Change in corporate debt levels in South Africa from 1994 to 2016

By

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Abstract

This paper aims to investigate the change in corporate debt levels in South Africa from 1994 to 2016 as well as analyse certain factors that play a role in the decision making of corporates when it comes to the all-important decision of capital structure. The study uses data from large capitalisation, retail and food producing firms listed on the Johannesburg Stock Exchange. Four different leverage measures are used to determine the change in capital structure over the period under review as well as six of the most common determinants of capital structure used in literature.

The analysis shows that South African corporates have drastically increased their appetite for debt funding compared to equity funding over the last two decades. Large capitalisation stocks reflected the largest increase in the use of debt, whilst food producers showed the smallest yet still significant increase in debt. Analysis has also shown that firms have changed their maturity profile of their debt significantly since the 2008 financial crises. Results from the analysis on determinants varied with some determinants showing statistical significance.

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1. Introduction

This paper aims to determine how corporate leverage has changed from 1994 to 2016 given the backdrop of the fundamental economic changes that South Africa has gone through over this period. A total of 68 firms from three different sectors namely large capitalisation stocks, retail firms and food producers were sampled. This paper forms part of a larger study thus other sectors will be covered by different authors.

The research conducted is quantitative in nature and relies on data extracted from IRESS as well as Bloomberg. Four different measures of leverage are used to analyse the capital structure decision of corporates: Total Debt to Book Value of Equity, Total Debt to Market Value of Equity, Total Liabilities to Book Value of Equity and Total Liabilities to Market Value of Equity.

The study is structured around two questions. Firstly, how has the capital structure of South African firms changed from 1994 to 2016 and secondly what are the catalysts of this change?

This study is inspired by Graham, Leary and Roberts' (2015) study on leverage of United Sates (US) listed firms from 1915 to 2015. This study focused on how capital structure has changed in the US over the last century as well as analysing drivers of this change in capital structure. The authors found that leverage has drastically increased over the last century. The aggregate leverage for non-regulated firms (firms excluding banks and financial stocks) was found to be between 10% and 15% from 1920 to 1945, and between 11% and 35% from 1945 to 1970. Since 1970 the aggregate leverage has been hovering around 35%, peaking at 47% in 1992.

The authors found that neither firm characteristics nor the relationship between these characteristics and leverage ratios explain much of the increase in leverage over the last

decade. They however found that corporate tax rate, reduction in economic uncertainty, growth in financial intermediation and a large reduction in government borrowings are credible explanations to this change in capital structure.

The economic environment in South Africa has drastically changed over the last couple of decades which forms the backdrop of this study as well as the main catalyst around the change of capital structure by corporates in South Africa.

By the mid 1980's South Africa had numerous trade and financial sanctions imposed upon the country by some of the world's largest economic powerhouses such as the USA, Japan and Europe. Due to these sanctions a substantial amount of foreign investment was withdrawn from South Africa.

The effects of this on South Africa were almost immediately noticeable. In the years preceding 1974 South Africa's GDP grew an average of 4.9% per year but from 1974 to 1987 GDP growth declined to 1.8% per year (Levy, 1999).

A further noticeable effect the sanctions had on the SA economy was that of external borrowings. From 1940 to 1984 SA ran an account deficit to GDP of 2% - 3%. These were offset by substantial capital inflows. This dependence on foreign capital left South Africa vulnerable to shifts in lending. A large shift occurred from 1976 to 1980 where net foreign capital outflow averaged 2.3% which left South Africa dependent on the willingness of foreign lenders to refinance their debt (Levy, 1999).

According to Hefti & Staehelin-Witt (2002) the massive capital outflows could be attributed to three factors. Firstly, the political unrest surrounding the Sharpeville massacre of 1960 and the Soweto unrest of 1976 which led to a national state of emergency in 1985/6 as large economic players imposed sanctions on South Africa.

In 1994 the first democratic election took place and Nelson Mandela was elected as the new president of South Africa.

In 1996 the Bond Exchange of South Africa (BESA) received their licence which increased the accessibility of capital for South African corporates. Over the period of 1998 to 2010 we saw the long bond rate decline from an average of 18.3% to 8.3% therein increasing the attractiveness of raising debt for corporates. In 1994 roughly R186 billion worth of bonds was in circulation versus the R2 trillion in issuance at the end of 2016, representing a growth in value of 975% over the last 22 years.

Over the last three decades we have also seen a drastic decrease in the prime lending rate in South Africa which peaked at 25% in the late 1980's whilst stabilising at between 8% - 10% since 2010.

All four measures of leverage showed an increase in the use of debt by South African corporates over the period of consideration with total debt to book value reflecting a considerable increase of over 146%. It is thus clear that the economic changes in South Africa over the last couple of decades have increased the appetite for debt funding. There has also been a clear change in the maturity profile of debt that firms are using. This change has especially been significant since 2008 where results have shown a vast increase in the use of long term debt relative to short term debt.

The paper is organised as follows. Section 2 covers the literature review which includes the theory surrounding capital structure decision making, determinants of capital structure, trend of leverage in the United States, United States and South Africa interest rate environment as well as the origin of South Africa's debt market. Data sources as well as the methods used are covered in section 3 and 4. Section 5 covers the results found in the data and lastly section 6 concludes the paper.

2. Literature Review

The optimal capital structure of a firm for the benefit of shareholder wealth has been the subject of extensive research and debate amongst academics in the field of finance. Research stemming from almost 50 years of study surrounding this topic, initiated by Modigliani & Miller (M&M) in 1958, the numerous contrasting opinions formed throughout subsequent years and the still ever elusive 'golden ratio' for the optimal capital structure for maximising shareholder wealth illustrates the sheer depth and complexity of this topic.

This paper will focus on analysing a sample of shares on the Johannesburg stock exchange to ascertain and therein explain any trends that may exist in the use of leverage (with a focus on debt rather than equity financing) during the period 1994 to 2016. The fundamental concept of capital structure theory in the form of M&M irrelevance theory, agency theory, trade-off and pecking order theory should first and fore most be understood before moving to more specific literature on the topic.

Furthermore, which operational factors have a material impact on the capital structure decisions of firms on the Johannesburg Stock Exchange (JSE) will be analysed and a brief discussion will be presented regarding the attributes and different theories of the determinants of capital structure as found in the literature.

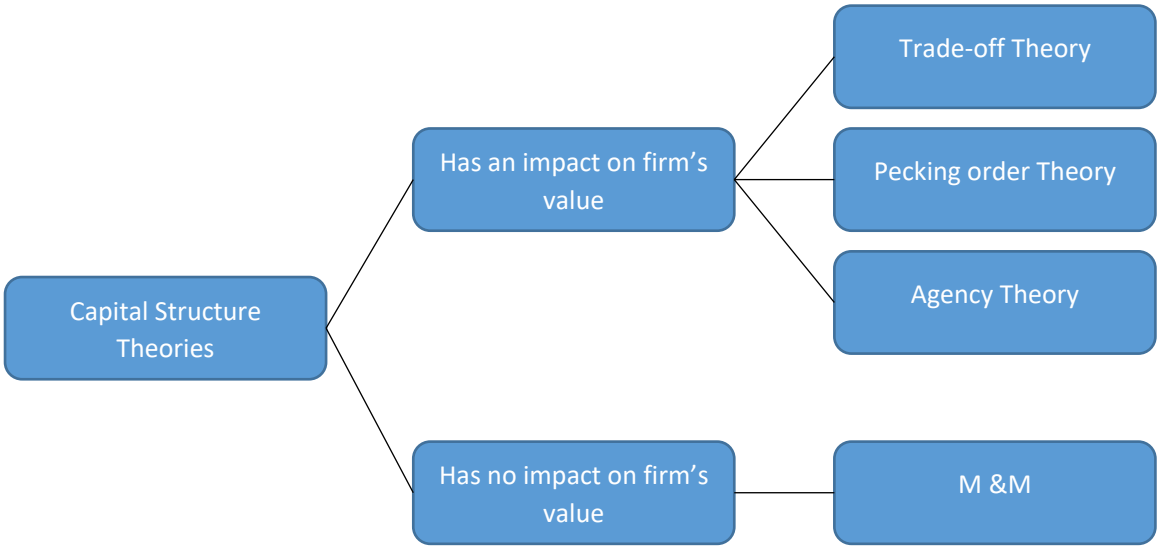
2.1 Capital Structure Theory

M&M work arguably forms the foundation for the formulation of the optimal capital structure within firms. The very nature of the theorems and assumptions concluded during the early work of M&M has earned the theoretical title of 'the capital structure irrelevance theory' or 'The Irrelevance Theory' in short – the reasons for which shall become apparent in the

following synopsis of this theory and thus, given the above, aptly forms the beginning of this paper.

Figure 1 below graphically illustrates the different capital structure theories and the impact the authors believed this had on the value of the firm. There are four main capital structure theories. M&M believe that capital structure has no impact on the value of the firm. “Trade-off, pecking order and agency theory however believe that changes to the capital structure makeup will have a material effect on the value of the firm (Xhaferi & Xhaferi 2015)”.

Figure 1: Capital structure theories



(Xhaferi & Xhaferi 2015)

2.1.1 Irrelevance theory

As referred to above the M&M’s paper of 1958 arguably forms the basis of modern thinking on the capital structure decision that firms are faced with. Based on their theorems and

assumptions, expanded upon further below, their theory is often referred to as the capital structure irrelevance theory.

The M&M theory is divided into two propositions. Proposition one looks at how a change in capital structure affects the value of the firm, and proposition two looks at how a change in capital structure affects the required rate of return of a firm.

M&M however made a few key assumptions in their theory - no corporate taxes, equal corporate and private lending costs, no transaction costs, no bankruptcy costs and symmetry of market information.

Under assumption one the value of a firm is not affected by changes in capital structure. The rationale behind this is that the cash flow of the firms has not changed, thus no change in value. Many academics have used the phrase, “it does not matter how you slice the pie (which mix of debt or equity is used) the size (value of the firm) of the pie stays exactly the same”.

Proposition two looks at the firms cost of capital. M&M argue that a firm’ cost of capital stays constant regardless of the firm’s capital structure. The rationale behind this theory is that if a firm increases its debt financing, due to the lower cost of raising capital, it would subsequently increase the return that equity holders required due to the extra risk that is being taken on (Myers 2001).

M&M then relaxed some of their assumptions to see how their theory would hold. Firstly, they relaxed the assumption of no corporate taxes. Interest on debt is tax deductible thus when a firm adds debt to its capital structure it reduces taxes. This reduction in taxes will subsequently increase the cash flow of a firm but also decrease net income. Thus, by adding the present value of the interest tax shield the value of the firm increases. Therefore, under this assumption, to derive the greatest value of the firm a company should simply use 100%

debt financing. However, it should be noted that there is no bankruptcy cost considered above.

Under proposition two (WACC), when the assumption of no corporate taxes is relaxed, the cost of debt goes down due to the tax deductibility of the interest payments. Purportedly then under this assumption the more debt that is added to the capital structure of a firm, the more the firm can decrease its' WACC.

M&M then further relax their assumptions by including corporate taxes and bankruptcy costs. As leverage increases (more debt relative to equity capital) the probability of bankruptcy goes up with the increasing interest payment that is due on this debt. The use of more debt creates a larger income tax shield but also increases the bankruptcy costs which then offsets the gain from the interest tax shield. Under proposition two the benefits of the additional savings from the tax shield is offset by the increase in bankruptcy cost, which will increase the cost of equity dramatically and push the WACC upwards again.

2.1.2 Agency Theory

"Being the manager rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Negligence and profusion, therefore, must always prevail, in the management of the affairs of such a company" – "An Inquiry into the Nature and Causes of the Wealth of Nations" Adam Smith (1776).

Two Hundred years later Jensen and Meckling re-examined and extended Smith's insight into what is referred to today as 'agency theory'. "Agency theory or principal-agent model arises from the friction between one or more persons (principals) and another person (the agent) (Jensen & Meckling 1976)". In the corporate environment, the principals can be the

shareholders of a corporation and the agents being management shareholders appoint to manage their corporation. The theory states that if both parties are utility maximizers, in that they want to maximise total value from available money, then the probability that the agent will not always act in the best interest of the principal could become common, thus causing a divergence in the interest between these two parties (Jensen & Meckling 1976).

Myers (2001) argues that this arises from the fact that managers are never fully accountable for the cost of their actions unless they are both manager and owner, and that there is no pure, observable measure of performance for managers.

Jensen & Meckling purported that debt could be used as a tool to solve potential conflicts in this principal-agent relationship, furthermore contending that the optimal capital structure is a result of two divergences that arise from this principle- agent relationship.

Therefore, in accordance to the above contention by Jensen & Meckling a significant amount of debt on the balance sheet will increase the bankruptcy cost to a level where it forces managers to perform. A high bankruptcy cost in turn generally means that managers have a higher risk of losing their jobs and subsequently their remuneration. This is subsequently seen as a sufficient threat to incite managers to increase cash flow to service the interest payment on the debt, be more productive and efficient through less wastage and in turn lead to better decision making when choosing investment projects that will maximise the value of the firm, therein toeing the line with the needs of shareholders (Jensen & Meckling 1976).

Leland (1998), however, argues that both M&M and Jensen & Meckling' research falls short in two critical dimensions. Firstly, he argues that the two approaches have not been fully integrated and secondly that both theories fail to offer a quantitative solution to the amount of debt a firm should issue in different environments.

2.1.3 Trade-off Theory

Trade-off theory suggests that the optimal capital structure of a firm is a ‘trade-off’ between the cost and benefit related to debt financing. The largest benefits of debt financing are the tax advantage and the reduction in agency cost through free cash flow. While costs include the increase in risk of financial distress (bankruptcy) and the increased monitoring and contracting costs associated with higher debt levels (Tong & Green 2005).

Static trade-off theory suggests that firms identify a target debt to equity ratio and converge towards it over the longer term by changing the financing mix. Trade-off theory suggests that the benefit of risk associated with debt financing influences this target or “ideal” capital structure (Xhaferi & Xhaferi 2015).

An interesting note is that the trade-off theory referred to in this paper originated through the adaptation of the M&M debate when their assumptions were relaxed. When M&M relaxed their assumptions and incorporated taxes into the original Irrelevance proposition, this created a benefit for debt in that it served to shield earnings from taxes (Frank & Goyal 2007). “Since the firm’s objective function is linear, and there is no offsetting cost of debt, this implied 100% debt financing (Frank & Goyal 2007)”.

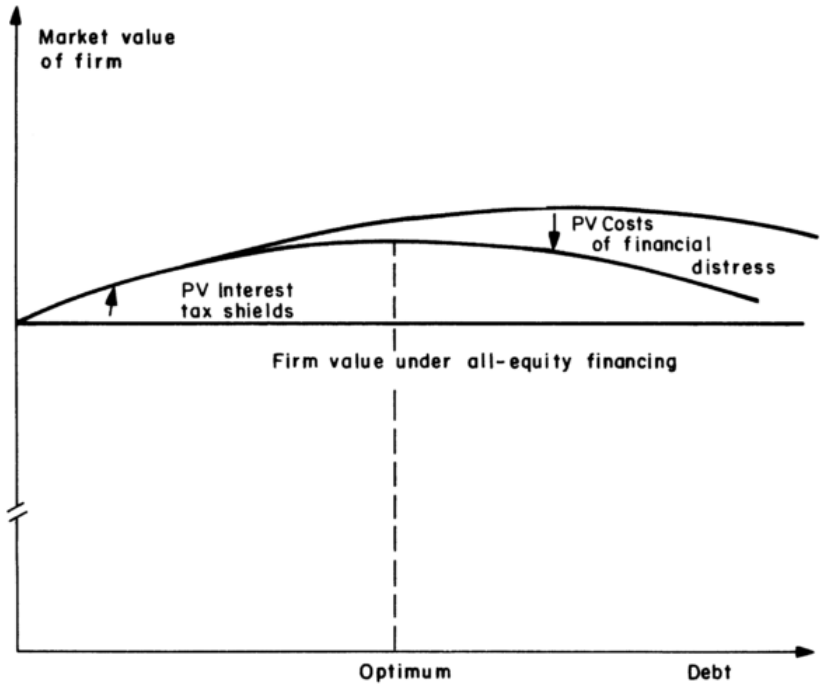
However, Myers & Majluf (1984) claim that the trade-off theory fails to explain the strong inverse correlation between profitability and financial leverage, and posed the question that if the interest tax shield on debt is so attractive why then would firms with higher profits have lower debt.

Fama & French (2002) highlight that bankruptcy cost is higher for less profitable firms as well as for firms that have higher earnings volatility. This forces firms of this type to use less debt financing (Fama & French 2002).

Research from Smith (1986) concluded that leverage increases transactions such as stock repurchases (exchange of debt for equity) by firms. These transactions are then perceived as good news by investors and subsequently results in an increase in the share price. Whilst all leverage decreasing transactions such as issue of common stock (exchange of equity for debt) were conversely perceived as negative. Per Smith (1986) this is further indication that investors appreciate the increase of debt due to the perceived value and benefit of the interest tax shield.

Figure 2 below illustrates the level where a value maximising firm would operate. Value maximising firms would operate at the top of the curve by benefitting mostly from the interest tax shield on debt. Financial distress would however come second in relation to the benefit of this interest tax shield on debt (Shyam-Sunder & C. Myers 1998).

Figure 2: Optimal Capital Structure under the trade-off theory



(Shyam-Sunder & C. Myers 1998)

Hovakimian et al., (2004) conducted a study on the choice between debt and equity. The study suggests that past profit and cash flows play a material role in the selected debt ratio of a firm and influences future financing decisions. They concluded that a firm's stock price plays an important role in the choice of financing. (Hovakimian et al., 2004)

2.1.4 Pecking Order Theory

Pecking order theory differs from other capital structure theories in that it does not attempt to calculate an optimal capital structure, and instead asserts that the achieved capital structure by a particular firm is the end product of the different funding resources available to the firm (Tong & Green 2005). Pecking order theory does acknowledge the benefit of the interest tax shield and the threat of bankruptcy albeit as less important metrics for capital structure decision making.

Pecking order theory further states that asymmetric information, which is when one party possesses greater information than the other, such that when management has more information than shareholders about the company and potential projects, it creates a hierarchy of costs in the use of external financing. New investments would be financed first by retained earnings, secondly by debt and lastly by equity.

