Modelling Changes in Financial Leverage and Firm Value in South Africa

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ABSTRACT

This study was based on the static trade-off theory for the determination of the optimal amount of leverage within firm capital structure. This theory suggests that the optimal capital structure involves balancing leverage-related costs, such as the present value of bankruptcy costs and agency costs, with the tax advantage of debt. The research has adopted an empirical approach by using historical financial data from the Top 20 industrial sector firms (by market capitalisation) listed on the main board of the JSE Securities Exchange. These companies have been grouped into related industry sectors by trade, allowing for sector related correlations to be easily distinguished.

A mathematical model, namely a discounted cash flow valuation model, constituted the methodology for the research. The valuation model used historical financial data for each of the firms and future market assumptions to calibrate the model to the market values of the firms over the longitudinal study (2006-2010). The financial data was downloaded from selected online financial databases, and any missing data was sourced from company annual reports.

The valuation model was used to determine the impact of increased leverage on firm value and risk profile. The re-levering process assumed that the firms' total capital employed remained the same and the increased leverage was used to buy-back shares at their related market value. The Altman Z" score was used as a measure for financial distress, which correlated to a Bond Rating Equivalent credit rating and risk profile. The analysis concluded that the inter-industry sector firms could potentially have realised a 1.1% to 15.6% increase in firm value through increased leverage over this longitudinal study. This leverage optimisation was possible without any inter-industry sectors dropping into a financial distress risk profile. The maximum value creation seemed to occur at debt to total value ratios of between 19.0% and 53.0%.it was also evident that in recent years that firms are capable of taking on more debt and have higher optimal debt to total value ratios.

The research concluded that the increase in firm value and tax reduction would be highly beneficial to the remaining shareholders. This would also indicate that firms in the industrial sector that announce share buy-backs could be excellent investment opportunities. It was recommended that this research be extended to cover the separate industry sectors on the JSE Securities Exchange main board.

DECLARATION

I, Shane Adrian de Villiers, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Shane Adrian de Villiers

Signed at ……

On the …….. day of …… 2012

DEDICATION

This research is dedicated to my parents, whose constant support made this work possible.

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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to evaluate the impact of changes in financial leverage on firm value in South Africa, and the risks associated with implementing these changes. The report establishes whether South African firms could improve their value through the use of additional financial leverage, and examines the associated risks.

1.2 Context of the study

The corporate financing decision as to what proportion of debt and equity a firm should utilise to fund its operations has been one of the most researched areas in finance for the last half century (Frank and Goyal, 2009). This is with regard to the effect of debt on a firm's ability to meet its contractual agreements and on the market value of the firm. Some of the earliest and most notable work on the subject was performed by Modigliani & Miller (1958), who stated that in a non-taxable world, under certain restrictive conditions, the market value of a firm is unaffected by its capital structure (financing and dividend policy). The authors go on to state that it is rather the firm's earning power and the risk of its underlying assets that determines the market value. In a taxable world, the authors subsequently proposed that the optimal capital structure exists at the point where the firm is financed completely with debt.

These propositions have received their fair share of criticism, as taxes do exist and have a great impact on the firm's capital structure, where the tax deductibility of interest payments proves debt often to be a favourable source of financing. This is not to say that a firm should be completely financed with debt, as the firm will be under operational constraints to meet the interest payments, and will subsequently face a higher probability of bankruptcy. This trade-off between the benefits of debt and the costs of debt has formed the basis for one of the most renowned capital structure theories, the aptly named Trade-Off

Theory, which is illustrated in Figure 1. There is a focus on the tax-bankruptcy trade-off, where firms look to balance the tax benefits of debt against the costs of bankruptcy, and the agency perspective, where debt must be repaid to avoid bankruptcy, thus disciplining managers and extenuating the agency problems of free cash flow (Jensen, 1986; Frank and Goyal, 2009). Even proponents for other capital structure theories are in agreement that taxes, together with asymmetric information, agency costs and market conditions are valid reasons why financing clearly matters (Myers, 2001; Baker and Wurgler, 2002).

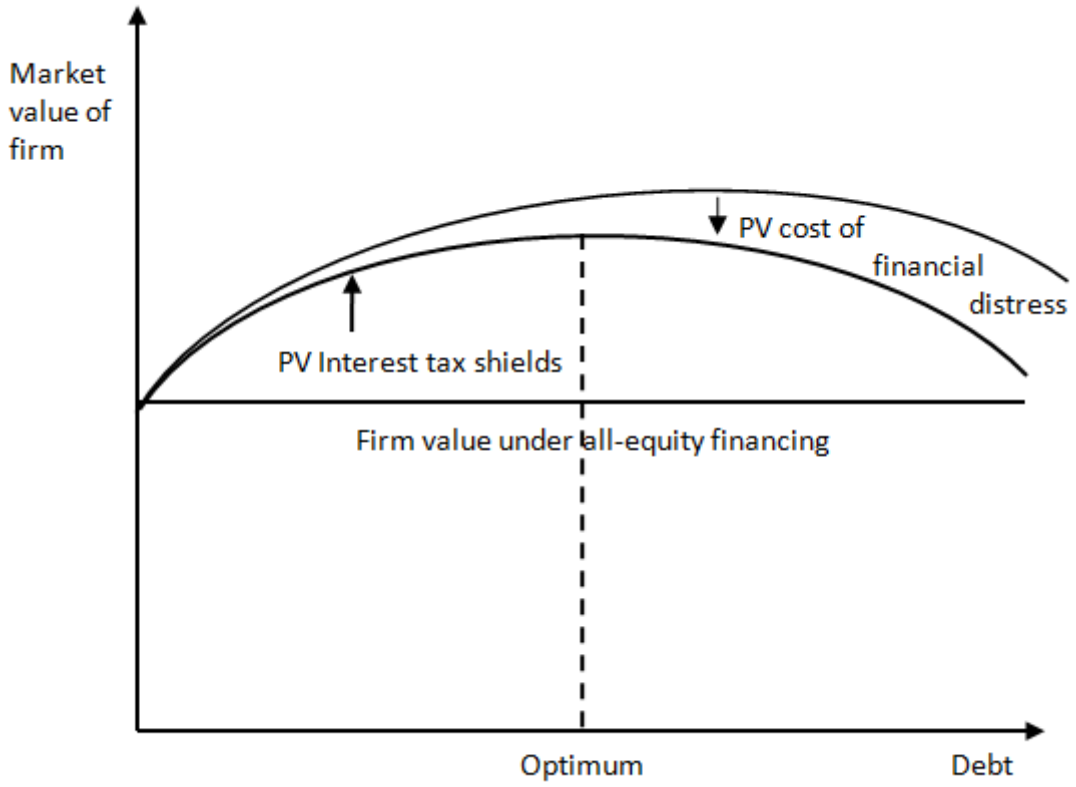

Figure 1: The Static Trade-Off Theory of Capital Structure (Myers, 1993)

The financing decision in South Africa has grown in significance over the past few years. The threat of bankruptcy has recently grown as an area of concern for firms in South Africa, as the economic recession in 2008/ 2009 resulted in a drastic increase in liquidations and insolvencies. In 2009 the liquidations and insolvencies were up by 58% on the annual average since 2000 (Statistics South Africa, 2011a). This reduced market sentiment towards the use of debt for financing, and perhaps to an underutilisation of debt, as the risks associated

with acquiring more debt are higher than that for equity in the form of issuing new ordinary shares. However, it appears the risk of liquidation and insolvency may have been drastically reduced by the implementation of the new Companies Act No. 71 of 2008. The Act came into effect on 1 May 2011, and introduced provisions for business rescue and compromise with creditors. There was a 72% year-on-year decline in liquidations in May 2011, as illustrated in Figure 2, mostly due to a 78% decrease reported for voluntary liquidations (Statistics South Africa, 2011a). This may be due the new provisions that, while under the Business Rescue Procedure, creditors can no longer take legal action against you as the surety of your company, or bring an application for the liquidation of your company (Companies Act, 2008).

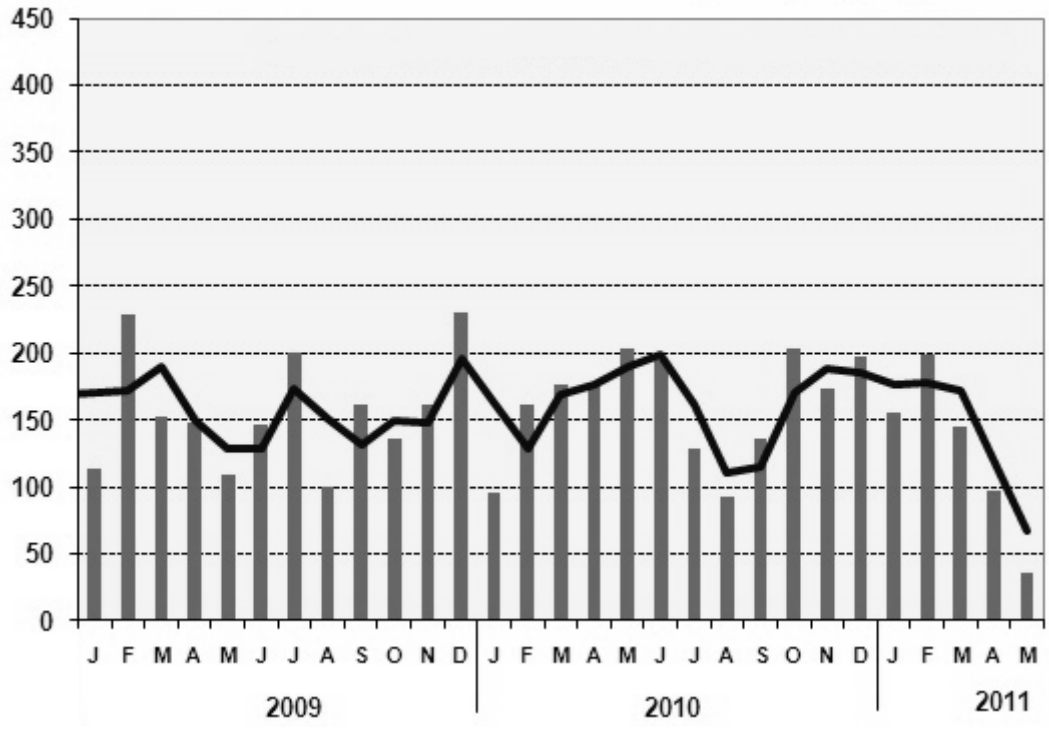

Figure 2: Monthly company liquidations (CRS Business Rescue 2011; Statistics South Africa, 2011b)

It is still too early to determine the success rate of the business rescue procedure, but the immediate hindrance of legal action and application for liquidation alone reduces the risk associated with debt, the degree to which is also unclear. There is subsequently an opportunity for firms in South Africa to re-evaluate their capital structure, and perhaps take on more debt (increase

financial leverage) to increase firm value, if there is capacity to do so and the risks are justifiable. Adding more debt to the firm's capital structure has shown to create a reliable signal of future cash flows (Barclay, Smith and Watts, 1995), as managers demonstrate confidence in meeting their payment obligations, and can improve firm value. An analysis of the impact of changes in financial leverage on firm value aims to illustrate whether South African firms are underutilising debt, and that increasing their financial leverage (while assessing risk) can increase their firm value.

1.3 Problem statement

1.3.1 Main problem

Analyse the impact of changes in financial leverage on firm value in South Africa, and assess the associated risks.

1.3.2 Sub-problem 1

The first sub-problem is to analyse the impact of changes in financial leverage on firm value in South Africa.

1.3.3 Sub-problem 2

The second sub-problem is to assess the risk that changes in financial leverage impose on a firm in South Africa.

1.4 Significance of the study

The study fills a gap in that there is currently no significant research addressing the recent state of firm leveraging in South Africa. There is a possibility that firms have continued to underutilise leverage in the wake of the 2008/ 2009 recession, even though the market risks have been reduced (EMPEA and Coller Capital, 2009; Damodaran, 2011a), and liquidations have declined dramatically (Statistics South Africa, 2011a).

There are numerous studies of financial leverage and capital structure (Modigliani and Miller, 1958; Harris and Raviv, 1991; Myers, 2001; Frank and Goyal, 2009), however, a limited number of studies address the capital structure of firms in South Africa post 2008/ 2009 economic recession. Fewer still address the impact that changes in financial leverage can have on firm value.

The study will provide guidance to finance and management professionals who wish to understand the potential value creation benefits associated with increased financial leverage within South African firms, and the corresponding risks. The insight gained from the study could be applied to firms in all South African industries with similar capital structure compositions.

Academics and students of corporate finance which are often enveloped in historical theory could benefit from a current, practical application of capital structure theory.

1.5 Delimitations of the study

The study addresses only the top 20 companies in the industrial sector listed on the JSE Securities Exchange main board. The top 20 companies are ranked by market capitalisation.

The study focuses on the trade-off theoretical model of capital structure, namely the trade-off between the benefits of debt and the costs of debt.

The study adopts a longitudinal approach, and analyses financial data recorded over the past 8 years.

1.6 Definition of terms

- Insolvency – “refers to an individual or partnership which is unable to pay its debt and is placed under final sequestration. The number of insolvencies does not refer to the number of persons involved, as a partnership which is unable to pay its debt is regarded as a single

insolvency, irrespective of the number of partner" (Statistics South Africa, 2011a: 9).

- Liquidation – "refers to the winding-up of the affairs of a company or close corporation when liabilities exceed assets and it can be resolved by voluntary action or by an order of the court" (Statistics South Africa, 2011a: 9).
- Voluntary liquidation – "takes place when a company or close corporation, by own choice, resolves to wind-up its affairs" (Statistics South Africa, 2011a: 9).
- Asymmetric information – This is a situation where one party in a transaction has greater information compared to another, with particular reference to managers that can have more information than external investors (Leland and Pyle, 1977).
- Agency costs - These are the costs that are associated with the conflicts of interest between shareholders and management of a firm (Jensen, 1986).
- Financial leverage – This refers to the degree to which a firm utilises borrowed money (Damodaran, 2010).
- Bankruptcy – This refers typically to the legal proceeding involving a person/ company that has "insufficient cash flows to meet the promised debt obligations" (Damodaran, 2010: 364). The debtor's assets are used to repay part of outstanding debt to the creditors.
- Tax shield – This is a reduction in taxable income for a firm that is achieved by "claiming allowable deductions, such as interest payments, amortization and depreciation" (Damodaran, 2010: 156).
- Non-debt tax shield - Corporate tax shield substitutes for debt such as depreciation and investment tax credits (DeAngelo and Masulis, 1980).
- Asset substitution – This is an agency cost that occurs when low risk debt is utilised by shareholders to "invest in very risky projects, even if they are value decreasing", and any high returns will be captured by the shareholders. If the project were to fail, the debt holders would have to bear the consequences (Harris and Raviv, 1991: 301).

- Equity rationing - The process whereby an upper limit to the quantity of capital that can be raised by a share issue is imposed, irrespective of how many shares the management of the firm issues (Krasker, 1986).
- Economic Value Added (EVA) - The return on capital employed is compared to the weighted average cost of capital. The difference is then multiplied by the book value of the capital employed to determine the EVA (Ross et al., 2009).

1.7 Assumptions

The following assumptions have been made regarding the study:

- The data for the research that is sourced from INet-Bridge, Standard Bank online share trading and other credible online sources is accurate, and all relevant data is attainable.
- The sample firms are able to restructure their debt and equity, and the chosen method to simulate these changes is sufficiently accurate.
- The additional leverage adopted by the sample firms is used to buy-back shares at market value, and brokering fees are negligible.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section of the report contains a review of the literature that is relevant to the key themes of this study. The first area looks at the forces that shape capital structure, with particular reference to those that can affect firm value and risk profile. The second area looks at the theoretical models of capital structure, where each theory is a collaboration of governing thoughts regarding the determinants of capital structure. This section concludes with a summary of the key points from the literature review, together with finalised research propositions.

2.2 Background discussion

Even though capital structure has been researched for decades, including vast empirical testing, there is still no indisputable evidence to support an optimal mix of debt and equity for a firm, or even the factors that drive the decision to use debt financing remain elusive (Frank and Goyal, 2009). Despite this, there is a vast body of research into this field which has resulted in several developments into the possible drivers of capital structure, with some of the most notable being: bankruptcy costs; tax shields; agency costs and asymmetric information (Baxter, 1967; Ross, 1977; Jensen, 1986). These developments have come a long way since the earliest notable proposition by Modigliani & Miller (1958), where the authors proposed that under certain restrictive conditions, the market value of a company is unaffected by its capital structure and consequently by its financing decisions. Although their proposition has been criticised for deducing that leverage decisions are supposedly irrelevant to firm value, the proposition created a valuable academic platform and starting point for capital structure theory. The forces that have been deemed to shape and drive capital structure have been extensively analysed in

academic literature, and there are often conflicting views of their relevance and significance. These conflicting views have resulted in the development of several theoretical models, with the most popular being the 'trade-off theory', that has centralised ideas surrounding the determinants of capital structure into a single framework. It has been noted that the guiding principle for determining capital structure decisions should be the maximisation of firm value (Ross, Westerfield, Firer and Jordan, 2009), and key factors to consider would be the risks and costs that this decision imposes on the firm.

2.3 Forces that shape capital structure

2.3.1 *Bankruptcy*

Bankruptcy has long been a concern for businesses globally, and it has been argued that excessive leverage induces risks on a firm that will most likely increase the firm's cost of capital (Baxter, 1967). Some of the earliest notable work in this field was completed by Baxter (1967), who argued that a high degree of leverage comes with a high amount of interest payments required by the firm, which increases the probability that the firm cannot meet these payments. This would increase the probability of the firm defaulting on payments and having to file for bankruptcy. The author also noted that the effect of the risk of bankruptcy is not likely to be linear with the reliance on debt, where the interest rate on debt will increase only very gradually (if at all) with leverage. This happens when there is a low reliance on debt, but the interest rate may begin to increase very rapidly when there is a high reliance on debt and the capital structure becomes more perilous.

The capacity of a firm to endure increases in leverage will depend on the variance of the firm's net operating earnings, where firms with reasonably steady income streams are less exposed to the possibility of bankruptcy, and may deem it advantageous to rely quite heavily on debt financing (Baxter, 1967; Bradley, Jarrell and Kim, 1984). Earnings volatility was later used as a proxy for bankruptcy risk by Bradley et al. (1984), where they predicted an inverse relationship between financial distress and leverage. Later work by Rajan and

Zingales (1994), however, argued that conventional measures of risk such as size or the volatility of earnings are too inaccurate, and that linking risk to capital structure has been very difficult in the past. Significant research has since gone into assessing corporate risk and possible indicators for financial distress, yielding more accurate indicators such as the Altman Z" Score and Emerging Market Score Model (Altman, Hartzell and Peck, 1995; Altman, 2005; Altman, Kant and Rattanaruengyot, 2009).

Not all early economists believed that bankruptcy costs were relevant to firm financing decisions, and some economists argued that since bankruptcies are reasonably uncommon, they cannot be an important factor/cost. Stiglitz (1972) argued that even though bankruptcies may be reasonably uncommon, the likelihood of bankruptcy may have a significant effect on the behaviour of the firm, where they may choose a mix of debt and equity which reduces the probability of bankruptcy. The author also concluded that the high costs of bankruptcy have lead some firms to consider take-overs and mergers, where firms approaching insolvency may favour these methods of departure. Later work by Kraus and Litzenberger (1973) formally introduced bankruptcy penalties and the benefit of debt into a state preference framework, where the "market value of a levered firm is shown to equal the unlevered market value, plus the corporate tax rate times the market value of the firm's debt, less the complement of the corporate tax rate times the present value of bankruptcy costs" (Kraus and Litzenberger, 1973: 918). The authors essentially presented a view that bankruptcy costs offset any possible benefits gained from the tax shield. This view was supported by Altman (1984), who tested a sample of 19 industrial companies which went bankrupt over the period 1970 to 1978. The findings from his study illustrated that bankruptcy costs are not trivial. Some of the key findings of the study were:

- Bankruptcy costs exceeded 20% of the value of the company in numerous cases.
- The average bankruptcy costs varied from 11% to 17% of company value.

