distress. The trade-off theory states that the increased costs of financial distress would raise the cost of capital and therefore cause the bank's value to decline. Financial distress will be measured by the Interest Cover (Interest/EBIT and Interest/Cash Flow) and probability of failure will be measured by the Bureau of Financial Analysis (BFA) financial distress model.

4.1.6 Proposition 6: Over time a bank's leverage will migrate towards industry mean levels

The great degree of regulation on banks suggests that they will tend towards the stipulated regulatory target levels of debt and capital over time. Capital structure theory, on the other hand suggests that banks would adopt a capital structure that would maximise their individual values rather than tend towards an industry level.

This remainder of chapter provides a description of the research design as well as the sampling, data collection and analysis methods used in the study and also address the quality and rigour of the research design as well as the research ethics associated with this study.

4.2 DESCRIPTION OF INQUIRY STRATEGY AND BROAD RESEARCH DESIGN

The proposed empirical research for the study will take the form of an exploratory, quantitative, cross-sectional research utilising secondary data. The information utilised relating to the capital structure of banks and their financial performance was sourced from the McGregor BFA online database. The data was confined to banks listed on the Johannesburg Stock Exchange (JSE) for the period under review.

The rationale behind selecting this methodology is discussed below and has the following core research characteristics:

- *Empirical*: This is an empirical study as it involves the analysis of secondary data in order to test hypotheses or to validate models;
- *Basic (pure/fundamental)*: The purpose of basic research outlined by Saunders, Lewis and Thornhill (2009:8), is to increase the knowledge of business process, management and research which enable the formulation of universal principles regarding these processes and their relationship to outcomes. This study does not attempt to solve a particular management problem, but rather to better understand it and as such can be classified as basic research;
- *Exploratory*: Exploratory studies are useful in understanding what the problem is, to seek additional insights and to consider events in an alternate point of view (Saunders, *et al*. 2009:139). This research is exploratory as the aim of the data analysis is to find patterns and trends which will grant us further insight into the impact of capital structure and regulation specific to South African banking institutions. The process of data analysis lends itself to the exploratory research process and does not allow much more;
- *Non-experimental research*: Experimental research is primarily concerned with identifying causal links and investigates whether a change in one variable produces a variation in another dependant variable (Saunders, *et al*. 2009:142) This study does not intend to identify causal links and through the analysis of historical data attempts to identify trends and therefore can be classified as non-experimental;

- *Cross-sectional and longitudinal*: This study involves the analysis of several banks over time. This introduces both cross sectional (banks) and longitudinal (time series) components;
- *Secondary data*: Only existing financial data collected by McGregor BFA and published financials available to the public will be analysed. This data has not been produced for the sole purpose of this study and as such is categorised as secondary data; and
- *Numeric (quantitative) data*: The financial variable and ratios that will be included in the analysis are all quantitative data series.

4.3 SAMPLING

Saunders, *et al.* (2009:206), state that sampling can be used when it is impractical for a researcher to survey an entire population due to various constraints. A sample can be taken and the inferences made from the analysis thereof can be extrapolated to the entire population. It would be quite onerous to attempt to analyse all banks in South Africa and it was found that the required information was not available for all banks for the period under review, thus a sample approach was best suited to this study.

The representative sample taken incorporates the recognised big four banks in South Africa, ABSA, FirstRand, SBSA and Nedbank, as information derived from them should be most indicative of conditions within the South African banking sector as a whole. The representative sample has been listed on the JSE and has information available which spans a twenty year period.

4.4 DATA COLLECTION

Three potential sources of secondary data have been identified for the proposed research.

The published financial results of the banks are collected from McGregor BFA. McGregor is a leading supplier of financial data and news and the data is uniform and includes history since 1990. In addition, certain basic and uniform analysis has been performed on

this data by McGregor BFA and is easily available. All standardisation of the data is carried out by the Bureau for Financial Analysis and therefore the information is comprehensive, reliable and accurate.

The regulatory returns of all banks are made available via the South African Reserve Bank. The returns in particular are the DI400 Capital Adequacy series of returns and have provided us with the necessary information to assess bank's capital structure from a regulatory compliance perspective.

Also, the published annual financial statements available from each specific bank, as well as via McGregor BFA, have been procured to assist in the analysis.

4.5 DATA ANALYSIS

The collected data was recorded, transformed to the correct form where necessary and stored in an Excel spreadsheet file. All sources of data are in electronic format and written to a compact disc for back-up purposes and ease of retrieval.

Exploratory data analysis was performed on an aggregate level to identify trends relating to the capital structure of South African Banks.

The primary analysis tools utilised are an evaluation of key financial ratios and general statistical tests.

4.5.1 Financial Ratio Analysis

It is submitted that the analysis of financial ratios and the interpretation thereof still serves as a very useful measure and enjoys wide use in business. One of the key strengths of ratio analysis is that it encourages a systematic approach to financial performance and focuses on the key aspects of a business. Ratio analysis expresses the relationship between financial items and allows for the observation of trends and comparison between companies. Although ratio analysis is based on historical data, it provides useful insights

into the performance of the firm and provides a point of departure for planning on how best to effect improvements in performance.

The following broad categories of ratios are considered:

- Profitability and financial efficiency ratios

  These describe the degree of success a firm has in creating wealth for its shareholders by the profit performance and the utilisation of resources.

- Liquidity and gearing ratios

  These describe the capital structure of the firm and the resultant riskiness. It provides an indication of whether a firm is able to meet its short-term debts as they fall due and the level of financial risk is prevalent in the firm as a result of its financial structure of the.

- Investment ratios

  These describe what returns and gains are derived from shareholders for their investment in the firm. It also provided an indication on the value the market attribute to the firm and its future growth prospects

What follows is a more in-depth look at the relevant ratios as classified in the categories above.

4.5.1.1 *Return on Assets (ROA)*

The return on assets measure the profitability of a firm in relation to the assets it utilises to generate that profit and indicates the effectiveness of a firm to generate value from all its capital. It is a popular measure of firm profitability and needs to be considered between firms with similar processes and business models to be of greatest usefulness. It is calculated as follows:

Equation 5: Return On Assets (ROA)

$$\frac{Net\ Profit}{Total\ Assets}\ x\ 100$$

Source: (Correia *et al*., 1993:153)

Previous studies conducted by Titman and Wessels (Titman & Wessels, 1988:1-19) and Rajan and Zingales (Rajan & Zingales, 1995:1421-1460) support the use of ROA to measure profitability.

4.5.1.2 *Return on Equity (ROE)*

The return on equity is similar to ROA but specifically measures the profitability of a firm in relation to the equity it utilises to generate that profit. It is defined as:

Equation 6: Return On Equity (ROE)

$$\frac{Net\ Profit}{Total\ Equity}\ x\ 100$$

Source: (Correia *et al*., 1993:157)

As in the case of ROA, previous studies conducted by Titman and Wessels (Titman & Wessels, 1988:1-19) and Rajan and Zingales (Rajan & Zingales, 1995:1421-1460) support the use of ROE to measure profitability.

4.5.1.3 *Debt Equity Ratio (D/E)*

The debt equity ratio measures the level of debt in relation to the total equity utilised by the firm. It is a key indicator of the level of gearing adopted by a firm and provides us with insights into the level of financial risk within the firm. A very high debt-equity ratio indicates the likelihood of bankruptcy and financial distress. However, a firm's debt equity ratio must be considered against its industry norms for a reliable conclusion on financial risk to be made.

Equation 7: Debt Equity (D/E)

$$\frac{Total\ Debt}{Total\ Assets}\ x\ 100$$

Source: (Vigario, 2002:173)

Equation 7 displays the most common understanding of the calculation of the D/E ratio, but results extracted off McGregor BFA could not be reproduced via this approach. Instead, Equation 8 was used as a more comprehensive and BASEL compliant method of calculating the D/E ratio.

Equation 8: Adapted Debt Equity (D/E)

$$\frac{Total\ Long-term\ \&\ Short-term\ Debt}{Total\ Ordinary\ Shareholders\ Equity}\ x\ 100$$

4.5.1.4 *Interest Cover*

The interest cover ratio measures the ability of a firm to meet its debt servicing requirements from its current profits. It is a key indicator of the financial risk within the firm as a firm that cannot meet its debt serving requirements in the short-term from its own cash flow is likely to go bankrupt.

Equation 9: Interest Cover

$$\frac{Earnings\ Before\ Interest\ and\ Taxes\ (EBIT)}{Interest}$$

Source: (Vigario, 2002:174)

4.5.1.5 *Capital Adequacy*

The capital adequacy ratio is specified by the Basel committee and the required minimum levels that must be met by banks for this ratio was outlined in greater detail in chapter three. It can be calculated as follows:

Equation 10: Capital Adequacy

$$\frac{Regulatory\ Capital\ (Tier\ 1+Tier\ 2+Tier\ 3)}{Total\ Risk\ Weighted\ Assets}\ x\ 100$$

4.5.1.6 *Earnings Per Share (EPS)*

Earnings per share measures the overall profit generated for each equity share over a given period. It is greatly relied upon as the key measure of determining the amount of shareholder value that has been generated. It is calculated as follows:

Equation 11: Earnings Per Share (EPS)

$$\frac{Earnings\ Attributible\ to\ Ordinary\ Shareholders}{Total\ Number\ of\ Ordinary\ Shares\ in\ Issue}\ x\ 100$$

Source: (Correia *et al*., 1993:154)

4.5.1.7 *Price-Earnings (P/E)*

The P/E ratio is an indication of how highly the market values a business. A P/E ratio needs to be viewed together with those of similar firms in order to get a feel for relative value and stock market pricing. It is calculated as follows:

Equation 12: Price/Earnings (P/E)

$$\frac{Price\ of\ Ordinary\ Share}{Earnings\ Attributible\ to\ Ordinary\ Shareholders}\ x\ 100$$

Source: (Correia *et al*., 1993:155)

4.5.1.8 *Market to Book Value*

The market to book ratio measure the ratio of the market value of a firm's assets to its book value. This gives an indication of the amount of value the market places on the firm. A high market to book ratio would indicate that investors place a high value on the future prospects of the firm. The calculation of the market to book ratio follows below:

Equation 13: Market to Book Value

$$\frac{Market\ Value\ of\ Assets}{Book\ Value\ of\ Assets}\ x\ 100$$

4.5.1.9 *Economic Value Added (EVA®)*

The economic value added is a measure derived by Stern, Stewart and Company that measures the difference between net profit after tax and the cost of the capital used to create that profit. A positive EVA means that a company is generating profits above its cost of capital and is generating value (De Wet, 2004:39). The calculation of EVA® follows below:

Equation 14: Economic Value Added (EVA®)

$$EVA = (ROIC - WACC) \times IC$$

Source: (De Wet, 2004:39)

Where:

ROIC = Return On Invested Capital

WACC = Weighted Average Cost of Capital

IC = Invested Capital (at the start of the year)

4.5.1.10 *Provisioning*

The level of provisions held by a bank against its advances indicates the general credit quality of its loan book. A decline in provisioning would indicate a strengthening of the credit quality and an increase in provisioning would indicate a decline in the credit quality. Poor credit quality would lead to defaults and loss of income to the banks. The aim of the provision is to account for the potential loss that may occur and may be an indicator of poor performance; in times of economic stress these losses can be substantial. The calculation of the market to book ratio follows below:

Equation 15: Provision Rate

$$\frac{Total\ Provisions\ for\ Loan\ Losses}{Total\ Advances}\ x\ 100$$

4.5.1.11 *Financial Distress*

The Z-Score was devised by Professor Edward Altman in 1968 to predict the probability of failure in firms (Correia *et al*., 1993:158). Altman used commonly available financial ratios in his model to determine the Z-Score as follows:

Equation 16: Altman's Z-Score Model

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

Source: (Correia *et al*., 1993:158)

Where:

Z = Altman's Z-Score
X_1 = Working Capital / Total Assets
X_2 = Retained earnings / Total Assets
X_3 = Earnings Before Interest & Taxes (EBIT) / Total Assets
X_4 = Market Value of Equity / Book Value of Total Liabilities
X_5 = Sales / Total Assets

Generally, a firm with a score of $Z > 2.99$ shows no threat of financial distress but a firm with a score of $Z < 1.81$ shows high threat of financial distress and is likely to go bankrupt. The financial distress of firms with scores of between 1.81 and 2.99 is uncertain.

A model to the Z-Score was devised by Dr. J.H. de la Rey at the Bureau of Financial Analysis in South Africa (Correia *et al*., 1993:158). The model is as follows:

Equation 17: BFA Financial Distress Model

$$k = -0.01662a + 0.0111b + 0.0529c + 0.086d + 0.0174e + 0.01071f - 0.068811$$

Source: (Correia *et al*., 1993:158)

Where:

k = financial distress score

a = total outside financing capital / total assets x 100%

b = profit before interest and tax / average total assets x 100%

c = total current assets / + listed investments / total current liabilities

d = profit after tax / average total assets at book value x 100%

e = cash flow profit after tax / average total assets x 100%

f = total stocks / inflation-adjusted total assets x 100%

The model was designed to be easily interpreted with zero being the point of distinction between a financially sound company and a finically distressed company. The further a firm's score moves way from zero into the negative, the more financially distressed it is. The further a firm's score moves way from zero into the positive, the more financially strong it is. The financial distress of firms with scores of between -0.2 and 0.2 is uncertain.

4.5.2 Statistical Tests

The chosen banks are first modelled together to determine descriptive statistics for the industry and then they will be modelled individually to evaluate their comparative performance.

Descriptive statistics are a way of summarising the variables in a dataset into a format that is easier to understand and interpret. What follows is a brief description of the items used in the descriptive statistical analysis:

4.5.2.1 *Variable*

The name given to each component of a dataset for which descriptive statistics have been calculated.

4.5.2.2 *N*

The number of cases for each variable.