To better demonstrate this hypothesis, Myers and Majluf (1984) analysed a firm that had some of its assets on the balance sheet as well as potential opportunities and projects the firm could partake in for future growth. One assumption made was that managers would always put funds towards projects that will have a positive net present value (NPV). They further argued that managers would always act in the best interest of current shareholders and thus would not raise equity capital if they knew their shares were undervalued, and only look to the market for financing when their shares were fairly valued or overvalued. The

result of management having this asymmetric information is that the market inevitably perceives a new issuance of shares as negative news. This then forces the share price to drop and therein negatively affecting current shareholders.

Debt issuance however would then have a contrary indication on the market - if we were to agree that managers would always act in the best interest of current shareholders. A debt issuance would then imply that managers felt their shares were undervalued.

The above then advocates the argument that internal financing will always be used as a primary source of financing, followed by debt financing where the extra debt issuance is not perceived to be too expensive (drastically increasing bankruptcy cost) whereby management would then turn to equity financing.

A comparison of the separate research conducted by Hovakimian, Opler and Titman (2001) and Donaldson (1961) yielded similar results, with both studies confirming that firms tend to accumulate profits and losses that are consistent with the pecking order theory.

2.2 Determinants of Capital Structure

In understanding the various factors involved in the capital structure decisions of firms and to determine which factors have historically shown to be the most reliable explanation of this decision, it is pertinent to analyse previous academic research conducted in conjunction with the capital structure theories presented above and how these theories correlate to findings in practice.

Toy, et al., (1974) study on capital structure tested three financial performance indicators – growth, measured as a logarithm of total assets; profitability, measured as earnings over total assets; and risk, measured as the coefficient of variation of earnings. The effects of a change in these indicators on the leverage ratio of firms applying its trade in the

manufacturing sector were observed. Total debt divided by total assets calculated at book value was used as a dependent variable in their model. The study was conducted across Norway, USA, Holland, Japan and France with a sample consisting of 816 firms spanning from 1966-1972. Toy et al., (1974) hypothesised, based on theoretical support, that firms with high growth rates, *ceteris paribus*, should have higher financial leverage and firms with high earnings, *ceteris paribus,* should have lower financial leverage. This in part was due primarily because of the use of internal funding to fund projects before looking elsewhere for funding – corresponding then with the pecking order theory. Finally, they hypothesised that firms with higher earnings risk, *ceteris paribus,* tend to have less leverage due to the uncertainty in their earnings. Toy et al., (1974) found that these three determinants varied with respect to the effects on leverage based on the firms' domicile. Growth rate in assets had a large effect on leverage in the United States and Japan but minimal affect in Norway and Holland. Earnings risk was considerable in Norway, Japan and the United States but not in Holland (Toy et al., 1974). Risk in earnings positively correlated to debt ratios, contrary to the author's initial beliefs. The differences in findings between countries based on debt levels was put down to the reactions each of these countries have various financial performance measures. Reaction to difference in the earnings rate variable is generally the most important differentiation factor among countries, whilst neither growth rate of assets or earnings risk is very helpful in explaining these cross-national differences. The authors concluded that their findings could potentially open opportunities for further research, especially research probing on country specific factors.

Titman & Wessels (1988) analysed eight determinants in their research to explain capital structure decision making. Their data included 469 firms over the period of 1974 to 1982. The authors used six different debt ratios as dependent variables based on some theories having different empirical implications regarding different types of debt instruments. Long Term, short term and total debt to market and book values of equity were used to calculate

the leverage of the chosen firms in this study. The authors used asset structure, non-debt tax shield, growth, uniqueness, industry classification, size, earnings volatility and profitability as determinants to try and ascertain the effect on the firm's debt-equity choice. Asset structure is thought to influence the capital structure decision of firms with assets that can be used as collateral, such as property, and that these firms then tend to issue more debt. A non-debt tax shield, such as the deduction on depreciation and investment credits, act as a substitute for the tax benefit of debt finance. Thus, it is believed that firms with large non-debt tax items use less debt in their capital structure. Growth as a determinant is derived from the agency theory where it is believed that equity-controlled firms are more inclined to invest in suboptimal projects to expropriate wealth from the firm's bondholders. This cost associated relationship tends to be higher for firms that are in a growth cycle with a large scope of future investment opportunities and as such expected growth should be negatively correlated to debt levels. Firms that produce a very specific or unique product tend to have suppliers and workers with very specific skill sets, resulting in relatively high costs for all parties in the event of liquidation. Therefore, firms with unique products tend to have lower debt levels to limit that cost of bankruptcy. Titman & Wessels, (1988) succinctly state that "Firms that produce products that require specialised servicing and spare parts will find liquidation especially costly". This then suggests that firms that manufacture machines and equipment would have lower levels of leverage. Larger firms however tend to have more diversified income streams and are thus less likely to be faced with a bankruptcy decision. It is believed that the larger the firm is, the more the firm tends to be able to issue debt at a lower cost and thus tends to be more highly leveraged. Firms with higher volatility in their earnings will tend to lower debt levels due to the risk associated with not meeting interest payments.

For all six debt ratios Titman & Wessels (1988) found that uniqueness, measured as Research and Development (R&D) over sales, had a negative effect. Short-term debt ratios

were found to be negatively correlated to firm size, which they determined as an indication of the importance of transaction costs to firms when analysing their funding options. The authors concluded that the non-debt tax shield, volatility, collateral value and future growth had no material effect on any of their debt ratios.

Harris and Raviv (1991) conducted an in-depth study of nine past research papers on the different theories of capital structure and determinants of leverage. They particularly analysed the results presented by these authors in their studies and what these authors found the effect on the dependent variable (leverage) to be. Harris and Raviv' findings are documented in Table 1 below where (N) represents the number of studies, (+) shows and increase in leverage and (-) shows a decrease in leverage.

Table 1: Determinants of Capital Structure

Capital Structure Determinant	N	+	-
Volatility	5	1	4
Bankruptcy Probability	1	0	1
Fixed Assets	5	5	0
Non-Debt Tax Shield	4	2	2
R&D Expenditure	2	0	2
Advertising	2	0	2
Profitability	5	1	4
Size	6	2	4
Free Cash Flow	1	0	1
Uniqueness	1	0	1

N represents the number of studies that used a particular determinant in their research. (+) and (-) represents the effect on leverage.

A pertinent derivation from the table above is the lack of total unanimity amongst the authors of the research studied by Harris and Raviv. The lack of unanimity could be a result of the differing methods used amongst authors when calculating this data. Rajan and Zingales (1995) and De Jong, Kabir and Nguyen (2007) offer a potential alternative when they concluded that capital structure movements could also be country specific. Certainly however, the absence of a definitive answer to the lack of unanimity illustrates the integrate and complex nature of the capital structure decision facing firms.

Van der Wijst and Thurik (1993) conducted a study analysing the effect of five determinants on the capital structure of small cap firms applying their trade in the retail sector. The author used data from Germany for the period of 1955 to 1977 and analysed 27 different shop

types. The variables used by Van der Wijst and Thurik (1993) included firm size, non-debt tax shield, bankruptcy cost, agency cost and return on investment. Van der Wijst and Thurik (1993) made use of long term, short term and total debt to total assets as the three dependent variables in their study. The authors found that all the variables, apart from the non-debt tax shield, appeared to have a material impact on the chosen debt ratios with the non-debt tax shield being inconclusive. Evidence, contrary to the author's hypotheses, showed the chosen variables had a larger impact on the maturity of debt used by these smaller firms than the actual leverage used. Short-term debt funding increased in popularity in the latter part of the study, where long-term debt funding decreased. The authors concluded that research on small cap firms has largely been overlooked by finance professionals and a lot more research in this sector is needed.

Rajan and Zingales (1995) conducted an international study involving 31 countries from 1982 to 1991 with the objective of discerning whether the capital structures of these countries followed the G-7 (US, Japan, Germany, France, Italy, UK and Canada). Rajan and Zingales tested four capital structure determinants - tangibility of assets, market-to-book ratio, firm size and profitability. The authors found that movements in tangibility had a material impact on leverage. Firms with higher tangibility could turn assets into cash quicker to cover the debt in the case of increased bankruptcy risk. The authors found that the impact was much larger in Japan than anywhere else examined. The market-to-book ratio was negatively correlated to leverage. Rajan and Zingales concluded that firms with a high market-to-book ratio were more inclined to issue stock rather than increase debt financing, thus decreasing the leverage ratio. The effect of firm size on leverage varied largely by country, with a predominantly negative correlation as observed by Titman & Wessels (1988). This is contrary to their hypothesis and the authors concluded that they did not understand the correlation between firm size and leverage.

Pandey (2001) examined the influence of profitability, growth, risk and tangibility on the capital structure of Malaysian companies from 1984 to 1999 using a sample size of 106 firms. They divided debt into three categories - short-term, long-term and total debt and subsequently ran the regression on all three dependent variables. Financial stocks however were excluded from this study as the corporate structure of these firms tended toward different determinants. The time line of this study was divided into four periods, a market downturn, market upturn, stability and growth phase to test for differences in debt ratios due to economic fluctuations. Pandy (2001) found that firms in Malaysia had very low levels of debt (average debt ratio over a 12-year period of 15%). It was also found that corporates did not increase their debt levels during times of economic growth but increased their debt levels in times of economic downturn. The author found that growth and size were positively correlated with all three debt ratios and profitability and tangibility were negatively correlated. Risk (volatility in earnings) was negatively correlated to long term debt ratios but positively correlated to short term debt ratios. Pandey (2001) concluded that the availability of data was a major constraint in this study and as more data becomes available a revised study would be beneficial in identifying additional determinants.

A study of 6000 Swedish firms from 1992 to 2000 by Song (2005) found that Swedish firms were highly leveraged with a mean ratio of total liabilities over total assets of approximately 80%. Total debt to assets had a mean of 67%, whilst total debt to capital had a mean of 75% over the period of study. It was also found that Swedish firms preferred to utilise short term debt. Song (2005) included eight determinants in the study - tangibility, non-debt tax shield, profitability, size, expected growth, uniqueness and income variability. The author found tangibility to be highly significant to all three of the debt measures used. Tangibility reflected a positive relationship to all debt ratios but found it to be negatively correlated to short-term debt which connects with the matching principle: long term debt is used to finance fixed (tangible) assets whilst non-fixed assets are financed with short term debt. Non-debt tax

shield did not reflect any statistically significant result with respect to total debt but when broken down by maturity reflected a positive relationship to short term debt and a negative relationship to long term debt. Profitability was found to be negatively correlated to all three leverage measures which relates to the pecking order theory. Size was found to be the most significant determinant of capital structure with a positive correlation to both total debt and short-term debt but negatively correlated to long term debt. The expected growth and uniqueness determinants revealed either little or no statistical significance and income variability was approximately zero in respect of its statistical significance.

Haung and Song' (2006) study of 1200 Chinese listed firms from 1994 to 2003. An interesting finding from this study was the environment in which these firms operate and the structural differences they face. A large portion of Chinese listed firms were state owned before being taken public. Even though these firms are now privately owned, the state still owns a large portion of the equity, giving them controlling right. "The Chinese economy is also in a transition phase, moving from a command economy to a market economy (Haung and Song, 2006)". The authors concluded that even though the Chinese economy has a very different structure, the factors that influence capital structures of a firm remain the same. Haung and Song (2006) found that profitability, non-debt tax shield, managerial shareholding and company size have a negative relationship to debt ratios, but that tangibility and effective tax rate was positively correlated to the debt ratios implemented. "State shareholding or institutional shareholding had no significant effect on capital structure (Haung and Song, 2006)".

De Jong, Kabir and Nguyen (2007) studied 11 845 firms across 42 countries (evenly dispersed between developed and emerging countries), with a chosen sample period, based on availability of data, from 1997 to 2001. The six firm-specific determinants of leverage used in this study were tangibility, risk, size of firm, tax rate, profitability and liquidity. De Jong, Kabir and Nguyen (2007) results showed that the mean long-term debt ratio of all the

firms observed was 12.9% with a median of 11.9%. Industrialised countries had a mean leverage ratio of around 10% with the mean ratio for developing countries being approximately 15%. De Jong, Kabir and Nguyen (2007) concluded that there are clear indications of direct and indirect effects on leverage based on the firm-specific determinants used in this study. Furthermore, De Jong, Kabir and Nguyen (2007) found that the effect of these determinants on leverage varied by country, with some cases exhibiting large discrepancies between the results and theoretical predictions. When the authors shifted the focus to country-specific factors that had a direct impact on leverage they found that creditor's rights protection, bond market development and GDP growth rate had significant effects on the country mean leverage ratio. Therein implying that firms in countries with a better legal environment and a stable, healthier economic environment are likely to not only take on more debt but the firm-specific determinants are also reinforced (De Jong, Kabir and Nguyen, 2007).

Frank & Goyal (2009) conducted a study on US publicly traded firms from 1950 to 2003 to analyse which factors exhibited the most influence on capital structure. The capital structure determinants used in this study were median industry mean, market-to-book, tangibility, profit, log of assets and expected inflation. Frank & Goyal (2009) found six factors that could succinctly sum up the data. They found that firms that operate in industries where the mean leverage is high, firms that have a substantial number of fixed assets and larger firms tend to have higher debt ratios. When firms expect inflation to be high they tend to increase leverage to ensure that they can create inflation plus returns. Furthermore, firms with high market-to-book and that operate on high profit margins tend to have less leverage. Frank & Goyal (2009) also found that firms that pay a dividend tend to have lower leverage ratios than firms that did not. Determinants such as market-to-book asset ratio, firm size and expected inflation is viewed as forward looking leverage indicators whilst industry mean, tangibility and profitability are backward-looking leverage indicators (Frank & Goyal, 2009).

Psillakii and Daskalakis (2009) analysed the determinants of capital structure of SME's in Greece, France, Italy and Portugal from 1998 to 2002. They compared country specific characteristics, asset structure, firm size, profitability, risk and growth to leverage. The study by Psillakii and Daskalakis (2009) yielded conclusions contrary to that of their peers. They found that firm size does have a positive relationship with regards to the leverage ratio where Rajan and Zingales (1995) & Titman & Wessels (1988) had found that it did not. Psillakii and Daskalakis (2009) also found that asset structure, profitability and risk were negatively correlated to leverage. Furthermore, they found that growth did not yield any statistical significance. Psillakii and Daskalakis (2009) concluded that there were similarities in the determinants of capital structure between these four countries and that these similarities could be attributed to very similar economies and legal structures. Furthermore, it was apparent that firm characteristics provided a superior explanation for the differences in capital structure than country specific characteristics.

Graham, Leary and Roberts (2015) found that firm size had a limited impact on their respective leverage ratio but changes in government borrowing, macro-economic uncertainty and financial sector development had a material impact on the amount of leverage used.

Oztekin (2015) conducted a study spanning 37 countries and 15 177 firms from 1991 to 2006 to ascertain which characteristics explain the choice of leverage across the world. The author subsequently tried to establish which determinants of leverage were the most reliable in this explanation of the capital structure choice and found firm size, tangibility, industry mean leverage, profits and inflation to be the most prominent determinants of leverage across the world.

Evgeny (2017) analysed the capital structure of listed firms in Russia from 2009 to 2015. The sample included 48 publicly traded firms but excluded financial firms due to the industry specific regulation. The Russian economy is exposed to rather unusual economic conditions

making this study rather interesting. Russia is subject to large and frequent economic swings due to changes in commodity prices and political and economic sanctions. This study is unique from its peers due to the author incorporating determinants that are very rarely used in other studies. The determinants used were business risk, uniqueness of assets, macroeconomic conditions and industry groups. Evgeny (2017) made use of two statistical measures - random-effect and ordinary least squares (OLS) regression, to estimate and measure the industry impact on capital structure. Total debt to market value of capital (TLMV), total debt to book value of capital (TLBV), long-term debt to market value of capital (LLMV) and long-term debt to book value of capital (LLBV) were used as measures of leverage.

Evgeny (2017) used 13 capital structure determinants and measured them against the sample of firms over the period. These determinants are business risk, profitability, firm size, growth opportunities, capital expenditures (CAPX), tangibility, uniqueness, average tax rate, depreciation, industry mean leverage, stock market returns, average lending rate and inflation rate. The author found that total debt measures increased substantially over the period but long-term debt measures only increased marginally. The correlation between the uses of market value of capital versus book value of capital was rather moderate with values between 56 per cent and 65 per cent. “This means that market value and book value of capital are not highly correlated and fairly consistent in measuring leverage (Evgeny, 2017)”.

Business risk was positively correlated to all leverage measures with statistical significance, which does not conform to the principles of trade-off theory which asserts that firms will borrow less when business risk increases due to the higher expected cost of financial distress. Profitability was found to be negatively correlated to all leverage ratios which is in line with the assertion of pecking order theory. Growth opportunities were negatively correlated with low levels of significance. Tangibility of assets reflected mixed results compared to the leverage ratios and thus does not align to the agency theory which holds

that firms with more tangible assets can borrow more easily and have lower cost of financial distress. Uniqueness showed a positive correlation which does not correspond to the assertion of trade-off theory that more unique assets will result in higher cost of financial distress. Tax expense showed no statistical significance to any leverage measure whilst mean industry leverage and inflation rate reflected positive relationships. Evgeny (2017) concluded that firm size, growth opportunities and industry mean were found to be the most reliable and influential determinants in Russia.

2.3 Leverage and Corporate Performance

A field of capital structure research that has been thoroughly covered in the last few decades has been the effect of capital structure decisions on corporate performance. This section will look at studies that divert slightly from the core focus of this paper but do however provide concrete evidence on why capital structure decision making has been such an important field of study.

Krishnan & Moyer (1997) conducted a study on capital structure and performance of Asian corporations. The study included firms from Hong Kong, Malaysia, Singapore and Korea. In all countries, there was evidence that corporate structure does have an impact on performance.

Majumdar & Chhibber' (1999) study on firms in India and their capital structure and performance found a negative relationship between the level of debt in the capital structure and corporate performance, wherein an increase in debt decreased the performance of the firms. This finding by Majumdar & Chhibber' (1999) does not follow the conventional western economic research which finds an increase in leverage resulted in superior performance. The authors concluded that this is due to financial/ lending institutions in India being

government owned. Due to financial institutions being government owned there is a lack of pressure exerted on the managers of borrowing firms to increase performance to access debt capital.