- For many of the bankrupt companies, the present value of the bankruptcy costs surpassed that of the tax benefits from the leverage.

These findings lead Altman (1984) to conclude that the bankruptcy-cost factor is indeed an important part of the optimum capital structure discussion. Barclay et al. (1995) stated these direct costs of bankruptcy as “out of pocket” costs, typically coupled with the administration (costs) of the bankruptcy process. The authors proposed that indirect costs are also incurred in the process, namely loss of reputation, amendments in investment policy, and passing up valuable opportunities.

Altman, Hartzell and Peck (1995) later developed a scoring system for creditworthiness, the Z”-Score. The model was initially developed for state owned industrial U.S. companies, but was then was adapted by Altman (2005) to be more robust across all industrial sectors, as well as for privately owned firms. The refined version, termed the Z”-Score model, was first fine-tuned for U.S. companies and then a version tailored for emerging market companies was created.

Z”-Score Model for Manufacturers and Non-Manufacturer Industrials:

- Z” = 6.56(X1) + 3.26(X2) + 6.72(X3) + 1.05(X4)

Emerging Market (EM) standardised Z”- Score Model:

- EM Score = 6.56(X1) + 3.26(X2) + 6.72(X3) + 1.05(X4) + 3.25

Where
X1 = working capital/total assets;
X2= retained earnings/total assets;
X3 = operating income/total assets;
X4 = book value of equity/total liabilities.
The constant (term) in the EM model of 3.25 is derived from the average Z”-Score for bankrupt US firms, and standardises the analysis so that a default equivalent rating (D) is consistent with the original model (Altman, 2005).

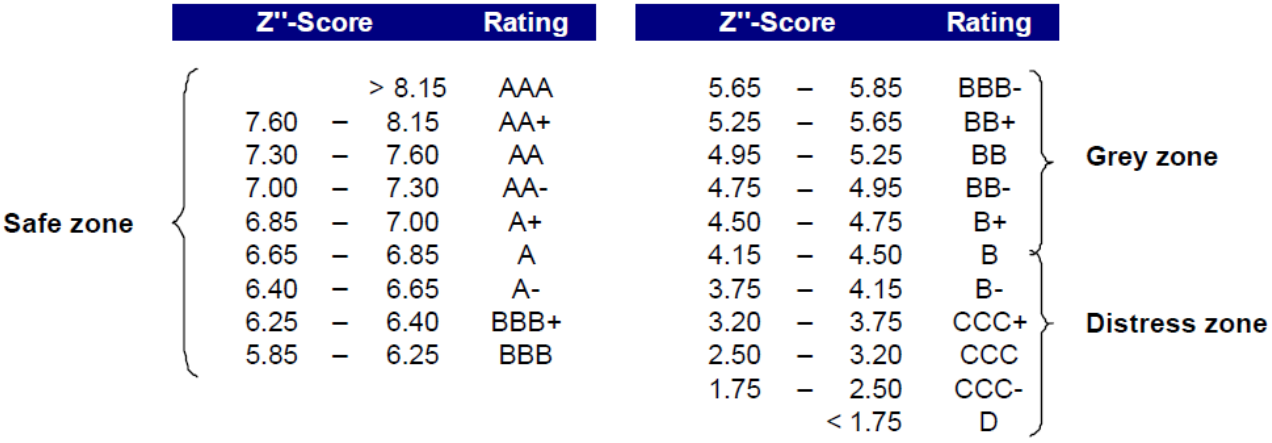

Figure 3: Z”-score and equivalent bond rating (Altman, 2005)

A comparison between credit ratings and Z”-scores can be found in Figure 3, which also illustrates the ranges of Z”-scores associated with being a safe, grey, and distress zone. This model has proven to be valid and reliable, and is generally accepted by academics and corporate practitioners for forecasting corporate distress[1], and may even be valuable in anticipating the future health of firms emerging from bankruptcy. This would have particular reference to South African firms, as the new Companies Act (No. 71 of 2008) that has recently come into effect introduced provisions for business rescue and creditor compromise. The Z”-score Model could effectively be used during the business rescue procedure; to give the personnel involved valuable insight into the possible future health of the firm, should it be reinstated.

2.3.2 *Tax shield*

The relevance of the tax shield has been highly debated, even in some of the earliest research into capital structure drivers. The famous Proposition 1 by Modigliani and Miller (1958) argued, in part, that corporate income taxes do not influence a firm’s capital structure given certain market constraints. When the authors took into account the fact that their assumed restrictive conditions (no

[1] The Altman Z”-Score models are widely accepted and found in financial software packages, financial textbooks, various electronic information sources and scholarly articles.

income taxes, no transactions costs, perfect market conditions), they concluded that the use of interest bearing debt reduces a firm's cost of capital. It was later suggested that when practical transactions costs are taken into account, leverage can possibly increase the value of the firm within specific ranges of leverage, through decreasing the cost of capital (Baumol and Malkiel, 1967; Baxter, 1967).

Miller (1977), a known proponent of the tax shield irrelevance theory, continued to look unfavourably on the validity of the tax shield as a capital structure determinant. The author argued that, while a levered firm has the benefit of deducting their interest payments to creditors before calculating their corporate income tax, these interest payments have already been inflated by the creditors to cover their income interest payments. It was proposed that attempts to exploit leveraging for wealth creation would disrupt market equilibrium, inciting changes in the yields on shares and in turn restoring the equilibrium, thus removing the incentives to incur additional debt (Miller, 1977). This proposition was itself criticised for overlooking corporate tax shield substitutes for debt such as depreciation and investment tax credits, known as non-debt tax shields (DeAngelo and Masulis, 1980). The authors proposed that these tax code features lead to market equilibrium due to the interaction of corporate and personal tax treatment of debt and equity, and in this equilibrium, comparative market prices will denote a net tax benefit to debt financing.

It has been suggested by MacKie-Mason (1990) that most studies do not find any significant tax shield effects because they are looking in the wrong place, and where previous researchers have studied debt/equity ratios, tests should rather be based on incremental decisions. The author analysed incremental choices made by firm managers and found clear and significant tax effects on financing decisions. It was noted that tax shields influence the cost of incremental debt as they decrease the effective marginal tax rate on interest deductions, where the attractiveness of debt financing at the margin is positively correlated with the effective marginal tax rate (MacKie-Mason, 1990). The concept that companies with a greater effective marginal tax rate should utilise more debt to acquire a tax-shield benefit was supported by Huang and Song

(2006). The authors analysed data from more than 1000 Chinese listed firms up to the year 2000, to document capital structure determinants. Although China, like South Africa, is a developing country, corporate tax rates are very low and firm leverage tends to be very low. This, however, did not prevent the authors from concluding that tax shields play an important part in capital structure decisions, and further concluded that it would be favourable for China to accelerate the growth of its bond market, which is seen as an infant industry.

It has been suggested that capital structure theory is portable across countries, both developing or developed, and that the associated financing decisions are affected by similar variables (Booth, Aivazian, Demirguc Kunt and Maksimovic, 2001; Huang and Song, 2006). Booth et al. (2001), however, recognise that much work needs to be done to adequately understand the impact of the different institutional facets on capital structure preferences across developing countries. Research into the capital structure decisions of South African listed companies is limited, with almost no research addressing the impact that financial leverage changes incur on firm value. Negash (2001) analysed 63 firms listed on the JSE securities exchange main board utilising 4 years of time series data, and reported an insignificant net gain in firm value from an increased use of interest bearing debt when capital losses from liquidation and financial distress were invoked. When bankruptcy associated costs were not included, the size of the present value of the tax shield was adequately equivalent to the results obtained in U.S. studies. The improvement from leverage was approximately between 13 and 18 percent of the market values of the companies in this sample (Negash, 2001, 2002). These results were similar to the findings of Wimberley (2001), who analysed 25 companies listed on the JSE Securities Exchange main board during the period 1990 to 1997. The author noted that the utilisation of debt to repurchase shares could potentially produce a 3% to 14% increase in firm value. It was further noted that maximum value creation seemed to occur at debt: total value ratios of between 0.28 and 0.32.

2.3.3 *Signalling/ Asymmetric information*

Market signalling, as a driver of capital structure, received significant attention during the 1970s from several notable academics (Spence, 1973; Leland and Pyle, 1977; Ross, 1977), and it was this early work which brought the notion of signalling and asymmetric information to the corporate world. Spence (1973) suggested that market equilibrium with signalling and asymmetric information may have relatively dissimilar attributes from equilibrium either with perfect information transfer or no information transfer. This notion of asymmetric information, as suggested by Ross (1977) and Leland and Pyle (1977), relates to the proposition that managers have greater knowledge of their firm's future prospects than external investors. If external investors believe that there exists an information asymmetry in the market place, any financing decisions made by managers would subsequently act as signals to these investors of the managerial belief in the future profitability of the company. Leland and Pyle (1977) suggest that one such signal is the readiness of managers with inside information to invest in the firm or project, and lenders will utilise the information transferred by the signal to value the firm/project. Ross (1977) supports this notion, and further develops it by suggesting that an empirical implication of the signalling theory is that the values of companies will increase with leverage, since escalating leverage improves the market's perception of value.

This early proposition by Ross (1977) suggesting a positive correlation between leverage and firm value has received considerable academic support in later studies, and has resulted in 'signalling theory' being one of the most researched factors deemed to shape capital structure decisions (Narayanan, 1988; Noe, 1988; Barclay et al., 1995). These further studies into signalling, while providing support for the work by Ross (1977) and Leland and Pyle (1977), have revealed the high degree of complexity surrounding asymmetric information and market responses. This would indicate that, although the authors were on the right track with signalling theory, there was much left to be discovered, analysed and explained. Noe (1988) recognized an alternate scenario that was not identified by earlier studies, in which managers observe the company's profitability imperfectly. The author suggested that this may create an alternate sequential

funding equilibrium, where firms stringently favour equity to debt financing. In line with the earlier studies, Noe (1988) was able to illustrate that, when managers have perfect information concerning the company's future profitability, there is a significant preference of debt over equity financing. This notion was developed to include the allowance for imperfect managerial information, where the effect of an equity financing announcement would be negative relative to that of a debt announcement for both perfect and imperfect information scenarios.

Narayanan (1988) offered a new benefit to the utilisation of debt, by proposing that the use of debt can act as a barrier to entry for substandard companies. This would consequently improve firm quality standards in the market, thus benefiting every firm in the market even when perfect discrimination is not possible. Barclay et al. (1995) looked at the theory through a different lens, and added that there was an inherently high cost associated with false signalling, where future cash flows that are not sufficient to meet interest payments may force the company into bankruptcy. Narayanan (1988) and Barclay et al. (1995), however, were both in agreement with the earlier theory that the addition of debt to a firm's capital structure served as a reliable and positive signal of future cash flows and profitability.

The notion of information asymmetry and signalling was also fundamental in the formation of a well-developed and accepted capital structure theory, the 'pecking order theory'. Myers and Majluf (1984) and Myers (1984) developed a sequential financing preference framework, which used the concept of signalling theory to support the preference for internal financing. It was suggested that the utilisation of available liquid assets would negate the requirement of acquiring finance from the capital markets, where subsequent regulation, control, and signalling consequences would be incurred. Krasker (1986) was able to provide support for this proposition, where he showed that share prices decrease in proportion to the size of the share issue in market equilibrium. The rate of decline, it was suggested, could even be so swift as to cause equity rationing, the process whereby an upper limit to the quantity of capital that can be raised

by a share issue is imposed, irrespective of how many shares the management of the firm issues.

Even though it was generally accepted in the academic realm that signalling and asymmetric information played a part in the capital structure decision making process, some academics believed it could be quite easily alleviated, and thus it is not as significant as previously thought. Brennan and Kraus (1987) and Constantinides and Grundy (1989) believed that certain financing methods could alleviate particular information asymmetries. The authors suggested that debt retirements combined with equity issues, as well as junior convertible bond issues would be examples of these financing options that would alleviate signalling costs. Further studies have continued to uncover new aspects of signalling theory that do not necessarily attempt to disprove the theory's significance, but rather question the application of the theory to real market occurrences. Harris and Raviv (1990; 1991) suggest that managers are unwilling to surrender control and to provide information that could result in a loss of control. The authors propose that debt is a disciplining device, rather than a signalling device, as default allows creditors the opportunity to force the company into bankruptcy. It would appear that earlier work on signalling theory did not consider the risk aspect associated with acquiring more debt, and this perhaps is the prevalent consideration when looking for additional financing. Halov and Heider (2004) analysed a large unequal panel of publicly listed U.S. companies, and found that companies issue debt to finance their investment requirements when default risk is low. However, when default risk was high, firms issue more equity to steer clear of the adverse selection costs of debt. This supports the findings by Harris and Raviv (1990; 1991), which would indicate that the ability of debt issuance to act as a signalling device and a disciplinary device should not be considered mutually exclusive, but rather (function) as collaborative actions.

2.3.4 *Agency costs*

Some of the earliest and most notable work into 'agency theory' and agency costs as a capital structure determinant was initiated by Jensen and Meckling

(1976), with further development of the theory by Harris and Raviv (1991). This is not to say that the concept of agency costs had not been addressed in earlier literature, it just was not pinned with the same title. Smith (1937) seemed to be well versed in the notion of agency costs, and suggested that directors are essentially managers of other people's money, and it should not be well expected that they would look after it with the same diligence as they would their own.

The author created a comprehensible analogy, where he likened managers to the servants of a wealthy man, who are capable to attend to minor matters, but would quickly give themselves a reward for doing so. This led Smith (1937) to conclude that over-indulgence and negligence would more or less prevail in the management of firm affairs. The studies by Jensen and Meckling (1976), Jensen (1986) and Harris and Raviv (1991) yielded much the same conclusion. The authors also developed the definition, identified that two agency conflicts in fact exist, and found that there are possible measures to alleviate these agency costs. Jensen and Meckling (1976) defined agency costs as the sum of:

- The monitoring expenditures by the principal (firm owners).
- The bonding expenditures by the agent (firm managers).
- The residual monetary loss experienced by the principal, resulting from the deviation of the agent's decisions from those which would favour the principal.

Jensen (1986) subsequently developed a free cash flow theory based on this progression of the agency theory, where he highlighted the problem that exists when a firm has more cash than lucrative investment opportunities. The problem exists in motivating the firm's management to adequately utilise the cash, rather than haphazardly spending it or investing it below the cost of capital. Jensen (1986) suggested that debt could be beneficial in reducing the agency costs of free cash flows, which has become a view adopted by a vast number of reputable academics (Harris and Raviv, 1991; Barclay et al., 1995; Myers, 2001).

Barclay et al. (1995) suggested that the separation of ownership and control in large public listed companies with dispersed shareholders creates a reduction in firm value. The authors proposed that debt financing would force some equity ownership involvement, thus improving the monitoring of the firm's management. Myers (2001) added that although sizable debt can be hazardous, it forces the company to pay out cash and adds value by effectively placing the company on a diet (watch what it spends).

Harris and Raviv (1991) favoured the definition of agency cost by Jensen and Meckling (1976), but further proposed that agency costs do not just exist between managers and shareholders, but also between debt and equity investors. This agency cost occurs when low risk debt is utilised by shareholders to invest in risky projects, and any high returns will be captured by the shareholders. If the project were to fail, the debt holders would have to bear the consequences. This concept also forms part of the structure of the static trade-off theory, and is known as 'asset substitution'. With regard to the conflicts between shareholders and managers, Harris and Raviv (1991) suggest possible solutions to be compensation schemes and increasing the equity ownership of management. It was noted that the alignment between managers' and shareholders' intentions may essentially be imperfect, which would suggest that increasing the equity ownership of management may be the only solution. This can easily be supported by the recent activity of listed company CEOs, who have had compensation and incentives linked to specific performance metrics [SA Airways, Home Depot, Pfizer, Exxon Mobil (Haffajee, 2001; Kirkland, 2006)]. These specific incentives resulted in a distortion of certain performance areas, and ultimately damaged the company's health and image. This tendency for CEOs to over perform in incentive linked areas creates a dilemma for many companies and their boards of directors.

Earlier work by Fama and Jensen (1983) yielded noteworthy propositions regarding agency costs, and perhaps even a solution to the CEO incentive dilemma, without even knowing it. The authors focused on the decision making process within a firm, which consists of decision management (initiation, execution) and decision control (authorization, monitoring), and proposed that:

- If decision management did not accept residual risk, this leads to decision systems that detach decision control from decision management.
- If a few agents combine decision management and control, this means that residual claims which are mainly restricted to these agents can be expected.

The authors suggest that boards of directors, the typical apex of decision control in firms, reduce collusion between decision management and control agents, and are mechanisms that separate management and control of the firm's most important decisions. One can barely question the validity of this statement, particularly as boards of directors have become commonplace structures of corporate control/decision making in firms, and are also mandatory in listed firms. There is also new legislation in South Africa, the Companies Act (No. 71 of 2008), governing these boards of directors, and looking to hold them accountable for their actions, which is far beyond previous legislative requirements. The new Companies Act (2008) includes a requirement for the company to disclose director compensation in the firm’s annual report, which was previously only required of listed. This compensation disclosure looks to make firms more transparent and reduce agency costs and incentive kickbacks. However, this may only partially address the CEO incentive dilemma. To be all encompassing in the CEO incentive approach, the board of directors should allocate the CEO incentive remuneration to several key performance areas, ensuring that they are mutually exclusive and collectively exhaustive. This would reduce the distortion of having incentives linked to only one key performance area.

A more recent study by Mauer and Sarkar (2005) again highlighted the significance of agency costs as a determinant of capital structure decisions. The authors showed that managers had an incentive to over-invest in risky projects (asset substitution), and the subsequent over-investment considerably reduced firm value and optimal leverage. It would appear that, regardless of the developments in agency theory and suggested solutions to reduce the associated costs; it remains a formidable opponent to optimal firm efficiency.

2.3.5 *Other (Non-debt tax shield, tangibility, profitability)*

Non-debt tax shields are corporate tax shield substitutes for debt such as depreciation and investment tax credits, and have been mention earlier in the tax shield section as it has been argued by DeAngelo and Masulis (1980) that they are interrelated and are not mutually exclusive. The authors, who essentially initiated non-debt tax shield research, proposed that firms with high non-debt tax shield levels would consequently have lower debt levels due to the presence of tax shield ceilings. This suggestion seems to validate their proposition that debt and non-debt tax shields are inherently entwined. Bradley et al. (1984) also recognised the importance of the non-debt tax shield, and looked to develop a model to support their theory that non-debt tax shields are inversely related to leverage. Their findings, however, were quite the contrary of what was expected in that leverage was directly related to non-debt tax shields. This result, which seemed to puzzle the authors quite considerably, can be quite easily explained by the notion of 'tangibility'. High tangibility (high level of fixed assets), which results in high non-debt tax shield levels from depreciation credits, has been shown to be directly related to leverage (Harris and Raviv, 1990; Stulz, 1990; Barclay et al., 1995; Frank and Goyal, 2009).