4.5.2.3 *Mean*

The mean is the average value of a variable in a sample. Simply put, it is the sum of the values in a sample divided by the total number of observations.

4.5.2.4 *Median*

The median is the middle value of the sample when all the values are ranked and arranged from the smallest to the largest. When is occurs that the median is smaller than the mean it shows that most of the values in the sample are of high values. When is occurs that the median is larger than the mean it shows that most of the values in the sample are of small values.

4.5.2.5 *Mode*

The most common value, i.e. the item that has the greatest frequency.

4.5.2.6 *Variance and Standard Deviation*

The variance is a measure of how greatly a variable differs from the mean. The standard deviation measures the relative location of values around the mean, i.e. is it widely dispersed or closely dispersed.

4.5.2.7 *Measures of dispersion*

- Minimum
  Is the smallest value in the data.
- Maximum
  Is the largest value in the data.
- Range
  Is the difference between the smallest and the largest values in the data.

4.5.2.8 *Skewness*

Skewness measures whether a distribution is symmetrical or not. A negatively skewed distribution has a score below 0 and there are more values found above the mean. A positively skewed distribution has a score greater than 0 and there are more values found below the mean.

4.5.2.9 *Kurtosis*

Kurtosis measure how thick the tails of the distribution are. A kurtosis score of 0 indicates that the tails of the distribution are moderately peaked and the shape of the distribution is neither flat nor peaked.

4.5.2.10 *95% Confidence Interval*

A confidence interval indicates the probability of a result being found in a sample. The higher the confidence interval selected, the greater the reliance that can be placed on the result. Generally a 95% confidence interval is considered appropriate for most tests.

4.5.2.11 *Correlation*

A Pearson product-moment correlation is used to measure the relationship between two variables that are normally distributed (Leedy & Ormond, 2010:274; Saunders *et al*., 2009:460). The strength of the relationship, reflected in the r value, is interpreted as follows (Leedy & Ormond, 2010:273):

- An r value of 1 shows a perfectly positive correlation where both variables move in the same direction at the same magnitude;
- An r value of 0 shows no correlation; and
- An r value of -1 shows a perfectly negative correlation where both variables move in the opposite direction at the same magnitude.

A Spearman rank order correlation is used to measure the relationship between two variables that are not normally distributed (Leedy & Ormond, 2010:274; Saunders *et al*., 2009:461). The strength of the relationship, reflected in the rho value, is interpreted as follows (Leedy & Ormond, 2010:273):

- An rho value of 1 shows a perfectly positive correlation where both variables move in the same direction at the same magnitude;
- An rho value of 0 shows no correlation; and
- An rho value of -1 shows a perfectly negative correlation where both variables move in the opposite direction at the same magnitude.

For both the Pearson and Spearman tests, the p value depicts how significant the correlation or relationship is. For a confidence interval of 95% a p value < 0.05

would indicate that a statistically significant relationship exists between the variables concerned.

4.6 ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR THE PROPOSED RESEARCH DESIGN

As data has been extracted from a reputable database (McGregor BFA), the potential for bias and measurement has been largely limited. McGregor BFA database covers a large amount of financial data in a standardised format over multiple time periods which are regularly updated.

Data extracted from the South African Reserve bank is assumed to be valid and free from bias and it is compiled and submitted as part of a regulatory requirement and non-compliance and/or falsification in any manner would incur strict penalties and repercussions from government.

4.7 RESEARCH ETHICS

Several research ethics concerns will arise during the proposed research. The following ethical considerations are adhered to in this study:

- Copyright, plagiarism and fabrication: Proper recognition is given to all sources used and the study supports all facts with relevant sources,
- Prohibition of incentives: Incentives have not been used as a means to gain participation and access to information,
- Researcher's honesty, integrity and objectivity: The researcher has been honest in reporting all findings and endeavours to the utmost to be as unbiased as possible.

By implementing the above precautions the researcher maintains high ethical standards and meets the requirements of the University of Pretoria.

4.8 DELIMITATIONS

This study focuses on the effects of capital structure theory and regulation applicable to banking institutions and does not attempt to focus on the effects of such theory and regulations in other types of firms or sectors of the economy. The regulations and rules applicable to banks are unique to these firms and are not enforced on other types of firms within the economy. Banking operations involve the taking of deposits and the provision of loan finance and as such their conducting of business is fundamentally different to other firms within the economy.

This study focuses on the effects of capital structure theory and regulation applicable to financial institutions operating in the Republic of Southern Africa. This study does not attempt to reach any conclusions on the impact on banking systems around the world.

This study focuses on the effects of capital structure theory and regulation on the four largest banking institutions in South Africa; ABSA, FirstRand, Standard Bank and Nedbank. Other financial institutions will not be considered as the four largest banks generally account for the majority of the financial sector. The four largest banks have been listed on the JSE and have data available going as far back as 1990, whereas data for other smaller banks are not available over the same period.

The data for the study has been collected from South African sources.

The study attempts to develop a framework from existing literature with which to measure capital structure and performance. Only elements identified are included in the research. The devised framework is not assumed to be exhaustive and creates the opportunity for future research into the area of capital structure.

4.9 ASSUMPTIONS

The study is made with the following underlying assumptions.

- Existing literature is sufficient to draw inferences and comparison about capital structure theory and its role in South African banks.

- All banks engage in some form of capital structure policy or management, be it in line with theory or regulation.
- Quantitative research was an appropriate means to explore the capital structure phenomenon.
- The data collected for each bank provides an accurate representation of actual events.
- The data collected is standardised data and does not require reclassifications and/or material manipulation
- The sample of banks chosen represents the majority of the industry in terms of market share.

The next chapter presents the results of the research as outlined in the aforementioned methodology.

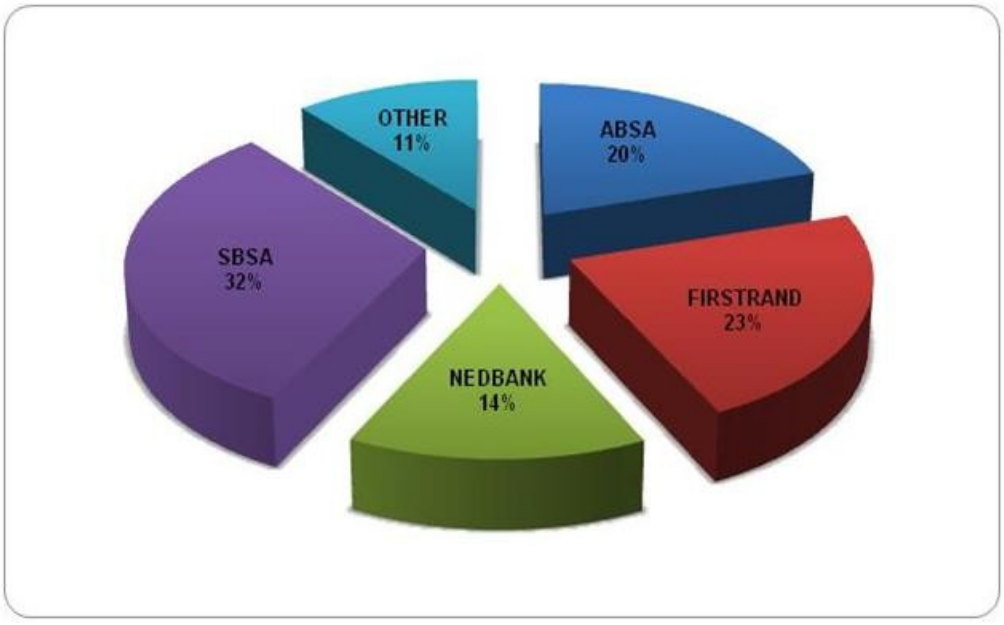
5 RESEARCH ANALYSIS – PRESENTATION OF RESULTS

This chapter presents the financial ratio analysis and statistical analysis of the secondary data conducted in accordance with the guidelines and research methodology presented in chapter five. The results are presented in the form of tables for ease of reference and attempt is made to draw inferences from the data in relation to the research propositions set out in chapter four. The presentation of results begins with a description of the sample selected for the study and well as descriptive statistics based on the independent variables of capital structure and capital adequacy. This is followed by the results of the correlation analysis that was run with the Moonstats and XLSTAT 2011 statistical software packages.

5.1 GENERAL INFORMATION AND DESCRIPTIVE STATISTICS FOR THE SAMPLE

As mentioned in chapter five, a sample of the banks listed on the JSE was taken which comprised of ABSA, FIRSTRAND, NEDBANK and SBSA. As per data extracted from McGregor BFA, these four banks are the majority players in the banking sector of South Africa and together account for 88.8% of the market share based on the market closing share prices on 14 October 2011. Figure 8 depicts the relative market share of each of these four banks and their respective shares of the market.

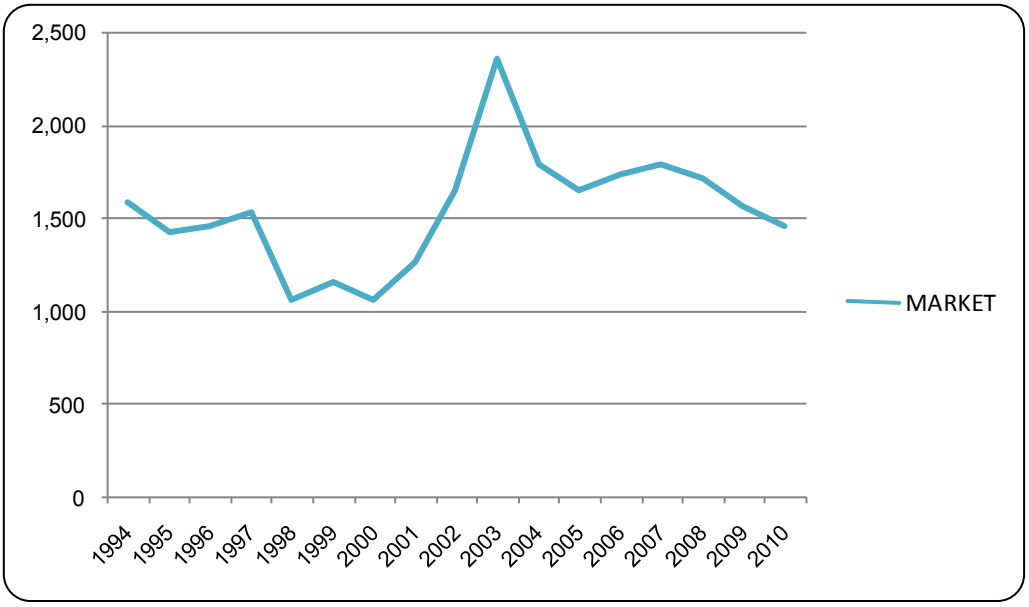
Figure 8: Composition of Banking Sector



Complete data available for these banks for the purposes of testing capital structure spanned a period of seventeen years from 1994 to 2010. Capital structure is represented by the D/E ratio. Complete data available for these banks for the purposes of testing regulatory capital spanned a period of nine years from 2002 to 2010. The regulatory capital levels are represented by the capital adequacy ratio. The reason for the difference in data availability between capital structure and capital adequacy is simply due to no data being made available prior to 2002.

The capital structure levels as observed over the test period at an industry level are shown in Figure 9.

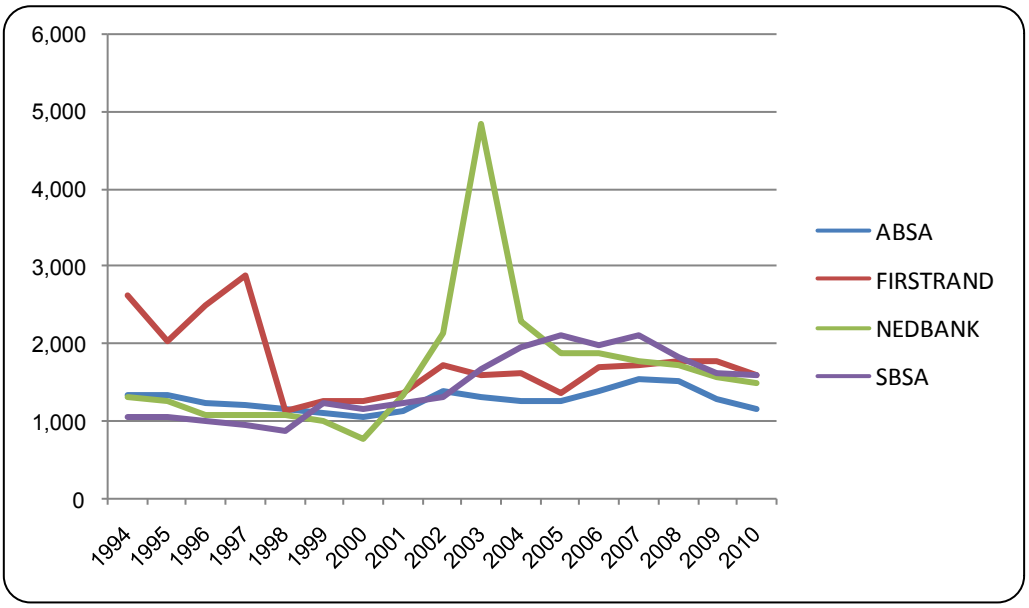
Figure 9: Capital Structure of Market



Over the last seventeen years capital structure in the banking industry has been at an average of 1547% debt to equity. Apart from drops to 1061% in 2002 and 1063% in 2002, and a spike to 2363% in 2003, debt levels have been fairly regular finally settling at 1462% in 2010.

The capital structure levels as observed over the test period for each of the test banks are shown in Figure 10.