Minton & Wruck (2001) conducted a study on low leverage firms and the reason for and theory behind their divergence from the use of debt. Their study was conducted over 25 years from 1974 to 1998 and covered 5 613 firms. Minton & Wruck (2001) yielded five main outcomes. Firstly, they concluded that firms that appeared to be underleveraged migrated towards a pecking order style financial policy, where internal funds are primarily used for financing of projects. These firms tended to have larger cash on hand than the average firm thus making it easier for them to fund projects out of retained earnings. Secondly, they found that 50% of these firms increased their leverage ratio substantially after five years and over 90% of these firms never returned to a conservative capital structure, thus making the conservative financial policy merely temporary. Thirdly, in conjunction with the temporary nature of these firms, as soon as the firms ran out of internal funds and required an outlay and costs increase, they tend to increase their long-term leverage ratio. Furthermore, Minton & Wruck (2001) found that these firms tend to have high market-to-book ratios and thus tended to apply their core business operations in industries that are subject to financial distress. Lastly, Minton & Wruck (2001) found that these firms do not consider the tax benefit of debt as a primary decision-making tool when constructing their financial policy.

Zeitun & Tian' (2007) study on capital structure and corporate performance focused on Jordan (Arab kingdom of Western Asia) concluded that capital structure does have a significant impact on corporate performance.

San & Heng (2009) performed a study testing for any relationship between corporate structure decisions and financial performance before and after the 2007 crisis. The study focused on the 49 construction companies listed on the Malaysian stock exchange, which they further categorised into large, medium and small based on market capitalisation. The

results, akin to those of Zeitun & Tian (2007) confirmed the existence of a relationship between corporate structure and financial performance. However, the impact on performance was found to be different between the three market capitalisation categories. In the large category of corporations only return on capital and earnings per share had a significant relationship. Medium size companies had a significant relationship in operating margin only and only EPS was found to have had a significant relationship in small cap firms.

Fosu (2013) conducted a study on 257 South African firms from 1998 to 2009 to determine the effect of capital structure on corporate performance as well as the influence of product market competition on the leverage-performance relationship. A large portion of South Africa's listings on the JSE are controlled by groups with a pyramid ownership structure, thus it is hypothesised that South Africa's agency cost will be much lower than that of the US and UK. In this sense, conflict will largely be between minority and majority shareholders rather than between managers and shareholders or creditors. Furthermore, South Africa exhibits a very high degree of concentration in market share thus reducing competition. Performance was measured by EBITDA divided by Total Assets and leverage was measured by Total Debt divided by total assets. The Herfindahl-Hirschman Index (HHI) which measures competition and the Boone Indicator (BI) which estimates the extent to which firms suffer lost earnings as result of being inefficient were used to model industry competition.

Fosu's (2013) model reflected a positive relationship between financial leverage and corporate performance. "These results suggest that financial leverage mitigates the agency costs of outside equity as noted in Jensen and Meckling (1976), particularly given the conservative use of debt among South African firms (Focus, 2013)". HHI yielded statistically significant results and were negatively correlated whilst the BI yielded statistically significant results and were positively correlated.

Thus, Fosu (2013) concluded that firms in industries with a high concentration suffer adverse effects of an increase in leverage whilst firms in industries with low concentration will subsequently benefit from an increase in leverage.

2.4 Trend of leverage in the United States

In 2009 the United States went through one of the worst financial crises since the Great Depression of 1929. This however was not isolated to the United States but spilled over into a global financial crisis with numerous institutions requiring bailouts from Government.

After the great depression of 1929 the United States government implemented strict financial regulations that worked successfully through to the 1960's. After the 1980's a rapid deregulation of financial structures combined with financial innovation stimulated powerful booms that all ultimately ended in crisis. The aftermath of these booms was trademarked by bailouts from government that allowed new expansion to begin and in turn ended in financial crises, and so the cycle continued (Crotty, 2009).

This deregulation or light form of government regulation has been referred to as New Financial Architecture (NFA) which is characterised by the integration of modern day capital markets and light government regulation of commercial and investment banks (Crotty, 2009).

The NFA system is structured in such a way that key personnel in financial institutions are incentivised to take excessive risk when financial markets are bullish. "Top investment bank traders and executives receive giant bonuses in years in which risk taking generates high revenue and profits. Profits and bonuses are maximised during a boom by maximising leverage, which in turn maximises risk (Crotty, 2009)". Most employees are not required to

repay the bonus earned during boom periods when the inevitable crash occurs, even if they are aware that their actions are likely to cause a financial crisis (Crotty, 2009).

One individual that profited highly from the 1980's financial deregulation was a man named Michael Milken (who worked for a firm called Drexel Burnham). Benjamin Stein states, "If any American had a good idea they could bring it to Milken, get it funded, and try his hand at capitalism". This funding was provided in the form of "junk bonds" which were characterised by high interest payments and very low credit ratings. This was perceived as good for the United States as it would enhance production efficiency, accelerate technological progress and increase competitiveness in world markets. This large issuance of "junk bonds" was well received by Michael Jensen, a well-known Harvard professor, who was of the view that it would make corporations more responsive to international competition. This led to a substantial number of firms, who otherwise would have been denied access to credit, bulking up their balance sheet with large amounts of high yielding debt (Adams, 1993).

By the end of 1990 one-fifth of all retailing industry debt, a quarter of all airline debt and half of all casino operations debt were in default, with corporate bankruptcies increasing 538% from 1986 to 1990. The impact of this increase in bankruptcies was felt by most players in the economic system including workers, retirees, bond holders, investors and taxpayers.

Graham, Leary and Roberts (2014) conducted a study on United States listed corporates over the last century to determine how their capital structure had changed over this period. The study included all firms listed on the NYSE, Amex and NASDAQ. Multiple measures of leverage were used in this study including interest bearing debt to capital, total debt to book value of equity and total liabilities to assets.

Modelling unregulated firms, it was found that firms had a relatively low and stable leverage ratio from 1920 through 1945 averaging between 11% and 17%. From 1946 through 1970 leverage increased considerably to 35%. Levels of leverage then fluctuated between 1970

through 2010 reaching a high of 45% in 1990, subsequently supporting the studies by Adams (1993) regarding the high issuance of junk bonds during this period, and stabilising around 35% from the 2000's onwards. Debt to market value of equity was found to follow the same trend but saw periods of increased fluctuation due to equity market valuations. The increase in leverage from 1920 through 1960 was largely due to increases in long term debt, whilst short term debt played a more significant role in the increase in leverage from 1960 onwards. "This coincides with the growth in commercial paper issuance by nonfinancial firms in the wake of the 1966 credit crunch (Graham, Leary and Roberts, 2014)".

Total liabilities to total assets as a measure of leverage exhibited significant increases over the period - this measure was modelled to give an indication of the change in balance sheet items over the period. Total liabilities represented approximately 20% to 25% of assets in the 1920's and 1930's but had increased to over 65% by 1990.

2.5 United States and South African Interest Rate Environment

The United States federal open market committee sets the Federal Funds Rate which is the main instrument for the implementation of monetary policy. Banks borrow money for short periods (typically overnight) to fund transitory cash shortfall. The rate that these funds are borrowed at is called the fed funds rate.

The United States Treasury regularly auctions short, intermediate and long-term debt instruments. The most common issues include 3-month and 6-month bills, 52-week bills, 2-year notes, 5-year notes, 7-year notes, 10-year notes and 30-year bonds (Econoday, 2016).

They are considered risk-free securities because the United States has never defaulted on its debt. Treasury securities are undoubtedly the most liquid of all fixed income securities.

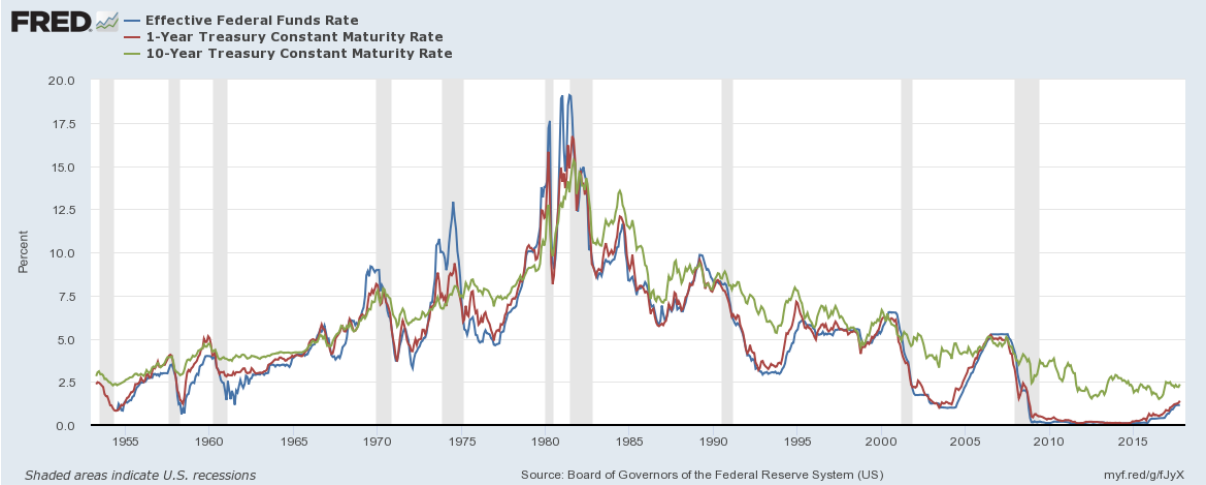
Corporate bonds vary by company. Some companies have higher credit ratings than others. Bonds are rated by firms such as Moody's, Standard & Poor and Citigroup. Bonds typically contain a rating of AAA to BBB- where AAA is seen as the most secure (lowest possibility of default) and BBB- the riskiest (highest probability of default) and junk bonds rated between BB+ to D (Econoday, 2016).

High investment grade bonds offer interest rates that are higher than Treasury securities but lower than bonds from companies with poor credit ratings. Bonds usually trade at risk spread against a vanilla treasury security. The spread is usually based on factors such as duration and risk.

Junk bonds are also known as high-yield bonds. These typically have a high probability of default and therefore investors are compensated for the higher risk with a higher yield (Econoday, 2016).

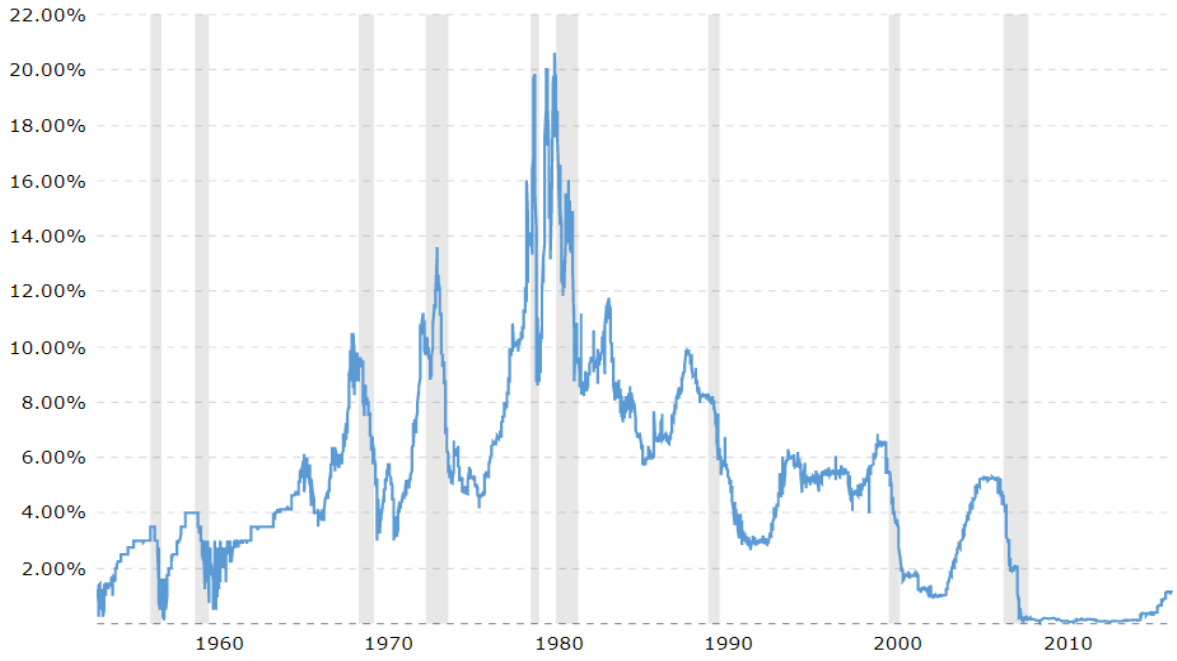
Figures 3 and 4 below illustrate the relationship between the feds fund rate and the one and ten-year government treasury rate from 1953 to 2017. The treasury rate is the rate at which corporates can raise capital in the bond market. The highlighted columns on the graph illustrate the financial crises that America was subject to over the period of illustration. The effective federal fund rate rose from 0.80% in 1954 to an all-time high of 19.04% in 1981 and is currently around 1%

Figure 3: Fed Funds Rate vs. United States Bond Rates



(Source: Fred, 2016)

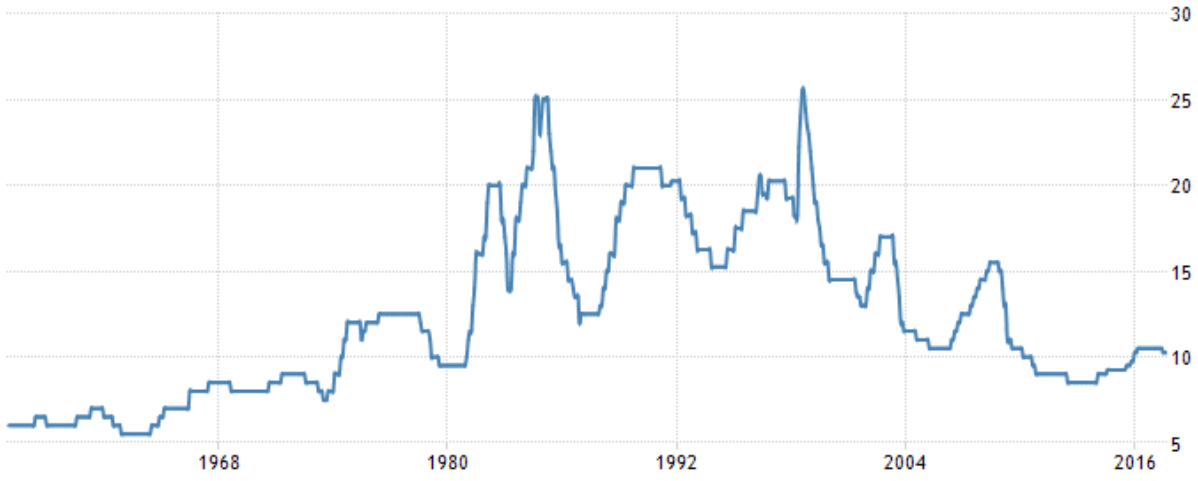
Figure 4: United States Federal Funds Rate



(Source: Macrotrends, 2016)

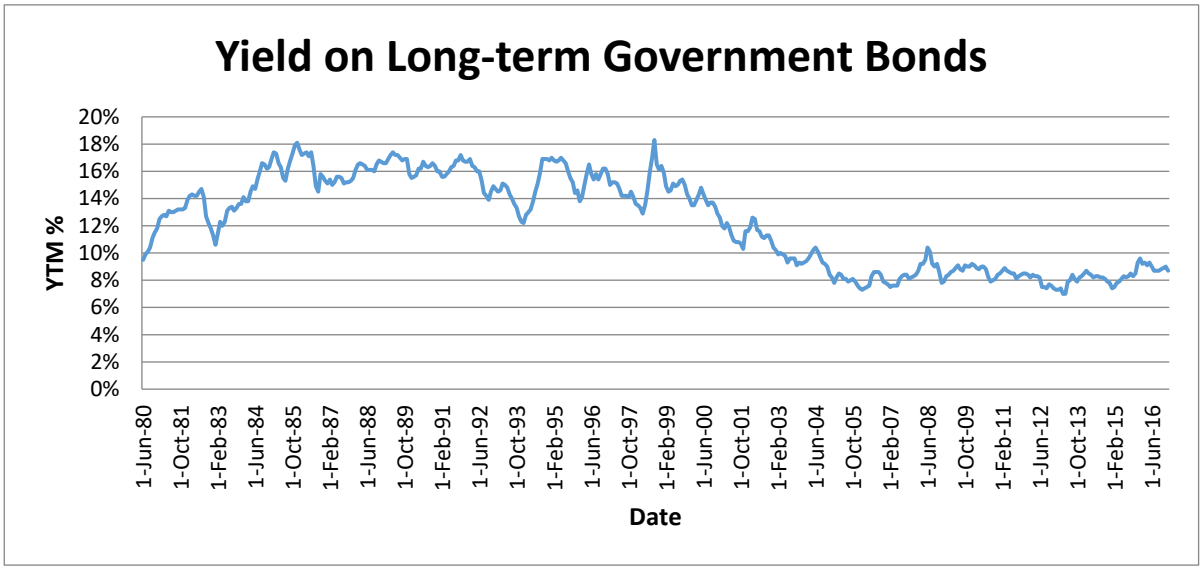
Figures 5 and 6 reflect the South African prime lending rate and bond market environment respectively. South Africa has followed much the same trend as the United States with a gradual increase in rates from 1950 to 1980 and a steady decline since 1998. It is thus hypothesised that firm leverage would have substantially increased since 1998 due to the decrease in the prime lending rate and the yield on the long bond. This decrease in the cost of debt would have increased the attractiveness of raising debt rather than equity capital for corporates.

Figure 5: South African Prime Lending Rate



(Source: Tradingeconomics, 2016)

Figure 6: Yield on Long-term Government Bonds from 1980 to 2016



(Source: Inet BFA 2017)

2.6 South-African Debt Market

Bonds are debt securities that are used by both the private and public sector to raise capital for government expenditures and investment requirements. These bonds effectively operate and are traded on a centralised exchange known as a bond exchange. The Bond Exchange of South Africa (BESA) serves this function in South Africa and is responsible for regulating and monitoring the debt and interest rate derivative market. Despite the exchange being characterised as an Emerging Market Exchange it is still by in large the largest on the continent (Lui, 2013).

The first corporate bond was issued in 1992, with the first government bond being issued two years later and the BESA receiving their licences in 1996. Currently there are approximately 1750 debt instruments listed on the BESA with a nominal outstanding value of roughly R2 trillion.