More recent research by Frank and Goyal (2009) has highlighted some additional forces that have been deemed to shape capital structure decisions. The authors looked at publicly traded American companies (from 1950 to 2003) to establish which factors have a reliable relationship to market-based leverage, that is the leverage experienced in the market. Using a large base of 25 probable factors from preceding studies, Frank and Goyal (2009) found that there were 6 factors that were statistically significant in providing an account for the leverage patterns.

It was found that firms tend to have high leverage if:

- The firm competes in an industry in which the average firm has high leverage.
- The firm has a high level of tangible assets (high tangibility).
- The firm is larger (as measured by book value of assets).

- Inflation is anticipated to be high.

It was found that firms tend to have low leverage if:

- The firm has a high market-to-book ratio.
- The firm has more profits (high profitability).

It was also determined in an earlier version of their paper that whether the firm pays a dividend or not is also strongly correlated with leverage, where a firm that pays dividends tend to have less leverage than firms that do not pay dividends.

Having reviewed the vast academic research into the drivers of capital structure, it appears that the general consensus amongst academics is that changes in financial leverage do influence firm value. There is, however, immense dispute about which factors actually drive these changes. Therefore, I am proposing that changes in financial leverage do have an impact on firm value in South Africa, and increasing a firm's leverage, to an extent, will improve firm value.

2.4 Capital structure theory

The vast amount of academic literature concerning capital structure determinants has yielded a number of conflicting views, with particular emphasis on the relevance and significance of the driving forces. Each conflicting view has resulted in a collaboration of supporting ideas to yield theoretical models, which are essentially centralised notions favouring specific forces that are deemed to shape capital structure.

2.4.1 Static trade-off theory

By the mid-1970s, the static trade-off theory was the prevalent and generally accepted academic view with regard to capital structure theory. The theory suggests that the optimal capital structure involves balancing leverage-related costs, such as the present value of bankruptcy costs and agency costs, with the

tax advantage of debt (DeAngelo and Masulis, 1980; Bradley et al., 1984; Myers, 1984). Using a simulation analysis and an empirical investigation of 851 firms covering 25 different industries, Bradley et al. (1984) were able to support the trade-off theory. The authors demonstrated that if financial distress costs are considerable, a firm's optimal leverage is inversely related to the variability of their earnings and the firm's expenditure intensity. The study did, however, highlight some of the weaknesses in the trade-off theory. Most notably, the trade-off theory doesn't account for the existence of strong industry forces on firm leverage, which explained the 54% (level of) variation in firm leverage, and does not account for the importance of non-debt tax shields in the capital structure decision (DeAngelo and Masulis, 1980; Bradley et al., 1984; Myers, 1984).

The static trade-off theory, although accepted to provide some explanation of capital structure decisions, was further criticised by Myers (1984) for not accounting for debt ratios that vary extensively across essentially similar companies. The author proposed that the static trade-off theory should account for adjustment costs, most notably those arising from agency costs and asymmetric information, which could possibly explain the high variability in similar firm leverage ratios.

A further consideration for the trade-off theory, it has been suggested, is that simply assessing the amount of debt is not sufficient, and the theory should also consider the debt maturity, as it plays an equally significant part in shaping capital structure decisions (Barclay et al., 1995; Leland and Toft, 1996). It was shown by Leland and Toft (1996) that longer term debt utilises tax advantages more effectively, but also creates larger agency costs by providing the shareholders with incentives to increase firm risk through asset substitution, whereby these low-risk assets are exchanged for high-risk investments. The authors propose that this probable agency cost can be considerably reduced by utilising shorter term debt, as they found that shareholders of companies issuing short term debt generally do not have an incentive to raise the company's risk. Through their findings, Leland and Toft (1996) were able to illustrate how these dual aspects of optimal capital structure, namely maturity and amount,

represents a trade-off between bankruptcy costs, agency costs and tax advantages. When the authors integrated their findings with earlier work by Barclay et al. (1995), they were able to suggest the following:

- When agency costs exist, riskier companies should utilise shorter term debt, and also use less debt.
- A company with more significant bankruptcy costs will favour longer term debt.
- Long term debt tax advantages are considerably reduced when a company's cash flows are small relative to their asset value, which may be the case for high growth companies.
- When agency costs exist beyond the incentive for asset substitution, higher-growth companies will favour shorter term debt.

These views supported the trade-off theory, but with an additional focus on agency costs, an aspect that traditional trade-off theory did not incorporate. Although the static trade-off theory has been criticised by some for being too simplistic and not accounting for a variety of important determinants (Miller, 1977; Myers, 1984), it is also this simplicity that has been lauded by others (Bradley et al., 1984; Barclay et al., 1995; Leland and Toft, 1996).

Myers (1993) suggested that most business people unanimously agree with the concept that utilising debt saves money on taxes and that incurring too much debt can be costly. It was also noted that analysis of financial distress costs provides testable trade-off theory predictions; where these costs would be most significant for firms with high intangible assets and growth options, and should be less significant for mature firms with high tangible assets, allowing them to take on more debt. This prediction has been found to be statistically significant on several occasions, providing supporting evidence for the trade-off theory (Myers, 1977; Bradley et al., 1984; Frank and Goyal, 2009). Myers (1993) further supported the simplistic trade-off theory by referring to earlier work by Smith (1986), who had shown that most leverage-increasing corporate actions signal positive news, and leverage-decreasing corporate actions signal negative news to the market. More specifically, this trade-off related to announcements

of share issues dropping share prices, and conversely share repurchases raising share prices.

The initial praise of the trade-off theory by Myers (1993) did not, however, mean that he favoured the theory. The author noted that the competing 'pecking order theory' explains the same occurrences in market responses to capital restructuring, and that the trade-off theory implies that managers would meticulously seek optimal capital structure, but the reality is that firms are often moved away from achieving the optimum by random events. It has been argued that the most decisive evidence in opposition to the trade-off theory is the strong inverse relationship between leverage and profitability, where more profitable companies within an industry borrow less, and less profitable companies borrow more (Myers, 1993; Booth et al., 2001). This view was also supported by Fama and French (2002), but the authors went further to suggest that all capital structure theories have their weaknesses, and it by no means negates the trade-off theory as a viable framework for assessing capital structure decisions.

2.4.2 Pecking order theory

The pecking order theory was first introduced, under this title, by Myers (1984), who noted that the results of an earlier study by Donaldson (1961) on the financing practices of large companies in effect formed the basis of this theory. The theory is based on the premise that a firm's capital structure financing decisions are based on preferential sources of finance, where:

1. Internal finance is preferable (retained earnings).
2. Intended dividend payout ratios are adapted to the firm's investment opportunities.
3. Internal cash flow may vary from investment expenditure due to volatility in the firm's profitability and investment opportunities, together with the sticky nature of dividend policies. If the cash flow is less than expenditure, the firm first would first utilise its cash reserve or marketable securities to cover the shortfall.

4. If external funding is required by a firm, they would utilise the safest security first, where they would start with debt, then perhaps hybrid securities (convertible bonds), then equity as their last resort.

Further confirmation of these findings came from Myers and Majluf (1984), where their model suggested that firms had a propensity to rely on internal financing if there is sufficient reserves to meet the funding requirements, and would prefer utilising debt instead of equity if external funding is required. It is suggested that this may be due to the division of control and ownership, where professional managers keep away from external finance as it subjects them to the regulation and control of the capital market (Donaldson, 1961; Myers, 1984).

Later studies have been able to support the pecking order theory, and have provided extensions to the knowledge base. Narayanan (1988) found similar results to Myers and Majluf (1984), and showed that all firms that were allowed to issue equity or take on more debt either chose to issue more debt or cancel the project. Krasker (1986) was also able to support and add to the theory by showing that larger share issues created worse signals, and the firm incurred a more severe decline in share price.

Much like the static trade-off theory, there were several critics of the pecking order theory. Brennan and Kraus (1987) suggested that a wider range of financing choices, such as issuing debt combined with equity or issuing junior convertible bonds, would resolve specific/particular anticipated signalling effects. Noe (1988) showed that, when inside management observed the cash flow of the firm incorrectly, there may exist an alternate sequential equilibrium to the pecking order theory in which some firms stringently favour equity financing to debt. The characteristic of a convertible bond to negate particular markets signals, as stated by Brennan and Kraus (1987), was later favoured by Constantinides and Grundy (1989), who were also in agreement with the notion that firms may not have an inclination for issuing debt over equity.

The case against the validity of the pecking order theory seemed to gain some acceptance in the academic realm, and Myers (1984), the architect of the pecking order theory, took note and tailored the initial pecking order theoretical

model. The author consequently termed it the "modified pecking order", noting that although it was still somewhat oversimplified, it was reasonably consistent with the empirical findings. This modified theory stated that:

1. There are good reasons for firms to avoid financing real investment through issuing shares or other high risk securities.
2. Target dividend payout ratios are set so that ordinary equity investment rates can be met by funds produced internally.
3. The threat of financial distress costs, together with the need for reserve borrowing power, restrains a firm's plans to cover part of normal investment with new debt, unless it is reasonably close to being default risk free.

This revised account of the pecking order theory's sequential financing preferences takes into account both financial distress costs and asymmetric information, indicating that a firm faces two escalating costs as it moves up the pecking order. Myers (1984) indicates that these costs include a higher risk of financial distress costs, as well as a greater probability that profitable future ventures will be passed by, as the firm would be unwilling to finance these ventures by issuing shares. Myers (1993) continued to favour this aspect of the pecking order theory, and proposed that financial slack is greatly valued by managers, as it alleviates their fears of passing profitable future ventures by when external equity funding is required. The author describes financial slack as cash reserves, readily marketable tangible assets and securities, as well as the ability to issue (virtually) default risk-free debt. It has also been noted that the competing static trade-off theory does not make this distinction between favourable equity from retained earnings and far less favourable equity from issuing shares (Myers, 1993).

Later studies by Fama and French (2002) and Frank and Goyal (2003) have again highlighted the complexities associated with forming a capital structure theoretical model, and have found evidence both for and against the pecking order theory. Fama and French (2002) showed that the net new issues of

common shares are insignificant for dividend payers, which is consistent with the 'sticky' dividend[2] notion of the pecking order theory. The authors, however, also found contradictory evidence in that small low-leverage growth firms would undertake significant equity issues. Frank and Goyal (2003) tested the pecking order theory on a broad cross-section of publicly listed U.S. companies from 1971 to 1998. The authors showed that large companies in a narrow industry range of samples provide some support for the pecking order theory, small firms do not follow the theory, and large samples incorporate sufficient small firms to inadequately support the theory. This was supported by evidence that equity financing was utilised more frequently and in greater magnitude than debt financing, and the net equity issues tracked the financing deficit quite accurately, while net debt did not (Frank and Goyal, 2003).

2.4.3 Market timing theory

The market timing theory began to evolve slowly from early findings by Myers (1984), and has only recently received significant attention by Baker and Wurgler (2002), prompting renewed academic interest into this capital structure theory. Myers (1984) suggested that firms try to time their share issues when market prices are high, and are more likely to issue shares than take on more debt after market prices have increased. This suggestion can be supported by the findings of an earlier study by Marsh (1982), who found that historical share price movements were one of the most accurate variables in explaining the firms' choices between new equity and debt issues. These findings demonstrated that firms' financing decisions are heavily influenced by market conditions. This empirical evidence can neither be explained by the static trade-off theory, nor the pecking order theory. This is an apparent weakness in the two most generally accepted capital structure theories (Myers, 1984).

[2] Refers to the idea that dividends track earnings, and changing dividend policy will affect investor sentiment. Thus most companies do not change dividend policy Myers, S. C. (1984) The Capital Structure Puzzle, *Journal of Finance,* 39(3), pp. 575-592..

Lucas and McDonald (1991) were able to support the earlier findings of Marsh (1982) when they developed a model to assess share price behaviour and issue timing. The authors found that:

- Unusually high share returns preceded equity issues on average, although there is substantial disparity across firms.
- Unusually high market returns preceded equity issues on average.
- The declaration of a share issue dropped the share price considerably.

Although these findings helped to support the market timing theory, they were unable to provide any evidence for the underperformance of the firms post share issue, and focused strictly on the relevance of equity and ignored any debt related market timing activities. This debt related void was later filled by Graham and Harvey (2001), who focused on the notion that managers may attempt to time debt issues with interest rate drops, or when they believe that interest rates are unusually low. The authors were able to find reasonably strong evidence that managers of firms try to time debt issues in this regard. It was further noted that market timing for large companies is particularly significant, implying that perhaps the consequentially large/sophisticated treasury department may have something to do with this. Attempting to cover all the aspects of debt use, Graham and Harvey (2001) had not forgotten to assess the importance of short term debt when testing their model. The less restrictive conditions for utilising short-term debt would make it easier to issue more short-term debt quickly if the market had to turn. The authors found evidence to support this notion, where firms did in fact attempt to time market interest rates with short-term debt issues. This was particularly evident when short-term rates were believed to be low relative to long-term rates, or when long-term rates were expected to drop.

Baker and Wurgler (2002) conducted extensive research into market timing theory, where they analysed 2,839 firms post-IPO (Initial Public Offering) between 1968 and 1998. The sample included a total of 715 firm observations with 10 years of post-IPO performance, where the steady attrition in firm observations over the years was due to mergers, bankruptcy and other factors.

The authors evaluated market timing opportunities using the market-to-book ratio of the firm, finding that:

- Firms with low leverage tended to raise capital when their valuations were high.
- Firms with high leverage tended to raise capital when their valuations were low.

These findings lead Baker and Wurgler (2002) to propose that capital structure is primarily the cumulative result of historical attempts to time the equity and debt market. This theory suggests that, in contrast to the other capital structure theories, there is no optimal capital structure, as market timing financing choices simply accrue over time into the ensuing capital structure. Although arguing that there are some holes in this theory, Frank and Goyal (2009) support these findings in the notion that debt market conditions and share returns are significant capital structure determinants.

Later work by Hovakimian, Hovakimian and Tehrania (2004) looked to test the relevance of the market timing theory with dual debt and equity issues, with the premise that the combination of debt and equity would offset any signalling and market timing significance. The authors found evidence against the market timing theory in that it does not predict any profitability effects, and that target capital structures for firms appear to exist. Although these findings did question the validity of the market timing theory, there were also findings that provided supporting evidence. It was shown that the attraction to time the market by issuing equity when the share price is comparatively high actually impeded on the firm's propensity to maintain its target debt ratio (Hovakimian et al., 2004). These findings were supported by Huang and Ritter (2005), who found that publicly listed U.S. companies strongly favoured equity issues as a source of funding when the anticipated risk premium on their equity is lower. The authors also found that historical equity and debt issues have substantial and long-term effects on the firm's capital structure, even after target leverage considerations. This finding appears to be an echo of the earlier proposition of Baker and Wurgler (2002), who suggested that market timing financing choices simply accrue over time into the ensuing capital structure.

All these findings suggest that the two key theories, namely the trade-off and pecking order theories, have a new contender, the market timing theory. Although the market timing theory is not without its faults, the key theories also have their own weaknesses. This indicates that there is yet to be an all encompassing theory, and with the multitude of historical research into this field, it is likely this may always be the case.

2.4.4 Organisational theory

The organisational theory is a more recent addition to the capital structure theoretical model family. The theory was first initiated by Myers (1993), but was based on agency theory and free cash flow theory that had been worked on for many years by several highly respected academics (Jensen and Meckling, 1976; Myers and Majluf, 1984; Jensen, 1986; Harris and Raviv, 1990). Myers (1993) recognised that the organisational theory that he proposed was an elaborated version of the free cash flow theory of Jensen (1986), which was founded on the widely accepted notion of agency costs. The free cash flow theory suggested that managers with substantial free cash flow had a natural tendency to waste it rather than creating value for the owners of the firm through share buy-backs or dividend increases. It was further proposed that debt can be the solution to this problem, where increased debt reduces the cash flow available for spending at the discretion of managers and thus reducing the agency costs of free cash flow.

Even though the organisational theory conflicts with the earlier pecking order theory proposed by Myers (1984), the author found that the significance of the considerable use of leverage in takeovers, leveraged buyouts, and firm restructurings could not be ignored. The theory developed explanations for this high use of leverage, in that it forced companies on a financial diet, and thus prevented non-profitable investments or unnecessary expenses from occurring. It was later noted that the organisational theory is most applicable to large, mature companies that are more susceptible to managerial over-investment (Myers, 2001).

Considering the vast amount of studies involved in developing the trade-off and pecking order theories, the organisational theory is in its infancy. Further meticulous and comprehensive development of the theory is required, and it is somewhat surprising that a theory based on the generally accepted notion of agency costs is still yet to receive the required attention. Perhaps this is due to the major developments in managerial control and increased transparencies through new legislation (Companies Act, 2008), or perhaps the increased cash flow vigilance forced onto managers due to recessionary times and slowing economic conditions.

There are no other well developed capital structure theories that exist in addition to the theories that have already been mentioned, but there are a few that exist in a developmental stage and are yet to take shape (Debt structuring, Product/Input interactions). Having reviewed the vast academic research into capital structure theoretical models, it is evident that there is a significant link between risk and leverage. I propose that the increased default risk associated with increased financial leverage does have an impact on financing decisions by firms in South Africa, and firms consequently have reserve borrowing power to take on more debt without incurring financial distress costs.

2.5 Conclusion of Literature Review

Modigliani & Miller (1958), the generally accepted initiators of capital structure research, surely could not have anticipated the significance of their research in stimulating one of the most researched areas in corporate finance. Their early propositions, even though they were often contested, created the thinking platform upon which most of the current theoretical frameworks and capital structure drivers are based. The earliest forces that were deemed to shape capital structure were tax shield advantages and financial distress costs, where the attempt to balance these two opposing forces yielded the static trade-off theory (Baxter, 1967; Bradley et al., 1984). The relevance of the tax shield was then used to illustrate the importance of the non-debt tax shield in corporate financing decisions (DeAngelo and Masulis, 1980), which was shown to have a positive correlation with tax shields and with leverage. Continuing work began to

reveal several other highly relevant factors including agency costs, signalling and asymmetric information, and firm profitability/tangibility (Jensen and Meckling, 1976; Myers, 1984; Frank and Goyal, 2009). These additional factors helped to initiate and develop new theoretical frameworks regarding capital structure determinants, where the pecking order and market timing theories have each received noteworthy and corroborative work by highly respected and reputable academics (Jensen and Meckling, 1976; Myers, 1984; Myers and Majluf, 1984; Lucas and McDonald, 1991; Baker and Wurgler, 2002; Frank and Goyal, 2009). The more recent organisational theory is yet to be adequately fleshed out, and is still in its infancy.

Although the insight gained from the vast academic studies into capital structure is significant, there is, however, much to be learned about capital structures in developing economies such as South Africa. Even though it has been argued that financing decisions in developing economies are affected by similar drivers to those found in developed economies (Booth et al., 2001; Huang and Song, 2006), there is little evidence to support the applicability of this notion to South Africa. This may be due to the South African economy's unique mix of legal, political and race-related agendas. There have only been a few studies of leverage and capital structure determinants for South African firms, and these studies have shown that additional leverage can increase firm value, but too much leverage can trigger financial distress costs and harm a firm's value (Negash, 2001; Wimberley, 2001; Negash, 2002). The limited number of South African firm capital structure studies as well as studies linking developed and developing economy capital structure determinants indicates the void in the literature has not been conclusively filled.

2.5.1 Proposition 1:

Changes in financial leverage have an impact on firm value in South Africa, and increasing a firm's leverage, to an extent, will improve firm value.