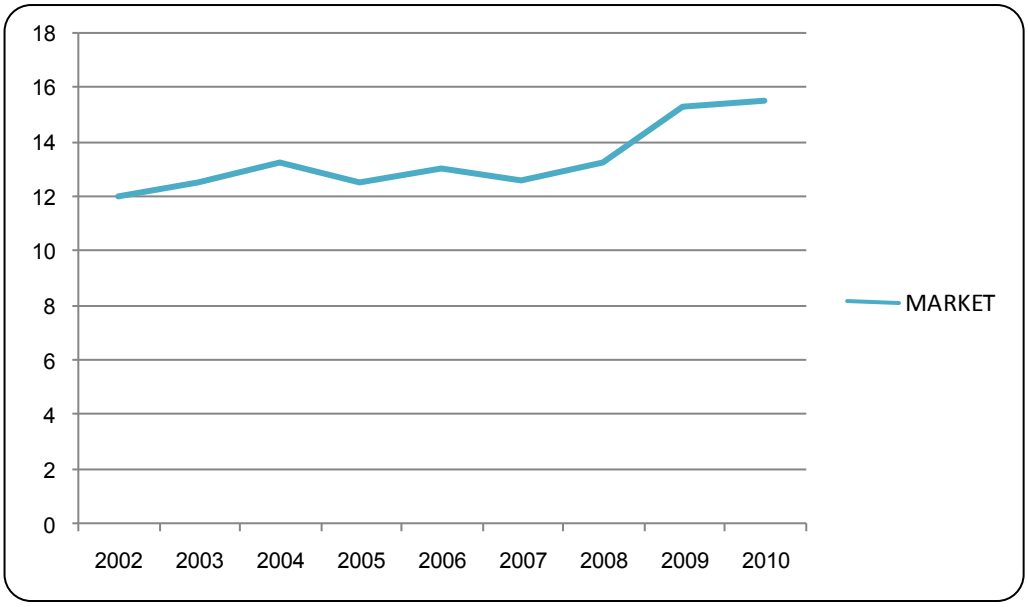
Figure 10: Capital Structure of Individual Banks



From the figure above it is clear that ABSA and SBSA have managed their capital structures with a degree of discipline over the last seventeen years and settled at 1168% and 1586% respectively in 2010. FirstRand has made huge progress in bringing down its debt usage from 2890% in 1997 to 1600% in 2010. Nedbank, after having a huge spike to 4838% in 2003 have brought down their debt levels to 1495% in 2010.

Figure 11 shows the capital adequacy levels that were observed over the test period at an industry level.

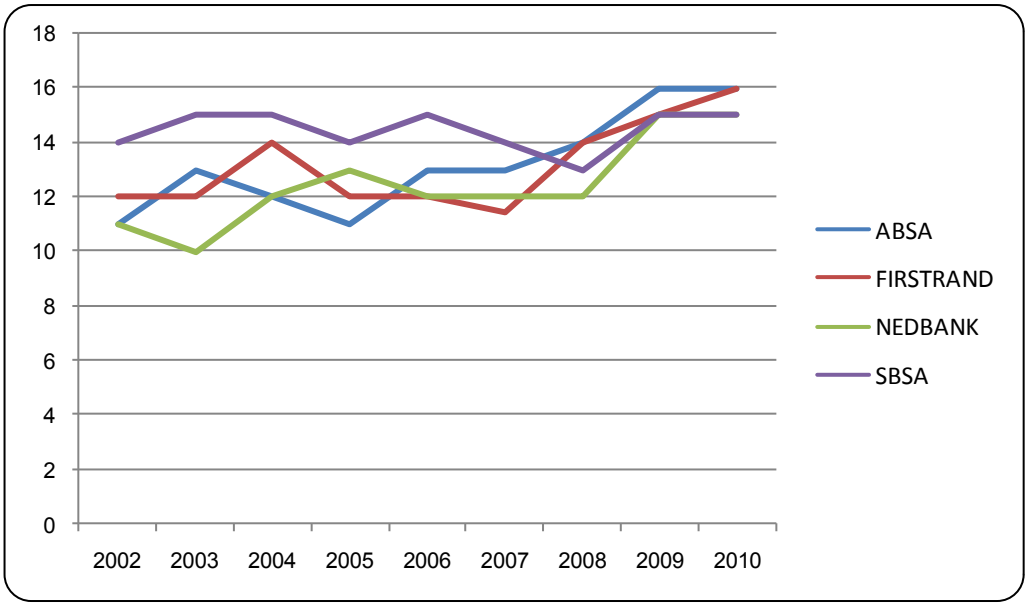
Figure 11: Capital Adequacy of Market



Over the last nine years capital adequacy in the banking industry has been on the rise. Starting at 12% in 2002, it has grown to an average of 15.5% in 2010. Bearing in mind that the requirements per Basel III is 8% capital adequacy, South African Banks are well above the minimum.

Figure 12 shows the capital adequacy levels that were observed over the test period for each of the test banks.

Figure 12: Capital Adequacy of Individual Banks



Over the last nine years capital adequacy in the banking industry has been on the rise. SBSA has been the leader with capital adequacy levels over time and has kept a fairly stable capital adequacy level. The other three banks have been growing their capital adequacy levels consistently over the last nine years, with the exception of 2007 which can be attributed to the global financial crisis.

5.2 RESULTS BY PROPOSITION

What follows are the results of the ratio and statistical analysis which was carried out on the entire sample and its constituents, presented by the proposition to which it relates.

5.2.1 Proposition 1: Increases in leverage increases a bank's profitability

The ratios used to measure profitability in the banks were Return on Assets (ROA), Return on Equity (ROE) and Earnings per Share (EPS).

The relationship between capital adequacy and capital structure as the dependant variables and ROA, ROE and EPS as the independent variables was conducted by first establishing the type of distribution followed by each of the variables. The distribution type then determined the most appropriate type of correlation test; Pearson product moment correlation for normally distributed variables and the Spearman rank order correlation for variables that are not normally distributed.

5.2.1.1 *Statistical Tests of Capital Adequacy*

Statistical tests to determine the relationship between capital adequacy and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 3: Statistical Tests of Capital Adequacy – Proposition 1 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	12.00	15.50	13.32	1.52	1.23	0.087	0.976	-0.527
ROA	3.83	7.60	5.97	2.03	1.43	0.225	-0.425	-1.320
ROE	11.17	25.36	18.81	29.84	5.46	0.274	-0.045	-1.551
EPS	277	1,031	691	68,468	262	0.357	-0.165	-1.137

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.820	0.035	0.05	0.772	0.028	0.05	Not Normal
ROA	0.891	0.205	0.05	0.428	0.239	0.05	Normal
ROE	0.898	0.242	0.05	0.401	0.283	0.05	Normal
EPS	0.943	0.612	0.05	0.252	0.645	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.048)	0.901	0.002	(0.143)	0.708	0.020
ROE	(0.297)	0.438	0.088	0.008	0.982	0.000
EPS	0.285	0.457	0.081	0.345	0.359	0.119

Capital Adequacy and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 4: Statistical Tests of Capital Adequacy – Proposition 1 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.00	16.00	13.22	3.44	1.86	0.132	0.405	-0.980
ROA	5.63	9.40	7.37	1.75	1.32	0.169	0.002	-1.247
ROE	6.61	24.38	18.27	40.69	6.38	0.329	-0.595	-0.930
EPS	291	1,466	965	157,164	396	0.387	-0.392	-1.001

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.893	0.215	0.05	0.412	0.265	0.05	Normal
ROA	0.942	0.607	0.05	0.252	0.645	0.05	Normal
ROE	0.887	0.187	0.05	0.430	0.237	0.05	Normal
EPS	0.951	0.705	0.05	0.230	0.728	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	0.011	0.978	0.000	0.154	0.708	0.024
ROE	(0.246)	0.524	0.060	(0.333)	0.359	0.111
EPS	0.531	0.141	0.282	0.564	0.121	0.318

Capital Adequacy and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 5: Statistical Tests of Capital Adequacy – Proposition 1 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.40	16.00	13.16	2.67	1.63	0.117	0.575	-1.129
ROA	1.16	7.14	4.56	2.92	1.71	0.353	-0.531	0.071
ROE	13.78	27.50	22.40	15.81	3.98	0.167	-1.004	0.577
EPS	87	203	144	1,830	43	0.280	-0.068	-1.352

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.853	0.081	0.05	0.677	0.050	0.05	Normal
ROA	0.960	0.800	0.05	0.249	0.656	0.05	Normal
ROE	0.920	0.391	0.05	0.346	0.395	0.05	Normal
EPS	0.940	0.579	0.05	0.220	0.764	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	0.243	0.529	0.059	0.079	0.843	0.006
ROE	(0.705)	0.034	0.497	(0.778)	0.017	0.606
EPS	0.183	0.638	0.033	(0.009)	0.982	0.000

Capital Adequacy and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and ROE: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Capital Adequacy and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 6: Statistical Tests of Capital Adequacy – Proposition 1 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	10.00	15.00	12.44	2.78	1.67	0.126	0.446	-0.711
ROA	5.48	9.42	7.25	1.68	1.30	0.169	0.166	-1.066
ROE	1.78	27.26	16.42	71.97	8.48	0.487	-0.282	-1.008
EPS	20	1,485	930	219,157	468	0.475	-0.778	-0.306

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.887	0.184	0.05	0.556	0.108	0.05	Normal
ROA	0.961	0.810	0.05	0.212	0.790	0.05	Normal
ROE	0.947	0.658	0.05	0.256	0.629	0.05	Normal
EPS	0.912	0.330	0.05	0.406	0.275	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.156)	0.688	0.024	(0.297)	0.437	0.088
ROE	0.273	0.476	0.075	0.437	0.250	0.191
EPS	0.378	0.316	0.143	0.157	0.708	0.025

Capital Adequacy and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 7: Statistical Tests of Capital Adequacy – Proposition 1 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	13.00	15.00	14.44	0.53	0.73	0.047	-0.837	-0.503
ROA	1.58	8.10	4.69	5.30	2.30	0.463	0.064	-1.269
ROE	4.04	25.10	18.13	50.77	7.13	0.370	-0.747	-0.417
EPS	396	1,033	725	47,820	219	0.284	-0.043	-1.059

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.763	0.008	0.05	1.001	0.007	0.05	Not Normal
ROA	0.955	0.742	0.05	0.192	0.852	0.05	Normal
ROE	0.890	0.201	0.05	0.413	0.263	0.05	Normal
EPS	0.960	0.795	0.05	0.181	0.881	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.344)	0.365	0.118	(0.261)	0.493	0.068
ROE	0.056	0.886	0.003	0.037	0.948	0.001
EPS	(0.402)	0.283	0.162	(0.261)	0.493	0.068

Capital Adequacy and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

5.2.1.2 *Statistical Tests of Capital Structure*

Statistical tests to determine the relationship between capital structure and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 8: Statistical Tests of Capital Structure – Proposition 1 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,061.28	2,363.14	1,546.45	100,258	316.64	0.199	0.563	0.922
ROA	3.83	9.30	6.91	2.54	1.59	0.224	-0.499	-0.475
ROE	11.17	25.36	18.79	17.56	4.19	0.216	-0.042	-0.915
EPS	277	1,031	582	53,867	232	0.387	0.632	-0.634

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.920	0.254	0.05	0.437	0.250	0.05	Normal
ROA	0.961	0.769	0.05	0.261	0.645	0.05	Normal
ROE	0.917	0.228	0.05	0.470	0.204	0.05	Normal
EPS	0.936	0.405	0.05	0.316	0.503	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.356)	0.161	0.127	(0.534)	0.029	0.285
ROE	(0.065)	0.804	0.004	0.096	0.712	0.009
EPS	0.160	0.540	0.026	0.301	0.237	0.091

D/E and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 9: Statistical Tests of Capital Structure – Proposition 1 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,063.89	1,552.21	1,285.82	18,903	137.49	0.104	0.295	-0.570
ROA	5.63	13.90	9.09	5.76	2.40	0.256	0.371	-0.667
ROE	6.61	24.38	17.97	24.67	4.97	0.268	-0.505	-0.310
EPS	118	1,466	624	221,144	470	0.731	0.581	-1.203

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.952	0.630	0.05	0.243	0.711	0.05	Normal
ROA	0.922	0.267	0.05	0.376	0.357	0.05	Normal
ROE	0.924	0.283	0.05	0.356	0.402	0.05	Normal
EPS	0.877	0.066	0.05	0.610	0.088	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.461)	0.063	0.212	(0.510)	0.039	0.260
ROE	0.206	0.428	0.042	0.179	0.488	0.032
EPS	0.542	0.025	0.294	0.306	0.229	0.094

D/E and ROA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EPS: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 10: Statistical Tests of Capital Structure – Proposition 1 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,149.37	2,889.77	1,773.51	241,663	491.59	0.269	1.000	0.106
ROA	0.61	7.59	3.83	5.45	2.33	0.591	-0.070	-1.306
ROE	6.66	27.50	20.34	26.03	5.10	0.243	-1.132	1.121
EPS	16	203	103	3,308	58	0.543	0.305	-1.044

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.886	0.085	0.05	0.628	0.079	0.05	Normal
ROA	0.964	0.820	0.05	0.229	0.761	0.05	Normal
ROE	0.844	0.024	0.05	0.806	0.027	0.05	Not Normal
EPS	0.952	0.623	0.05	0.233	0.748	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.616)	0.008	0.380	(0.498)	0.044	0.248
ROE	(0.069)	0.792	0.005	(0.017)	0.951	0.000
EPS	(0.143)	0.583	0.021	0.113	0.663	0.013

D/E and ROA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 11: Statistical Tests of Capital Structure – Proposition 1 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	764.14	4,838.41	1,671.91	848,183	920.97	0.534	2.491	6.424
ROA	5.48	12.22	8.77	4.60	2.15	0.237	0.169	-1.067
ROE	1.78	38.36	18.36	78.13	8.84	0.467	0.125	0.176
EPS	20	1,576	874	200,558	448	0.497	-0.186	-0.909

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.745	0.002	0.05	1.150	0.003	0.05	Not Normal
ROA	0.947	0.555	0.05	0.287	0.563	0.05	Normal
ROE	0.977	0.959	0.05	0.176	0.902	0.05	Normal
EPS	0.927	0.311	0.05	0.405	0.302	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.457)	0.065	0.209	(0.755)	0.001	0.570
ROE	(0.587)	0.013	0.344	(0.397)	0.116	0.158
EPS	(0.414)	0.098	0.172	(0.076)	0.773	0.006

D/E and ROA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 12: Statistical Tests of Capital Structure – Proposition 1 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	869.14	2,109.32	1,454.57	184,157	429.14	0.286	0.237	-1.411
ROA	1.15	11.39	5.95	10.89	3.30	0.538	0.114	-1.245
ROE	4.04	32.10	18.49	39.65	6.30	0.330	-0.018	0.605
EPS	171	1,586	728	154,907	394	0.525	0.452	-0.466

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.941	0.466	0.05	0.309	0.513	0.05	Normal
ROA	0.940	0.460	0.05	0.291	0.551	0.05	Normal
ROE	0.974	0.934	0.05	0.216	0.803	0.05	Normal
EPS	0.946	0.534	0.05	0.265	0.632	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
ROA	(0.654)	0.004	0.427	(0.684)	0.003	0.468
ROE	0.372	0.141	0.139	0.480	0.052	0.231
EPS	0.015	0.955	0.000	0.007	0.977	0.000

D/E and ROA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and ROE: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EPS: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

5.2.2 Proposition 2: An increase in leverage increases a bank's market value

The ratios used to measure market value of the banks were Price Earnings Ratio (P/E), Market to Book Value (Market/Book), Economic Value Added (EVA) and share price.