The South African economy relies heavily on its domestic bond market, which is unique as other African and Emerging Market economies depend on international borrowings. This is

due in part to the historical political situation in South Africa when aggressive sanctions were imposed on the country in the 1970's and 1980's, which denied accessibility to the international financial market (Mboweni, 2006).

The SARB established the Bond Market Association (BMA) in the mid 1980's and subsequently managed it as a self-regulating organisation. The BMA received its exchange licenses in 1996 and evolved into the BESA. Through the course of the next twelve years the BESA made substantial improvements to the bond market development in South Africa such as the inclusion of electronic trading, matching and settlement, and improved efficiency and transparency (Mboweni, 2006).

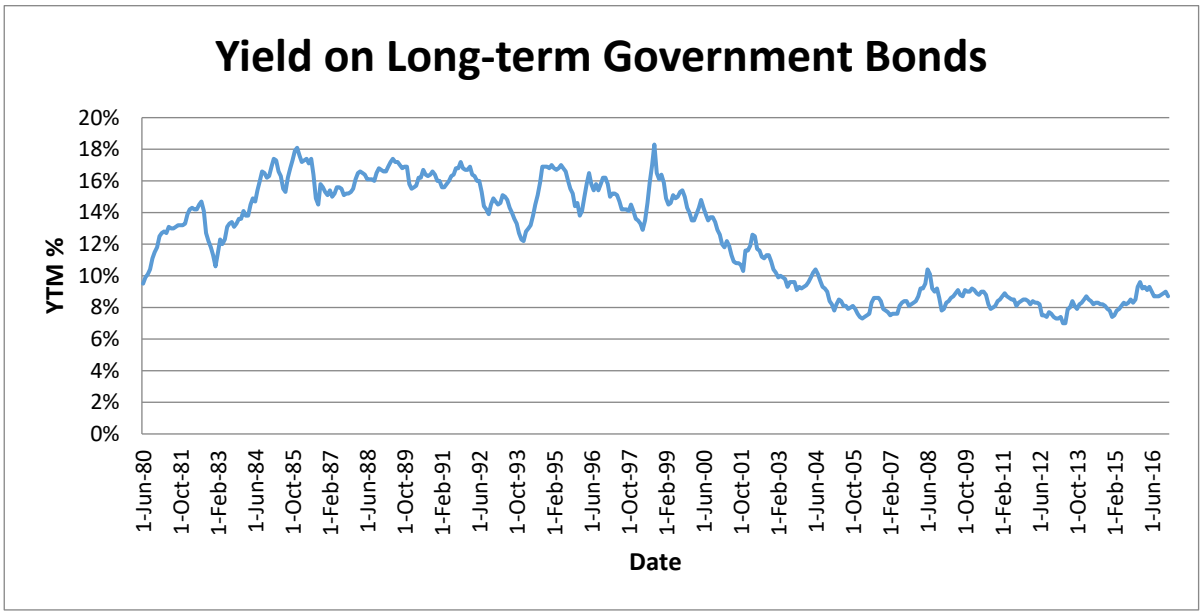
"The National Treasury continued to contribute to the development of the domestic bond market by introducing new types of bonds for which there was a demand in the market (Mboweni, 2006)", this included inflation linked bonds, floating rate notes, a STRIP programme and retail bonds subsequently making it easier for smaller companies to raise capital.

The growth in the bond market enticed the private sector into participating in bond issuance. In 1996 over 80% of bond issuances were attributed to government issuance. Government contribution has since declined to 66% by mid-2006 as a growing number of companies began to use debt instruments as a source of capital which has since resulted in some of the largest bond issuances in South Africa such as the MTN issuance in 2006 of R6.5bn, the Eskom R65 billion multi-term note issuance and Transnet's R18.1Bn debt issuance (Mboweni, 2006).

Figures 7 and 8 below illustrate the trend in the South African bond market over the last three decades. Figure 7 illustrates the decrease in the yield on long-term government bonds from a high of 18.3% in 1998 to an average yield of 8.3% from 2010 as raising capital through debt securities became more attractive for corporates. Figure 8 illustrates the rapid growth in the South African debt market. In 1994 roughly R186 billion worth of bonds were in

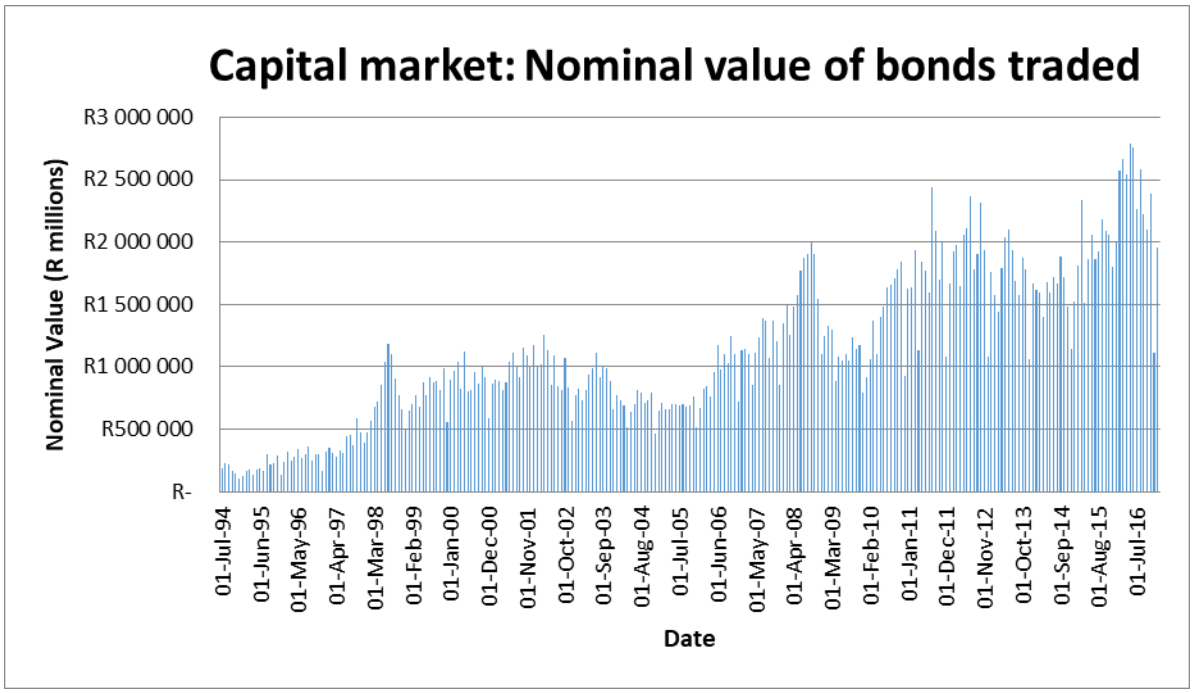
circulation versus the R2 trillion in issuance at the end of 2016, representing a growth in value of 975% over the last 22 years.

Figure 7: Yield on Long-term Government Bonds from 1980 to 2016



(Source: Inet BFA 2017)

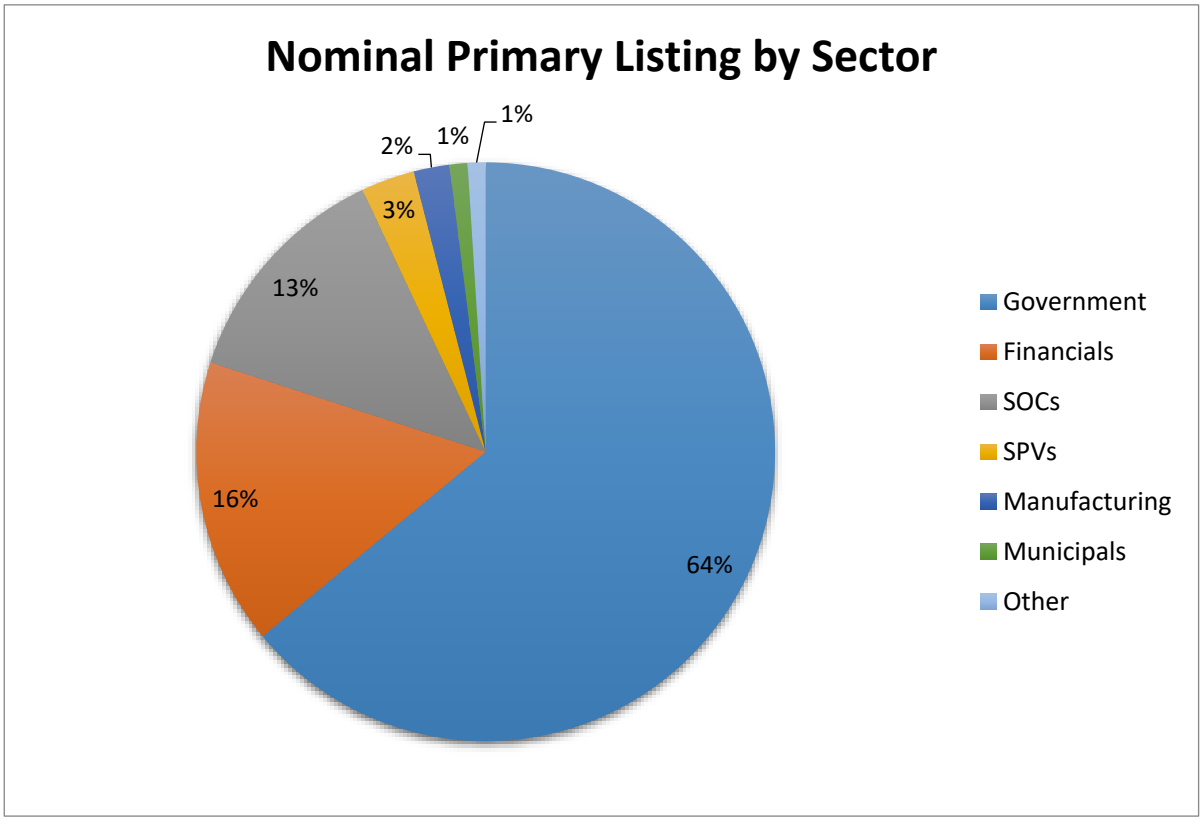
Figure 8: Nominal Value of Bonds Traded in South Africa from 1994 to 2016



(Source: IRESS 2017)

Figure 9 below illustrates the breakdown by sector of South Africa's total bond market. Much of the market still consists of government debt followed by financials and state-owned enterprises. Government debt has increased substantially over the last few years due to a widening of the budget deficit. Financials have also added a substantial amount of debt over the last year to satisfy certain BASEL III requirements (National Treasury 2016).

Figure 9: Composition of primary listings of debt securities on the JSE by instrument as at 31 March 2016



(Source: Debt Management Report 2015/16)

2.7 Relevant Leverage Ratio's

This section will explore the different calculations of the leverage ratio that the authors used in their various studies. As noted by Harris & Raviv (1991) and Frank & Goyal (2009) there is a multitude of ways in which leverage can be calculated, which makes for challenging exercise when comparing and interpreting the research. Some authors made use of net debt (long plus short-term interest-bearing debt) whilst others used total liabilities (which included accounts payable, tax payable, deferred taxes, cash and other non-interest-bearing liabilities). "Some studies measured leverage as a ratio of book value of debt to book value

of equity, others as book value of debt to market value of equity, still others as debt to market value of equity plus book value of debt (Harris & Raviv, 1991)".

Toy et al., (1974) defined the corporate debt ratio as a firm's total debt divided by its total assets. Included in total debt (other than the obvious balance sheet items such as long and short-term interest bearing debt) were accounts payable, accruals and other short term debt. Similar calculations of the debt ratio were used by Hovakimian, Opler and Titman (2001) and Song (2005) in their studies. The formula used by these authors can be seen below.

$$\text{Debt to Assets} = \frac{Total\ Debt}{Total\ Assets}$$

In their study of analysing the leverage ratio of US firms from 1962-1981 Harris and Raviv (1991) combined long term and short-term debt and divided this total by the total assets as a measure of leverage. The same ratio was used by Oztekin (2015) in his international study involving 15 177 firms from 37 different countries.

Rajan and Zingales (1995) viewed the broad ratio of total debt to total assets, as used by Toy et al., (1974) and Hovakimian, Opler and Titman (2001), as a bad indicator for leverage due to this ratio including non-financing items such as accounts payable, which is more for transaction purposes. Thus, the leverage ratio could be overstated when including these items. Given the above, the authors felt that a more appropriate ratio would be net debt (both long term and short-term interest bearing) to total assets, excluding accounts payable and receivable that are generally influenced by industry movements. The formula can be seen below.

$$\text{Net Debt to Assets} = \frac{Net\ Debt\ (ST{+}LT\ Interst\ bearing\ debt)}{Total\ Assets}$$

Titman & Wessels (1988) and De Jong, Kabir and Nguyen (2007) used a ratio of long term debt over market value of total assets where total assets was calculated as the book value of total assets minus book value of equity plus market value of equity. They argued that short term debt is influenced by different determinants, and the examination of total debt would yield unreliable results (De Jong, Kabir and Nguyen, 2007). The formula used by Titman & Wessels (1988) and De Jong, Kabir and Nguyen (2007) can be seen below.

$$\text{Long Term Debt to Total Assets} = \frac{Long\ Term\ Debt}{MV\ of\ Total\ Assets}$$

Welch (2004) defined the actual corporate ratio as the book value of debt divided by the book value of debt plus the market value of equity. Welch argued for the appropriateness of using market based inputs as this is closely aligned to the inputs when calculating a firms WACC.

Welch (2004) elaborates on this with the use of an interest coverage ratio (see below), which expresses interest on debt as a multiple of earnings before interest and tax (EBIT). The author found that firms with poor interest cover tend to reduce their leverage in the following years.

$$\text{Interest Cover Ratio} = \frac{Earnings\ Before\ Interest\ and\ Tax\ (EBIT)}{Interest\ Expense}$$

Frank & Goyal (2009) reiterate that there are various measures and definitions of leverage in the literature and an author's calculation of debt ratios differs whether market or book values are used and whether only long-term debt or total debt is used as the numerator. In their study, Frank & Goyal (2009) used four methods of calculating leverage which included total debt to market value of assets, total debt to book value of assets, long term debt to market value of assets and long-term debt to book value of assets.

Table 2: Summary of Leverage Measures used in Literature

Authors	Leverage Ratio used
Toy et al., (1974)	Total Debt over Total Assets (at Book Value)
Titman & Wessels (1988)	Short Term Debt over BV of Equity Short Term Debt over MV of Equity Long Term Debt BV of Equity Long Term Debt MV of Equity Convertible Debt BV of Equity Convertible Debt MV of Equity
Van der Wijst and Thurik (1993)	Long Term Debt over BV of Equity Short Term Debt over BV of Equity Total Debt over BV of Equity
Rajan and Zingales (1995)	Non-equity Liabilities over Total Assets Debt over Total Assets Debt over Net Assets Debt over Capital

	Interest Coverage Ratio
	All the above ratios were calculated using BV and MV for equity
Pandey (2001)	Short Term Debt over Capital
	Long Term Debt over Capital
	Total Debt over Capital
	All the above ratios were calculated using BV and MV for equity
Haung and Song (2006)	Long Term Debt over Capital
	Total Debt over Capital
	Total Liabilities over Capital
De Jong, Kabir and Nguyen (2007)	Long Term Debt over MV of Total Assets
Frank & Goyal (2009)	Total Debt over MV of Assets
	Total Debt over BV of Assets
	Long Term Debt over MV of Assets
	Long Term Debt over BV of Assets
Psillaki and Daskalakis (2009)	Total Liabilities over Total Assets
Graham, Leary and Roberts (2015)	Total Debt over Capital
Oztekin (2015)	Total Debt over MV of Total Assets
Evgeny (2017)	Total Debt over MV of Capital
	Total Debt over BV of Capital
	Long Term Debt over MV of Capital
	Short Term Debt over BV of Capital

3. Data Sources

Ratios were computed using yearly financial statements data extracted from IRESS for a sample consisting of 68 firms (which can be seen in Appendix 1), from 1994 until 2016 – or since the initial public offering (IPO). Firms with limited data or that have been suspended were removed from the sample. The sample consists of the JSE Top 40 largest listed companies measured by market capitalisation, excluding financial and property shares (which are covered in a different study), general retailers and food producers. The data was split into four subsamples and regression and data analysis was done on each sample. These four subsamples were as follows; total sample (consisting of all 68 selected firms), retail firms (consisting of 27 selected firms), food producers (consisting of 14 selected firms) and large capitalisation companies (consisting of 20 selected firms).

The South-African prime interest rate, extracted from IRESS was used to measure the cost of raising capital. Data analysis was done using Statistica and IBM SPSS software packages.

4. Method

With increasing research in the field of capital structure theory and determinants, different opinions and methods of calculating leverage arise, each with its own pro's and con's. Therefore, appropriate comparisons between different studies becomes rather challenging and this study will utilise the most widely used ratio and determinants to enable an easily comparable set of results to that of past research. This study is quantitative in nature, whilst making use of different determinants of capital structure to ascertain how these determinants influence the use of debt and equity capital.

Studies with the objective of analysing the agency problem tend to use debt to firm value as the dependent variable. Interest coverage is most suitable when conducting studies on leverage and firms in distress (Pandy, 2001). Harris and Raviv (1991) noted the increasing challenge in interpreting capital structure research when this research differs in the calculation methods of some of these determinants. An illustration of this is the measuring of growth opportunities, which is measured by market value of the firm to the book value of assets. While large firms should have a large value in respect of this ratio, other potentially small firms whose asset base has appreciated significantly since purchase would also have a large ratio, thus creating difficulties when trying to interpret statistical results. (Harris & Raviv, 1991).

Four alternative leverage ratios will be used as the dependent variable in this study. These will include total debt over book value of equity, total debt over market value of equity, total liabilities over book value of equity and lastly total liabilities over market value of equity. This corresponds with the studies by Titman & Wessels (1988), Rajan and Zingales (1995), De Jong, Kabir and Nguyen (2007) and Graham, Leary and Roberts (2015). The four alternative leverage ratios can be seen below. Total debt will consist of only interest-bearing liabilities and thus only include items that could potentially increase the bankruptcy risk of a firm. Total liabilities of equity will include accounts payable, deferred taxes, dividends payable, tax payable and other long and short-term liabilities. Both the above ratios will be divided by book value of equity and market value of equity.

Table 3 presents the leverage measures used in this study and the methods used in calculation.