2.5.2 Proposition 2:

Firms in South Africa have reserve borrowing power to take on more debt without incurring financial distress costs.

CHAPTER 3: RESEARCH METHODOLOGY

This section of the report outlines the methodology followed in order to address the research propositions. The first area looks at the literature around quantitative research, and concludes on the applicability of this method to the requirements of this study. This is followed by a review of the proposed research design, population and sample size, as well as the research instrument to be used in this research. The next area will focus on the methods of data collection, analysis, and interpretation and support for the chosen methods will be provided. The last areas of this section address the anticipated limitations of the study, and discuss the validity and reliability of the proposed research.

3.1 Research Methodology /Paradigm

This study addresses the research propositions by utilising a quantitative methodology, which has been the renowned method of research in capital structure. The minority of capital structure research, being qualitative, focused primarily on collaborating empirical findings into theories. This study seeks to collect a new set of empirical data on capital structure for analysis. This study will adopt the empirical-analytic paradigm associated with quantitative research, because it is intended to be disconnected from, and independent of, the historical performance of the sample firms (Garrison, 1986; Hathaway, 1995). This replicates the intention of this study in its entirety, where historical South African firm leverage in the industrial sector will be adjusted to alter capital structure. It has also been noted by Firestone (1987) that quantitative research is based on a positivist philosophy, which carries with it an assumption that social facts exist within an objective reality. It has been noted that the drivers of change in these social facts can be determined through quantitative analysis (Firestone, 1987; Hathaway, 1995). This finding by Firestone (1987) and Hathaway (1995) adequately represents the context of this study, and suggests that a quantitative methodology would be the best fit for the research.

The data is collected from online databases such as INet-Bridge, JSE Securities Exchange, and Standard Bank online share trading. These databases manage the data published by the JSE Securities Exchange, and are updated to correctly account for share splits, consortium unbundlings, and other corporate actions that might affect the financial data (Cubbin, Eidne, Firer and Gilbert, 2006). It is assumed that the data provided is both accurate and valid.

3.2 Research Design

The research design incorporates mathematical modelling, namely the: 'discounted cash flow' (DCF) model that will be created using historical financial data from the sample firms. The DCF model provides simulated firm valuations using 'free cash flows to the firm' (FCFF), and allows for the adjustment of leverage in order to measure the impact on firm value. This method is widely used by financial analysts and academics for firm valuation, and will yield a more realistic estimate for firm equity value than other comparable methods, such as the dividend discount model (Ross et al., 2009; Damodaran, 2010). Although this notion was supported by Mun (2006), the author highlighted some of the disadvantages of this valuation method. It was argued that this method is too static, lacks flexibility in the discount rate, and can be thrown off by forecasting errors in future cash flows (Mun, 2006).

3.3 Population and sample

3.3.1 Population

The population is the industrial sector firms listed on the JSE Securities Exchange main board.

3.3.2 Sample and sampling method

The sample is limited to firms that have at least the previous 8 years of historical financial data, as this would be required for the DCF model to ensure accurate forecasting. Due to the significant amount of data analysis required per

firm, the sample has been limited to the Top 20 companies by market capitalisation. These companies all meet the minimum financial data requirement, and are listed in Table 1.

Table 1: Top 20 Industrial sector firms listed on JSE Securities Exchange main board (JSE Securities Exchange, 2011)

Share Code	Company	Industrial Sector
ACL	Arcelormittal Sa Ltd	Iron & Steel
APN	Aspen Pharmacare Hldgs.	Pharmaceuticals
BVT	Bidvest Ltd Ord	Diversified Industrials
CFR	Compagnie Fin Richemont	Clothing & Accessories
IPL	Imperial Holdings Ltd	Transportation Services
TKG	Telkom Sa Ltd	fixed line telecommunications
NTC	Netcare Limited	health care providers
MSM	Massmart Holdings Ltd	Broadline Retailers
MTN	Mtn Group Ltd	Mobile Telecommunications
NPN	Naspers Ltd -N-	Broadcasting & Entertainment
PIK	Pik N Pay Stores Ltd	Food Retailers & Wholesalers
REM	Remgro Ltd	Diversified Industrials
SAB	Sabmiller Plc	Brewers
SHF	Steinhoff Interntl Hldgs	Furnishings
SHP	Shoprite Hldgs Ltd Ord	Food Retailers & Wholesalers
TBS	Tiger Brands Ltd Ord	Food Products
TFG	The Foschini Group Ltd	Apparel Retailers
TRU	Truworths International	Apparel Retailers
MDC	Medi-Clinic Corp Ltd Ord	health care providers
WHL	Woolworths Holdings Ltd	Broadline Retailers

The income statements and balance sheets, now known as the statement of comprehensive income and statement of financial position respectively, were sourced for these 20 companies for the period 2003 to 2010. These financial

statements were sourced from online databases, mainly INet-Bridge, JSE Securities Exchange, and Standard Bank online share trading.

3.4 The Research Instrument

A DCF model was used as the research instrument, and can be found in Appendix A. The model uses historical financial data to replicate the market value of a firm during a selected financial year (2007 to 2011), and allows for adjustments to be made to the firm leverage and equity values. These adjustments should yield changes in the total value of the firm, as well as changes in financial distress costs. The Altman Z" score model and corresponding credit rating is the measure for financial distress and the change in risk. Any changes in firm value or risk are then compared with historical data, and indicate clearly whether changes in financial leverage do have an impact on firm value or risk profile. The validity and applicability of the Altman Z" score model and the DCF model to this research has been discussed earlier, and the combination of the two measures provides a unique and all-encompassing model for analysing changes in firm leverage and risk profile.

3.5 Procedure for data collection

The required data, namely the sample firms' financial statements, was downloaded from the selected online databases. The financial statements were saved into excel spreadsheets to allow easy transfer of the required data into the DCF analysis model. All missing data from the online resources was found in the company annual reports (downloaded from their investor relation websites), and the required data was then entered manually into the DCF model. Where the required financial data was missing from every anticipated resource, methods for averaging the historical data were used, such as the Cumulative Average Growth Rate (CAGR).

3.6 Data Analysis and Interpretation

The data analysis procedure follows the DCF mathematical model, namely the FCFF model, as prescribed by Ross (2009) and Damodaran (2010). Historical financial data was used to forecast future cash flows and a terminal value, which are then discounted back to 'present value' (PV) using the 'weighted average cost of capital' (WACC) to yield an implied firm value. Changes in firm leverage in the model yield changes in firm value and risk profile, where conclusions are drawn from a compare/contrast analysis with historical data, as well as trend or pattern identification. Plotting the changes graphically aids in pattern and trend recognition, and a final summary table is provided in order to comprehend /analyse the findings. The researcher seeks verification of the findings and conclusions by comparing the results with earlier studies, such as those of Negash (2001) and Wimberley (2001).

3.7 Limitations of the study

The study addresses only a small portion of companies within industrial sector listed on the JSE Securities Exchange main board. This potentially limits the applicability of the findings to large industrial companies, although firms in other industries with similar capital structures will benefit from the findings. Some further limitations of the study include:

- The assumption was made that the trade-off theoretical model of capital structure is always applicable.
- The longitudinal approach used in the DCF model does not allow for the possibility of another recession in the future.
- All the data for the research was assumed to be accurate and attainable, even though mass data capturing is never 100% accurate.
- The sample firms were assumed to be able to restructure their debt and equity, where additional leverage was used to buy-back shares at market value. This may not always be the case as restructuring requires a willing debt provider, as well as a vote by the common shareholders.

3.8 Validity and Reliability

3.8.1 External validity

The external validity of a study, also known as ‘transferability’, is simply a decision about the applicability of the findings from one environment to another (White and Marsh, 2006). Although the research sample was limited to large industrial sector firms, the findings would be applicable to firms with similar capital structures. This would include firms across all the sectors listed on the JSE Securities Exchange main board, including firms that are listed elsewhere or are not listed at all. This is not limited to South African firms, and firms in other developing markets will derive value from the study as they are deemed to have similar capital structure determinants (Booth et al., 2001; Huang and Song, 2006).This provides acceptable external validity, even though the findings will not be applicable to all the firms listed on the JSE Securities Exchange main board.

3.8.2 Internal validity

The internal validity of a study, or credibility, essentially is a measure of consistency in the data collection process (White and Marsh, 2006). This study ensures internal validity by utilising the same method for retrieving all the required data from the online databases. This is possibly more important for qualitative research, and other validity measures are more applicable for quantitative research. Criterion validity, a measure of the association between the criteria and code; and content validity, a measure of the entirety of representation of the concept are deemed important (Neuendorf, 2002; White and Marsh, 2006). This study ensures both criterion and content validity were met through the use of a well developed DCF model, where the valuation equations are inherently linked to capital structure and firm value (Ross et al., 2009; Damodaran, 2010).

3.8.3 Reliability

Neuendorf (2002) describes the reliability of a study as the degree to which the findings are dependable and produce the same results through repetition. The DCF model that was utilised for this study has been based on the well developed models by Ross (2009) and Damodaran (2010), ensuring that the underlying equations are dependable and accurate. The model has also been tested on trial data to ensure repetition of results. The trial data consisted of a random sample of firms listed on the JSE Securities Exchange Alt X board, and the simulated firm values adequately represented the market values of the sample firms. To further ensure reliability, the model has been sent to a financial modelling professional, namely Dr. Thabo Mosala, who has verified the accuracy and reliability of the model and has provided some further insight.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

The results from the company analysis are presented graphically and in a tabulated format where applicable. The perpetuity growth rates that were used to calibrate the models will be displayed, together with any inaccuracies that were encountered in the calibration process. The next focus is the graphical display of the optimal capital structures that were obtained by re-levering the companies. As far as practicable, these results are grouped into inter-industry sectors to illustrate any sector related correlations. The next section looks at the risk profile and corresponding Altman Z" Score of the companies before and after the re-levering exercise to assess the increase in risk. These values are displayed graphically with the risk profile zones displayed to indicate if the companies are still within acceptable risk limits. Lastly, a concise summary of the results is presented, which encapsulates both the firm value and risk profile results.

4.2 Demographic profile of sample firms

The sample consisted of firms selected from the Top 20 Industrial Index listed companies on the JSE Securities Exchange main board, ranked by market capitalisation. Of these selected firms, there was substantial data missing from three of the companies:

- Vodacom Group Limited (R124.2bn Market Cap) only listed in 2009, and thus did not have sufficient Market Cap data;
- Mondi PLC (R35bn Market Cap) did not list until 2007, and thus no data was available for the years preceding it;

and

- Kumba Iron Ore (R148.6bn Market Cap) did not list until 2006, and thus no data was available for the years preceding it.

These three companies were replaced by the next three largest companies in the Industrial Index by market capitalisation that had sufficient data for analysis, and these included: Netcare Limited (R20.5bn Market Cap), Medi-clinic Limited (R19.8bn Market Cap), and Telkom SA Limited (R19.1bn Market Cap).

The DCF model utilised forecast cash flows based on consistent and reasonable assumptions for a 5 year period, and then the perpetuity growth rate of the company was adjusted in order to arrive at the market value at the beginning of the forecast period. It was assumed that the firms could be calibrated to their market capitalisation within the model simply by adjusting the perpetuity growth rate of the company. This proved to be quite difficult in a few cases as the firms were making almost their entire market capitalisation value in free cash flow in a single year. For these companies, no perpetuity growth rate would allow for a 100% market capitalisation calibration; and in these instances, the closest value that could be achieved while keeping the forecast assumptions realistic was used. The perpetuity growth rates for calibration can be found in Table 2, together with the instances where 100% calibration was not possible.

Table 2: Perpetuity growth rate figures for calibration of the model

Company	Perpetuity growth rates for calibration					% Market Cap
	2006	2007	2008	2009	2010	Average
Arcelormittal Sa Ltd	13.66%	7.65%	0.90%	5.99%	4.21%	100%
Aspen Pharmacare Hldgs.	3.36%	2.91%	2.35%	0.96%	0.75%	100%
Bidvest Ltd Ord	-8.24%	-2.77%	-5.73%	2.70%	1.17%	100%
Compagnie Fin Richemont	-50.00%	-50.00%	-50.00%	-50.00%	-1.38%	**265%**
Imperial Holdings Ltd	5.86%	6.37%	4.05%	4.55%	5.19%	100%
Telkom Sa Ltd	-0.73%	6.18%	7.28%	10.12%	6.26%	100%
Netcare Limited	0.00%	-5.40%	-9.11%	-6.81%	-2.92%	100%
Massmart Holdings Ltd	-6.34%	-3.50%	-21.86%	-19.91%	-10.17%	100%
Mtn Group Ltd	7.88%	8.32%	10.05%	9.11%	8.00%	100%
Naspers Ltd -N-	0.58%	8.06%	6.30%	2.61%	9.65%	100%

Company	Perpetuity growth rates for calibration					% Market Cap
	2006	2007	2008	2009	2010	Average
Pik N Pay Stores Ltd	-9.36%	2.19%	4.26%	4.38%	1.57%	100%
Remgro Ltd	0.83%	5.73%	6.71%	1.18%	5.91%	100%
Sabmiller Plc	9.67%	8.56%	9.47%	10.28%	11.61%	100%
Steinhoff Interntl Hldgs	4.43%	9.93%	-3.19%	-5.78%	-3.47%	100%
Shoprite Hldgs Ltd Ord	-50.64%	-50.00%	-50.00%	-19.21%	-5.54%	**107%**
Tiger Brands Ltd Ord	-2.04%	3.60%	-8.98%	-15.75%	0.00%	100%
The Foschini Group Ltd	0.97%	3.73%	-5.22%	-7.01%	-4.12%	100%
Truworths International	-12.86%	-4.07%	-43.80%	-18.26%	-4.88%	100%
Medi-Clinic Corp Ltd Ord	1.53%	2.27%	1.13%	0.28%	-0.97%	100%
Woolworths Holdings Ltd	-45.17%	-28.12%	-50.00%	-50.00%	-0.83%	**117%**

During the initial phase of selecting a sample population of firms, one of the key characteristics of the firms would be the ability to take on more leverage. Thus, a reasonably low ‘debt to total value’ figure would be required to allow for this re-levering. It was discovered early on that financial service firms, looking particularly at the Financial 15 Index, are typically highly levered. This traditionally highly geared nature of financial service firms is required in terms of regulations such as Basel III, and thus would make a poor choice for analysis in this sample population.

On average, the industrial sector companies had far lower debt to total value figures and well within acceptable limits to allow for re-levering. This sample also allowed for some fluctuation of debt to total value figures between inter-industry sectors which would allow for varying the amount of additional debt to be used to re-lever the companies. This would provide greater insight into the amount of additional ‘safe’ debt that can be used at a greater variety of debt to total value ratios. This ‘safe’ debt refers to the additional debt that can be taken on by the company without bringing on any financial distress costs. The ‘historic debt to total value’ ratios for the sample firms can be found in Table 3, together

with company averages and yearly sample averages. The yearly averages are quite closely grouped, with a range of 'debt to total value' ratios of 17.7% to 26.9% and a standard deviation of 3.9%. The company averages vary widely, with a range of 'debt to total value' ratios of 0.7% to 71.7% and a standard deviation of 18.7%.

Table 3: Historic debt to total value ratios for the sample firms over the period of 2006 to 2010

Company	Debt: Total Value ratios					
	2006	2007	2008	2009	2010	Ave
Arcelormittal Sa Ltd	7.2%	6.6%	10.9%	10.4%	12.8%	**9.6%**
Aspen Pharmacare Hldgs.	12.2%	25.0%	25.0%	25.4%	17.2%	**21.0%**
Bidvest Ltd Ord	15.4%	13.9%	24.7%	22.3%	19.2%	**19.1%**
Compagnie Fin Richemont	34.7%	28.6%	28.9%	19.2%	5.3%	**23.3%**
Imperial Holdings Ltd	42.8%	47.5%	64.5%	58.7%	47.8%	**52.3%**
Telkom Sa Ltd	15.9%	14.5%	25.0%	38.1%	44.5%	**27.6%**
Netcare Limited	72.5%	71.3%	79.4%	72.0%	63.4%	**71.7%**
Massmart Holdings Ltd	12.7%	6.9%	8.8%	7.2%	5.1%	**8.1%**
Mtn Group Ltd	19.6%	14.3%	19.0%	16.9%	14.9%	**16.9%**
Naspers Ltd -N-	13.0%	7.2%	23.4%	16.6%	10.2%	**14.1%**
Pik N Pay Stores Ltd	6.5%	5.6%	8.5%	8.1%	6.9%	**7.1%**
Remgro Ltd	4.9%	5.7%	6.7%	3.9%	3.2%	**4.9%**
Sabmiller Plc	30.7%	22.8%	27.4%	30.3%	20.7%	**26.4%**
Steinhoff Interntl Hldgs	33.6%	30.7%	49.7%	57.3%	51.7%	**44.6%**
Shoprite Hldgs Ltd Ord	9.8%	4.3%	4.1%	2.7%	4.4%	**5.1%**
Tiger Brands Ltd Ord	10.3%	4.2%	9.4%	4.8%	3.6%	**6.5%**
The Foschini Group Ltd	7.1%	7.2%	19.5%	19.0%	13.6%	**13.3%**
Truworths International	0.9%	0.6%	0.9%	0.6%	0.4%	**0.7%**
Medi-Clinic Corp Ltd Ord	12.3%	16.3%	73.0%	73.3%	65.1%	**48.0%**
Woolworths Holdings Ltd	27.5%	21.3%	28.2%	19.0%	11.6%	**21.5%**
Average	**19.5%**	**17.7%**	**26.9%**	**25.3%**	**21.1%**	**22.1%**

4.3 Results pertaining to Proposition 1

The first proposition stated that changes in financial leverage has an impact on firm value in South Africa, and increasing a firm's leverage to an extent will improve firm value. The first section of the results includes each firm's optimal leverage curve displayed graphically for the final year where firms will be grouped into similar inter-industry sectors by trade. This done/shown to allow for the possibility of any sector related correlations to be easily distinguishable. Where inter-industry sectors could not be grouped with similar sectors by trade, they were grouped by similar debt to total value ratio averages. The inter-industry sector groupings can be found in Table 4, together with the minimum, maximum, and average group's debt to total value ratios.

Table 4: The inter-industry sector groupings for the sample firms and historic average 'debt to total value' ratios

Group	Industrial Sectors	Historic average Debt: Total Value ratios		
		Min	Max	Ave
1	Iron & Steel	4.9%	21.0%	13.6%
	Pharmaceuticals			
	Diversified Industrials			
2	Clothing & Accessories	0.7%	23.3%	13.4%
	Broadline Retailers			
	Apparel Retailers			
3	Transportation Services	44.6%	71.7%	54.1%
	health care providers			
	Furnishings			
4	fixed line telecommunications	14.1%	27.6%	19.5%
	Mobile Telecommunications			
	Broadcasting & Entertainment			
5	Food Retailers & Wholesalers	5.1%	26.4%	11.3%
	Brewers			
	Food Products			

The optimal debt to total value graphs for each industrial sector group for 2010 can be found in Figures 4-8. These graphs plot the increase or decrease in firm value for varying re-levered 'debt to total value' ratios, where the first point plotted intercepts the x-axis and indicates the actual 'debt to total value' ratio for the company in 2010. The x-axis corresponds with the 0% increase in firm value on the y-axis, as this represents the exact firm value for 2010. The optimal re-levering 'debt to total value' ratio can be distinguished as a crest or peak in the graph, and this is the value used for re-levering and assessing the change in risk profile.