The relationship between capital adequacy and capital structure as the dependant variables and P/E, Market to Book and EVA as the independent variables was conducted by first establishing the type of distribution followed by each of the variables. The distribution type then determined the most appropriate type of correlation test; Pearson product moment correlation for normally distributed variables and the Spearman rank order correlation for variables that are not normally distributed.

5.2.2.1 *Statistical Tests of Capital Adequacy*

Statistical tests to determine the relationship between capital structure and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 13: Statistical Tests of Capital Adequacy – Proposition 2 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	12.00	15.50	13.32	1.52	1.23	0.087	0.976	-0.527
P/E	1.11	2.31	1.75	0.19	0.44	0.236	-0.267	-1.198
MARKET TO BOOK	1.53	2.58	2.10	0.14	0.37	0.166	0.001	-1.338
EVA	2.86	6.59	5.10	1.76	1.33	0.245	-0.506	-1.135

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.820	0.035	0.05	0.772	0.028	0.05	Not Normal
P/E	0.935	0.531	0.05	0.234	0.710	0.05	Normal
MARKET TO BOOK	0.923	0.415	0.05	0.352	0.380	0.05	Normal
EVA	0.921	0.402	0.05	0.319	0.461	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.254	0.509	0.065	0.210	0.581	0.044
MARKET TO BOOK	(0.392)	0.297	0.154	(0.454)	0.213	0.206
EVA	(0.052)	0.894	0.003	(0.126)	0.744	0.016

Capital Adequacy and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 14: Statistical Tests of Capital Adequacy – Proposition 2 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.00	16.00	13.22	3.44	1.86	0.132	0.405	-0.980
P/E	0.79	2.22	1.42	0.26	0.51	0.340	0.379	-1.146
MARKET TO BOOK	1.09	2.47	1.76	0.24	0.49	0.260	0.109	-1.144
EVA	4.68	8.07	6.17	1.60	1.26	0.193	0.116	-1.324

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.893	0.215	0.05	0.412	0.265	0.05	Normal
P/E	0.932	0.504	0.05	0.262	0.608	0.05	Normal
MARKET TO BOOK	0.955	0.740	0.05	0.185	0.872	0.05	Normal
EVA	0.921	0.396	0.05	0.296	0.516	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.492	0.179	0.242	0.445	0.230	0.198
MARKET TO BOOK	0.052	0.895	0.003	0.154	0.708	0.024
EVA	(0.060)	0.878	0.004	0.085	0.843	0.007

Capital Adequacy and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 15: Statistical Tests of Capital Adequacy – Proposition 2 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.40	16.00	13.16	2.67	1.63	0.117	0.575	-1.129
P/E	1.42	3.04	2.24	0.34	0.59	0.246	-0.203	-1.384
MARKET TO BOOK	1.70	3.16	2.29	0.25	0.50	0.206	0.541	-0.855
EVA	0.28	6.64	4.19	3.28	1.81	0.408	-0.858	0.710

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.853	0.081	0.05	0.677	0.050	0.05	Normal
P/E	0.929	0.469	0.05	0.305	0.502	0.05	Normal
MARKET TO BOOK	0.933	0.512	0.05	0.278	0.560	0.05	Normal
EVA	0.897	0.233	0.05	0.479	0.174	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	(0.349)	0.357	0.122	(0.437)	0.230	0.191
MARKET TO BOOK	(0.579)	0.102	0.336	(0.619)	0.076	0.383
EVA	0.197	0.611	0.039	(0.017)	0.948	0.000

Capital Adequacy and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 16: Statistical Tests of Capital Adequacy – Proposition 2 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	10.00	15.00	12.44	2.78	1.67	0.126	0.446	-0.711
P/E	0.73	1.93	1.38	0.18	0.42	0.288	-0.557	-0.866
MARKET TO BOOK	1.27	3.08	2.15	0.35	0.59	0.259	-0.034	-1.023
EVA	2.82	7.81	5.68	2.42	1.56	0.258	-0.349	-0.623

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.887	0.184	0.05	0.556	0.108	0.05	Normal
P/E	0.905	0.284	0.05	0.398	0.287	0.05	Normal
MARKET TO BOOK	0.963	0.826	0.05	0.223	0.754	0.05	Normal
EVA	0.968	0.877	0.05	0.183	0.878	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.293	0.443	0.086	0.303	0.437	0.092
MARKET TO BOOK	(0.745)	0.021	0.555	(0.726)	0.031	0.527
EVA	0.327	0.390	0.107	0.122	0.776	0.015

Capital Adequacy and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Market to Book: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Capital Adequacy and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 17: Statistical Tests of Capital Adequacy – Proposition 2 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	13.00	15.00	14.44	0.53	0.73	0.047	-0.837	-0.503
P/E	1.26	2.80	1.97	0.25	0.50	0.238	0.041	-0.934
MARKET TO BOOK	1.57	2.96	2.22	0.29	0.54	0.228	0.171	-1.411
EVA	1.31	8.27	4.37	5.99	2.45	0.528	0.166	-1.265

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.763	0.008	0.05	1.001	0.007	0.05	Not Normal
P/E	0.951	0.703	0.05	0.276	0.564	0.05	Normal
MARKET TO BOOK	0.912	0.330	0.05	0.316	0.470	0.05	Normal
EVA	0.948	0.669	0.05	0.219	0.765	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.508	0.162	0.258	0.447	0.230	0.200
MARKET TO BOOK	0.266	0.489	0.071	0.186	0.644	0.035
EVA	(0.309)	0.418	0.096	(0.335)	0.359	0.113

Capital Adequacy and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

5.2.2.2 *Statistical Tests of Capital Structure*

Statistical tests to determine the relationship between capital adequacy and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 18: Statistical Tests of Capital Structure – Proposition 2 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,061.28	2,363.14	1,546.45	100,258	316.64	0.199	0.563	0.922
P/E	0.74	6.55	2.20	2.22	1.49	0.656	1.757	2.491
MARKET TO BOOK	0.76	3.52	2.04	0.43	0.65	0.311	-0.029	0.633
EVA	2.86	7.56	5.84	1.87	1.37	0.227	-0.680	-0.301

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.920	0.254	0.05	0.437	0.250	0.05	Normal
P/E	0.837	0.019	0.05	0.706	0.049	0.05	Not Normal
MARKET TO BOOK	0.923	0.278	0.05	0.496	0.174	0.05	Normal
EVA	0.942	0.487	0.05	0.337	0.446	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	(0.224)	0.388	0.050	(0.208)	0.421	0.043
MARKET TO BOOK	0.009	0.973	0.000	0.066	0.798	0.004
EVA	(0.404)	0.107	0.163	(0.586)	0.015	0.343

D/E and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EVA: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 19: Statistical Tests of Capital Structure – Proposition 2 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,063.89	1,552.21	1,285.82	18,903	137.49	0.104	0.295	-0.570
P/E	0.51	2.22	1.16	0.24	0.49	0.405	0.925	-0.055
MARKET TO BOOK	0.76	2.47	1.57	0.25	0.50	0.306	0.265	-0.828
EVA	4.68	11.57	7.29	3.88	1.97	0.262	0.462	-0.561

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.952	0.630	0.05	0.243	0.711	0.05	Normal
P/E	0.890	0.096	0.05	0.503	0.167	0.05	Normal
MARKET TO BOOK	0.942	0.487	0.05	0.262	0.643	0.05	Normal
EVA	0.939	0.449	0.05	0.260	0.649	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.123	0.639	0.015	0.076	0.769	0.006
MARKET TO BOOK	0.141	0.591	0.020	0.083	0.748	0.007
EVA	(0.532)	0.028	0.283	(0.569)	0.019	0.323

D/E and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EVA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 20: Statistical Tests of Capital Structure – Proposition 2 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,149.37	2,889.77	1,773.51	241,663	491.59	0.269	1.000	0.106
P/E	0.88	23.27	4.76	38.67	6.22	1.267	2.086	3.060
MARKET TO BOOK	0.32	9.45	2.82	4.22	2.05	0.706	2.024	4.585
EVA	0.28	7.84	3.66	5.51	2.35	0.621	0.008	-1.156

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.886	0.085	0.05	0.628	0.079	0.05	Normal
P/E	0.510	< 0.0001	0.05	2.575	< 0.0001	0.05	Not Normal
MARKET TO BOOK	0.801	0.007	0.05	0.857	0.020	0.05	Not Normal
EVA	0.972	0.912	0.05	0.227	0.767	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.528	0.029	0.278	(0.223)	0.388	0.050
MARKET TO BOOK	0.322	0.207	0.104	(0.239)	0.354	0.057
EVA	(0.613)	0.009	0.375	(0.458)	0.066	0.210

D/E and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EVA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 21: Statistical Tests of Capital Structure – Proposition 2 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	764.14	4,838.41	1,671.91	848,183	920.97	0.534	2.491	6.424
P/E	0.73	2.20	1.49	0.18	0.43	0.281	-0.152	-0.677
MARKET TO BOOK	1.27	3.08	2.17	0.24	0.49	0.217	-0.098	-0.645
EVA	2.82	10.18	7.16	4.29	2.07	0.280	-0.370	-0.647

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.745	0.002	0.05	1.150	0.003	0.05	Not Normal
P/E	0.949	0.590	0.05	0.241	0.719	0.05	Normal
MARKET TO BOOK	0.943	0.498	0.05	0.456	0.222	0.05	Normal
EVA	0.969	0.881	0.05	0.196	0.862	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	(0.479)	0.052	0.229	(0.236)	0.361	0.055
MARKET TO BOOK	0.422	0.091	0.178	0.137	0.595	0.019
EVA	(0.779)	0.000	0.606	(0.850)	< 0.0001	0.723

D/E and P/E: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Market to Book: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and EVA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 22: Statistical Tests of Capital Structure – Proposition 2 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	869.14	2,109.32	1,454.57	184,157	429.14	0.286	0.237	-1.411
P/E	0.15	2.80	1.40	0.71	0.85	0.584	-0.255	-1.040
MARKET TO BOOK	0.20	2.96	1.59	0.86	0.93	0.567	-0.292	-0.957
EVA	0.07	9.99	5.23	9.22	3.04	0.563	-0.053	-1.169

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.941	0.466	0.05	0.309	0.513	0.05	Normal
P/E	0.946	0.541	0.05	0.368	0.375	0.05	Normal
MARKET TO BOOK	0.937	0.419	0.05	0.344	0.428	0.05	Normal
EVA	0.971	0.910	0.05	0.182	0.891	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
P/E	0.747	0.001	0.559	0.761	0.001	0.579
MARKET TO BOOK	0.854	< 0.0001	0.729	0.870	< 0.0001	0.757
EVA	(0.580)	0.015	0.336	(0.637)	0.007	0.406

D/E and P/E: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and Market to Book: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and EVA: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

5.2.3 Proposition 3: Larger banks borrow more than smaller banks

The four sampled banks were ranked in accordance with their respective market shares as at the end of 2010, depicted in the table below.