Table 3: Leverage measures

Proxy	Variable	Calculation
TDBV	Total Debt to Book Value of Equity	Long-Term Interest-Bearing Debt + Short-Term Interest-Bearing Debt / Total Book Value of Equity
TDMV	Total Debt to Market Value of Equity	Long-Term Interest-Bearing Debt + Short-Term Interest-Bearing Debt / Total Market Value of Equity
TLBV	Total Liabilities to Book Value of Equity	Total Liabilities / Total Book Value of Equity
TLMV	Total Liabilities to Market Value of Equity	Total Liabilities / Total Market Value of Equity

The determinants used in this study include firm size (calculated as the natural logarithm of sales), tangibility of assets (calculated as fixed assets over total assets), profitability (calculated as EBIT over total assets), growth (calculated as the natural Logarithm of total assets) and cost of raising debt (with the prime interest rate used as a benchmark).

Table 4 presented below shows the capital structure determinants used in this study and the method used to calculate these determinants.

Table 4: Capital Structure Determinants Measures

Determinants	Proxy	Calculation
Firm Size	SIZE	Natural logarithm of Turnover
Tangibility of Assets	TANG	Fixed Assets (Property, plant & Equipment) / Total Assets
Profitability	PROF	Earnings Before Interest and Tax (EBIT) / Total Assets
Growth	GROW	Natural logarithm of Total Assets
Cost of Debt	CORD	Prime Rate in South Africa
SA Corporate Tax Rate	TAX	SA Corporate Tax Rate

a) Growth

Growth is calculated as the natural logarithm of total assets. Alternative growth calculations have been used in the literature. Titman & Wessels (1988) calculated growth using CAPX to Assets and R&D to Assets, but due to the limitation in data the natural logarithm of total assets will be used, corresponding with the study conducted by Toy et al., (1974) & Pandy (2001). The theory as to why growth in assets influences leverage is due to firms that find themselves in a high growth phase find it necessary to increase their assets base to keep up with the demand (Pandy, 2001). This growth in assets base needs to be funded in some way and thus we expect a positive relationship between growth and leverage. However, Titman and Wessels (1988) found no significant relationship between growth and leverage whilst Frank and Goyal (2009) found that the capital structure theories on growth tend to be uncorrelated.

Trade-off theory predicts that growth will decrease the use of debt base due to growing firms placing a greater value on stakeholder co-investment, whilst pecking order theory

anticipates an increase in debt with an increase in growth opportunities (Frank & Goyal, 2009).

b) Profitability

Profitability will be calculated as EBIT divided by Total Assets. Based on the 1963 paper by M&M, profitable firms tend to use more debt to get the full advantage of the interest tax shield and these firms also face lower risk in terms of bankruptcy (Frank & Goyal, 2009). From an agency theory perspective, debt, in terms of the discipline it forces onto managers, is more valuable as managers tend to waste this extra resource on projects and investment that do not meet the minimum required rate of return (Frank & Goyal, 2009). “For firms with high free cash flow or high profitability can use debt to restrain management discretion (Haung & Song, 2006)”. However, Pecking order theory asserts that the increase in profitability should decrease leverage as firms tend to first use internally generated funds before sourcing finance externally (Frank & Goyal, 2009).

c) Firm Size

Firm size is calculated as the natural logarithm of sales/revenue in this study. Larger firms tend to have diversified income streams, therein decreasing their risk and larger, older firms also tend to incur a lower direct cost of issuing debt or equity (Frank & Goyal, 2009). The author also found that under the agency theory, larger firms should have higher levels of debt. Pecking order theory also suggests that larger firms will tend to have higher debt ratios based on having more experience and information and a better opportunity to retain earnings (Frank & Goyal, 2009). Marsh (1982) found that larger firms tend to choose long-term debt whilst smaller firms tend to use short-term debt. “Larger firms may be able to take

advantage of economies of scale in issuing long-term debt, and may even have bargaining power over creditors (Haung & Song, 2006)".

d) Tangibility

Tangibility – the nature of assets is calculated as fixed assets divided by total assets. Tangibility is aligned toward the trade-off theory, which states that tangible assets act as collateral and provide security to lenders in the event of financial distress (Jense & Mekling, 1976 & Pandy, 2001). It is thus expected that firms with higher tangible assets should have higher levels of debt. Frank & Goyal (2009) alluded to the fact that tangible assets are easier to value than intangibles, thus lowering the expected financial distress costs. The pecking order theory however makes the opposite predication. "Low information asymmetry associated with tangible assets makes equity issuance less costly (Frank & Goyal, 2009)". Thus, based on the pecking order theory an increase in tangibility should be negatively correlated to debt ratios.

e) Cost of Debt

The South African prime interest rate is used as a benchmark to model the cost of debt. Ideally, the Johannesburg Interbank Agreed Rate (JIBAR) should be used, but due to a lack of historical data regarding this rate, the South African prime rate is used. Large corporate banks lend to institutions at the JIBAR rate plus some risk premium based on the institutions underlying risks. "Clients of retail banks are exposed to the prime interest rate when taking out an overdraft, car loan, and mortgage and there are debt structures in existence for institutions, which are linked a spread above or below prime" (West, 2008).

The hypothesis of using a lending rate, such as prime, as a determinant of leverage has not yet been published in the literature. South African prime rate has decreased from a high of

23% in 1998 to a low of 8.50% in 2013. The decrease in this cost of borrowing should increase the appetite for more debt as the bankruptcy risk would be drastically decreased, which could be closely linked to the trade-off theory of debt. The decrease in the cost of debt would move the optimal debt level upwards to gain the same tax benefit in the low-cost environment, thus, we are anticipating that this decrease in rate should have an inverse correlation on the debt levels of corporates in South Africa.

f) Corporate Tax Rate

The effect of corporate tax rate on aggregate leverage is measure by the South African corporate tax rate which was at a peak of 37.80% in 2001 to the current low of 28%. “Interest payments are deducted from corporate income tax and therefore enjoy a tax advantage. Firms with higher corporate tax rates have an incentive to increase leverage (Gropp & Ebril, 1997)”. Although all firms face the same statutory tax rate, effective corporate tax rate will differ from firm to firm based on certain accounting entries such as investment credits, accelerated depreciation or tax loss carry forwards (Gropp & Ebril, 1997).

It is thus hypothesised that an increase in corporate tax rate would increase aggregate leverage of firms as firms would put more emphasis on interest deduction to shield profits from tax. A decrease in corporate tax rate would subsequently allow corporate to reduce their debt levels as less profits are paid to tax collectors.

5. Results

This chapter focuses on the results obtained from the research into the leverage ratio and determinants of South Africa listed firms for the period of 1994 to 2016. A total sample of 68

JSE listed companies where sampled in this study comprising of large capitalisation stocks, retailers and food producers. Together these companies make up approximately 75% of the total market capitalisation of the JSE index. This section will look at the determinants of firm leverage as well has how leverage has change in the South African environment over time.

5.1 Total Sample

The total sample comprised of 68 companies listed on the Johannesburg stock exchange. Both debt to equity ratios increased significantly whilst total liabilities to equity ratios increase modestly over the period.

TDBV increase from an average of 19, 36% (average debt to BV of equity from 1994 to 1998) to 47, 65% (average debt to BV of equity from 2012 to 2016). That equates to an increase of 146, 13% over the period. TDMV of equity increase from an average of 13, 40% (average debt to MV of equity from 1994 to 1998) to 26, 26% (average debt to MV of equity from 2012 to 2016). That equates to an increase of 95% over the period.

TLBV equity increase from 94, 71% (average total liabilities to BV of equity from 1994 to 1998) to 127, 50% (average total liabilities to BV of equity from 2012 to 2016). That equates to an increase of 34.62%. TLMV equity increase from 68, 56% (average total liabilities to MV of equity from 1994 to 1998) to 71, 63% (average total liabilities to MV of equity from 2012 to 2016). That equates to an increase of 4.48%.

Figure 10, 11, 12, 13, and 14 below present a graphical representation of the different leverage ratios under the period of consideration. Table 5 below presents the different leverage rations broken down into yearly increment.