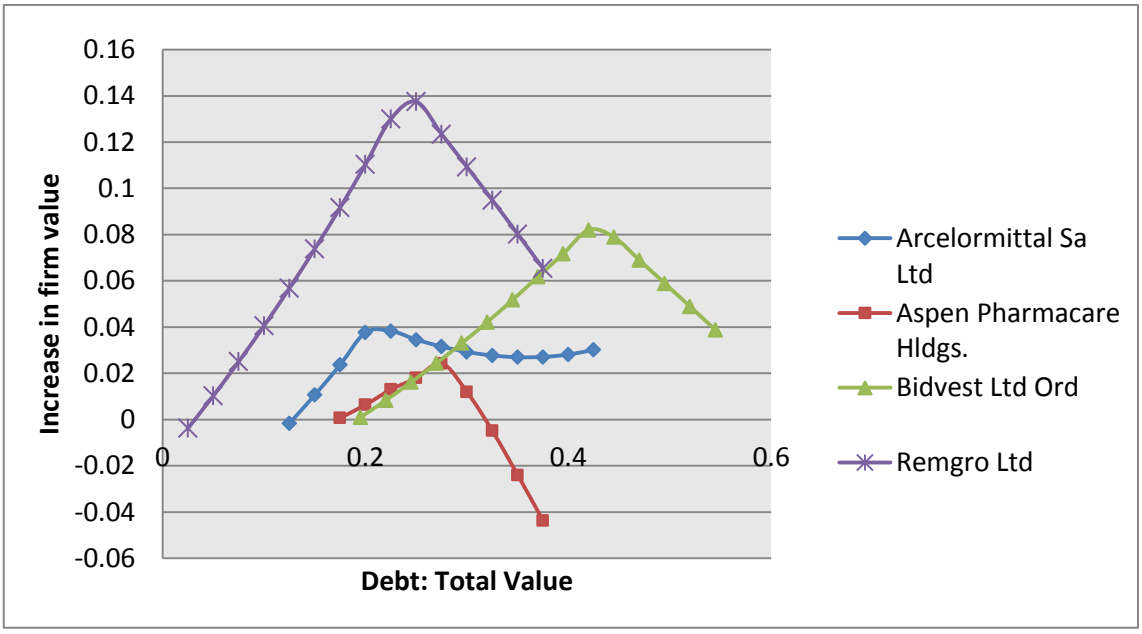

Figure 4: Increase in firm values for industrial sector Group 1 (2010)

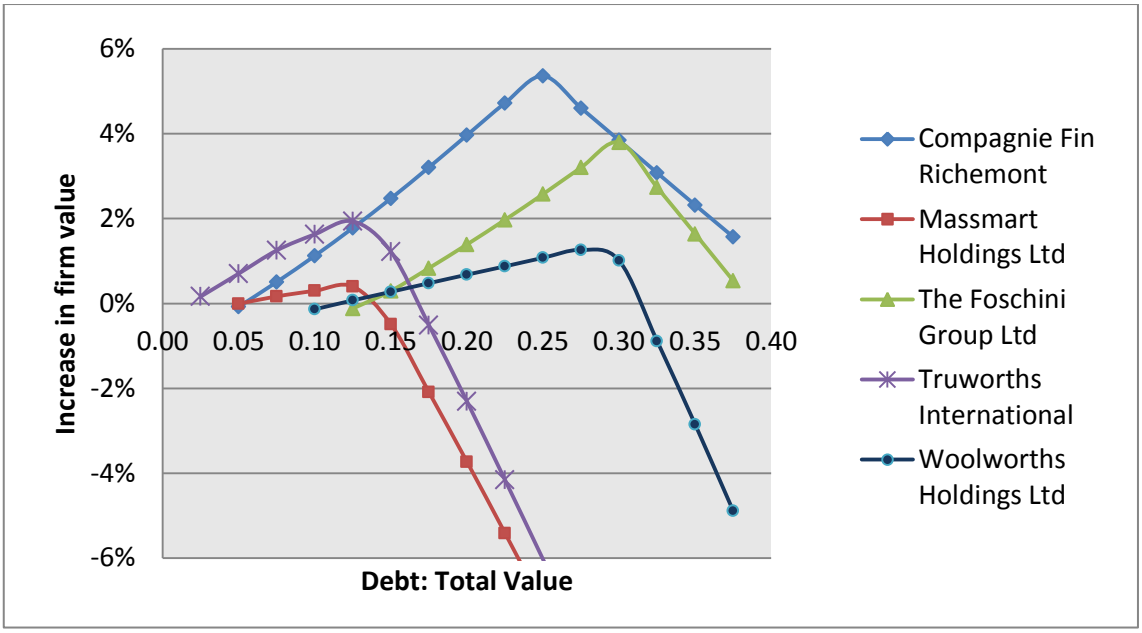

Figure 5: Increase in firm values for industrial sector Group 2 (2010)

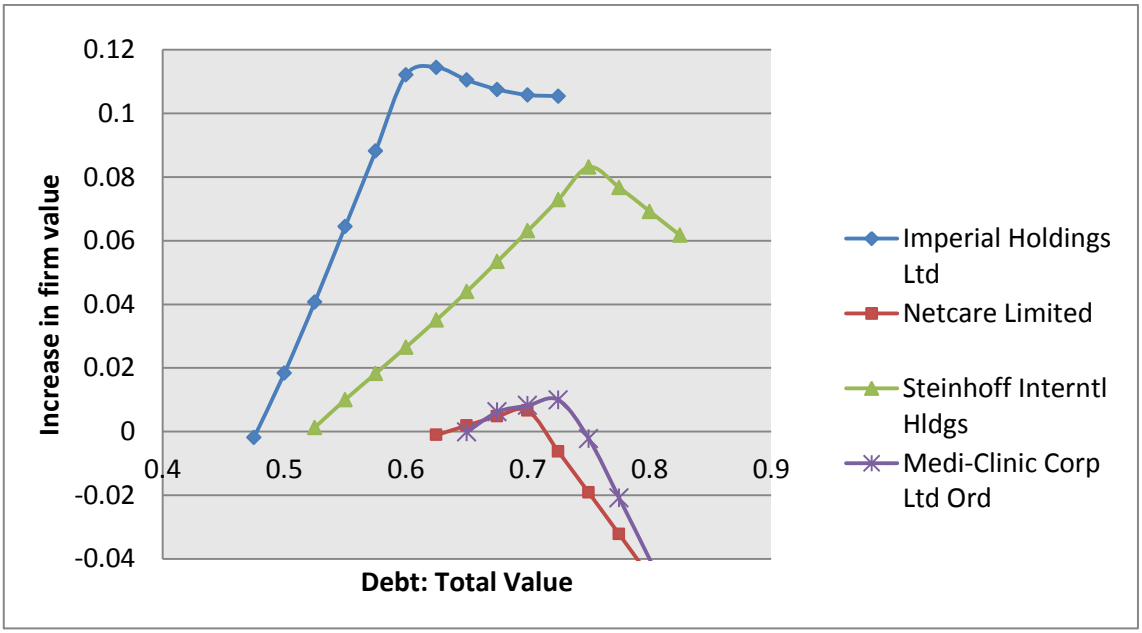

Figure 6: Increase in firm values for industrial sector Group 3 (2010)

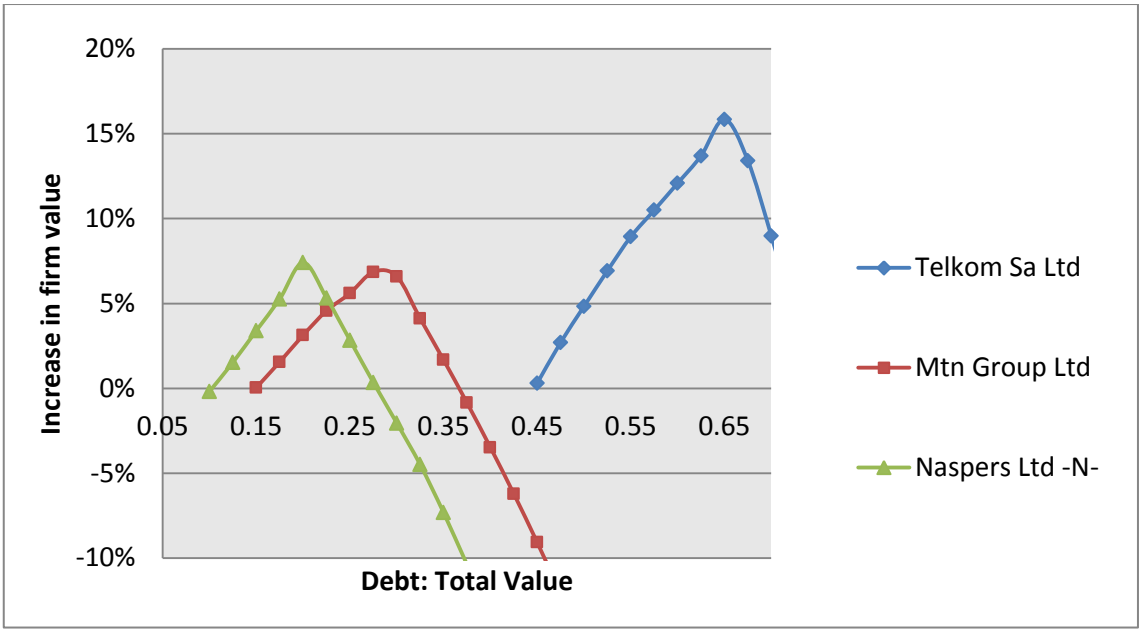

Figure 7: Increase in firm values for industrial sector Group 4 (2010)

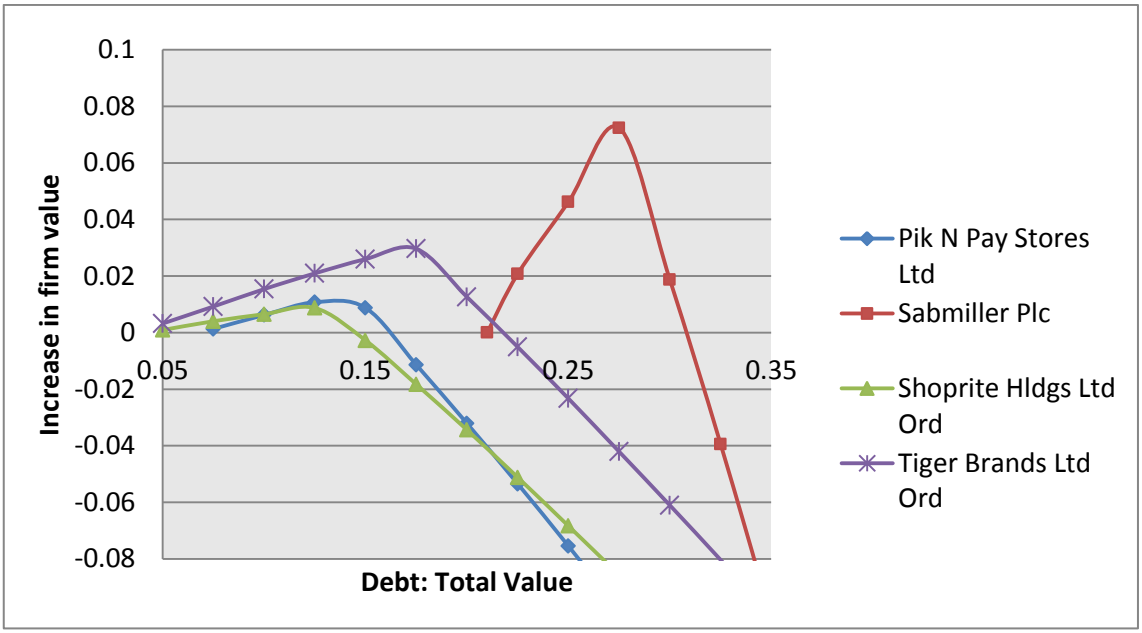

Figure 8: Increase in firm values for industrial sector Group 5 (2010)

It is evident from these results that change in financial leverage does have an impact on firm value in South Africa. In all of the cases, increasing a firm's leverage to some extent did improve firm value.

4.4 Results pertaining to Proposition 2

The second proposition stated that firms in South Africa have reserve borrowing power to take on more debt without incurring financial distress costs. In order to adequately address this proposition, the Altman Z" Scores of the companies before and after the re-levering can be found in Figures 9-13. These figures contain only the results for 2010.The full set of results can be found in Appendix B. These Z" scores relate to Bond Rating Equivalent (BRE) credit ratings and risk profiles for the companies (safe, grey and distress). The risk profile zones are also displayed to indicate whether the companies are still within acceptable risk limits. The companies have again been grouped into their inter-industry sectors as found in Table 4 to allow for possible sector correlations to be easily discernible.

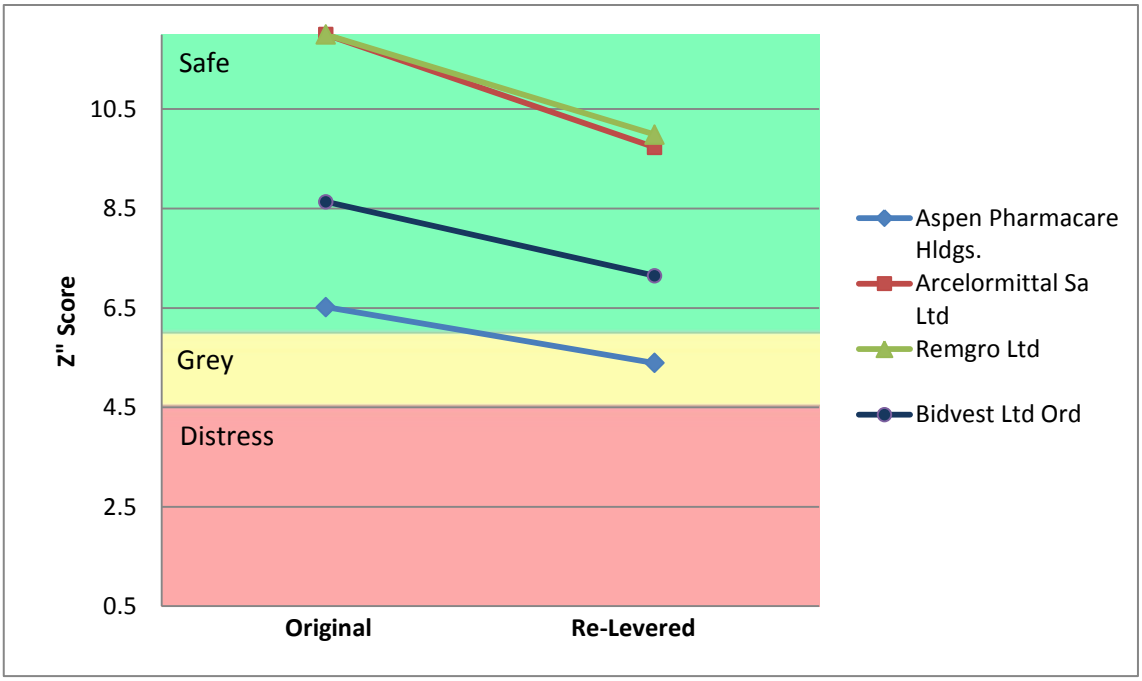

Figure 9: Change in Z" Score and risk profile for industrial sector Group 1 (2010)

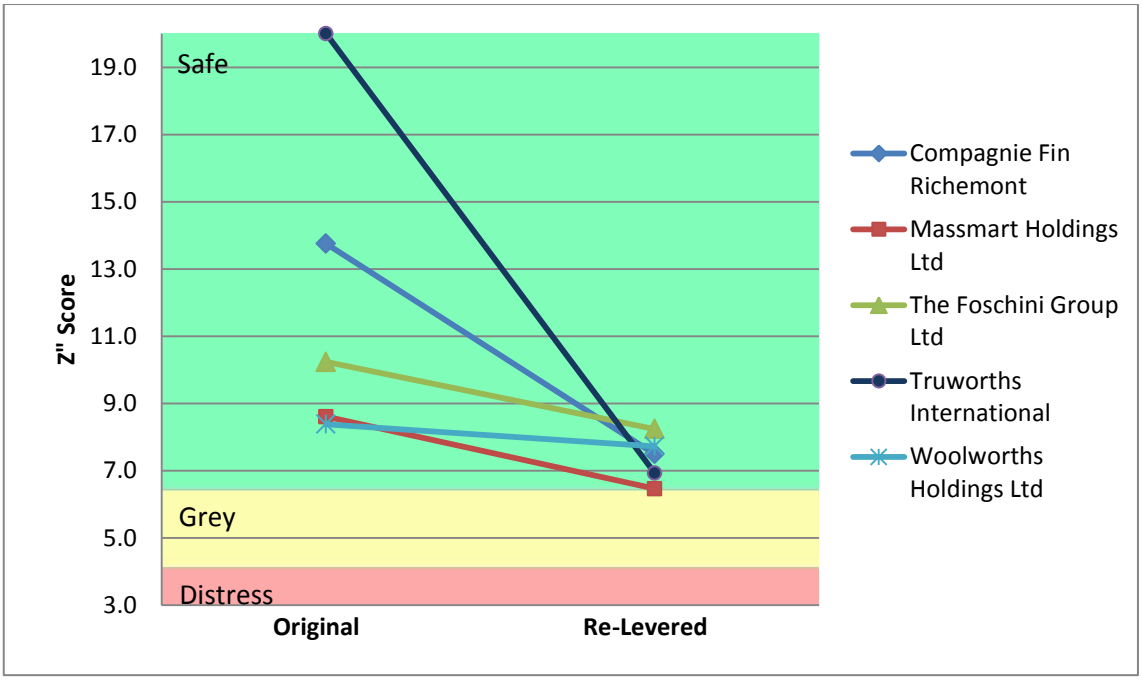

Figure 10: Change in Z" Score and risk profile for industrial sector Group 2 (2010)

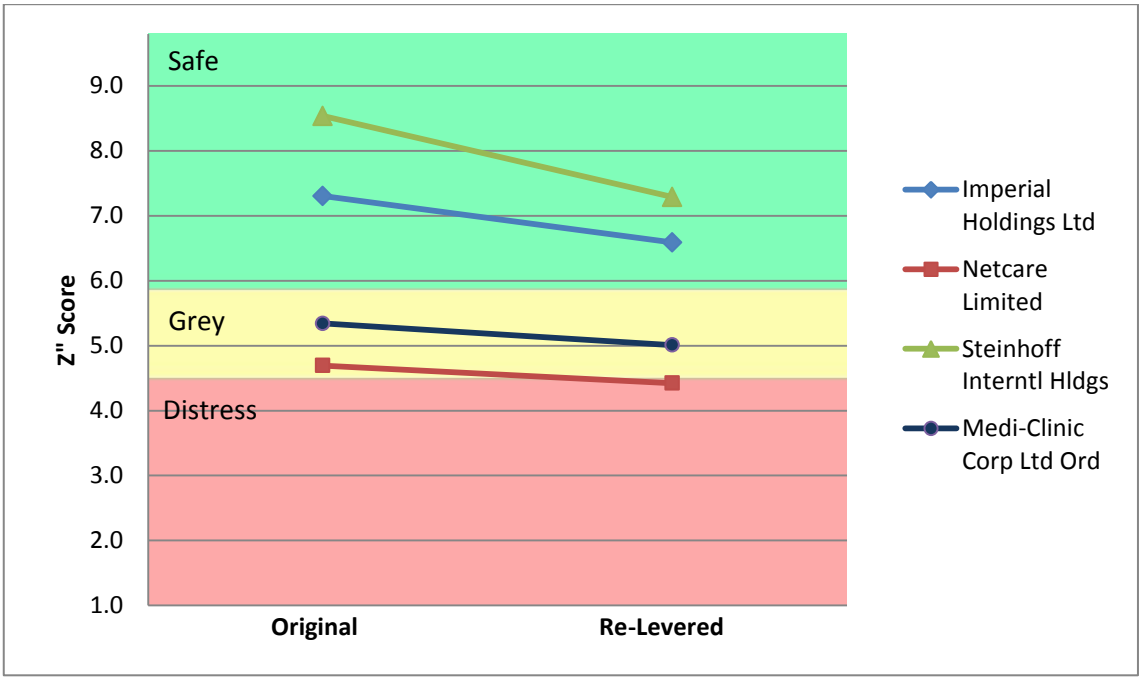

Figure 11: Change in Z" Score and risk profile for industrial sector Group 3 (2010)