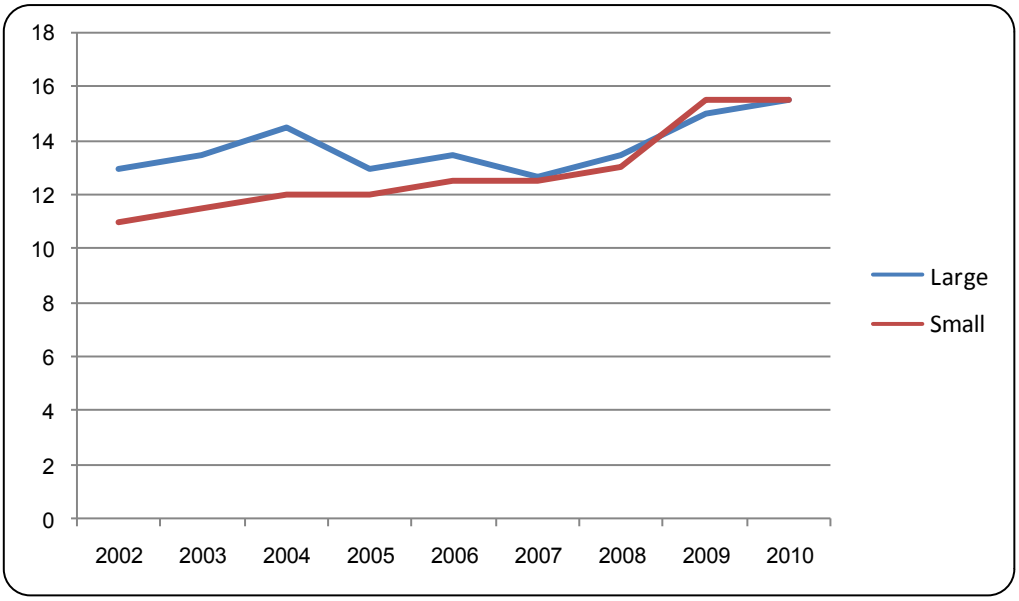
Table 23: Proposition 3 Market Share Ranking

	Market Share	Rank	Grouping
SBSA	31.52%	1	Large
FIRSTRAND	22.81%	2	Large
ABSA	20.16%	3	Small
NEDCOR	14.35%	4	Small

The two banks with the highest market shares were grouped as the large banks and the two banks with the smallest market shares were grouped as the smaller banks.

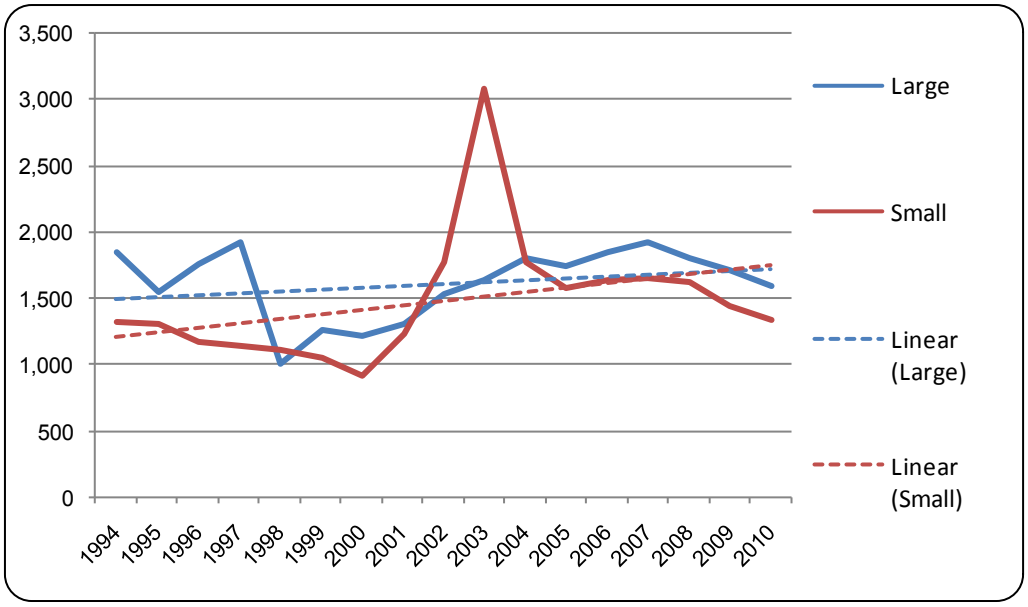
The average D/E and capital adequacy ratios were calculated for the grouped banks and then plotted on graphs to identify trends.

Figure 13: Proposition 3 Capital Adequacy



There does not appear to be any distinction in the levels of capital adequacy of the smaller banks compared to that of the larger banks. Figure 15 shows all banks converging to a similar level, which can be inferred as the required and accepted regulatory norm.

Figure 14: Proposition 3 Capital Structure

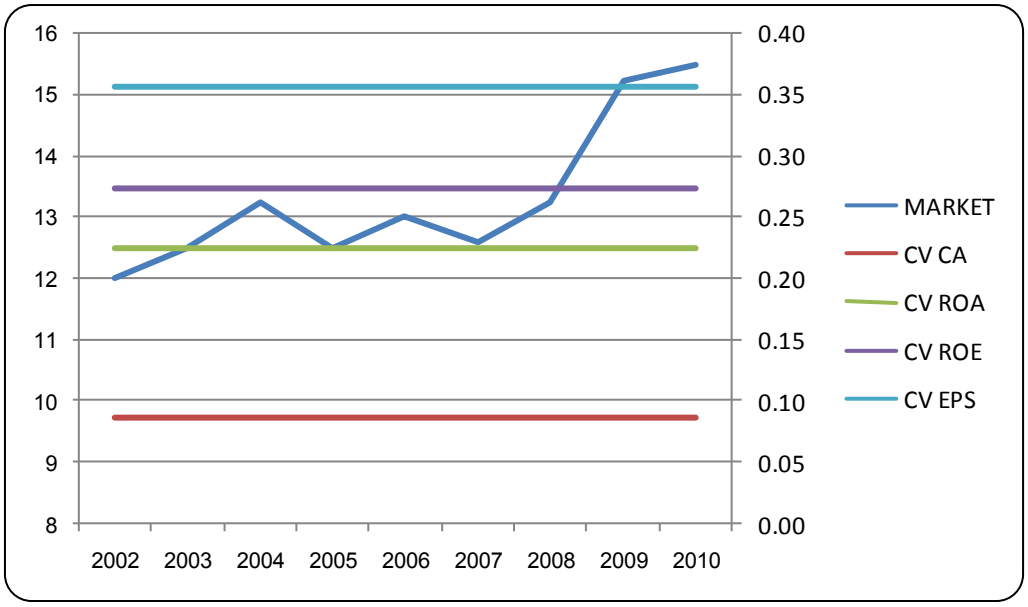


There does not appear to be much distinction between the capital structures of large banks and smaller banks. Figure 16 shows that as at the end of 2010 large banks were borrowing almost 261% more than smaller banks. Larger banks usage of debt is on an upward trend since 1994 and smaller banks usage of debt is on an upward trend since 1994 but at a faster pace than large banks as evident by the slope of the trendline.

5.2.4 Proposition 4: An increase in leverage increases the volatility of a bank's earnings

The metrics used to measure volatility of the bank's earnings were the coefficient of variation (CV) of its Return on Assets (ROA), Return on Equity (ROE) and Earnings per Share (EPS).

Figure 15: Proposition 4 Capital Adequacy

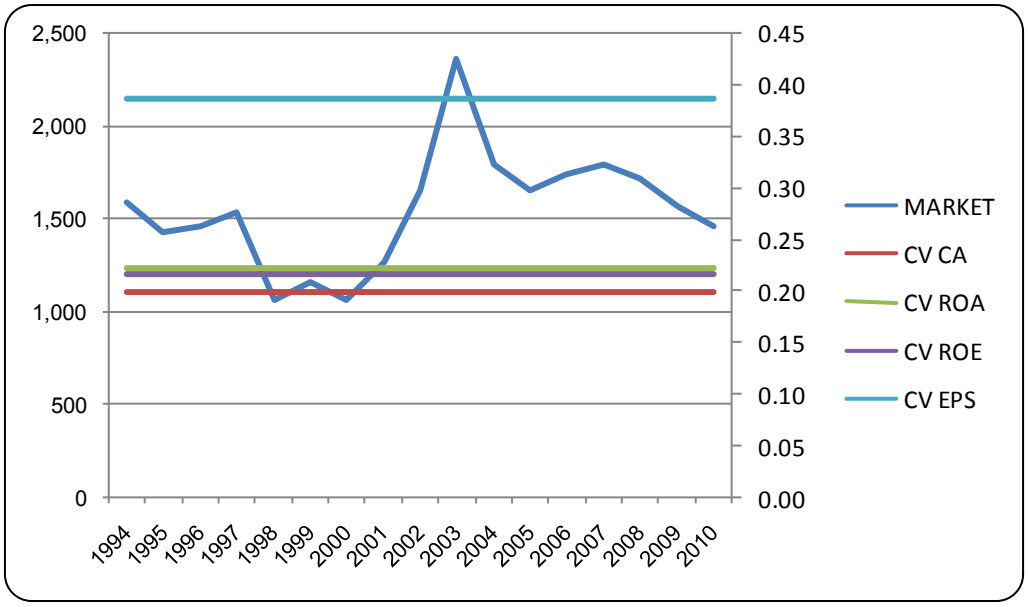


In figure 17 the coefficient of variation (CV) for the various variables are depicted on the secondary axis with the actual values of the market's capital adequacy levels plotted on the primary axis.

The CV is the ratio of the standard deviation to the mean and represents the level of variability of a result around the mean of a particular measure. It is a standardised result and is a comparable metric amongst different variables.

The comparative CV of the variables differs greatly, with capital adequacy being the least volatile and EPS being the most volatile. The CV measures are dissimilar and suggest that changes in capital adequacy produce disproportionate changes, if any, in the bank's profitability. In order to make a judgement, this needs to be considered in conjunction with the statistical analysis of proposition one.

Figure 16: Proposition 4 Capital Structure



The comparative CV of the variables in Figure 18 differs greatly, with capital structure being the least volatile and EPS being the most volatile. The CV measures are similar for ROA, ROE and CA which suggest that changes in the capital structure produce similar changes in the ROA and ROE. In order to make a judgement, this needs to be considered in conjunction with the statistical analysis of proposition one.

5.2.5 Proposition 5: An increase in leverage increases a bank's financial distress and probability of failure

The metrics used to measure financial distress of the banks were the K-Score as referred to in chapter five available from the McGregor BFA database as well as the Interest Cover ratio.

The relationship between capital adequacy and capital structure as the dependant variables and Interest Cover and K-Score as the independent variables was conducted by first establishing the type of distribution followed by each of the variables. The distribution type then determined the most appropriate type of correlation test; Pearson product moment correlation for normally distributed variables and the Spearman rank order correlation for variables that are not normally distributed.

5.2.5.1 *Statistical Tests of Capital Adequacy*

Statistical tests to determine the relationship between capital structure and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 24: Statistical Tests of Capital Adequacy – Proposition 5 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	12.00	15.50	13.32	1.52	1.23	0.087	0.976	-0.527
INTEREST COVER	1.07	1.48	1.35	0.02	0.14	0.100	-1.041	-0.334
FINANCIAL DISTRESS	(1.23)	(1.00)	(1.17)	0.00	0.07	-0.054	2.037	2.993

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.820	0.035	0.05	0.772	0.028	0.05	Not Normal
INTEREST COVER	0.834	0.049	0.05	0.693	0.045	0.05	Not Normal
FINANCIAL DISTRESS	0.683	0.001	0.05	1.238	0.001	0.05	Not Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.446	0.229	0.199	0.487	0.194	0.238
FINANCIAL DISTRESS	0.522	0.150	0.272	0.109	0.776	0.012

Capital Adequacy and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 25: Statistical Tests of Capital Adequacy – Proposition 5 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.00	16.00	13.22	3.44	1.86	0.132	0.405	-0.980
INTEREST COVER	1.21	1.42	1.35	0.01	0.08	0.057	-0.814	-0.922
FINANCIAL DISTRESS	(1.44)	(1.25)	(1.32)	0.00	0.06	-0.041	-0.937	0.002

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.893	0.215	0.05	0.412	0.265	0.05	Normal
INTEREST COVER	0.817	0.032	0.05	0.732	0.036	0.05	Not Normal
FINANCIAL DISTRESS	0.898	0.239	0.05	0.506	0.146	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.184	0.635	0.034	0.017	0.982	0.000
FINANCIAL DISTRESS	(0.098)	0.802	0.010	0.009	0.982	0.000

Capital Adequacy and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 26: Statistical Tests of Capital Adequacy – Proposition 5 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	11.40	16.00	13.16	2.67	1.63	0.117	0.575	-1.129
INTEREST COVER	0.66	1.74	1.42	0.10	0.32	0.214	-1.482	1.625
FINANCIAL DISTRESS	(1.06)	(0.77)	(0.93)	0.01	0.10	-0.101	0.305	-1.252

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.853	0.081	0.05	0.677	0.050	0.05	Normal
INTEREST COVER	0.813	0.029	0.05	0.686	0.048	0.05	Not Normal
FINANCIAL DISTRESS	0.945	0.632	0.05	0.238	0.698	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.349	0.358	0.122	0.096	0.810	0.009
FINANCIAL DISTRESS	0.391	0.298	0.153	0.402	0.291	0.162

Capital Adequacy and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 27: Statistical Tests of Capital Adequacy – Proposition 5 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	10.00	15.00	12.44	2.78	1.67	0.126	0.446	-0.711
INTEREST COVER	1.10	1.50	1.33	0.02	0.13	0.091	-0.303	-0.600
FINANCIAL DISTRESS	(1.55)	(0.93)	(1.35)	0.03	0.17	-0.120	1.623	2.217

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.887	0.184	0.05	0.556	0.108	0.05	Normal
INTEREST COVER	0.958	0.778	0.05	0.195	0.844	0.05	Normal
FINANCIAL DISTRESS	0.769	0.009	0.05	0.981	0.007	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.697	0.037	0.485	0.720	0.037	0.518
FINANCIAL DISTRESS	0.676	0.046	0.457	0.498	0.178	0.248

Capital Adequacy and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Capital Adequacy and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 28: Statistical Tests of Capital Adequacy – Proposition 5 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
CAPITAL ADEQUACY	13.00	15.00	14.44	0.53	0.73	0.047	-0.837	-0.503
INTEREST COVER	0.61	1.73	1.29	0.16	0.39	0.289	-0.763	-0.730
FINANCIAL DISTRESS	(1.18)	(0.91)	(1.08)	0.01	0.08	-0.070	0.838	0.398

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
CAPITAL ADEQUACY	0.763	0.008	0.05	1.001	0.007	0.05	Not Normal
INTEREST COVER	0.886	0.180	0.05	0.471	0.183	0.05	Normal
FINANCIAL DISTRESS	0.892	0.210	0.05	0.464	0.191	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	(0.184)	0.635	0.034	(0.186)	0.613	0.035
FINANCIAL DISTRESS	0.446	0.229	0.199	0.261	0.493	0.068

Capital Adequacy and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Capital Adequacy and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

5.2.5.2 *Statistical Tests of Capital Structure*

Statistical tests to determine the relationship between capital adequacy and the independent variables were first conducted on the market sample of banks and thereafter on each of the four banks; ABSA, FirstRand, Nedbank and SBSA.