Figure 10: Leverage Ratios' of the Total Sample

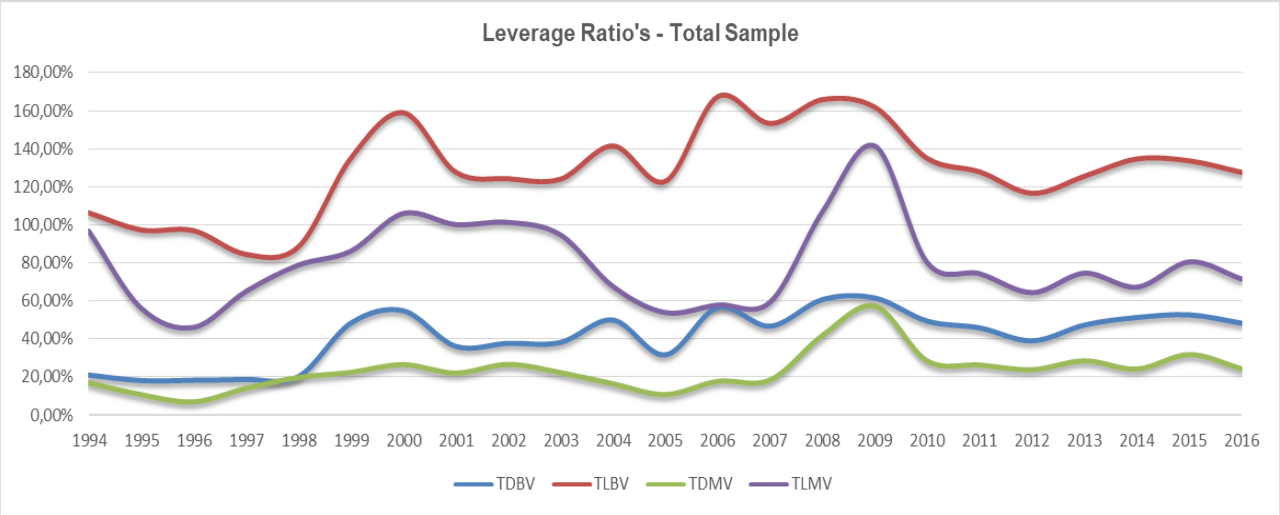


Figure 11: Total Debt to Book Value ratio of the Total Sample

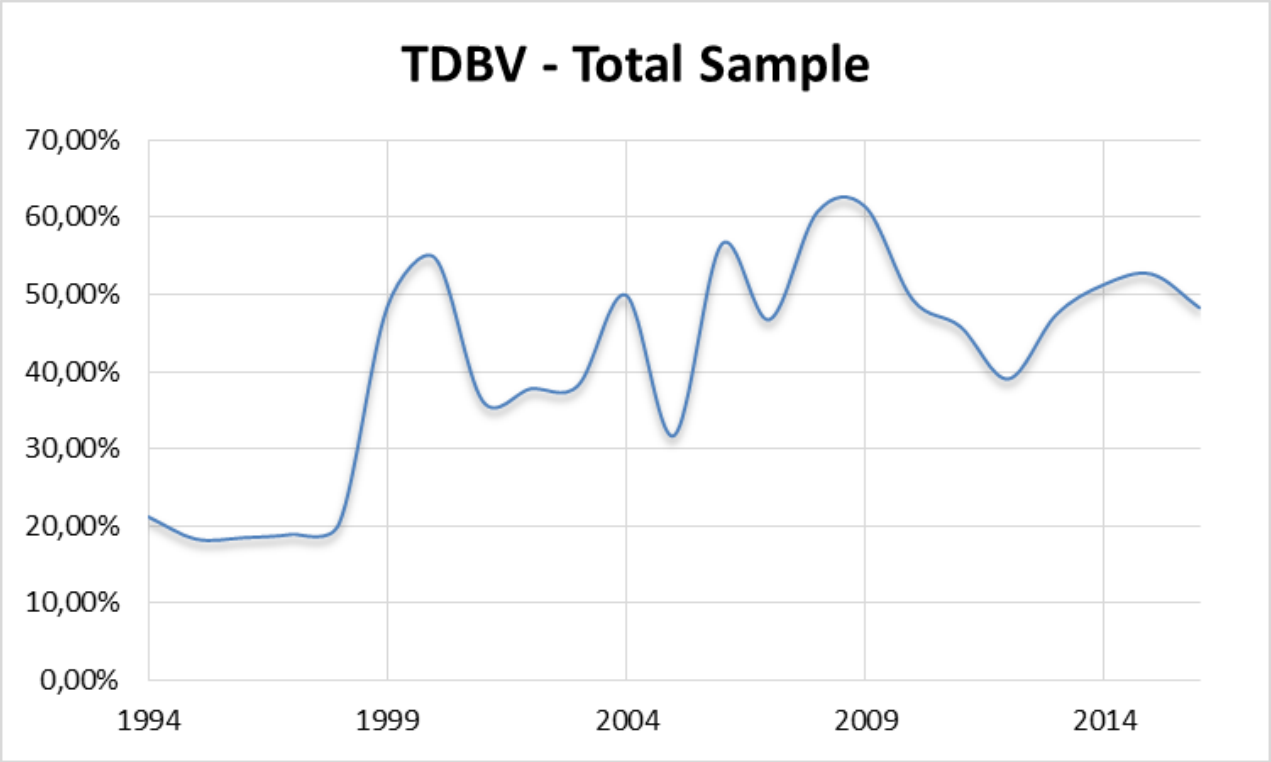


Figure 12: Total Liabilities to Book Value ratio of the Total Sample

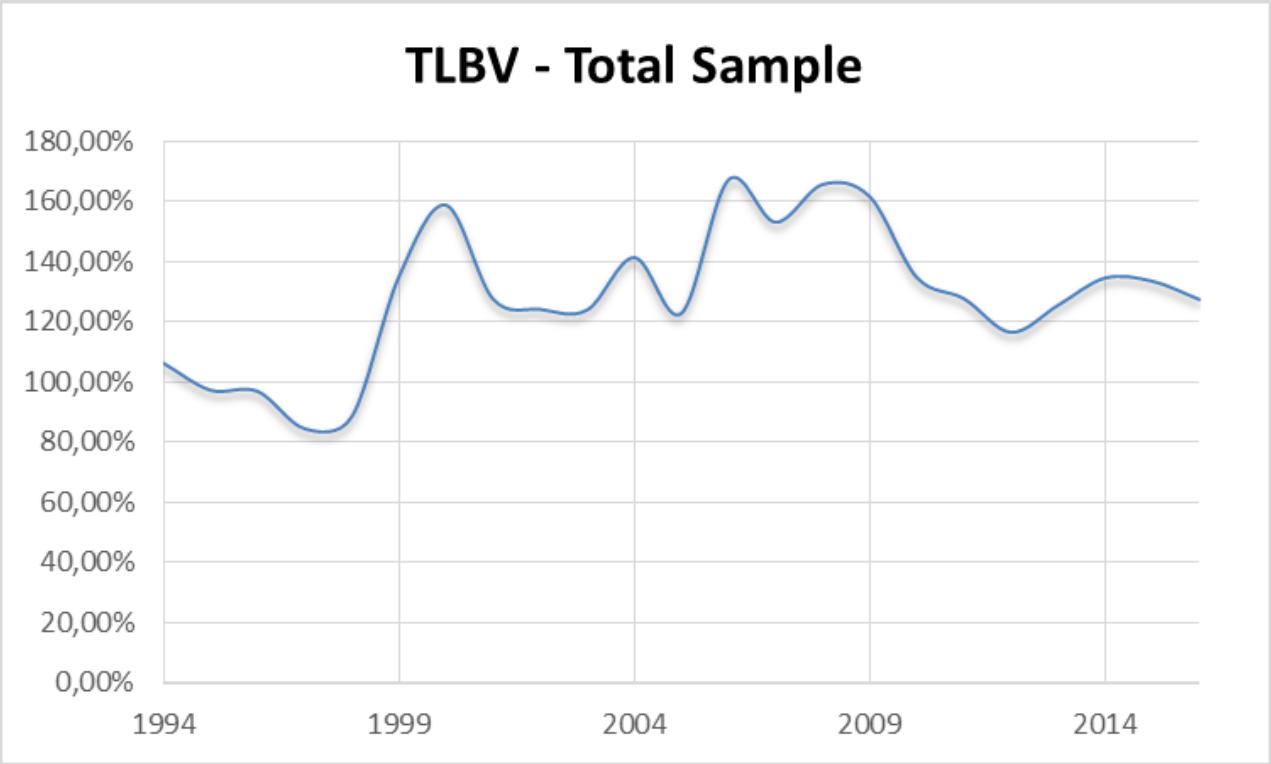


Figure 13: Total Debt to Market Value of the Total Sample

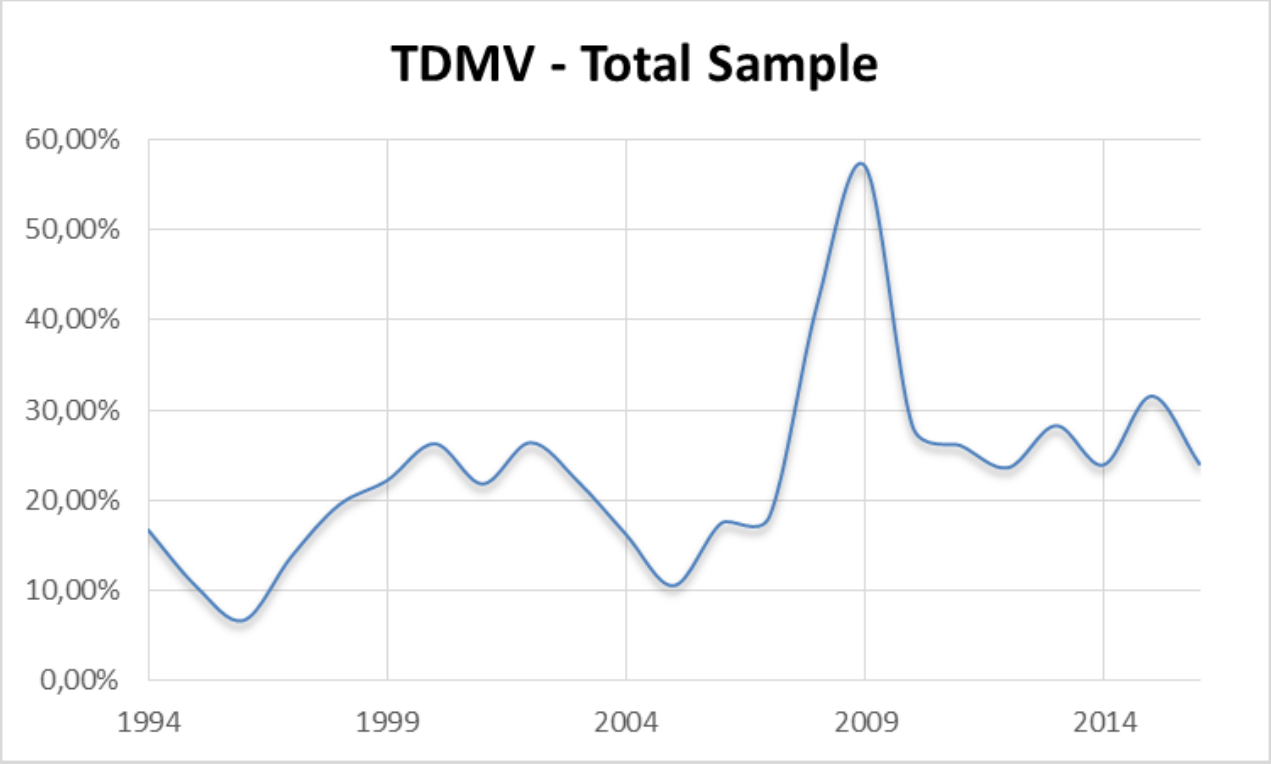


Figure 14: Total Liabilities of Market Value of the Total Sample

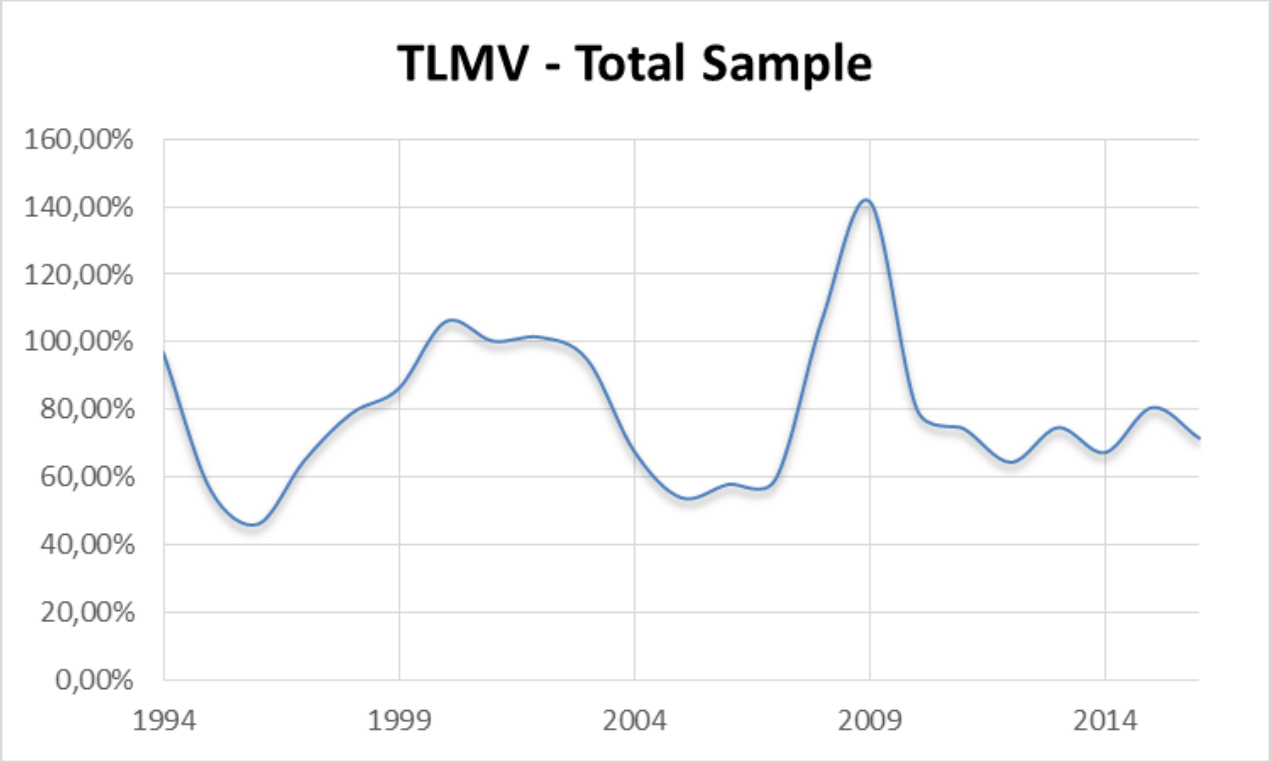


Table 5: Yearly Leverage for Total Sample

	TDBV	TLBV	TDMV	TLMV
1994	21,11%	106,30%	16,68%	96,75%
1995	18,22%	97,33%	10,44%	56,20%
1996	18,40%	96,94%	6,64%	46,05%
1997	18,83%	84,52%	13,74%	64,99%
1998	20,26%	88,48%	19,47%	78,82%
1999	48,23%	134,88%	22,17%	86,17%
2000	54,70%	158,74%	26,25%	105,94%
2001	36,11%	127,59%	21,78%	100,14%
2002	37,69%	124,15%	26,37%	101,30%
2003	38,14%	123,93%	22,04%	94,71%

2004	49,84%	141,34%	16,18%	67,58%
2005	31,62%	122,78%	10,49%	53,87%
2006	56,41%	167,15%	17,45%	57,85%
2007	46,66%	153,09%	18,14%	59,38%
2008	60,59%	165,61%	41,67%	107,02%
2009	61,35%	161,55%	57,09%	141,39%
2010	49,25%	134,74%	28,12%	80,02%
2011	45,75%	127,70%	26,05%	74,26%
2012	38,98%	116,52%	23,59%	64,34%
2013	47,28%	125,51%	28,26%	74,58%
2014	51,20%	134,54%	23,90%	67,22%
2015	52,57%	133,50%	31,54%	80,53%
2016	48,21%	127,42%	24,01%	71,46%
Average	41,36%	128,45%	23,13%	79,59%
Min	18,22%	84,52%	6,64%	46,05%
Max	61,35%	167,15%	57,09%	141,39%
Std Dev	13,95%	23,37%	10,65%	22,16%
Range	43,13%	82,63%	50,45%	95,33%

Table 6, 7 and 8 below summarises the descriptive statistics, regression analysis and the correlations between the four leverage ratios used as well as the capital structure determinants. The average leverage ratio ranges from 23% to 128% based on the measure of leverage used with a standard deviation of between 10% and 23%.

Firm size reflects a positively correlation to all four leverage ratios with TDBV, TLBV and TDMV reflecting significant correlations at the 0.01 level. Tangibility is negatively correlated to all four leverage ratios but none shows statistical significance. Profitability reflects a positive correlation to TDBV and TLBV but negative correlation against TDMV and TLMV. Growth is positively correlated to all four leverage ratios with TDBV and TDMV showings statistical significance to the 0.01 level and TLBV showing statistical significance at the 0.05 level. Cost of debt is negatively correlated to all four leverage ratios with TDBV and TLBV showing statistical significance. Corporate tax rate is negatively correlated to all four leverage ratios with TDBV, TLBV and TDMV showing statistical significance.

Table 6: Descriptive Statistics of Total Sample

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TDBV	23	18.22%	61.35%	41.36%	13.95%
TLBV	23	84.52%	167.15%	128.45%	23.37%
TDMV	23	6.64%	57.09%	23.13%	10.65%
TLMV	23	46.05%	141.39%	79.59%	22.16%
SIZE	23	13.87	16.86	15.55	0.98%
TANG	23	34.85%	42.44%	36.88%	1.78%
PROF	23	9.64%	18.61%	13.16%	2.76%
GROW	23	13.69	16.88	15.40	1.02%
CORD	23	8.50%	23.00%	13.36%	4.17%
TAX	23	28.00%	35.00%	29.96%	2.51%
Valid N	23				

Table 7: Regression Statistics of Total Sample

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.860[a]	.739	.642	8.35428%

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3167.469	6	527.911	7.564	.001[b]
	Residual	1116.703	16	69.794		
	Total	4284.172	22			

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-40.545	184.613		-.220	.829
	SIZE	94.898	43.215	6.671	2.196	.043
	TANG	.896	1.393	.115	.643	.529
	PROF	-1.745	1.078	-.345	-1.619	.125
	GROW	-85.928	39.461	-6.293	-2.178	.045
	CORD	-.228	.748	-.068	-.304	.765
	TAX	-2.589	1.798	-.466	-1.440	.169

a. Dependent Variable: TDBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787[a]	.619	.476	16.91244%

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7435.252	6	1239.209	4.332	.009[b]
	Residual	4576.488	16	286.030		
	Total	12011.740	22			

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	187.140	373.731		.501	.623
	SIZE	181.467	87.484	7.618	2.074	.055
	TANG	-.451	2.821	-.034	-.160	.875
	PROF	-1.771	2.182	-.209	-.812	.429
	GROW	-173.307	79.884	-7.580	-2.169	.045
	CORD	.234	1.515	.042	.154	.879
	TAX	-5.836	3.640	-.628	-1.603	.128

a. Dependent Variable: TLBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771[a]	.595	.443	7.94861%

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1483.815	6	247.303	3.914	.013[b]
	Residual	1010.887	16	63.180		
	Total	2494.702	22			

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.892	175.648		.244	.810
	SIZE	85.630	41.116	7.888	2.083	.054
	TANG	-.722	1.326	-.121	-.545	.593
	PROF	-2.859	1.026	-.741	-2.788	.013
	GROW	-79.226	37.544	-7.603	-2.110	.051
	CORD	.432	.712	.169	.606	.553
	TAX	-2.428	1.711	-.573	-1.420	.175

a. Dependent Variable: TDMV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661[a]	.437	.226	19.49885%

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4720.743	6	786.791	2.069	.115[b]
	Residual	6083.284	16	380.205		
	Total	10804.027	22			

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	913.692	430.886		2.120	.050
	SIZE	111.372	100.863	4.930	1.104	.286
	TANG	-4.153	3.252	-.334	-1.277	.220
	PROF	-6.535	2.516	-.814	-2.597	.019
	GROW	-130.112	92.101	-6.000	-1.413	.177
	CORD	-.673	1.747	-.127	-.385	.705
	TAX	-10.485	4.196	-1.189	-2.499	.024

a. Dependent Variable: TLMV

Table 8: Correlations between dependent variables and determinants of total sample

Correlations

		TDBV	TLBV	TDMV	TLMV	SIZE	TANG	PROF	GROW	CORD	TAX
TDBV	Pearson Correlation	1	.924**	.704**	.407	.750**	-.153	.199	.731**	-.659**	-.805**
	Sig. (2-tailed)		.000	.000	.054	.000	.485	.363	.000	.001	.000
	N	23	23	23	23	23	23	23	23	23	23
TLBV	Pearson Correlation	.924**	1	.585**	.403	.549**	-.241	.402	.511*	-.508*	-.653**
	Sig. (2-tailed)	.000		.003	.056	.007	.269	.057	.013	.013	.001
	N	23	23	23	23	23	23	23	23	23	23
TDMV	Pearson Correlation	.704**	.585**	1	.803**	.577**	-.190	-.107	.571**	-.394	-.601**
	Sig. (2-tailed)	.000	.003		.000	.004	.386	.626	.004	.063	.002
	N	23	23	23	23	23	23	23	23	23	23
TLMV	Pearson Correlation	.407	.403	.803**	1	.058	-.006	-.212	.052	-.074	-.239
	Sig. (2-tailed)	.054	.056	.000		.794	.978	.332	.812	.736	.271
	N	23	23	23	23	23	23	23	23	23	23
SIZE	Pearson Correlation	.750**	.549**	.577**	.058	1	-.370	.189	.997**	-.799**	-.875**
	Sig. (2-tailed)	.000	.007	.004	.794		.083	.387	.000	.000	.000
	N	23	23	23	23	23	23	23	23	23	23
TANG	Pearson Correlation	-.153	-.241	-.190	-.006	-.370	1	-.340	-.343	.327	.121
	Sig. (2-tailed)	.485	.269	.386	.978	.083		.112	.109	.128	.584
	N	23	23	23	23	23	23	23	23	23	23
PROF	Pearson Correlation	.199	.402	-.107	-.212	.189	-.340	1	.130	-.325	-.246
	Sig. (2-tailed)	.363	.057	.626	.332	.387	.112		.555	.131	.257
	N	23	23	23	23	23	23	23	23	23	23
GROW	Pearson Correlation	.731**	.511*	.571**	.052	.997**	-.343	.130	1	-.783**	-.865**
	Sig. (2-tailed)	.000	.013	.004	.812	.000	.109	.555		.000	.000
	N	23	23	23	23	23	23	23	23	23	23
CORD	Pearson Correlation	-.659**	-.508*	-.394	-.074	-.799**	.327	-.325	-.783**	1	.725**
	Sig. (2-tailed)	.001	.013	.063	.736	.000	.128	.131	.000		.000
	N	23	23	23	23	23	23	23	23	23	23
TAX	Pearson Correlation	-.805**	-.653**	-.601**	-.239	-.875**	.121	-.246	-.865**	.725**	1
	Sig. (2-tailed)	.000	.001	.002	.271	.000	.584	.257	.000	.000	
	N	23	23	23	23	23	23	23	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

5.2 Retail Firms

The retail analysis comprises of 27 firms listed on the Johannesburg stock exchange. Average TDBV increase from 19.70% to 43.58% whilst average TDMV increased from 9.45% to 15.77%. Average TLBV increased from 129.90% to 148.87% whilst average TLMV of debt decreased from 88.28% to 66.90%.

Figure 15, 16, 17, 18 and 19 below present a graphical representation of the different leverage ratios under the period of consideration. Table 9 below presents the different leverage rations broken down into yearly increment.