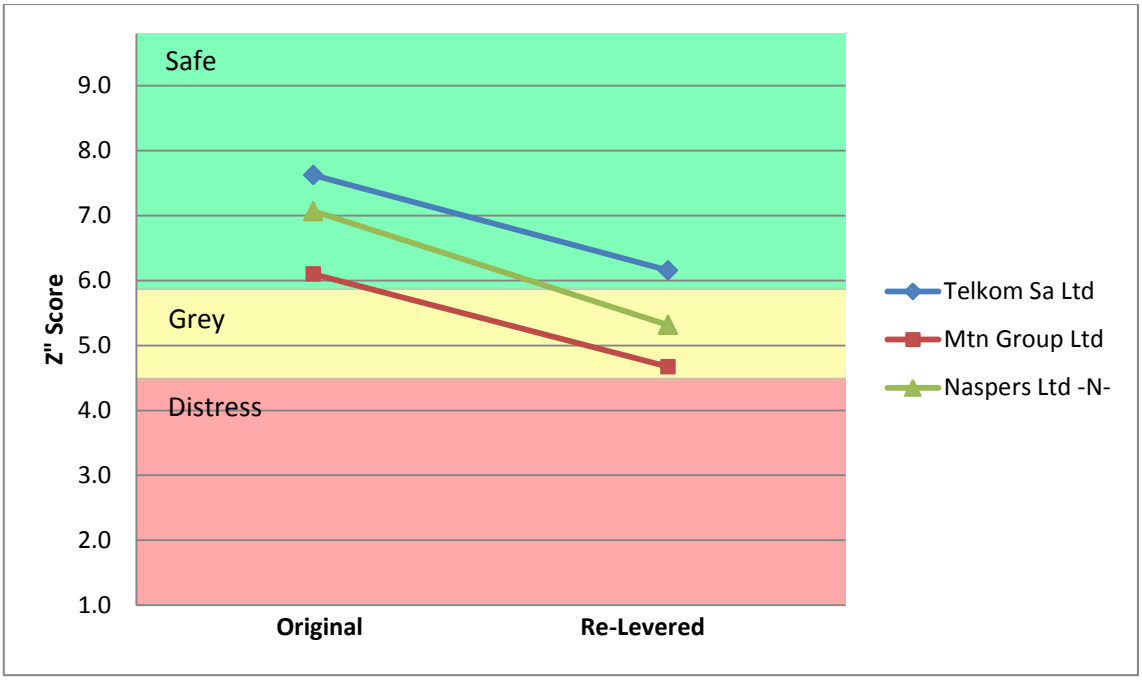

Figure 12: Change in Z" Score and risk profile for industrial sector Group 4 (2010)

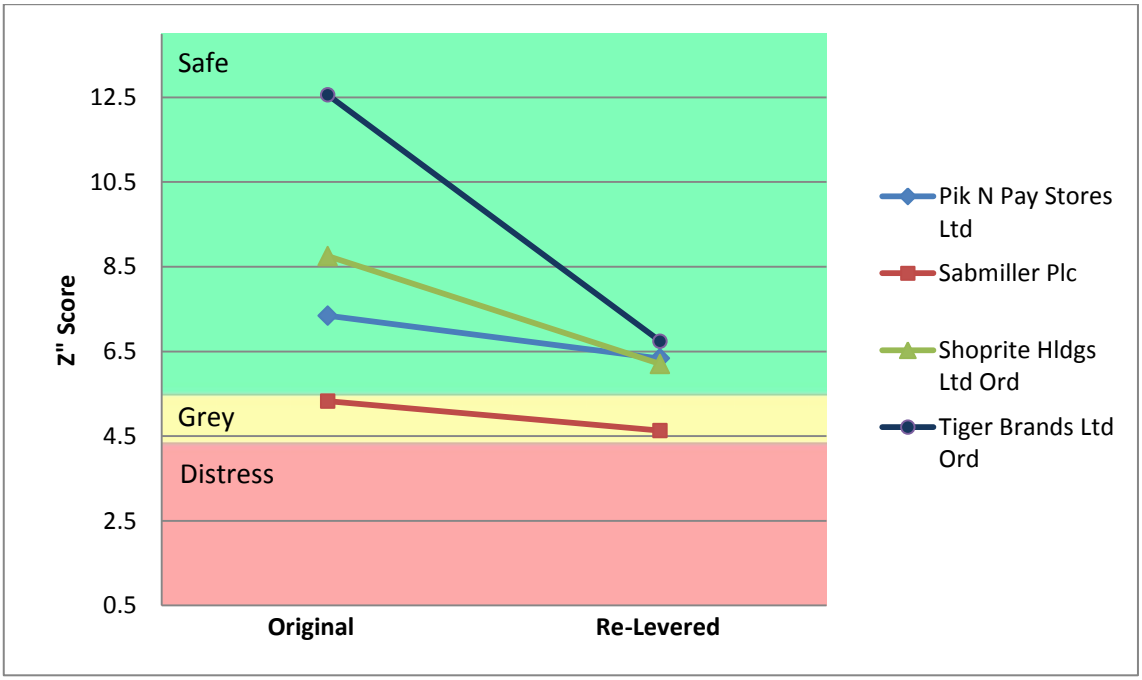

Figure 13: Change in Z" Score and risk profile for industrial sector Group 5 (2010)

It is evident from these results that firms in South Africa do indeed have reserve borrowing power to take on more debt. In 95% of the cases in 2010, firms could do so without incurring financial distress costs.

4.5 Summary of the results

A summary of the results can be found in Table 5, which contains the results for the changes in firm value and risk profile for the inter-industry sector groups (as found in Table 4). More specifically, these include results pertaining to the optimal Debt to Total Value ratios (Optimal D/TV), the potential increase in firm value (Value Increase), the Altman Z" Score, the BRE credit rating, and finally the risk profile. The average values for the entire longitudinal study (2006-2010) for all the inter-industry sector group's critical values have also been provided. From the summary of these results, it is evident that changes in financial leverage in each industrial sector group has an impact on firm value, and in all groups increasing firm leverage to some extent did improve firm value. These results also clearly indicate that each industrial sector group has reserve borrowing power to take on more debt, and all groups could do so without incurring financial distress costs.

Table 5: Summary of the changes in firm value and risk profile results for the inter-industry sector groups

Group	Critical Values	2006	2007	2008	2009	2010	Ave
1	Optimal D/TV	0.23	0.25	0.34	0.34	0.30	0.31
	Value Increase	3.83%	4.70%	8.38%	6.13%	7.51%	6.22%
	Z" Score	8.41	7.79	9.41	8.56	7.96	8.49
	BRE Rating	AAA	AA+	AAA	AAA	AA+	AAA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
2	Optimal D/TV	0.29	0.24	0.35	0.29	0.22	0.28
	Value Increase	2.96%	3.62%	4.40%	2.18%	2.62%	3.16%
	Z" Score	11.29	10.39	12.01	8.64	7.16	9.90
	BRE Rating	AAA	AAA	AAA	AAA	AA-	AAA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe

3	Optimal D/TV	0.50	0.52	0.79	0.78	0.70	0.66
	Value Increase	3.93%	6.80%	5.33%	5.71%	5.59%	5.47%
	Z" Score	5.64	5.58	5.76	6.05	5.83	5.77
	BRE Rating	BB+	BB+	BBB-	BBB	BBB-	BBB-
	Risk Profile	Grey	Grey	Grey	Safe	Grey	Grey
4	Optimal D/TV	0.29	0.23	0.38	0.46	0.38	0.35
	Value Increase	3.17%	4.53%	10.87%	8.83%	10.73%	7.63%
	Z" Score	4.95	4.93	4.62	5.92	5.38	5.16
	BRE Rating	BB-	BB-	B+	BBB	BB+	BB
	Risk Profile	Grey	Grey	Grey	Safe	Grey	Grey
5	Optimal D/TV	0.23	0.19	0.23	0.30	0.18	0.23
	Value Increase	2.55%	2.28%	2.73%	14.95%	2.85%	5.07%
	Z" Score	6.14	5.50	5.72	5.83	5.98	5.83
	BRE Rating	BBB	BB+	BBB-	BBB-	BBB	BBB-
	Risk Profile	Safe	Grey	Grey	Grey	Safe	Grey

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

This section of the report contains a discussion of all the findings from the analysis that are relevant to the study. The first area looks at discussing and comparing any findings relating to the demographics of the study, and compares the results that were planned with those that were actually obtained. The next two sections discuss and explain the results pertaining to Proposition 1 and 2, with particular reference to the literature study as well as previous findings. Lastly, this section draws together the main findings into a summary regarding the demographic profile of respondents and the propositions.

5.2 Demographic profile of respondents

It was anticipated that the grouping of the companies into similar inter-industry sectors would uncover small to moderate differences in capital structure and risk profile. However, from the results, it was evident that even within the inter-industry sector groups, companies can function completely differently from one other. This finding emerged from their cash flows and risk profile, but also from their pre- and post-recession performance and changes in capital structure.

Capital Structure

The industrial sector D/TV average of 22.1% was anticipated for the inter-industry sector groups. The averages for the groups can be found in Table 4, where they indicate that only one group came close to the average (group 4 with 19.5%). Group 1, 2 and 5 were approximately half the industrial average, while group 4 was more than double it. This level of volatility in similar industry capital structure was not anticipated. Highly leveraged firms posed a problem for the research as they may be over-levered, and no optimisation and firm value improvement could take place. Fortunately, this scenario did not occur

and all firm capital structures were able to be optimised, improving their firm values. (The complete firm analysis results can be found in Appendix B.)

The low D/TV averages came from the following industrial sectors:

- Iron &Steel (9.6%)
- Apparel Retailers (7.0%)
- Food Products (6.5%)
- Food Retailers & Wholesalers (6.1%)

A low D/TV average for Arcelormittal (Iron & Steel) is surprising because asset-intensive businesses tend to have higher leverage to fund their large asset base (Harris and Raviv, 1990; Barclay et al., 1995). This may be due to the reduction in capital investments made by Arcelormittal in recent years, where poor market conditions and declining revenue have perhaps pushed them to make use of existing assets. The low D/TV averages for the retailers and wholesalers are, however, not surprising. These firms tend to generate a large amount of net working capital which is used for funding the business, rather than taking on more debt. This supports the 'pecking order theory' of capital structure that was introduced by Myers (1984) in that internal finance is preferable when it is available.

The high D/TV averages came from the following industrial sectors:

- Transportation Services (52.3%)
- Health Care Providers (59.9%)
- Furnishings (44.6%)

The high D/TV averages for these industry sectors are understandable as they tend to require a high level of tangible assets (vehicles, property, machinery etc.). This high 'tangibility' has been shown by Frank and Goyal (2009) to result in significantly higher levels of leverage.

Pre- and post-recession performance

It was anticipated that firms would perform better pre-recession and have utilised more debt in their capital structure. The negative market growth during the recession and slow post-recession growth suggests that companies would not be as profitable during this period, and free cash flow would decrease. The perpetuity growth rate figures for calibration of the model (as found in Table 2) are an indication of the performance of the firm in each year. It would then be expected that firms would have lower perpetuity growth rates in pre-recessionary times and higher growth rates during and after the recession. However, 8 companies within the inter-industry sector groups 1-3 increased their perpetuity growth rates from pre- to post-recession. This can explained due to a variety of factors, such as:

- Underestimation of value by the market
- Increased cash flows from adaptive strategies
- Improved capital structure and cost of capital

Although these are all viable factors, it can be argued that the improved capital structure and cost of capital would be the major factor. This is because all 8 of the firms that showed improvement increased their D/TV ratios during and post-recession by taking on more debt. This improved their cost of capital and reduced the discount rate on the future cash flows. This is somewhat contradictory to the 'static trade-off theory' in that companies took on more debt in times where there were increased financial distress and bankruptcy risks. These results also support earlier findings that suggest there is an existence of strong industry forces on firm leverage (DeAngelo and Masulis, 1980; Bradley et al., 1984).

Risk profile

It was anticipated that the sample firms would be able to increase their leverage within their optimal capital structure, and that the firms would not begin with financial distress. If the firms were already in financial distress, re-levering would not be possible as the risk of the firm defaulting on payments and having

to file for bankruptcy would be too high. The anticipated capacity of the sample firms to endure increases in leverage is based on the variance of their earnings, where these large firms have reasonably steady earnings and are less exposed to the likelihood of bankruptcy (Baxter, 1967; Bradley et al., 1984). This anticipated excess capacity for debt held true for all of the sample firms, where on average over the longitudinal study (2006-2010) each firm exhibited either a grey or safe risk profile, thus allowing re-levering to take place.

5.3 Discussion pertaining to Proposition 1

It was anticipated that the inter-industry groups would be able to increase their leverage to their optimal capital structure, and improve firm value in the process. Looking at the summarised inter-industry group results (see Table 5), the average optimised debt to total value ratio for the groups is 36.3%, where the highest is 66% for group 3 and the lowest is 23% for group 5. This is a D/TV increase of 14.2% on average, where the highest improvement was seen by group 1 with 17% increase, and the lowest improvement seen by group 5 with 11.3%. These increases in debt to total value ratios correspond with an average firm value improvement of 5.5% across the groups, with the highest firm value increase of 7.6% for group 4 and the lowest improvement of 3.2% for group 2. The following industrial sectors have the most firm value improvement potential, and were able to gain the most value by optimising their capital structure:

- Brewers (15.6%)
- Furnishings (10.4%)
- Diversified Industrials (9.2%)
- Mobile Telecommunications (8.8%)

The historical average debt to total value ratios for the companies within these sectors' varies widely (4.9% to 44.6%), and would suggest that there is no direct correlation between debt to total value ratios and firm value improvement potential. However, these companies did increase their debt to total value ratios on average over the recessionary period. This D/TV increase would have dropped their cost of capital and increased their operating profitability, and

resulted in an increase in firm value improvement potential over the period. This debt related timing of the market supports the notions of Graham and Harvey (2001) who suggested that managers may attempt to time debt issues to coincide with interest rate drops, or when they believe that interest rates are unusually low. Although the prime interest rate and repo rate increased during the recession (Stanlib, 2011), the cost disparity between debt and equity would have widened to a greater extent. This relative drop in the cost of debt compared to equity would be due to the significant drop in investor sentiment and demand for equity purchases during the recession. The negative signals sent out to the market from an equity issue (Ross, 1977; Noe, 1988), and the dramatic increase in return required for the higher risk made equity issues far too costly. This increased debt utilisation when the relative cost compared to equity has dropped supports the market timing theory initiated by Myers (1984) and further developed by Baker and Wurgler (2002). Another possible explanation for this recessionary increase in debt is market signalling where managers show confidence in their future cash flows by taking on more debt. It has been shown that that the values of companies will increase with leverage, since escalating leverage improves the market's perception of value (Narayanan, 1988; Noe, 1988; Barclay et al., 1995). This increased debt utilisation helped these companies to remain competitive during the recessionary times, and correlates closely with increased capital expenditure and corporate actions such as mergers, acquisitions and share buy-back schemes. These corporate actions sent positive signals to the market place, increasing investor sentiment in their firms, and thereby reduced the damage done to their share prices and market capitalisation by the declining economy.

The companies within these sectors also exhibit the highest historical average perpetuity growth rates (4.1%). Higher perpetuity growth rates for calibration may be due to either low market-to-book ratios or low future profitability (free cash flows). This would suggest that there may be a correlation between low profitability/market-to-book ratios and the potential for firm value improvement through the increased utilisation of leverage. Although this has not been explicitly identified in previous research, it is supported by the work of Frank and Goyal (2009). These authors identified the behaviour that high leverage firms

tend to have low profitability/market-to-book ratios. Thus, if firms have low profitability/market-to-book ratios and low leverage, then they would have a greater capacity to take on more debt.

The following industrial sectors have the least firm value improvement potential:

- Food Retailers & Wholesalers (1.1%)
- Broadline Retailers (1.4%)
- Health Care Providers (1.5%)
- Food Products (2.4%)

The companies within these sectors exhibit some of the lowest historical average perpetuity growth rates (-12.9%). The low perpetuity growth rates for calibration may be due to either high market-to-book ratios or high future profitability (free cash flows). This supports the earlier findings in that there appears to be a negative correlation between high profitability/market-to-book ratios and firm value improvement potential.

With industrial sector firm improvement values ranging from 1.1% to 15.6%, these findings strongly support the earlier work on South African firms by Negash (2001, 2002) and Wimberley (2001). The improvement from leverage was between 13% and 18% of the market values of the companies in the study by Negash (2001, 2002), while Wimberley (2001) noted that the utilisation of debt to repurchase shares could potentially produce a 3% to 14% increase in firm value. The authors noted that maximum value creation seemed to occur at debt to total value ratios of between 28.0% and 32.0%. This D/TV range is supported by the findings of this study, where the maximum value creation seemed to occur at debt to total value ratios of between 19% and 53% (36.3% mean). Since the average historic debt to total value ratios were approximately the same (between 21% to 22%) for all the above mentioned studies, from data from recent years, it becomes evident that firms are capable of taking on more debt than previously thought, and have higher optimal debt to total value ratios. This may be due to the reduced interest rates on debt repayments or simply larger retained earnings reserves that can be used to fund the increased leverage.

It is evident from the results and comparisons with earlier findings that changes in financial leverage do have an impact on firm value in South Africa. This conclusion/finding held true for every sample firm over the longitudinal study (2006-2010), and in all of the cases, increasing the firm's leverage to some extent did improve firm value.

5.4 Discussion pertaining to Proposition 2

It was anticipated that the inter-industry groups would be able to increase their leverage to their optimal capital structure without incurring financial distress costs. This held true for all of the inter-industry groups, where groups 1 and 2 were able to do so without dropping risk profile at all and maintained their AAA BRE rating and safe risk profile (see Table 5). The Altman Z" Scores range from 8.49 to 9.90 for groups 1 and 2, putting them well into the AAA BRE rating (8.15 minimum). The following industrial sectors have the most reserve borrowing power, and were able to optimise their capital structure while maintaining AAA BRE rating and a safe risk profile:

- Iron & Steel
- Diversified Industrials
- Clothing & Accessories
- Broadline Retailers

The higher reserve borrowing power may be due to the fact that these industrial sectors contain the largest firms within the industry (as measured by book value of assets). These larger firms tend to have higher degrees of diversification across inter-industries, making their earnings more resilient to market fluctuations. Some of these firms are also among the most profitable (high EBITDA as percentage of sales), which would account for the large accumulation of retained earnings and strong future cash flows. Although not conclusive, this does provide some support for the 'pecking order' theory of capital structure, in that the broadline retailers are also among the firms with the least firm value improvement potential. This may be due to the firms already low

cost of capital (low betas), which would coincide with stable and resilient earnings.