Table 29: Statistical Tests of Capital Structure – Proposition 5 MARKET

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,061.28	2,363.14	1,546.45	100,258	316.64	0.199	0.563	0.922
INTEREST COVER	0.91	6.50	2.07	3.02	1.74	0.815	1.897	1.955
FINANCIAL DISTRESS	(1.23)	(1.00)	(1.15)	0.00	0.07	-0.055	0.606	-0.327

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.920	0.254	0.05	0.437	0.250	0.05	Normal
INTEREST COVER	0.914	0.208	0.05	0.417	0.281	0.05	Normal
FINANCIAL DISTRESS	0.864	0.043	0.05	0.603	0.092	0.05	Not Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	(0.040)	0.879	0.002	0.051	0.843	0.003
FINANCIAL DISTRESS	(0.212)	0.413	0.045	(0.277)	0.281	0.077

D/E and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 30: Statistical Tests of Capital Structure – Proposition 5 ABSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,063.89	1,552.21	1,285.82	18,903	137.49	0.104	0.295	-0.570
INTEREST COVER	1.10	1.42	1.25	0.02	0.13	0.097	0.182	-1.640
FINANCIAL DISTRESS	(1.44)	(1.25)	(1.33)	0.00	0.05	-0.038	-0.636	-0.476

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.952	0.630	0.05	0.243	0.711	0.05	Normal
INTEREST COVER	0.867	0.048	0.05	0.626	0.080	0.05	Not Normal
FINANCIAL DISTRESS	0.886	0.086	0.05	0.731	0.042	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.381	0.131	0.145	0.385	0.127	0.148
FINANCIAL DISTRESS	0.188	0.469	0.035	0.077	0.766	0.006

D/E and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 31: Statistical Tests of Capital Structure – Proposition 5 FIRSTRAND

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	1,149.37	2,889.77	1,773.51	241,663	491.59	0.269	1.000	0.106
INTEREST COVER	0.66	22.42	4.58	49.30	7.02	1.488	1.909	1.953
FINANCIAL DISTRESS	(1.06)	(0.16)	(0.80)	0.06	0.25	-0.302	1.160	0.637

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.886	0.085	0.05	0.628	0.079	0.05	Normal
INTEREST COVER	0.881	0.073	0.05	0.632	0.077	0.05	Normal
FINANCIAL DISTRESS	0.917	0.226	0.05	0.381	0.347	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.627	0.007	0.393	0.750	0.001	0.563
FINANCIAL DISTRESS	0.760	0.000	0.578	0.390	0.122	0.152

D/E and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

D/E and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation can be rejected.

Table 32: Statistical Tests of Capital Structure – Proposition 5 NEDBANK

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	764.14	4,838.41	1,671.91	848,183	920.97	0.534	2.491	6.424
INTEREST COVER	1.10	1.50	1.28	0.02	0.12	0.094	0.382	-0.866
FINANCIAL DISTRESS	(1.55)	(0.93)	(1.34)	0.02	0.13	-0.096	1.472	3.402

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.745	0.002	0.05	1.150	0.003	0.05	Not Normal
INTEREST COVER	0.968	0.867	0.05	0.199	0.853	0.05	Normal
FINANCIAL DISTRESS	0.765	0.003	0.05	1.194	0.003	0.05	Not Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	(0.173)	0.506	0.030	0.210	0.414	0.044
FINANCIAL DISTRESS	(0.363)	0.152	0.132	(0.435)	0.082	0.189

D/E and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

Table 33: Statistical Tests of Capital Structure – Proposition 5 SBSA

Descriptive Statistics	Minimum	Maximum	Mean	Variance	Standard deviation	Variation coefficient	Skewness	Kurtosis
D/E	869.14	2,109.32	1,454.57	184,157	429.14	0.286	0.237	-1.411
INTEREST COVER	0.27	1.73	1.17	0.14	0.38	0.315	-0.776	0.185
FINANCIAL DISTRESS	(1.34)	(0.91)	(1.13)	0.02	0.14	-0.124	-0.138	-1.300

Normality Tests	Shapiro-Wilk test			Anderson-Darling test			Accept / Reject Normality
	W	p-value	alpha	A^2	p-value	alpha	
D/E	0.941	0.466	0.05	0.309	0.513	0.05	Normal
INTEREST COVER	0.942	0.480	0.05	0.338	0.443	0.05	Normal
FINANCIAL DISTRESS	0.951	0.616	0.05	0.294	0.543	0.05	Normal

Correlation Statistics	Pearson			Spearman		
	r(x,y)	p	R^2	rho	p	R^2
INTEREST COVER	0.001	0.997	0.000	0.151	0.559	0.023
FINANCIAL DISTRESS	0.408	0.104	0.167	0.397	0.114	0.158

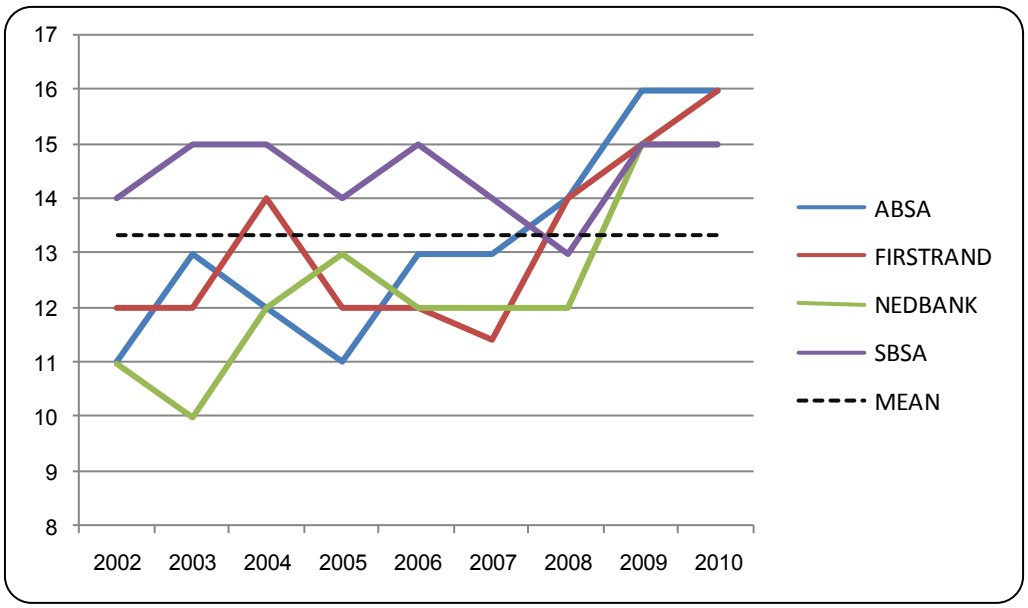
D/E and Interest Cover: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

D/E and Financial Distress: At a 5% level of confidence the null hypothesis of no correlation cannot be rejected.

5.2.6 Proposition 6: Over time a bank's leverage will migrate towards industry mean levels

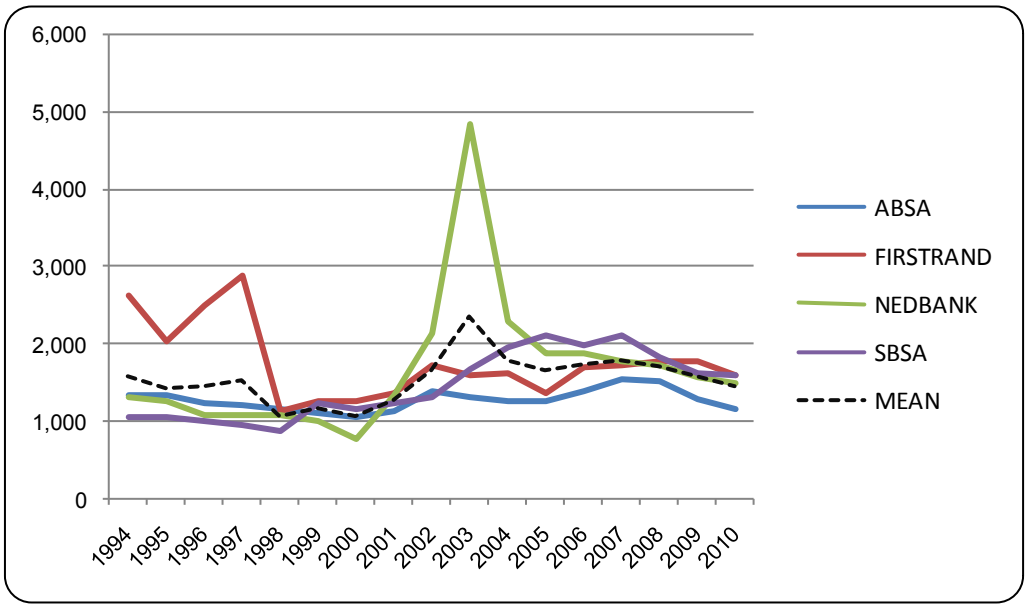
The historical results of the bank's capital structure and adequacy levels were graphically compared to the industry means and regulatory standards of best practice.

Figure 17: Proposition 6 Capital Adequacy Trend



The trend depicted in figure 19 is that all four banks in the sample are actually increasing their amounts of regulatory capital over the last three years. Each of the four bank's level of capital adequacy at the end of 2010 is in excess of the industry mean and in excess of the minimum levels of 8% prescribed by Basel III (Basel Committee on Banking Supervision, 2011).

Figure 18: Proposition 6 Capital Structure Trend



The capital structure of the four banks in Figure 20 tends to fluctuate around the industry mean of 1547%. FirstRand was at high debt levels since 1994 but have brought that down

to that of its peers in five years. Nedbank experienced a spike in debt levels in 2003 which was short lived and they returned to industry levels within 2 years thereafter. Overall the banks maintain similar debt/equity levels with no significant volatility in the last 5 years.

The following chapter will outline the conclusions made from the results presented in this chapter. Effort is made to incorporate findings of past studies into the conclusions and implications for further research are considered.

6 CONCLUSIONS AND IMPLICATIONS

This chapter presents the conclusions that can be drawn from the analysis presented in chapter five. Reference is made to both the research propositions and literature review to gauge whether research propositions are supported by capital structure theory and regulation. Each proposition will be discussed on the basis of the anticipated result, the actual result and the possible reasons for the actual results. Finally the chapter concludes with a summary of the study and recommendations for future research.

6.1 RESULTS BY PROPOSITION

6.1.1 Proposition 1: Increases in leverage increases a bank's profitability

Modigliani and Miller stated in their proposition II (MM II) (1958:261-297; 1963:433-443) that the firm may increase its profitability and market value by taking on additional debt which is cheaper than equity financing. The trade-off theory (Myers, 2003:215-253) supports MM II but also states that the use of debt is only profitable as long as the potential bankruptcy costs associated with additional debt, does not outweigh the savings generated from the cheaper debt.

The test results in Table 3 to Table 7 show that there is no correlation between capital adequacy and a bank's profitability. Correlation was not present between any of our dependant variables of ROA, ROE or EPS with the exception of FirstRand which showed a correlation between capital adequacy and ROE. In other words, increasing a bank's regulatory capital may not result in an increase in the profitability of the bank.

The test results in Table 8 to Table 12 were rather varied. Three out of the four sample banks showed a correlation between capital structure and ROA whereas only one bank showed a correlation with EPS. Overall, however, no correlation could be established at an industry level.

The findings suggest that an increase in the usage of debt by a bank has some effect of increasing the profitability of that bank but is not the sole determinant of an increase in

profitability. This finding is significant as it supports the MM II where a firm can increase its value by increasing its use of cheaper debt finance. The usage of the cheaper debt finance has a leveraging effect on the returns of the bank which in turn enhances the ROA, ROE and EPS.

6.1.2 Proposition 2: An increase in leverage increases a bank's market value

Two of the most popular theories of capital structure, MM II and the trade-off theory, both state that the increased usage of debt by a firm (up to an optimal level) increases the value of that firm. The results of the analysis in chapter 5 however do not conclusively support this proposition and therefore the relationship between leverage and market value for South African banks cannot be established.

The test results in Table 13 to Table 17 show that there is no correlation between capital adequacy and a bank's market value. Correlation was not present between any of our dependant variables of P/E, Market to Book or EVA with the exception of Nedbank which showed a correlation between capital adequacy and Market to Book. In other words, increasing a bank's regulatory capital may not necessarily result in an increase in the market value of the bank.

The test results in Table 18 to Table 22 were rather varied. ABSA, FirstRand and Nedbank showed a correlation only between capital structure and EVA. SBSA showed a correlation between capital structure, P/E, EVA and Market to Book. Overall, no correlation could be established at an industry level. The findings suggest that an in certain cases an increase in the usage of debt by a bank has some effect of increasing the market value of that bank but is not conclusive. It cannot be determined if capital structure is responsible for an increase or decrease in the market value of a bank.

This finding is significant as it supports the MM II where a firm can increase its value by increasing its use of cheaper debt finance. The usage of the cheaper debt finance has a leveraging effect on the returns of the bank which in turn enhances the ROA, ROE and EPS. However results using the EPS measure must be interpreted with caution as the EPS is influenced by changes in dividend policy, which is not entirely dependent on capital structure policy.