Figure 15: Leverage Ratios' of Retail Firms

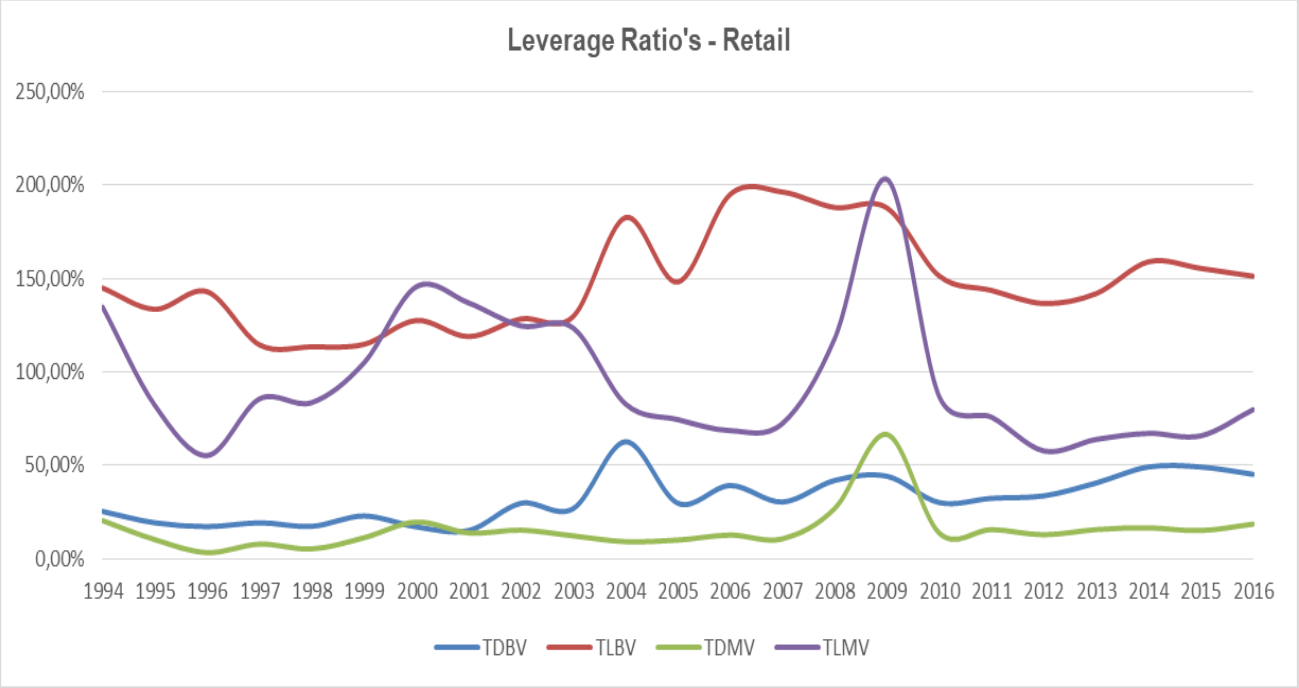


Figure 16: Total Debt to Book Value ratio of Retail Firms

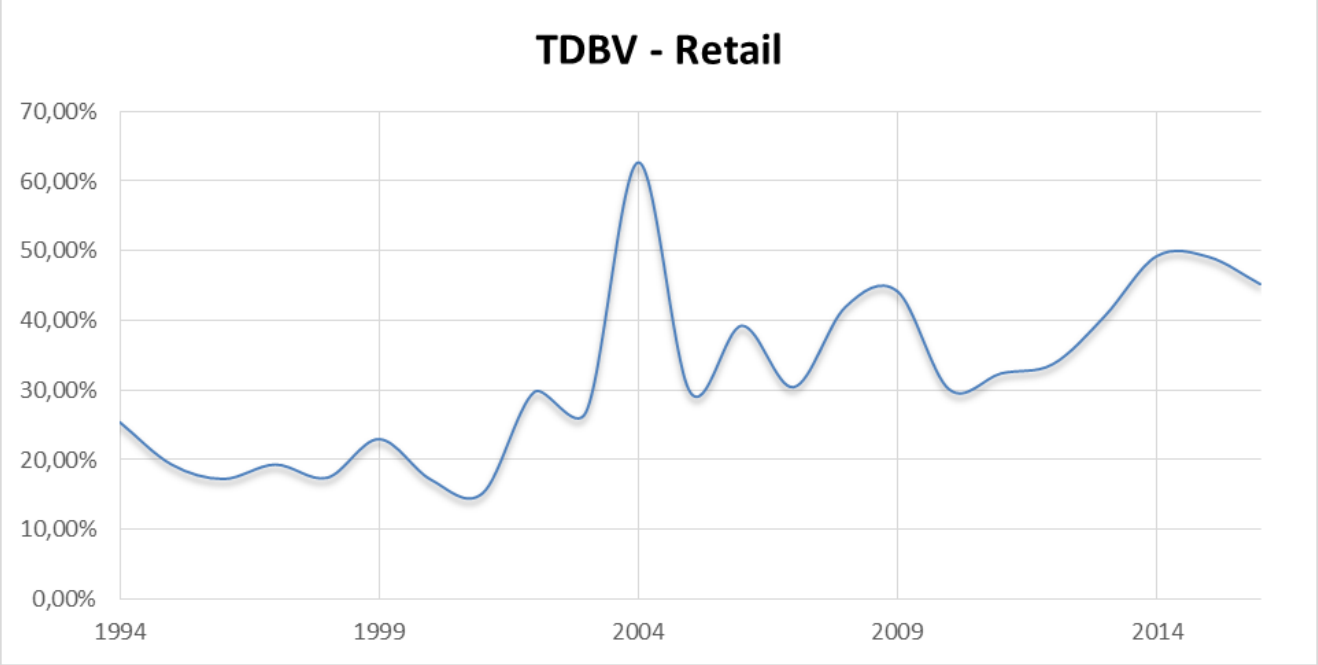


Figure 17: Total Liabilities to Book value ratio to of Retail Firms

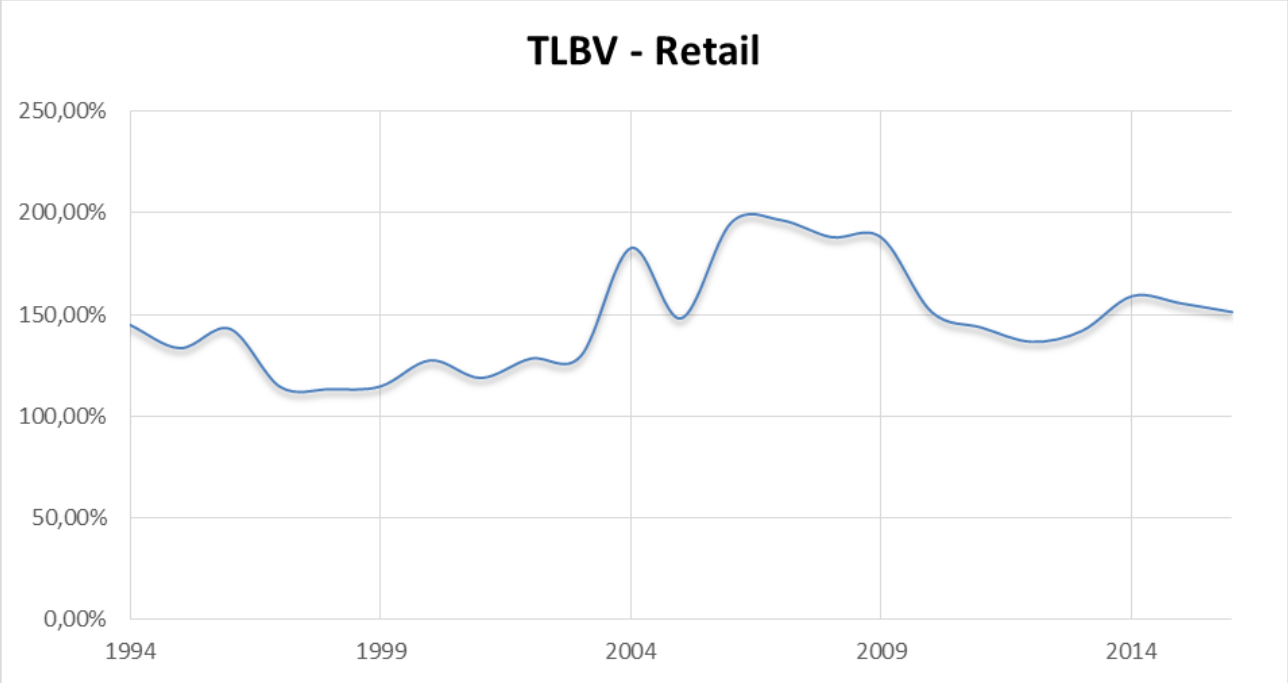


Figure 18: Total Debt to Market value of Retail Firms

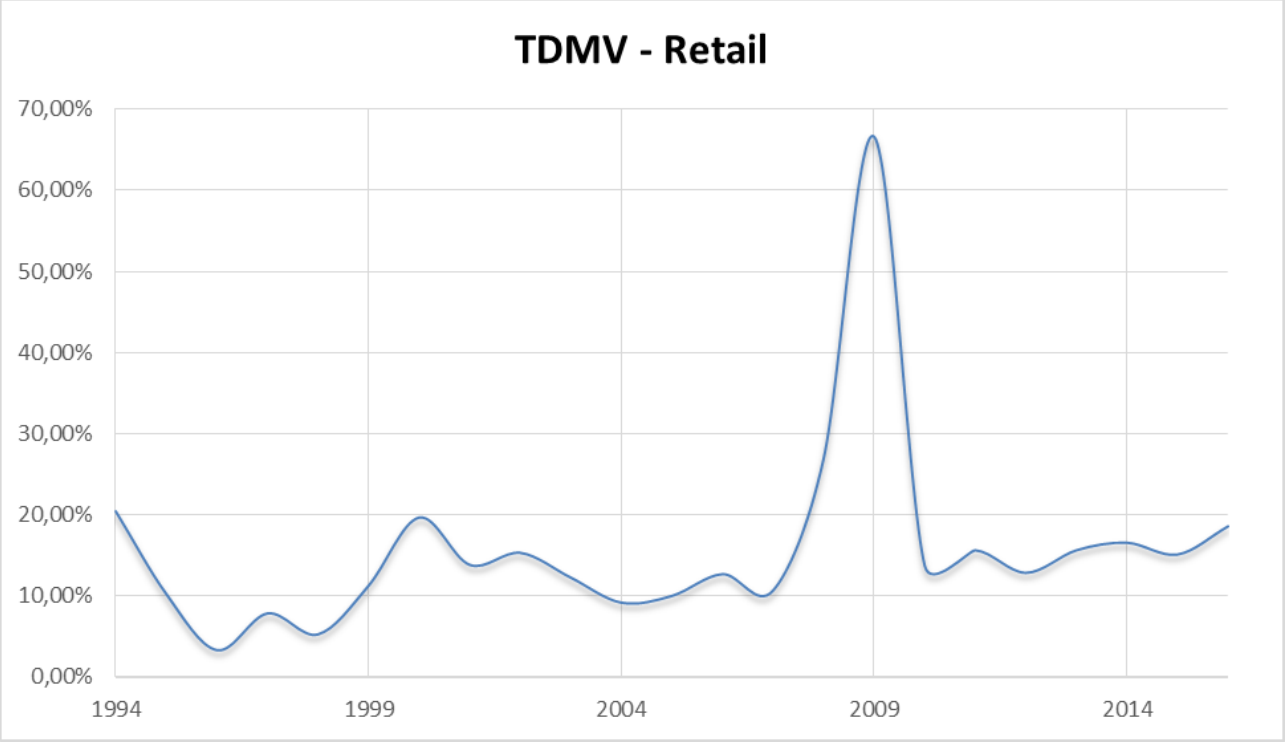


Figure 19: Total Liabilities to Market value ratio of Retail Firms

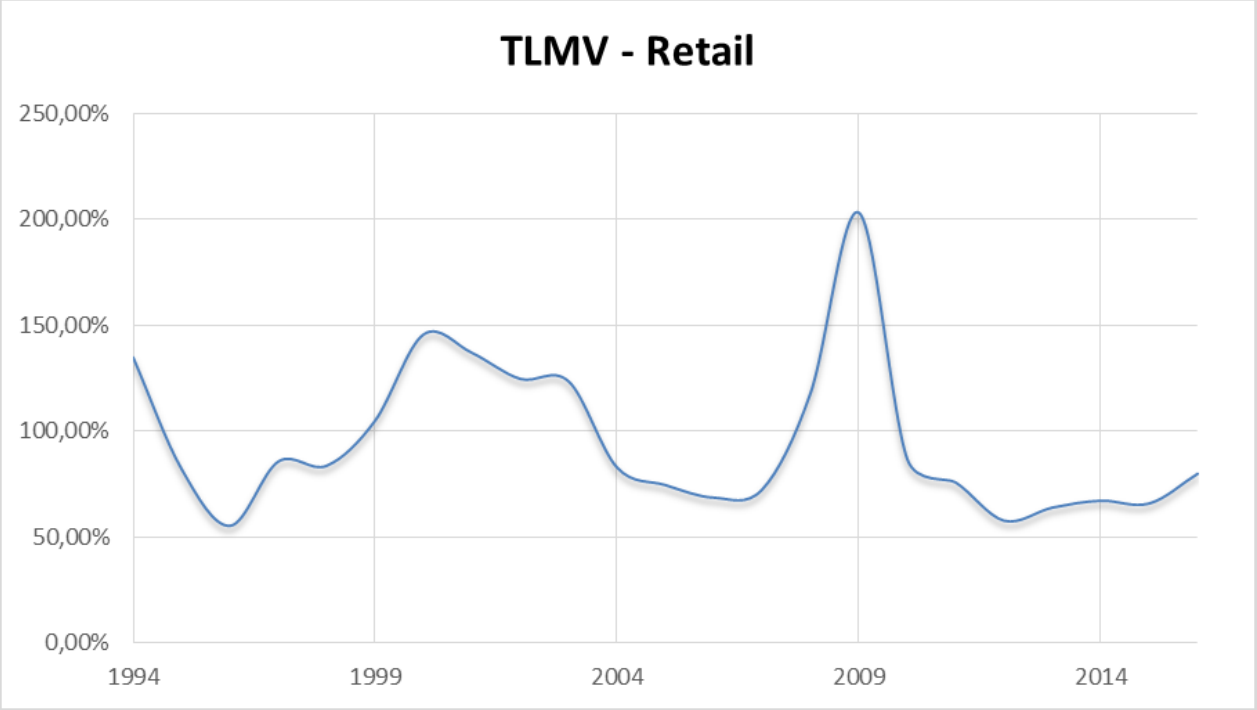


Table 9: Yearly Leverage for Retail Firms

	TDBV	TLBV	TDMV	TLMV
1994	25,38%	144,96%	20,46%	134,75%
1995	19,28%	133,56%	10,25%	82,10%
1996	17,21%	142,96%	3,35%	55,30%
1997	19,28%	114,56%	7,87%	85,63%
1998	17,38%	113,47%	5,29%	83,65%
1999	22,93%	114,80%	11,29%	104,92%
2000	17,12%	127,59%	19,69%	145,63%
2001	15,15%	118,96%	13,86%	136,95%
2002	29,73%	128,42%	15,34%	124,67%
2003	26,88%	129,72%	12,28%	123,49%
2004	62,69%	182,67%	9,20%	82,84%

2005	29,73%	148,14%	10,03%	74,52%
2006	39,23%	195,07%	12,71%	68,63%
2007	30,41%	196,31%	10,69%	72,43%
2008	41,94%	188,01%	26,95%	117,98%
2009	44,18%	187,77%	66,61%	203,08%
2010	30,08%	151,35%	13,74%	86,68%
2011	32,38%	143,64%	15,66%	75,78%
2012	33,71%	136,67%	12,88%	57,70%
2013	40,60%	141,96%	15,66%	63,92%
2014	49,22%	159,02%	16,58%	67,15%
2015	49,14%	155,44%	15,14%	65,85%
2016	45,22%	151,27%	18,61%	79,86%
Average	32,12%	148,10%	15,83%	95,37%
Min	15,15%	113,47%	3,35%	55,30%
Max	62,69%	196,31%	66,61%	203,08%
Std Dev	12,64%	26,07%	12,20%	35,85%
Range	47,55%	82,84%	63,26%	147,78%

Table 10, 11 and 12 below summarises the descriptive statistics and the correlations between the four leverage ratios used as well as the capital structure determinants. The average leverage ratio ranges from 15.83% to 148.10% based on the measure of leverage used with a standard deviation of between 12.20% and 35.85%.

The results in the determinants of capital structure saw some deviations from the expected especially with regards to market value ratios. Firm size is positively correlated to TDBV, TLBV and TDMV but negatively correlated to TLMV. TDBV and TLBV showed both

statistical significant at the 0.01 level. Tangibility is positively correlated to TDBV but negatively correlated to TLBV, TDMV and LTMV. Profitability is positively correlated to TDBV, TLBV and TDMV but negatively correlated to TLMV. TDBV showed statistical significance at a 0.05 level whilst TLBV showed statistical significance at a 0.01 level. Growth is positively correlated to TDBV, TLBV and TDMV but negatively correlated to TLMV. TDBV showed statistical significance at a 0.01 level whilst TLBV showed statistical significance at an 0.05 level. Cost of debt as well as corporate tax rate is negatively correlated to TDBV, TLBV and TLMV but positively correlated to TLMV. In both instance TDBV showed statistical significance at a 0.01 level.

Table 10: Descriptive Statistics of Retail firms

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TDBV	23	15.15%	62.69%	32.12%	12.64%
LTBV	23	113.47%	196.31%	148.10%	26.07%
TDMV	23	3.35%	66.61%	15.83%	12.20%
TLMV	23	55.30%	203.08%	95.37%	35.85%
SIZE	23	12.92	16.64	15.22%	1.09%
TANG	23	19.64%	26.88%	23.33%	1.94%
PROF	23	1.75%	17.24%	11.75%	3.89%
GROW	23	12.89	16.36	14.82%	1.07%
CORD	23	8.50%	23.00%	13.36%	4.17%
TAX	23	28.00%	35.00%	29.96%	2.51%
Valid N	23				

Table 11: Regression Statistics of Retail firms

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733[a]	.537	.364	10.08%

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1887.828	6	314.638	3.097	.033[b]
	Residual	1625.650	16	101.603		
	Total	3513.477	22			

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-104.347	120.917		-.863	.401
	SIZE	-2.150	14.467	-.186	-.149	.884
	TANG	-1.123	1.390	-.172	-.808	.431
	PROF	-.016	.920	-.005	-.017	.987
	GROW	11.687	15.155	.989	.771	.452
	CORD	-.625	.905	-.206	-.691	.500
	TAX	1.027	1.831	.204	.561	.583

a. Dependent Variable: TDBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845[a]	.714	.607	16.34%

a. Dependent Variable: LTBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10676.427	6	1779.405	6.662	.001[b]
	Residual	4273.411	16	267.088		
	Total	14949.838	22			

a. Dependent Variable: LTBV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	64.133	196.048		.327	.748
	SIZE	24.515	23.456	1.027	1.045	.311
	TANG	-7.696	2.254	-.572	-3.415	.004
	PROF	2.607	1.492	.389	1.747	.100
	GROW	-9.332	24.571	-.383	-.380	.709
	CORD	1.276	1.467	.204	.870	.397
	TAX	-.636	2.969	-.061	-.214	.833

a. Dependent Variable: LTBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.503[a]	.253	-.027	12.36%

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	828.407	6	138.068	.904	.516[b]
	Residual	2444.141	16	152.759		
	Total	3272.549	22			

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.626	148.264		.200	.844
	SIZE	17.622	17.739	1.577	.993	.335
	TANG	-2.423	1.704	-.385	-1.421	.174
	PROF	-.869	1.129	-.277	-.770	.453
	GROW	-12.515	18.583	-1.098	-.674	.510
	CORD	-.377	1.109	-.129	-.340	.738
	TAX	-.828	2.245	-.171	-.369	.717

a. Dependent Variable: TDMV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.587[a]	.344	.098	34.05%

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9731.906	6	1621.984	1.399	.275[b]
	Residual	18550.852	16	1159.428		
	Total	28282.759	22			

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, TANG, PROF, CORD, SIZE, GROW

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	861.098	408.466		2.108	.051
	SIZE	60.554	48.871	1.843	1.239	.233
	TANG	-6.626	4.696	-.358	-1.411	.177
	PROF	-4.908	3.109	-.532	-1.579	.134
	GROW	-77.379	51.194	-2.309	-1.511	.150
	CORD	-2.277	3.057	-.265	-.745	.467
	TAX	-9.957	6.186	-.698	-1.610	.127

a. Dependent Variable: TLMV

Table 12: Correlations between dependent variables and determinants of Retail Firms

Correlations

		TDBV	LTBV	TDMV	TLMV	SIZE	TANG	PROF	GROW	CORD	TAX
TDBV	Pearson Correlation	1	.680**	.317	-.143	.680**	.216	.505*	.695**	-.636**	-.565**
	Sig. (2-tailed)		.000	.140	.514	.000	.321	.014	.000	.001	.005
	N	23	23	23	23	23	23	23	23	23	23
LTBV	Pearson Correlation	.680**	1	.406	-.008	.536**	-.230	.689**	.479*	-.367	-.376
	Sig. (2-tailed)	.000		.054	.972	.008	.291	.000	.021	.085	.077
	N	23	23	23	23	23	23	23	23	23	23
TDMV	Pearson Correlation	.317	.406	1	.741**	.347	-.084	.229	.323	-.296	-.314
	Sig. (2-tailed)	.140	.054		.000	.105	.703	.293	.132	.171	.145
	N	23	23	23	23	23	23	23	23	23	23
TLMV	Pearson Correlation	-.143	-.008	.741**	1	-.194	-.291	-.271	-.210	.078	.016
	Sig. (2-tailed)	.514	.972	.000		.375	.179	.210	.336	.723	.941
	N	23	23	23	23	23	23	23	23	23	23
SIZE	Pearson Correlation	.680**	.536**	.347	-.194	1	.504*	.712**	.986**	-.755**	-.859**
	Sig. (2-tailed)	.000	.008	.105	.375		.014	.000	.000	.000	.000
	N	23	23	23	23	23	23	23	23	23	23
TANG	Pearson Correlation	.216	-.230	-.084	-.291	.504*	1	.154	.527**	-.315	-.506*
	Sig. (2-tailed)	.321	.291	.703	.179	.014		.483	.010	.143	.014
	N	23	23	23	23	23	23	23	23	23	23
PROF	Pearson Correlation	.505*	.689**	.229	-.271	.712**	.154	1	.660**	-.597**	-.530**
	Sig. (2-tailed)	.014	.000	.293	.210	.000	.483		.001	.003	.009
	N	23	23	23	23	23	23	23	23	23	23
GROW	Pearson Correlation	.695**	.479*	.323	-.210	.986**	.527**	.660**	1	-.784**	-.878**
	Sig. (2-tailed)	.000	.021	.132	.336	.000	.010	.001		.000	.000
	N	23	23	23	23	23	23	23	23	23	23
CORD	Pearson Correlation	-.636**	-.367	-.296	.078	-.755**	-.315	-.597**	-.784**	1	.725**
	Sig. (2-tailed)	.001	.085	.171	.723	.000	.143	.003	.000		.000
	N	23	23	23	23	23	23	23	23	23	23
TAX	Pearson Correlation	-.565**	-.376	-.314	.016	-.859**	-.506*	-.530**	-.878**	.725**	1
	Sig. (2-tailed)	.005	.077	.145	.941	.000	.014	.009	.000	.000	
	N	23	23	23	23	23	23	23	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

5.3 Food Producers

The Food producing sector analysis comprises of 14 firms listed on the Johannesburg stock exchange. Average TDBV increase from 18.97% to 32.61% whilst average TDMV of equity increased from 15.55% to 19.20%. Average TLBV increased from 79.87% to 98.27% whilst average TLMV of debt increased from 59.26% to 61.16%.