However, inter-industry groups 3 to 5 did not perform as well as the first two groups and dropped to grey risk profiles. The Altman Z" Scores range from 5.16 to 5.83 for groups 3 to 5, putting them into the BB to BBB- BRE rating range. The following industrial sectors have the least reserve borrowing power, and displayed the greatest drop in BRE rating and risk profile during the re-levering process:

- Fixed Line Telecommunications
- Mobile Telecommunications
- Health Care Providers

The main reasons for the lower reserve borrowing power may be the high capital expenditure and lower profitability of these firms. This lower profitability has been shown to result in higher leveraging, and is the case for the health care providers (Barclay et al., 1995; Frank and Goyal, 2009). The healthcare providers sector also includes the only firm (Netcare) which, on average over the longitudinal study, cannot increase their leverage without incurring financial distress costs. This may be due to the unusually high leverage that Netcare already exhibits in their capital structure, with an average debt to total value ratio of 71.7%. Netcare were only, on average, able to improve their firm value by 1% by optimising their capital structure. If it were assumed that the average bankruptcy costs for industrial firms varies from 11% to 17% of company value (Altman, 1984), it is clear that no benefit can take place when financial distress costs are invoked. This supports earlier findings by Negash (2001, 2002), who found that net gains from leverage became insignificant when capital losses as a result of liquidation and financial distress were invoked.

Over the longitudinal study, the distribution of firms that dropped to a distress risk profile during the capital structure optimisation process included:

- 6 firms pre-recession
- 5 firms during the recession

- 1 firm post-recession

This provides strong support for the earlier stated notion that financial distress risk has reduced, and firms can take on additional leverage with reduced bankruptcy risk. To add to this, the provisions for business rescue and compromise with creditors, as set out in the new Companies Act No. 71 of 2008, has not been accounted for. These provisions have only been recently introduced, and their true financial distress risk reduction capacity is still unknown.

From these results and comparisons with earlier findings it is evident that firms in South Africa do have reserve borrowing power to take on more debt. Over the longitudinal study (2006-2010), 95% of the firms on average could increase their leverage to optimal levels without incurring financial distress costs.

5.5 Conclusion

The high variance in capital structure may have presented problems in the form of over-levered firms. However, all firm capital structures have been optimised which improved their firm values. This leverage optimisation was also possible because the sample firms were not already in financial distress, and thus were able to optimise their capital structures (increase leverage).

Proposition 1

The average D/TV increase is 14.2% for the inter-industry groups illustrates a potential for these firms to significantly increase their leverage. This corresponded with an average firm value improvement of 5.5% across the groups. The disparity in the improvements between different industrial sectors provided support for the following findings:

- There is no correlation between debt to total value ratios and firm value improvement potential;
- The market timing theory by Myers (1984)and Graham and Harvey(2001);

- Signalling theory/ Asymmetric information (Narayanan, 1988; Noe, 1988; Barclay et al., 1995);
- The correlation between low leverage and high market-to-book/ profitability findings by Frank and Goyal (2009);
- The earlier work on South African firm value improvements using leverage by Negash (2001, 2002) and Wimberley (2001).

The findings of this study clearly illustrate that changes in financial leverage have a positive/significant impact on firm value in South Africa, and in all of the cases increasing the firm's leverage, to an extent, did improve firm value.

Proposition 2

The inter-industry groups were able to increase their leverage to their optimal capital structure without incurring financial distress costs. Only if a firm could not increase their leverage without incurring financial distress costs on average. The disparity in the risk profiles and reserve borrowing power between different industrial sectors provided support for the following:

- The correlation between high 'tangibility' and high leverage findings by Frank and Goyal (2009);
- The 'pecking order' theory of capital structure (Myers, 1984);
- The findings by Negash (2001, 2002) where there is zero benefit when financial distress costs are invoked;
- The notion that financial distress risk has reduced, and firms can take on additional leverage with reduced bankruptcy risk.

The findings of this study clearly illustrate that firms in South Africa do have sufficient reserve borrowing power to take on more debt, and all but one of the firms on average could increase their leverage to optimal levels without incurring financial distress costs.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This section of the report contains the conclusions and recommendations pertaining to all the findings from the analysis that are relevant to the study. The first section summarises the conclusions of the study relating to the demographics of the sample firms, Proposition 1 and Proposition 2. The next area looks to provide some recommendations to the identified stakeholders of the study. Lastly, this section provides some suggestions for further research, drawing on findings within this study and facilitating further research efforts into capital structure and leverage optimisation.

6.2 Conclusions of the study

Demographic profile of respondents

It was evident from the results that even within the inter-industry sector groups; companies can exhibit greatly different cash flows, risk profiles, pre- and post-recession performance and change in capital structure. Highly leveraged firms (Health Care Providers show an average of 59.9% debt to total value) could possibly have created a problem for the research since they may be overly levered and capital structure optimisation would not be possible. This was not the case, and all firm capital structures were optimised and, improved their firm values.

It was anticipated that firms would perform better pre-recession and have utilised more debt in their capital structure. However, several companies improved their performances from pre- to post-recession. Although several factors could be responsible for this, it is suggested that improved capital structure and cost of capital is the most significant, as all of these firms increased their debt to total value ratios during and post-recession.

This study relied on the expectation that the sample firms would be able to optimise their capital structure (increase leverage), and would not already be in financial distress. This position held true for all of the sampled firms over the period of the longitudinal study (2006-2010) where on average each firm exhibited either a safe or grey risk profile, thus allowing for re-levering to take place.

Proposition 1

The average optimised D/TV for the inter-industry groups is 36.3%, a 14.2% debt to total value increase. This illustrates a potential for these firms to significantly increase their leverage. These increases in debt to total value ratios correspond with an average firm value improvement of 5.5% across the groups. The firms within the industrial sectors that displayed the most firm value improvement potential (Brewers (15.6%), Furnishings (10.4%)), displayed the following characteristics:

- No correlation between debt to total value ratios and firm value improvement potential;
- Increased debt to total value ratios on average over the recession; decreasing their cost of capital, increasing their operating profitability and providing support for the market timing theory by Myers (1984)and Graham and Harvey(2001);
- The recessionary increase in debt may support market signalling, where managers show confidence in their future cash flows by taking on more debt which improves the market's perception of their firm value (Narayanan, 1988; Noe, 1988; Barclay et al., 1995);
- The highest historical average perpetuity growth rates, due to either low market-to-book ratios or low future profitability, which supports the work of Frank and Goyal (2009).

The firms within the industrial sectors that displayed the least firm value improvement potential (Food Retailers & Wholesalers (1.1%), Broadline Retailers (1.4%)), displayed the following characteristics:

- The lowest historical average perpetuity growth rates, due to either high market-to-book ratios or high future profitability, which supports the work of Frank and Goyal (2009);
- Marginal increases in debt to total value ratios on average over the recession also provide some support for the market timing theory by Myers (1984)and Graham and Harvey(2001).

With industrial sector firm improvement values ranging from 1.1% to 15.6%, these findings strongly support the earlier work on South African firms by Negash (2001, 2002) and Wimberley (2001), whose improvement values ranged from 3% to 18%. The authors noted that maximum value creation seemed to occur at debt to total value ratios of between 28% and 32%, which is also supported by the findings of this study (between 19% and 53%).

These results and comparisons with earlier findings clearly illustrate that changes in financial leverage do have an impact on firm value in South Africa. This conclusion/finding held true in each/for every sample firm over the longitudinal study (2006-2010), and in all of the cases increasing the firm's leverage, to a significant extent, did improve firm value.

Proposition 2

The inter-industry groups were able to increase their leverage to their optimal capital structure without incurring financial distress costs. The firms within the industrial sectors that displayed the most reserve borrowing power (Clothing & Accessories, Broadline Retailers), displayed the following characteristics:

- Maintained AAA BRE rating and safe risk profiles during the capital structure optimisation process;
- The largest firms within the industry, with the least volatile earnings and cash flows that are more resilient to market fluctuations;
- The most profitable, where the Broadline Retailers also displayed some of the lowest firm value improvements, providing some support for the pecking order theory of capital structure (Myers, 1984).

The firms within the industrial sectors that displayed the least reserve borrowing power (Health Care Providers, Mobile Telecommunications), displayed the following characteristics:

- Low Altman Z" Scores, putting them into the bottom of the grey risk profile;
- High capital expenditure and lower profitability of these firms, which has been shown to result in higher leveraging, and is the case for the healthcare providers (Barclay et al., 1995; Frank and Goyal, 2009);
- They include the only firm (Netcare) which, on average over the longitudinal study, cannot increase their leverage without incurring financial distress costs;
- No benefit can take place when financial distress costs are invoked, supporting earlier findings by Negash (2001, 2002).

The significant drop in recorded firm distress results over the study provides strong support for the notion that financial distress risk has reduced and that firms can take on additional leverage with a reduced bankruptcy risk.

These results and comparisons with earlier findings clearly illustrate that firms in South Africa do have reserve borrowing power to take on more debt. Over the period of the longitudinal study (2006-2010), 95% of the sampled firms on average could increase their leverage to optimal levels without incurring financial distress costs.

6.3 Recommendations

The findings of this study are pertinent to the following stakeholders:

- **Academics:** The current, practical use of debt to improve firm value and the related changes in financial risk help to explain some of the historical capital structure theories and studies. These results also help illustrate the impact of various capital structure drivers.
- **Management:** The potential value creation benefits associated with increased financial leverage within South African firms can be beneficial

to company managers. However, it must be noted that only the insight gained from the study can be applied to firms in South African industries with similar capital structures. A full individual company analysis must be performed before a decision concerning leverage optimisation can be made.

- **Finance firms:** This study has shown strong support for the notion that financial distress risk has reduced, and provides a positive outlook for the increased use of debt in firm capital structure. Finance firms would be able to consider more companies for loans due to the reduced risk of bankruptcy and financial distress.
- **Investors:** This study has shown that firms in the industrial sector have reserve borrowing power to take on more debt and improve their firm value. Therefore, any firm in this sector which announce leveraged share buy-backs could possibly be seen as an excellent investment opportunity.

6.4 Suggestions for further research

It is recommended that the work in this study be extended to cover the separate industry sectors on the JSE Securities Exchange main board to determine whether increased leverage can show similar firm value improvements across all/other industries. Although the DCF method is widely used by financial analysts and academics for firm valuation (Ross et al., 2009; Damodaran, 2010), it would be valuable for further research to incorporate alternative firm valuation methods. Some alternative valuation methods that would provide credible and comparable research data include:

- The options pricing valuation model based on Black-Scholes assumptions, where the value of equity is calculated as a call option on the value of the underlying firm (Damodaran, 2011b);
- The Economic Value Added (EVA) model developed by Stern Stewart & Co. This model is very similar to the DCF model in that earnings are forecast, allowing future EVA's to be calculated and discounted back to

the present value. This method should provide the most similar results to the findings in this study.

Another aspect of this research that should be tested in further studies is the measure adopted for bankruptcy risk. This study has utilised the Altman Z" Score, and although it is widely proven to be valid and reliable, alternative measures for bankruptcy risk should be utilised in further studies to help validate the findings in this study. Some alternative bankruptcy risk measures that would provide credible and comparable research data include:

- The KMV distance-to-default option based measure, where the distance-to-default is the difference between the market value of the firm's assets and the book value of the firm's liabilities (KMV LLC, 2002);
- The Ohlson O-Score model, which uses discrete variables as a proxy for the probability of financial distress (Ohlson, 1980).

Further valuable research would also include analysing actual firm share repurchases and debt issues, and the effect on their market capitalisation and credit risk profile. This would provide support for the valuation method, risk measures and assumptions used in this research.

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APPENDIX A

Actual Research Instrument: DCF model

Input Page

DCF Ref	*Online Ref*	*Amounts in Millions*							
		2010	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**
Sales	Turnover	10146	8445	4881	4021	3451	2815	2207	1900
Total costs	COS	5143	4564	2511	2084	1789	1424	1144	1040
Depreciation & Amortization:	Depn & Amort	102	95	128	121	93	95	78	54
Taxes (28%)	Tax	459	359	333	292	216	208	173	116
Cash and Prepaid expenses	Cash	2962	2065	1522	3331	625	440	466	200
Total Current Assets	Tot Curr Ass	7623	5601	4679	5139	2151	1381	1137	828
Retained Earnings (RE)	Dist Rsv	5580	3515	2649	1758	997	426	949	642
Shareholders' Equity	Tot SH Int	10886	4263	3203	2389	1720	1116	1067	795
	LT Liab	3085	4038	623	512	587	578	268	279
	STLoan/ODraft	3721	2670	3116	3802	1179	810	290	151
Total Current Liabilities	Tot Curr Liab	5830	4220	6814	4630	1954	1464	775	607
Capex	Capital expenditure	344	508	435	358	488	53	45	12
Dividends	DivsPaid	281	251	246	244	213	163	107	71
Beta (5)	3 Yr Beta	0.42	0.21	0.89	0.81	0.7	0.38	0.24	0.32
Market Value of Equity (2)	MrktCap	32830	19746	11207	12973	12682	8079	4788	2894
Market Value of Debt (1)		6806	6708	3739	4314	1766	1388	558	430

Company name:	Aspen

Risk-free rate (3)	7.70%
Market risk Premium (4)	6.73%
Size Premium (6)	0.90%
Cost of Debt	9.0%
Tax rate	28.0%

DCF model page (2006-2010)

Aspen : DCF model										
(in R million)	Actual				Ave	Forecast period				
Income Statement & Cash flow	**2007**	**2008**	**2009**	**2010**	**(07-10)**	**2011**	**2012**	**2013**	**2014**	**2015**
Sales	**4,021**	**4,881**	**8,445**	**10,146**		11,668	13,419	15,431	17,746	20,408
% growth		*21.4%*	*73.0%*	*20.1%*	*38.2%*	**15.0%**	*15.0%*	*15.0%*	*15.0%*	*15.0%*
Total costs	**-2,084**	**-2,511**	**-4,564**	**-5,143**		-6,534	-7,514	-8,642	-9,938	-11,428
% sales	*51.8%*	*51.4%*	*54.0%*	*50.7%*		*56.0%*	*56.0%*	*56.0%*	*56.0%*	*56.0%*
EBITDA	**1,937**	**2,370**	**3,881**	**5,003**		**5,134**	**5,904**	**6,790**	**7,808**	**8,979**
% margin	*48.2%*	*48.6%*	*46.0%*	*49.3%*	*48.0%*	**44.0%**	*44.0%*	*44.0%*	*44.0%*	*44.0%*
Depr. & Amort.:	**-121**	**-128**	**-95**	**-102**		-117	-134	-154	-177	-204
% sales	*3.0%*	*2.6%*	*1.1%*	*1.0%*	*1.9%*	**1.0%**	*1.0%*	*1.0%*	*1.0%*	*1.0%*
EBIT	**1,816**	**2,242**	**3,786**	**4,901**		**5,017**	**5,770**	**6,635**	**7,631**	**8,775**
Taxes (28%)	**-292**	**-333**	**-359**	**-459**		-1,405	-1,616	-1,858	-2,137	-2,457
Capex	**-358**	**-435**	**-508**	**-344**		-933	-1,073	-1,235	-1,420	-1,633
% sales	*8.9%*	*8.9%*	*6.0%*	*3.4%*	*6.8%*	**8.0%**	*8.0%*	*8.0%*	*8.0%*	*8.0%*
Increase/Decrease in NWC		**2,644**	**-3,515**	**-412**		**-541**	**-350**	**-403**	**-463**	**-532**
Free Cash Flow		**4,246**	**-501**	**3,789**		**2,255**	**2,865**	**3,295**	**3,789**	**4,357**
WACC	**10.6%**									
Discount Period						0.5	1.5	2.5	3.5	4.5
Discount Factor						0.95	0.86	0.78	0.70	0.64
Present value of free cash flow						**2,144**	**2,464**	**2,562**	**2,665**	**2,772**
Adjusted Free Cash Flow						**2,255**	**2,865**	**3,295**	**3,789**	**4,357**
Discount Factor						0.95	0.87	0.79	0.71	0.65
Adj Present value of free cash flow						**2148**	**2478**	**2587**	**2701**	**2820**

(in R million) Net Working Capital	Actual 2007	2008	2009	2010	Ave (07-10)	Forecast period 2011	2012	2013	2014	2015
Cash and Prepaid expenses	**3,331**	**1,522**	**2,065**	**2,962**						
Total Current Assets	**5,139**	**4,679**	**5,601**	**7,623**		**9,335**	**10,735**	**12,345**	**14,197**	**16,326**
% sales	*127.8%*	*95.9%*	*66.3%*	*75.1%*	*91.3%*	**80.0%**	*80.0%*	*80.0%*	*80.0%*	*80.0%*
Total Current Liabilities	**-4,630**	**-6,814**	**-4,220**	**-5,830**		**-7,001**	**-8,051**	**-9,259**	**-10,648**	**-12,245**
% sales	*115.1%*	*139.6%*	*50.0%*	*57.5%*	*90.5%*	**60.0%**	*60.0%*	*60.0%*	*60.0%*	*60.0%*
Net Working Capital	**509**	**-2,135**	**1,380**	**1,793**		**2,334**	**2,684**	**3,086**	**3,549**	**4,082**
% sales	*13%*	*-44%*	*16%*	*18%*		*20%*	*20%*	*20%*	*20%*	*20%*

(in R million) Balance Sheet & Cash flow	Actual 2007	2008	2009	2010	CAGR (07-10)
Dividends	**244**	**246**	**251**	**281**	
Shareholders' Equity	**2,389**	**3,203**	**4,263**	**10,886**	*66%*
Retained Earnings (RE)	**1,758**	**2,649**	**3,515**	**5,580**	*47%*

Aspen : DCF model

Input		Output	
WACC Calculation		**Terminal Value**	
Capital Structure		Terminal Year Free Cash Flow	4,357
Debt to Total Capitalization	17.2%	Perpetuity Growth Rate (9)	**0.75%**
Equity to Total Capitalization	82.8%	Terminal Year EBITDA	8,979
Debt to Equity Ratio	20.7%	Terminal Value	44,694
Market Value of Debt (1)	**6,806**	**Implied Exit Multiple**	**5.2x**
Market Value of Equity (2)	**32,830**	Discount Period	5.0
		Discount Factor	0.60
Cost of Equity*		**Present Value of Terminal Value**	**27,035**
Risk-free rate (3)	**7.70%**	*% of Enterprise Value*	*68%*
Market risk Premium (4)	**6.73%**		
Beta (5)	**0.42**	**Firm value**	
Size Premium (6)	**0.90%**	Present value of Free Cash Flow	12,607
Cost of Equity	**11.4%**	**Terminal Value**	44,694
		Discount Factor	0.60
Cost of Debt			
Cost of Debt	**9.0%**	**Present Value of Terminal Value**	**27,035**
Tax rate	**28.0%**	*% of Firm Value*	*68%*
After Tax Cost of Debt	**6.5%**		
		Firm Value	**39,642**
WACC	**10.6%**	*% of Firm Market Value*	*100.0%*

Leverage Adjustment Calculation	
Unlevered Beta	
Levered Beta	0.42
Debt/ Equity	20.7%
Debt/ Total Value	17.2%
Marginal Tax Rate	**28.0%**
Unlevered Beta (7)	**0.37**
Relevered Beta	
Target Debt/ Total Value	**0.28**
Unlevered Beta	0.37
Target Debt/ Equity	24.1%
Relevered Beta	**0.43**
Target Value of Debt	7927.2
Target Value of Equity	31708.7
Debt Increase	1121.3
RE & Cash	8,542
% RE & Cash to fund Debt Increase	**50%**
Debt less 25% RE & Cash	-1014.1
Interest Rate Increase	-1.68%
Annual Payment Increase	0.00
Adjusted WACC	10.2%
Adjusted Terminal Value	46723
Adj Present value of Free Cash Flow	12736
Adjusted Firm Value	**40648**
% Increase of Firm Value	2.54%