6.1.3 Proposition 3: Larger banks borrow more than smaller banks

Larger banks due to their size and the integral role they play in the economy would be subject to a higher degree of regulatory scrutiny as well as reserving requirements. The failure of a large bank poses a serious risk to an economy and as such regulatory bodies would require them to hold a higher degree of risk mitigating insurance and reserves. Credit wrap agreements, debt covenants and deposit insurance are just examples of some of the instruments used to mitigate the risk of failure by the banks. Apart from a bank's own endeavours, the government may offer guarantees on bank's deposits and liabilities (Sinkey, 2002:261) which has the effect of decreasing a bank's cost of capital. Due to the systemic importance of the four banks considered in the study, the South African Reserve Bank (SARB) guarantees their deposits, which offers further protection. The costs of financial distress then become lower for the larger bank due to all the forms of protection it has in place or on offer and as such the level of borrowing is increased.

Figure 13 shows that in prior years the level of capital adequacy amongst the larger banks was higher, but as at the end of 2010 the capital adequacy levels of both the larger and smaller banks have converged to approximately 15.50%. This phenomenon can be explained by the adoption of regulatory standards such as Basel II and the imposition of regulatory capital minimums by the SARB. As all of the banks in our sample are governed by the SARB and subject to regulatory requirements and disciplines, it stands to reason that they would gravitate to similar capital adequacy levels. This only demonstrates that the banks are moving towards an industry and regulatory accepted standard and does nothing to establish a causal link between capital adequacy and market capitalisation or size.

The capital structure of the large and smaller banks in Figure 14 shows that the debt levels of the larger banks have been higher than their smaller competitors. The debt usage of the higher banks has remained higher over the last seventeen years and as at the end of 2010 is approximately 1% higher than the smaller banks.

After considering the trend lines of capital structure over the last seventeen years the financing behaviour becomes clearer. The usage of debt has increased in the larger banks

and increased in the smaller banks, however the larger banks have been increasing their debt usage at a slower rate as compared to the smaller banks. This is contradictory to expectations but can possibly be attributed to market conditions. The recent global financial crisis has brought the large banks under immense scrutiny and pressure. In response to this pressure, the large banks have slowed their usage of leverage in order to satiate the requirements for decreased risk. The decreased rate of use of debt by the large banks has led to an increased availability of funding which has been acquired by the smaller banks. Another possible cause for the decreased rate of use of debt by the larger banks could be the provision of deposit guarantees by the SARB. The SARB would require the large banks to manage their debt to lower levels and decrease their probability of financial distress as a condition for the provision of the deposit guarantees.

6.1.4 Proposition 4: An increase in leverage increases the volatility of a bank's earnings

An increase in debt results in an increase in the payments to service that debt. As the servicing costs of debt become larger the need to generate income to meet those servicing requirements becomes greater. In order to generate this additional income, a bank's management may be tempted to invest in high value and high risk projects which may increase the volatility in earnings.

In Figure 15 it can be seen that capital adequacy has grown from almost 12% in 2002 to 15.5% in 2010. During this time the coefficient of variation (CV) of capital adequacy has been 0.09 whereas the CV of ROA (0.23), ROE (0.27) and EPS (0.36) has been much higher. This suggests that the volatility of the performance metrics have been much greater over the period than the volatility of capital adequacy. Taking this into consideration along with the findings for Proposition 1, that profitability and capital adequacy show no correlation, it cannot be concluded that an increase in capital adequacy decreases the volatility of a bank's earnings. The finding only shows that earnings volatility levels were high over the period that capital adequacy levels increased and further work needs to be done to determine if these volatility levels were lower than those for the period prior to the capital adequacy increases.

In Figure 16 it can be seen that capital structure has grown from almost 1590% in 2002 to 1462% in 2010. During this time the CV of capital structure has been 0.20 whereas the CV of ROA (0.22), ROE (0.22) have been similar and EPS (0.39) has been much higher. This suggests that the volatility of the performance metrics have been similar over the period to the volatility of capital structure. However after taking this into consideration along with the findings for Proposition 1, that profitability and capital structure show no correlation, it cannot be concluded that an increase in leverage increases the volatility of a bank's earnings.

It is appropriate to infer from the results that the variability in a bank's earning is attributable to its operations and conditions of the market in which it operates. As capital structure and adequacy is a financing decision and not an operational one, it appears to only have little impact on earnings volatility and thus disproves the initial assumption that financing influences investment and operational decisions.

6.1.5 Proposition 5: An increase in leverage increases a bank's financial distress and probability of failure

The trade-off theory (Ross *et al*., 2008:465) displayed in Figure 5 shows that an increase in leverage passed a certain threshold increases the financial risk of the bank. As mentioned previously in point 6.1.5 the increased debt results in an increased servicing cost for that debt which will hamper a bank's cash flow. Overall, the risk of bankruptcy is increased as well as the associated costs of financial distress. The demands on cash flow and earnings along with the proportion of debt on the balance sheet should negatively impact the banks solvency and increase its probability of failure.

On the other hand, an increase in the capital adequacy of a bank will increase its ability to meet obligations when they fall due and should lower the probability of financial distress. This in a nutshell is the primary purpose of the Basel Accord and it's promulgation of minimum accepted capital standards (Basel Committee on Banking Supervision, 2011).

Table 24 to Table 28 detail the results for the statistical tests between capital adequacy, financial distress and probability of failure. Only the results for Nedbank in Table 27 showed a correlation between capital adequacy and interest cover.

Table 29 to Table 33 detail the results for the statistical tests between capital structure, financial distress and probability of failure. Only the results for FirstRand in Table 31 showed a correlation between the metrics.

The statistical test showed no significant correlation between capital adequacy and financial distress or capital structure and financial distress which is contrary to expectations. This can be attributed to the K-Score (Correia *et al*., 1993:158) being an unsuitable metric for the purpose of the correlation tests. The K-Score incorporates many operational as well as financing measures and the number of operation measures used is higher than the financing measures used. The K-Score then gives a holistic interpretation of financial distress rather than an interpretation related to purely capital structure.

6.1.6 Proposition 6: Over time a bank's leverage will migrate towards industry mean levels

For a financial manager, many decisions made are done with taking consideration of the bank's share price and any potential impact a decision taken may have on that share price. As suggested by the signalling theory (Ross, 1977a; Ross, 1977b) investors view the actions of management as a signal regarding the status of the firm and a transfer of information. Ross also argued that the capital structure of a firm is a costly signal (1977b:38) and this implies that a financial manager would be reluctant in making large moves in changing capital structure. It would be safer to keep capital structure at a level that the market is comfortable and thus keep the share price stable. This level, in a highly regulated industry such as banking, would be the capital adequacy levels recommended by regulatory bodies and the industry wide debt ratio norms.

The trend depicted in figure 17 is that all four banks in the sample are actually increasing their amounts of regulatory capital over the last three years. Each of the four bank's level of capital adequacy at the end of 2010 is in excess of the industry mean and in excess of the minimum levels of 8% prescribed by Basel III (Basel Committee on Banking Supervision, 2011:77).

The capital structure of the four banks in Figure 18 tends to fluctuate around the industry mean of 1462%. FirstRand was at high debt levels since 1994 but have brought that down to that of its peers in five years. Nedbank experienced a spike in debt levels in 2003 which was short lived and they returned to industry levels within 2 years thereafter. Overall the banks maintain similar debt/equity levels with no significant volatility in the last 5 years other than an abnormal spike by Nedbank in 2003.

The results show that the capital adequacy levels for the individual banks as well as the leverage levels have converged to similar levels which are in line with expectations.

6.2 SUGGESTIONS FOR FUTURE RESEARCH

Overall the results did not conclusively align with a particular theory of capital structure. Elements of the various theories such as the Modigliani and Miller Propositions, Trade-off Theory and Signalling Theory, were applicable in the findings, but no one theory specifically. As initial stated, the capital structure decision is a complex and difficult one, but the findings do provide insights which would are useful to the financial manager of a bank. Capital structure does influence the profitability and market value positively. Capital structure does not necessarily impact volatility in a bank's earning or financial distress.

Considerable work remains before a framework can be developed for the determination of an optimal capital structure of a bank can be developed. More detailed statistical analysis is required with a focus on multivariate analysis to identify combinations of factors that influence capital structure. A larger sample size over a lengthier period is required to identify trends for the financial services sector rather than just a few banks. A questionnaire approach needs to be investigated to determine the behaviours of financial managers and their decision making preferences with regards to theory and practice. More focused analysis is required to identify the impacts of specific theories such as Pecking Order, Signalling and Agency Costs on the capital structure decision.

Nevertheless, even with these suggestions for future research, this study does provide useful insights into the implications of capital structure and regulation for South African banks.

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8 APPENDICES

8.1 RATIOS: INDUSTRY

	CAPITAL ADEQUACY	ROA	ROE	EPS	P/E	MARKET TO BOOK	EVA	SHARE PRICE	INTEREST COVER	FINANCIAL DISTRESS	PROVISIONS
2010	15.50	5.39	18.52	785.48	2.25	1.89	4.12	99.35	1.47	-1.00	2.32
2009	15.25	7.25	29.23	753.45	1.62	1.79	6.14	93.22	1.48	-1.22	2.32
2008	13.25	8.77	31.85	1,020.43	1.11	1.53	6.42	75.69	1.42	-1.23	1.70
2007	12.60	7.21	24.34	1,030.70	1.91	2.48	4.91	91.71	1.43	-1.19	1.25
2006	13.00	4.72	0.53	821.75	2.31	2.58	2.86	93.83	1.07	-1.17	1.24
2005	12.50	4.79	4.17	637.29	2.09	2.52	3.56	73.82	1.17	-1.18	1.52
2004	13.25	6.64	23.98	444.63	1.82	2.27	5.56	58.24	1.39	-1.18	2.28
2003	12.50	8.14	21.83	276.55	1.15	1.99	5.79	38.07	1.30	-1.17	2.60
2002	12.00	8.34	25.71	449.03	1.53	1.89	6.59	45.05	1.42	-1.20	2.89

	D/E	ROA	ROE	EPS	P/E	MARKET TO BOOK	EVA	SHARE PRICE	INTEREST COVER	FINANCIAL DISTRESS	PROVISIONS
2010	12.99	5.39	18.52	785.48	2.25	1.89	4.12	99.35	1.47	-1.00	2.32
2009	13.56	7.25	29.23	753.45	1.62	1.79	6.14	93.22	1.48	-1.22	2.32
2008	14.67	8.77	31.85	1,020.43	1.11	1.53	6.42	75.69	1.42	-1.23	1.70
2007	15.12	7.21	24.34	1,030.70	1.91	2.48	4.91	91.71	1.43	-1.19	1.25
2006	14.75	4.72	0.53	821.75	2.31	2.58	2.86	93.83	1.07	-1.17	1.24
2005	14.84	4.79	4.17	637.29	2.09	2.52	3.56	73.82	1.17	-1.18	1.52
2004	15.54	6.64	23.98	444.63	1.82	2.27	5.56	58.24	1.39	-1.18	2.28
2003	19.00	8.14	21.83	276.55	1.15	1.99	5.79	38.07	1.30	-1.17	2.60
2002	14.94	8.34	25.71	449.03	1.53	1.89	6.59	45.05	1.42	-1.20	2.89
2001	12.17	7.25	13.14	589.78	1.87	1.90	5.84	49.49	1.23	-1.12	2.75
2000	10.31	8.05	16.31	479.05	1.92	1.92	6.72	59.63	1.26	-1.13	2.86
1999	11.16	9.00	-5.39	405.25	1.42	2.10	7.24	49.74	0.91	-1.12	2.75
1998	12.39	10.53	16.70	314.20	3.80	2.66	7.56	38.13	1.19	-1.23	2.33
1997	15.10	9.94	18.66	616.18	6.55	3.52	7.55	41.30	1.82	-1.09	
1996	15.10	9.42	19.00	523.60	4.60	2.04	7.31	27.56	4.00	-1.11	
1995	14.35	8.38	18.73	412.15	0.74	0.84	5.69	25.90	6.14	-1.11	
1994	15.98	7.81	18.15	336.85	0.78	0.76	5.42	17.31	6.50	-1.05	

8.2 RATIOS: ABSA

	CAPITAL ADEQUACY - ABSA	ROA - ABSA	ROE - ABSA	EPS - ABSA	P/E - ABSA	MARKET TO BOOK - ABSA	EVA - ABSA	SHARE PRICE - ABSA	INTEREST COVER - ABSA	FINANCIAL DISTRESS - ABSA	PROVISIONS - ABSA
2010	16.00	6.37	16.95	1,122.60	2.12	1.75	4.75	140.00	1.42	-1.39	2.59
2009	16.00	7.89	22.23	1,099.40	1.65	1.83	6.59	128.50	1.35	-1.30	2.38
2008	14.00	10.16	25.27	1,466.20	1.02	1.57	6.91	108.15	1.31	-1.34	1.64
2007	13.00	8.80	27.04	1,401.90	1.55	2.08	5.74	111.00	1.40	-1.25	1.10
2006	13.00	7.24	20.50	1,181.80	2.22	2.47	4.83	125.10	1.40	-1.30	1.15
2005	11.00	6.87	24.05	903.66	1.40	2.37	4.68	101.00	1.42	-1.31	1.78
2004	12.00	9.33	33.56	688.50	1.14	1.50	7.65	75.99	1.40	-1.44	3.35
2003	13.00	10.04	22.54	528.00	0.79	1.17	8.07	42.14	1.21	-1.29	3.90
2002	11.00	8.93	15.05	291.10	0.90	1.09	6.35	31.60	1.23	-1.31	4.03