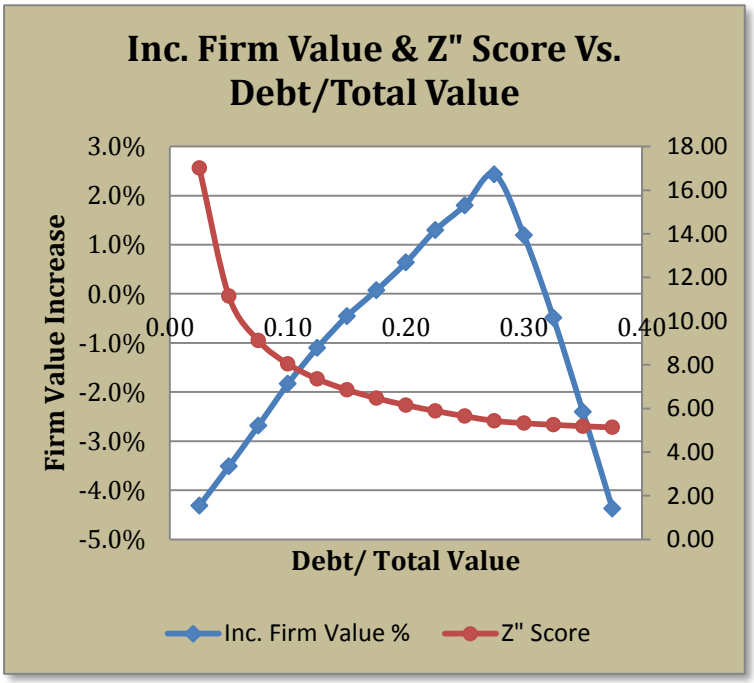
Notes:
All light blue cells require entered data
** calculated using CAPM model*
(1) Book Value of Debt, in R million
(2) From Bloomberg/ INet-Bridge, in R million
(3) Interpolated Yield on 10-year Treasury bond
(4) Obtained from Damodaran Online
(5) Obtained from Cadiz ERS Betas Jun10B
(6) Mid-Cap Decile size premium based on market capitalization, per Ibbotson
(7) Unlevered Beta = Levered Beta / (1 + Debt/Equity) x (1-t))

Altman Z" Score Model	
Initial	
Working Capital/Total Assets	0.04523
Retained Earnings/Total Assets	0.14078
Operating Income/Total Assets	0.12366
Book Value of Equity/Total Liabilities	1.59955
Z" Score	**6.52**
Bond Rating Equivalent	***A-***
Zone status	***Safe***
Target Debt	
Working Capital/Total Assets	0.02655
Retained Earnings/Total Assets	0.10559
Operating Income/Total Assets	0.12366
Book Value of Equity/Total Liabilities	4.14146
Z" Score	**5.39**
Bond Rating Equivalent	***BB+***
Zone status	***Grey***

Notes:
(9) Calibrate Perp. Growth rate so that Firm Value = Market Value of Debt + Equity (Goal Seek)
Altman Z" Score Model
= 6.56(X1) + 3.26(X2) + 6.72(X3) + 1.05(X4) + 3.25
Where X1 = working capital/total assets;
X2= retained earnings/total assets;
X3 = operating income/total assets;
X4 = book value of equity/total liabilities.

Z" Score Rating Table					
Z" Score		Rating	Zone	Range	Interest Rate Increase
8.15	1000.00	AAA	Safe		0.00%
7.60	8.15	AA+		0.55	0.05%
7.30	7.60	AA		0.30	0.13%
7.00	7.30	AA-		0.30	0.20%
6.85	7.00	A+		0.15	0.30%
6.65	6.85	A		0.20	0.35%
6.40	6.65	A-		0.25	0.45%
6.25	6.40	BBB+		0.15	0.58%
5.85	6.25	BBB		0.40	0.65%
5.65	5.85	BBB-	Grey	0.20	0.78%
5.25	5.65	BB+		0.40	0.90%
4.96	5.25	BB		0.29	1.05%
4.75	4.96	BB-		0.21	1.35%
4.50	4.75	B+		0.25	1.50%
4.15	4.50	B	Distress	0.35	1.80%
3.75	4.15	B-		0.40	2.10%
3.20	3.75	CCC+		0.55	2.50%
2.50	3.20	CCC+		0.70	3.10%
1.75	2.50	CCC-		0.75	3.70%
0	1.75	D		1.75	4.50%

Debt/ Total Value	Inc. Firm Value %	Z" Score
0.03	-4%	17.02
0.05	-4%	11.14
0.08	-3%	9.11
0.10	-2%	8.04
0.13	-1%	7.35
0.15	0%	6.85
0.18	0%	6.47
0.20	1%	6.15
0.23	1%	5.88
0.25	2%	5.65
0.28	2%	5.43
0.30	1%	5.32
0.33	0%	5.25
0.35	-2%	5.19
0.38	-4%	5.13



Aspen : DCF model Firm Value Sensitivity Analysis						
		Perpetuity growth %				
WACC	39,642	-0.2%	0.3%	0.8%	1.3%	1.8%
	6.6%	60,231	56,851	56,851	60,231	68,732
	8.6%	86,687	79,591	79,591	86,687	106,446
	10.6%	86,687	79,591	**79,591**	86,687	106,446
	12.6%	60,231	56,851	56,851	60,231	68,732
	14.6%	36,900	35,711	35,711	36,900	39,642

		Annual sales growth %				
EBITDA %	39,642	14.0%	14.5%	15.0%	15.5%	16.0%
	42.0%	35,833	35,284	35,284	35,833	36,953
	43.0%	34,539	34,015	34,015	34,539	35,609
	44.0%	34,539	34,015	**34,015**	34,539	35,609
	45.0%	35,833	35,284	35,284	35,833	36,953
	46.0%	38,421	37,823	37,823	38,421	39,642

		Retained Earnings & Cash				
Debt/ Total Value	40,648	4,520	5,022	5,580	6,138	6,752
	0.10	38,928	38,928	38,928	38,928	38,926
	0.15	39,478	39,475	39,471	39,468	39,466
	0.20	39,865	39,872	**39,877**	39,882	39,886
	0.25	39,489	39,733	40,004	40,275	40,324
	0.30	38,123	38,372	38,648	38,925	39,229

		% RE & Cash to fund Debt				
Debt/ Total Value	40,648	30%	40%	50%	60%	70%
	0.10	38,921	38,921	38,921	38,921	38,921
	0.15	39,460	39,460	39,460	39,460	39,460
	0.20	39,895	39,895	**39,895**	39,895	39,895
	0.25	39,881	39,130	39,130	39,881	40,361
	0.30	38,533	37,749	37,749	38,533	40,117

Valuation Assumptions

Sales growth rate

The historical Cumulative Average Growth Rate (CAGR) in sales as well as the previous year sales growth was used in most valuations as a forecasting starting point. In the pre-recession valuations, a lower sales growth was used to account for the anticipated dip in revenue growth. During the recession (2008/2009) a slightly higher value than the previous year sales growth was used as these values were often negative, and would not realistically continue into the future. A sales growth rate close to the average between the CAGR and

previous year sales was used for the post-recession period (2009/2010), and this most accurately represented the growth opportunities coming out of a recession.

Depreciation and Amortisation

These values have been kept close to the historical average for most firms throughout the longitudinal study period of 2006-2010. These values were raised slightly when there was an anticipated growth in Capital expenditure (Capex), or lowered slightly when there was an anticipated drop in Capex.

EBITDA

The historical average and previous year values were used for forecasting the EBITDA (Earnings Before Interest Tax Depreciation and Amortisation) values. The most conservative value was often used, and the 5^{th} year value was often lowered slightly to account for a lowered operational efficiency and the market competition tightening into perpetuity.

Capex

In the pre-recession period, historical averages were used for the Capex forecasting values. During the recession, I have assumed that Capex would rise above historical averages to counter the slowing market growth and retain revenue levels by improving market share. Capex forecasting values have been kept to historical averages post-recession, however the 5^{th} year values were often increased to account for increased market competition into perpetuity.

Cost of Capital parameters

- Market risk premium range = 6.7% (Calculated South African market risk premium, (Damodaran, 2011a))
- Risk free rate range = 7.7% (Interpolated Yield on 10-year Treasury bond, (Trading Economics, 2011))
- Tax rate = 28% (current South African corporate tax rate)
- Cost of debt = 9% (prime lending rate). This value was used for firms with a BRE credit rating of AAA. This value increased gradually in

increments to 13.5% for firms with a BRE credit rating of D. These incremental interest rate increases were based on differences in lending rates for companies with varying BRE credit ratings.

- Size premium = 0.9% (Mid-Cap Decile size premium based on market capitalisation, per Ibbotson Associates Modified CAPM (Geenen, Kirisits, Chadwick and Hoeveler, 2009))

Net Working Capital (NWC)

- NWC = Total current assets - Total current liabilities
- This has been kept close to the historical average for most firms throughout the study period from 2006-2010. These values were lowered slightly when there was an anticipated growth in Capital expenditure (Capex), or raised slightly when there was an anticipated drop in Capex. The 5th year value was often lowered slightly to account for a lowered operational efficiency and the market competition tightening into perpetuity.

Percentage of Retained Earnings and Cash to Fund Debt Increase

The Retained Earnings (RE) and Cash value was kept between 10% and 50% in all cases as an acceptable range of values. In only a few cases, this value was the low of 10%, due to extremely large RE values distorting the optimal capital structure. Likewise, in companies that had smaller relative RE to cash flow, this value was pushed up to a maximum of 50% as an acceptable upper limit that companies would be will to use for capital restructuring.

APPENDIX B

Complete firm analysis results

Table 6: Full analysis results for changes in firm value and risk profile for the sample firms

Company	Critical Values	2006	2007	2008	2009	2010	Ave
Arcelormittal Sa Ltd	Optimal D/TV	0.15	0.11	0.21	0.18	0.23	0.23
	Value Increase	4.00%	2.00%	3.40%	3.40%	4.00%	3.80%
	Z" Score	8.86	8.72	12.06	9.09	8.66	9.73
	BRE Rating	AAA	AAA	AAA	AAA	AAA	AAA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Aspen Pharmacare Hldgs.	Optimal D/TV	0.18	0.4	0.38	0.35	0.28	0.32
	Value Increase	1.40%	3.80%	3.90%	1.70%	2.50%	2.66%
	Z" Score	4.73	4.05	3.91	5.04	5.39	4.62
	BRE Rating	B+	B-	B-	BBB	BB+	B+
	Risk Profile	Grey	Distress	Distress	Grey	Grey	Grey
Bidvest Ltd Ord	Optimal D/TV	0.3	0.25	0.45	0.45	0.43	0.37
	Value Increase	2.00%	2.00%	5.10%	7.12%	8.85%	5.01%
	Z" Score	7.15	6.58	7.71	8.75	7.79	7.59
	BRE Rating	AA-	A-	AA+	AAA	AA+	AA+
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Remgro Ltd	Optimal D/TV	0.3	0.25	0.33	0.38	0.25	0.30
	Value Increase	7.90%	11.00%	21.10%	12.31%	14.70%	13.40%
	Z" Score	12.89	11.82	13.94	11.37	9.99	12.00
	BRE Rating	AAA	AAA	AAA	AAA	AAA	AAA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Compagnie Fin Richemont	Optimal D/TV	0.48	0.48	0.48	0.35	0.25	0.41
	Value Increase	6.70%	9.40%	9.70%	4.00%	5.50%	7.06%
	Z" Score	26.84	24.63	24.91	11.53	7.5	19.08
	BRE Rating	AAA	AAA	AAA	AAA	AA	AAA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe

Company	Critical Values	2006	2007	2008	2009	2010	Ave
Massmart Holdings Ltd	Optimal D/TV	0.25	0.15	0.2	0.18	0.13	0.182
	Value Increase	1.60%	1.40%	1.20%	0.40%	0.40%	1.00%
	Z" Score	7.24	6.15	7.73	7.05	6.47	6.93
	BRE Rating	AA-	BBB	AA+	AA-	A-	A+
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
The Foschini Group Ltd	Optimal D/TV	0.18	0.18	0.38	0.38	0.3	0.28
	Value Increase	2.50%	3.50%	5.40%	3.20%	3.90%	3.70%
	Z" Score	7.25	7.09	8.21	8.49	8.24	7.86
	BRE Rating	AA-	AA-	AAA	AAA	AAA	AA+
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Truworths International	Optimal D/TV	0.15	0.1	0.2	0.15	0.13	0.15
	Value Increase	2.80%	2.40%	2.70%	1.60%	2.00%	2.30%
	Z" Score	7.41	6.95	8.69	7.7	6.93	7.54
	BRE Rating	AA	A+	AAA	AA+	A+	AA
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Woolworths Holdings Ltd	Optimal D/TV	0.4	0.3	0.5	0.4	0.28	0.38
	Value Increase	1.20%	1.40%	3.00%	1.70%	1.30%	1.72%
	Z" Score	7.73	7.11	10.53	8.44	6.66	8.09
	BRE Rating	AA+	AA-	AAA	AAA	A	AA+
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Imperial Holdings Ltd	Optimal D/TV	0.5	0.53	0.73	0.75	0.63	0.63
	Value Increase	6.00%	2.90%	5.60%	15.43%	12.00%	8.39%
	Z" Score	5.82	5.86	6.26	6.9	6.59	6.29
	BRE Rating	BBB-	BBB	BBB+	A+	A-	BBB+
	Risk Profile	Grey	Safe	Safe	Safe	Safe	Safe
Netcare Limited	Optimal D/TV	0.78	0.78	0.88	0.75	0.7	0.78
	Value Increase	1.20%	1.30%	1.50%	0.50%	0.70%	1.04%
	Z" Score	3.87	4.41	4.58	4.75	4.42	4.40
	BRE Rating	B-	B	B+	B+	B	B
	Risk Profile	Distress	Distress	Grey	Grey	Distress	Distress
Steinhoff	Optimal D/TV	0.5	0.5	0.7	0.8	0.75	0.65

Company	Critical Values	2006	2007	2008	2009	2010	Ave
Interntl Hldgs	Value Increase	7.30%	20.20%	9.80%	6.20%	8.67%	10.43%
	Z" Score	6.51	6.13	7.48	7.62	7.29	7.01
	BRE Rating	A-	BBB	AA	AA+	AA-	AA-
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Medi-Clinic Corp Ltd Ord	Optimal D/TV	0.23	0.28	0.83	0.8	0.73	0.57
	Value Increase	1.20%	2.80%	4.40%	0.70%	1.00%	2.02%
	Z" Score	6.37	5.91	4.7	4.92	5.01	5.38
	BRE Rating	BBB+	BBB	B+	BB-	BB	BB+
	Risk Profile	Safe	Safe	Grey	Grey	Grey	Grey
Telkom Sa Ltd	Optimal D/TV	0.28	0.2	0.4	0.73	0.65	0.45
	Value Increase	1.40%	0.90%	4.00%	12.90%	17.20%	7.28%
	Z" Score	5.33	4.71	3.4	7.39	6.15	5.39
	BRE Rating	BB+	B+	CCC+	AA	BBB	BB+
	Risk Profile	Grey	Grey	Distress	Safe	Safe	Grey
Mtn Group Ltd	Optimal D/TV	0.3	0.25	0.35	0.3	0.28	0.29
	Value Increase	5.00%	4.70%	19.60%	7.50%	7.30%	8.82%
	Z" Score	4.44	4.46	4.67	4.4	4.67	4.52
	BRE Rating	B	B	B+	B	B+	B+
	Risk Profile	Distress	Distress	Grey	Distress	Grey	Grey
Naspers Ltd - N-	Optimal D/TV	0.28	0.23	0.38	0.35	0.2	0.28
	Value Increase	3.10%	8.00%	9.00%	6.10%	7.70%	6.78%
	Z" Score	5.09	5.63	5.79	5.96	5.31	5.55
	BRE Rating	BB	BB+	BBB-	BBB	BB+	BB+
	Risk Profile	Grey	Grey	Grey	Safe	Grey	Grey
Pik N Pay Stores Ltd	Optimal D/TV	0.13	0.1	0.15	0.15	0.13	0.13
	Value Increase	0.60%	0.80%	1.50%	1.50%	1.20%	1.12%
	Z" Score	5.47	3.11	4.19	4.83	6.33	4.78
	BRE Rating	BB+	CCC+	B	BB-	BBB+	BB-
	Risk Profile	Grey	Distress	Distress	Grey	Safe	Grey
Sabmiller Plc	Optimal D/TV	0.35	0.28	0.35	0.73	0.28	0.39
	Value Increase	6.40%	3.20%	6.40%	55.70%	6.50%	15.64%

Company	Critical Values	2006	2007	2008	2009	2010	Ave
	Z" Score	4.57	4.66	4.56	4.09	4.63	4.50
	BRE Rating	B+	B+	B+	B-	B+	B+
	Risk Profile	Grey	Grey	Grey	Distress	Grey	Grey
Shoprite Hldgs Ltd Ord	Optimal D/TV	0.2	0.18	0.2	0.15	0.13	0.17
	Value Increase	0.60%	1.10%	1.70%	1.00%	1.00%	1.08%
	Z" Score	7.41	7.17	7.4	6.85	6.21	7.00
	BRE Rating	AA	AA-	AA	A	BBB	AA-
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe
Tiger Brands Ltd Ord	Optimal D/TV	0.23	0.18	0.23	0.18	0.18	0.20
	Value Increase	2.60%	4.00%	1.30%	1.60%	2.70%	2.44%
	Z" Score	7.11	7.04	6.71	7.55	6.74	7.03
	BRE Rating	AA-	AA-	A	AA	A	AA-
	Risk Profile	Safe	Safe	Safe	Safe	Safe	Safe

APPENDIX C

Consistency matrix

Table 7: Consistency matrix

Research problem: Analyse the impact of changes in financial leverage on firm value in South Africa, and assess the associated risks.					
Sub-problem	**Literature Review**	**Propositions**	**Source of data**	**Type of data**	**Analysis**
Analyse the impact of changes in financial leverage on firm value in South Africa	Modigliani and Miller (1958) Baxter (1967) Jensen and Meckling (1976) Leland and Pyle (1977) Bradley, Jarrell and Kim (1984) Altman, Hartzell and Peck (1995) Myers (2001)	Changes in financial leverage have an impact on firm value in South Africa, and increasing a firm's leverage, to an extent, will improve firm value	Online databases, preferably INet-Bridge, JSE Securities Exchange, and Standard Bank online share trading Annual reports	Quantitative data	Mathematical modelling Data Display Conclusion Drawing/Verification
Assess the risk that changes in financial leverage impose on a firm in South Africa	DeAngelo and Masulis (1980) Bradley, Jarrell and Kim (1984) Myers (1984, 1993, 2001) Myers and Majluf (1984) Fama and French (2002) Frank and Goyal (2003, 2009)	Firms in South Africa have reserve borrowing power to take on more debt without incurring financial distress costs	Online databases, preferably INet-Bridge, JSE Securities Exchange, and Standard Bank online share trading Annual reports	Quantitative data	Mathematical modelling Data Display Conclusion Drawing/Verification