	D/E - ABSA	ROA - ABSA	ROE - ABSA	EPS - ABSA	P/E - ABSA	MARKET TO BOOK - ABSA	EVA - ABSA	SHARE PRICE - ABSA	INTEREST COVER - ABSA	FINANCIAL DISTRESS - ABSA	PROVISIONS - ABSA
2010	10.79	6.37	16.95	1,122.60	2.12	1.75	4.75	140.00	1.42	-1.39	2.59
2009	11.92	7.89	22.23	1,099.40	1.65	1.83	6.59	128.50	1.35	-1.30	2.38
2008	13.80	10.16	25.27	1,466.20	1.02	1.57	6.91	108.15	1.31	-1.34	1.64
2007	14.07	8.80	27.04	1,401.90	1.55	2.08	5.74	111.00	1.40	-1.25	1.10
2006	12.99	7.24	20.50	1,181.80	2.22	2.47	4.83	125.10	1.40	-1.30	1.15
2005	13.78	6.87	24.05	903.66	1.40	2.37	4.68	101.00	1.42	-1.31	1.78
2004	14.43	9.33	33.56	688.50	1.14	1.50	7.65	75.99	1.40	-1.44	3.35
2003	14.22	10.04	22.54	528.00	0.79	1.17	8.07	42.14	1.21	-1.29	3.90
2002	14.40	8.93	15.05	291.10	0.90	1.09	6.35	31.60	1.23	-1.31	4.03
2001	11.38	9.98	21.46	378.70	1.06	1.35	7.77	35.10	1.27	-1.30	2.90
2000	11.02	10.31	13.31	310.30	0.82	1.05	8.60	28.60	1.13	-1.39	2.51
1999	11.40	14.75	17.21	309.70	0.80	1.45	11.57	27.60	1.12	-1.27	2.07
1998	11.98	13.25	18.17	271.30	1.30	2.19	9.05	27.90	1.13	-1.30	1.90
1997	12.51	13.41	15.27	222.20	0.94	1.65	9.86	28.00	1.10	-1.31	
1996	12.84	12.44	19.67	178.00	0.90	1.52	9.48	24.00	1.13	-1.33	
1995	13.84	9.93	15.37	136.80	0.67	0.97	5.70	20.50	1.13	-1.38	
1994	13.64	9.95	17.55	117.80	0.51	0.76	6.39	11.60	1.14	-1.39	

8.3 RATIOS: FIRSTRAND

	CAPITAL ADEQUACY - FIRSTRAND	ROA - FIRSTRAND	ROE - FIRSTRAND	EPS - FIRSTRAND	P/E - FIRSTRAND	MARKET TO BOOK - FIRSTRAND	EVA - FIRSTRAND	SHARE PRICE - FIRSTRAND	INTEREST COVER - FIRSTRAND	FINANCIAL DISTRESS - FIRSTRAND	PROVISIONS - FIRSTRAND
2010	16.00	4.71	21.09	180.10	2.49	2.16	3.56	19.51	1.64	-0.77	2.02
2009	15.00	7.35	43.89	133.30	1.55	1.75	6.64	18.34	1.72	-1.01	2.25
2008	14.00	5.77	17.17	191.50	1.42	1.70	4.24	16.11	1.39	-1.04	1.63
2007	11.40	6.96	35.44	202.50	2.69	3.16	4.73	19.75	1.74	-1.06	1.19
2006	12.00	1.98	-23.32	157.80	3.04	2.92	0.28	22.20	0.66	-0.96	1.06
2005	12.00	4.14	5.30	146.20	2.79	2.51	3.48	18.45	1.31	-0.99	1.10
2004	14.00	4.69	15.24	110.30	2.40	2.31	4.22	13.35	1.41	-0.82	1.42
2003	12.00	6.62	27.44	89.90	1.65	1.93	6.11	8.92	1.48	-0.90	1.40
2002	12.00	5.63	21.86	86.70	2.14	2.16	4.45	7.36	1.46	-0.87	2.43

	D/E - FIRSTRAND	ROA - FIRSTRAND	ROE - FIRSTRAND	EPS - FIRSTRAND	P/E - FIRSTRAND	MARKET TO BOOK - FIRSTRAND	EVA - FIRSTRAND	SHARE PRICE - FIRSTRAND	INTEREST COVER - FIRSTRAND	FINANCIAL DISTRESS - FIRSTRAND	PROVISIONS - FIRSTRAND
2010	13.80	4.71	21.09	180.10	2.49	2.16	3.56	19.51	1.64	-0.77	2.02
2009	14.58	7.35	43.89	133.30	1.55	1.75	6.64	18.34	1.72	-1.01	2.25
2008	14.64	5.77	17.17	191.50	1.42	1.70	4.24	16.11	1.39	-1.04	1.63
2007	14.34	6.96	35.44	202.50	2.69	3.16	4.73	19.75	1.74	-1.06	1.19
2006	13.77	1.98	-23.32	157.80	3.04	2.92	0.28	22.20	0.66	-0.96	1.06
2005	11.92	4.14	5.30	146.20	2.79	2.51	3.48	18.45	1.31	-0.99	1.10
2004	13.88	4.69	15.24	110.30	2.40	2.31	4.22	13.35	1.41	-0.82	1.42
2003	15.36	6.62	27.44	89.90	1.65	1.93	6.11	8.92	1.48	-0.90	1.40
2002	16.80	5.63	21.86	86.70	2.14	2.16	4.45	7.36	1.46	-0.87	2.43
2001	13.54	5.84	22.39	67.90	3.02	2.66	5.25	7.45	1.46	-0.77	2.68
2000	12.01	6.33	22.12	54.10	2.74	2.51	6.01	8.40	1.38	-0.80	2.96
1999	13.38	7.93	-2.18	45.60	1.83	2.63	7.84	8.80	1.01	-0.89	3.35
1998	17.32	3.57	11.05	27.60	11.68	4.97	1.89	6.42	1.29	-1.04	2.96
1997	26.35	1.24	21.52	15.50	23.27	9.45	1.02	7.70	3.81	-0.49	
1996	25.34	0.93	16.55	103.40	15.99	4.37	0.70	3.85	12.52	-0.51	
1995	19.47	1.55	28.51	72.80	0.88	0.32	1.26	2.60	21.10	-0.51	
1994	25.80	1.10	17.28	60.60	1.37	0.47	0.62	2.00	22.42	-0.16	

8.4 RATIOS: NEDBANK

	CAPITAL ADEQUACY - NEDCOR	ROA - NEDCOR	ROE - NEDCOR	EPS - NEDCOR	P/E - NEDCOR	MARKET TO BOOK - NEDCOR	EVA - NEDCOR	SHARE PRICE - NEDCOR	INTEREST COVER - NEDCOR	FINANCIAL DISTRESS - NEDCOR	PROVISIONS - NEDCOR
2010	15.00	7.14	30.81	1,104.00	1.59	1.55	5.69	130.35	1.50	-0.93	2.31
2009	15.00	8.46	31.81	1,010.00	1.22	1.58	6.94	124.05	1.39	-1.39	2.13
2008	12.00	10.50	33.86	1,422.00	0.73	1.27	7.81	95.50	1.31	-1.37	1.78
2007	12.00	8.49	31.72	1,485.00	1.41	2.13	6.12	136.00	1.38	-1.32	1.60
2006	12.00	6.89	35.97	1,110.00	1.93	2.44	5.02	133.50	1.50	-1.34	1.65
2005	13.00	5.84	23.03	797.00	1.78	2.24	4.55	100.00	1.33	-1.37	2.06
2004	12.00	6.33	21.50	401.00	1.48	2.33	4.92	77.80	1.22	-1.38	2.89
2003	10.00	8.23	15.44	20.00	0.73	3.08	2.82	62.03	1.10	-1.47	3.36
2002	11.00	9.64	33.19	1,022.00	1.57	2.73	7.28	111.10	1.27	-1.55	3.15

	D/E - NEDCOR	ROA - NEDCOR	ROE - NEDCOR	EPS - NEDCOR	P/E - NEDCOR	MARKET TO BOOK - NEDCOR	EVA - NEDCOR	SHARE PRICE - NEDCOR	INTEREST COVER - NEDCOR	FINANCIAL DISTRESS - NEDCOR	PROVISIONS - NEDCOR
2010	13.78	7.14	30.81	1,104.00	1.59	1.55	5.69	130.35	1.50	-0.93	2.31
2009	13.72	8.46	31.81	1,010.00	1.22	1.58	6.94	124.05	1.39	-1.39	2.13
2008	14.94	10.50	33.86	1,422.00	0.73	1.27	7.81	95.50	1.31	-1.37	1.78
2007	15.09	8.49	31.72	1,485.00	1.41	2.13	6.12	136.00	1.38	-1.32	1.60
2006	15.90	6.89	35.97	1,110.00	1.93	2.44	5.02	133.50	1.50	-1.34	1.65
2005	15.72	5.84	23.03	797.00	1.78	2.24	4.55	100.00	1.33	-1.37	2.06
2004	18.60	6.33	21.50	401.00	1.48	2.33	4.92	77.80	1.22	-1.38	2.89
2003	32.07	8.23	15.44	20.00	0.73	3.08	2.82	62.03	1.10	-1.47	3.36
2002	17.42	9.64	33.19	1,022.00	1.57	2.73	7.28	111.10	1.27	-1.55	3.15
2001	13.11	9.22	25.31	1,576.00	2.13	2.21	7.48	124.20	1.37	-1.45	3.29
2000	7.86	9.51	22.01	1,267.00	2.20	2.27	7.89	171.00	1.31	-1.39	3.29
1999	10.09	11.43	22.39	1,024.00	1.77	2.58	9.46	137.00	1.22	-1.34	2.66
1998	11.02	13.30	20.36	787.20	1.25	2.26	9.32	100.20	1.19	-1.30	1.90
1997	10.98	13.65	20.56	641.00	1.82	2.78	9.97	108.00	1.18	-1.24	
1996	10.95	12.85	21.56	502.00	1.37	2.06	10.18	64.00	1.16	-1.27	
1995	12.72	11.46	16.11	386.00	1.22	1.82	8.19	63.00	1.12	-1.24	
1994	13.57	10.63	19.42	309.00	1.06	1.61	8.15	43.75	1.16	-1.34	

8.5 RATIOS: SBSA

	CAPITAL ADEQUACY - SBSA	ROA - SBSA	ROE - SBSA	EPS - SBSA	P/E - SBSA	MARKET TO BOOK - SBSA	EVA - SBSA	SHARE PRICE - SBSA	INTEREST COVER - SBSA	FINANCIAL DISTRESS - SBSA	PROVISIONS - SBSA
2010	15.00	3.35	5.23	735.20	2.80	2.08	2.47	107.55	1.31	-0.91	2.35
2009	15.00	5.29	18.98	771.10	2.07	2.01	4.37	102.00	1.46	-1.18	2.52
2008	13.00	8.65	51.10	1,002.00	1.26	1.59	6.70	83.00	1.66	-1.17	1.75
2007	14.00	4.57	3.16	1,033.40	2.00	2.55	3.05	100.08	1.19	-1.14	1.11
2006	15.00	2.77	-31.03	837.40	2.04	2.50	1.31	94.50	0.70	-1.08	1.11
2005	14.00	2.31	-35.69	702.30	2.37	2.96	1.52	75.81	0.61	-1.07	1.14
2004	15.00	6.22	25.60	578.70	2.27	2.92	5.46	65.80	1.51	-1.07	1.45
2003	15.00	7.68	21.91	468.30	1.43	1.78	6.17	39.18	1.40	-1.04	1.74
2002	14.00	9.14	32.73	396.30	1.49	1.57	8.27	30.15	1.73	-1.07	1.95

	D/E - SBSA	ROA - SBSA	ROE - SBSA	EPS - SBSA	P/E - SBSA	MARKET TO BOOK - SBSA	EVA - SBSA	SHARE PRICE - SBSA	INTEREST COVER - SBSA	FINANCIAL DISTRESS - SBSA	PROVISIONS - SBSA
2010	13.58	3.35	5.23	735.20	2.80	2.08	2.47	107.55	1.31	-0.91	2.35
2009	14.02	5.29	18.98	771.10	2.07	2.01	4.37	102.00	1.46	-1.18	2.52
2008	15.28	8.65	51.10	1,002.00	1.26	1.59	6.70	83.00	1.66	-1.17	1.75
2007	16.97	4.57	3.16	1,033.40	2.00	2.55	3.05	100.08	1.19	-1.14	1.11
2006	16.33	2.77	-31.03	837.40	2.04	2.50	1.31	94.50	0.70	-1.08	1.11
2005	17.92	2.31	-35.69	702.30	2.37	2.96	1.52	75.81	0.61	-1.07	1.14
2004	15.23	6.22	25.60	578.70	2.27	2.92	5.46	65.80	1.51	-1.07	1.45
2003	14.35	7.68	21.91	468.30	1.43	1.78	6.17	39.18	1.40	-1.04	1.74
2002	11.14	9.14	32.73	396.30	1.49	1.57	8.27	30.15	1.73	-1.07	1.95
2001	10.63	3.94	-16.60	336.50	1.27	1.36	2.86	31.20	0.83	-0.95	2.11
2000	10.35	6.04	7.79	284.80	1.93	1.85	4.38	30.50	1.21	-0.95	2.66
1999	9.78	1.90	-58.99	241.70	1.27	1.75	0.07	25.55	0.27	-0.97	2.93
1998	9.24	12.00	17.22	170.70	0.98	1.20	9.99	18.00	1.16	-1.31	2.56
1997	10.55	11.45	17.29	1,586.00	0.15	0.20	9.34	21.50	1.17	-1.31	
1996	11.27	11.47	18.22	1,311.00	0.15	0.20	8.86	18.40	1.17	-1.34	
1995	11.37	10.57	14.94	1,053.00	0.20	0.25	7.60	17.50	1.20	-1.31	
1994	10.89	9.55	18.35	860.00	0.19	0.20	6.53	11.90	1.26	-1.30	