Figure 20, 21, 22, 23 and 24 below present a graphical representation of the different leverage ratios under the period of consideration. Table 13 below presents the different leverage rations broken down into yearly increment.

Figure 20: Leverage Ratios' of the Food Producers

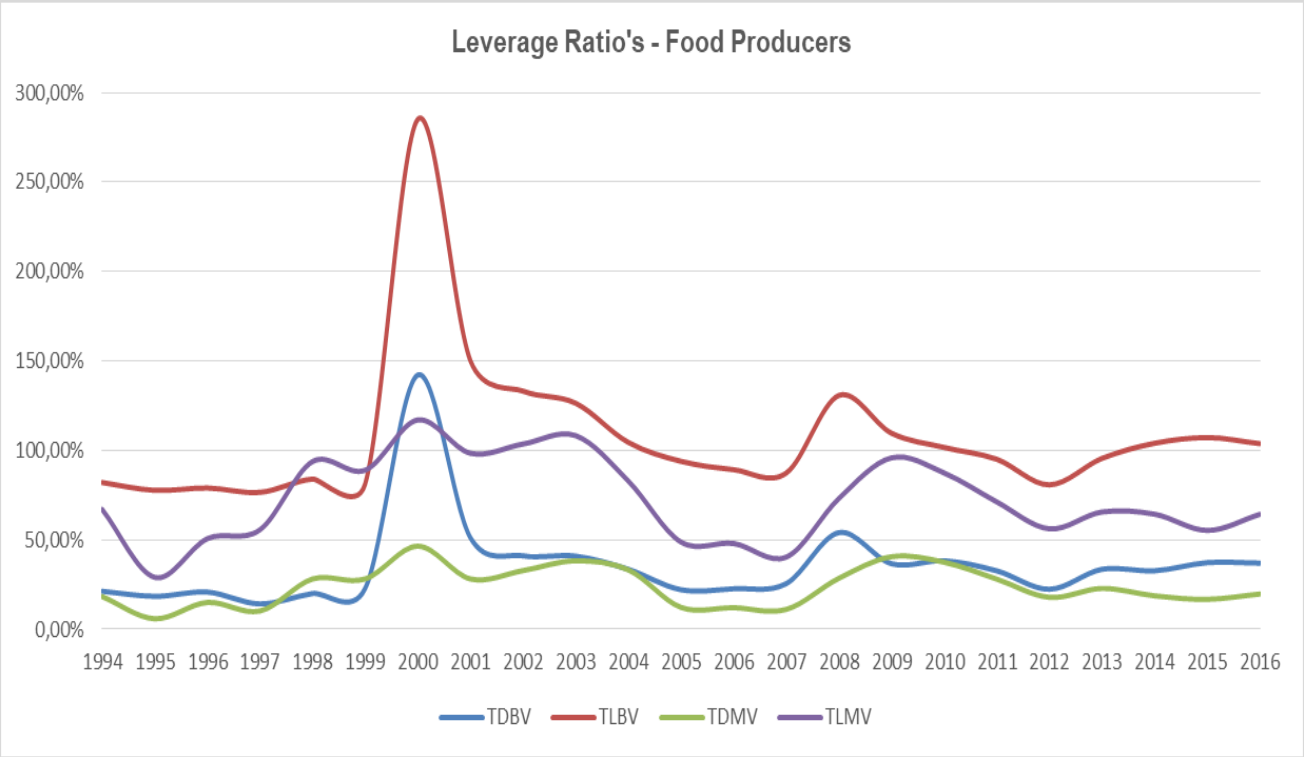


Figure 21: Total Debt to Book value ratio Food Producers

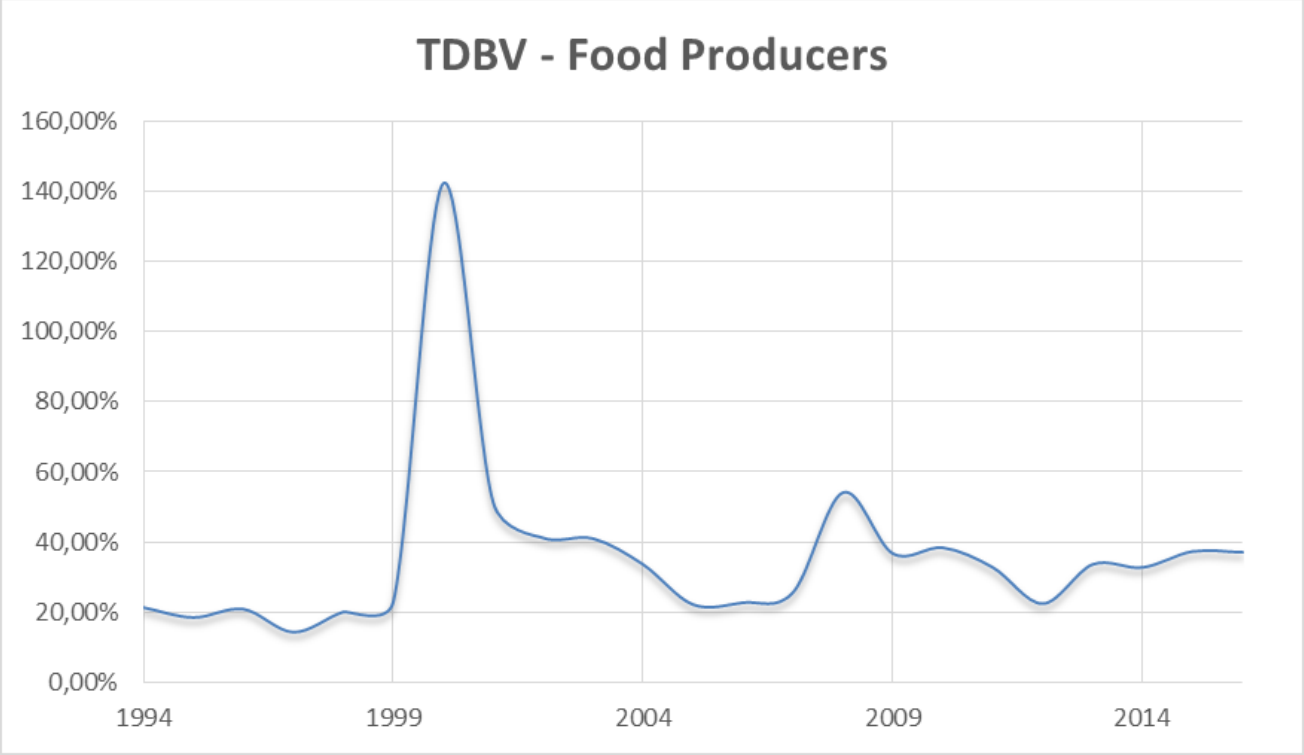


Figure 22: Total Liabilities to Book value ratio of Food Producers

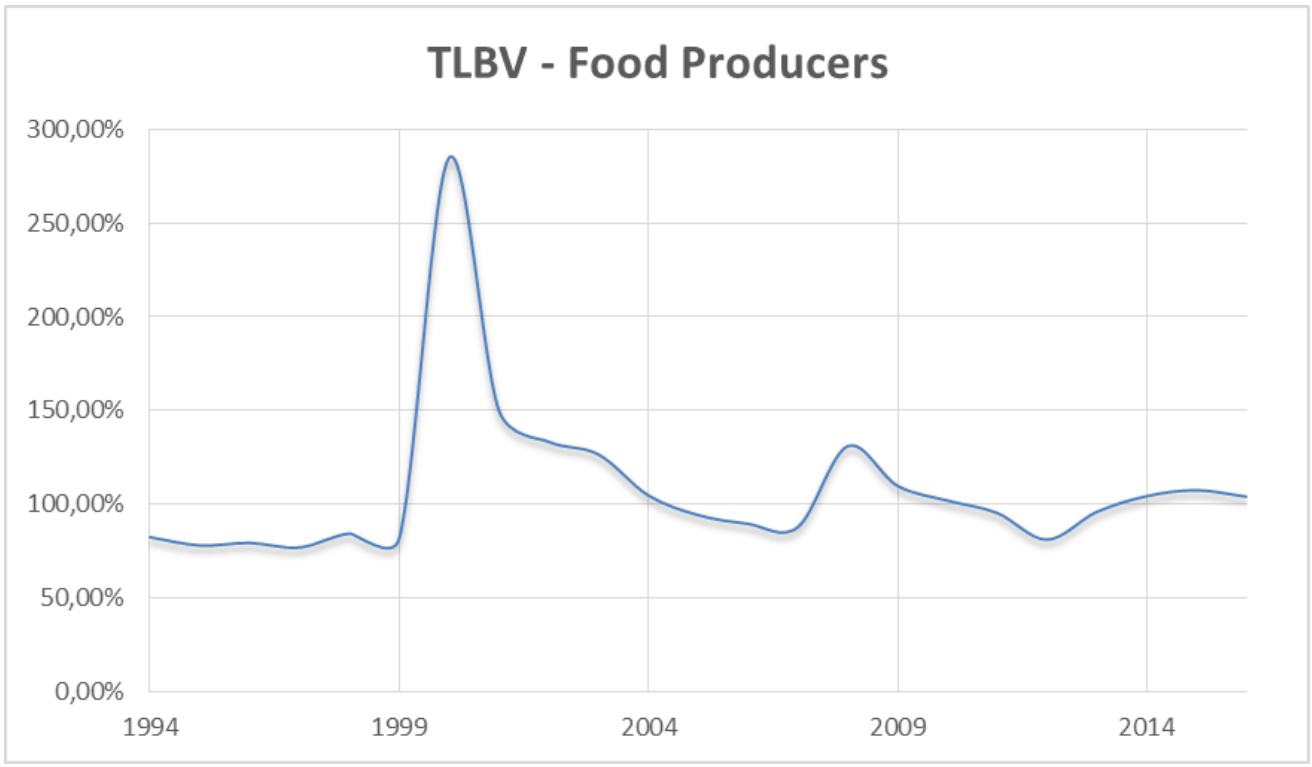


Figure 23: Total Debt to Market value of Food Producers

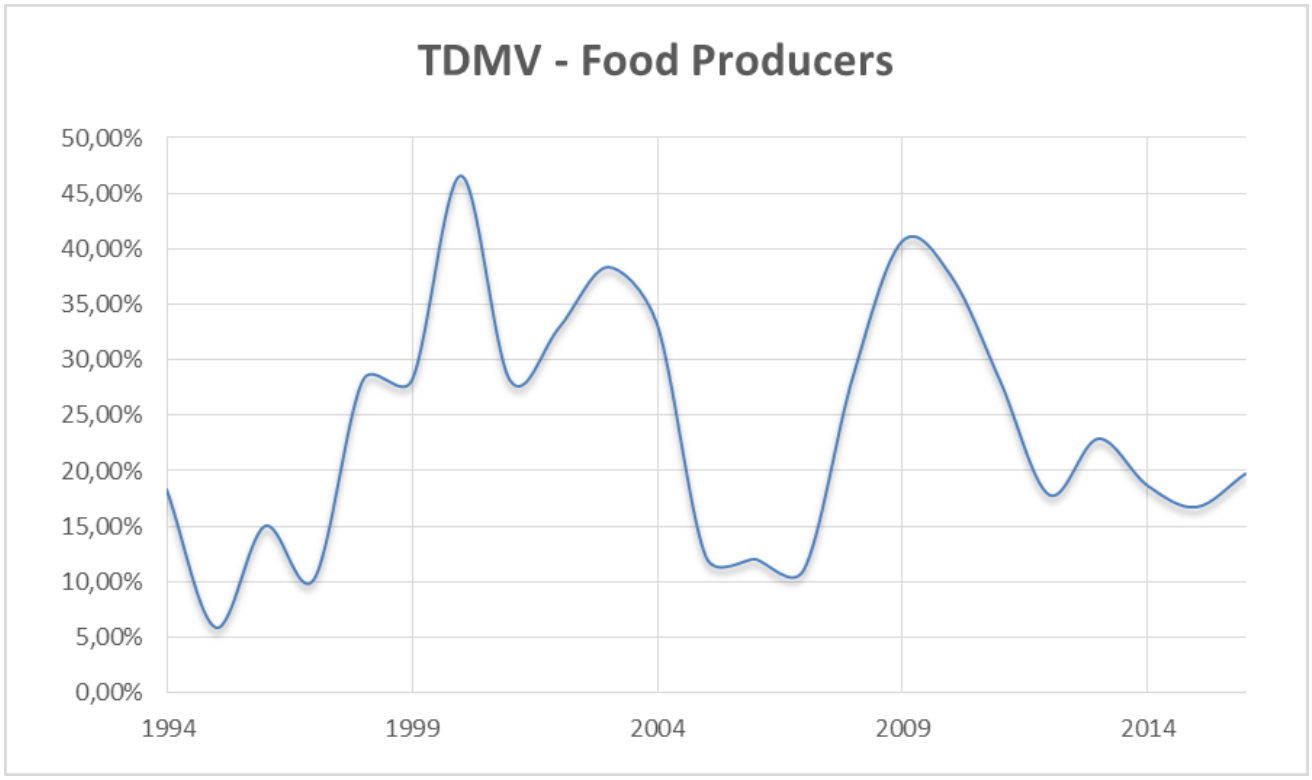


Figure 24: Total Liabilities to Market value of Food Producers

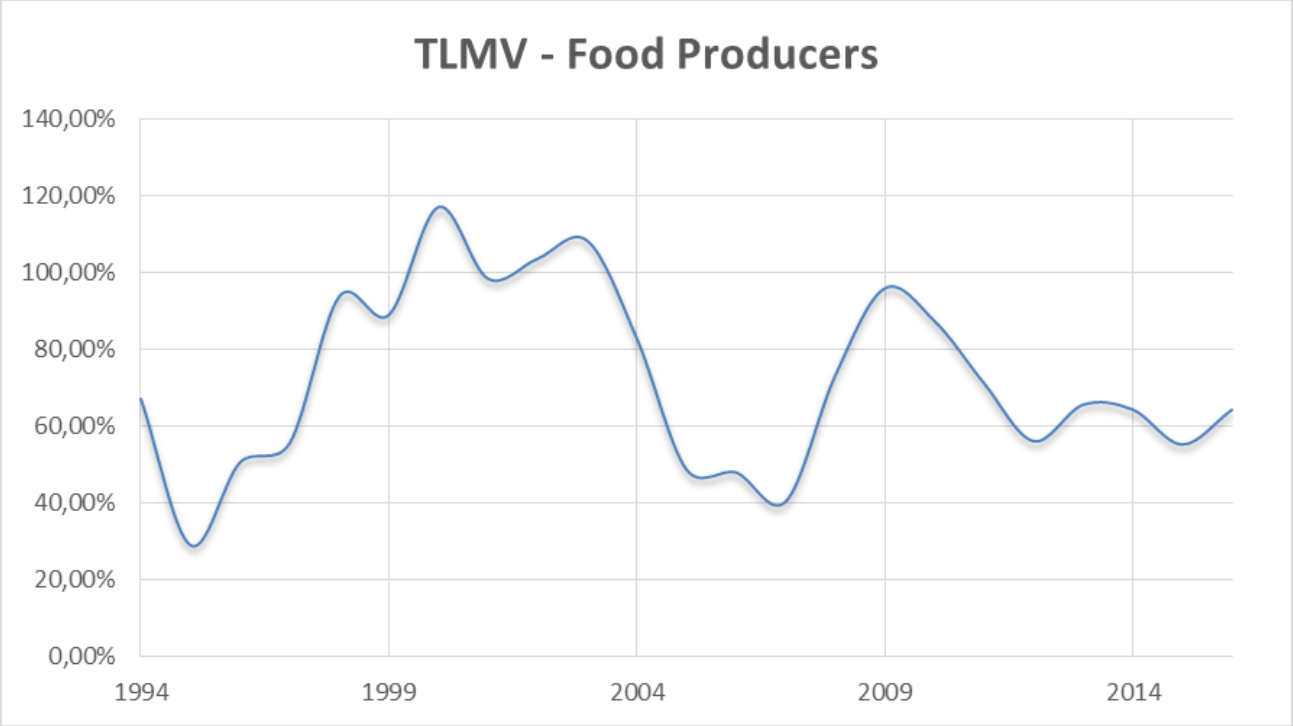


Table 13: Yearly Leverage of Food Producers

	TDBV	TLBV	TDMV	TLMV
1994	21,30%	82,09%	18,33%	67,13%
1995	18,45%	77,68%	5,94%	29,08%
1996	20,84%	79,00%	15,05%	50,67%
1997	14,26%	76,59%	10,26%	55,66%
1998	20,02%	83,99%	28,15%	93,79%
1999	22,88%	81,28%	28,15%	88,97%
2000	142,19%	285,11%	46,53%	117,07%
2001	51,20%	150,10%	28,17%	98,39%
2002	41,13%	133,16%	32,86%	103,61%

2003	40,93%	126,36%	38,32%	108,30%
2004	33,56%	104,49%	33,23%	82,87%
2005	22,14%	93,92%	12,29%	48,82%
2006	22,71%	89,25%	12,09%	48,00%
2007	25,56%	87,38%	11,16%	40,40%
2008	54,07%	130,76%	28,53%	73,19%
2009	36,67%	109,62%	40,63%	95,91%
2010	38,36%	101,70%	37,52%	87,44%
2011	32,71%	95,09%	28,08%	71,23%
2012	22,42%	80,78%	17,86%	56,17%
2013	33,58%	95,57%	22,91%	65,64%
2014	32,72%	104,02%	18,72%	64,37%
2015	37,28%	107,19%	16,76%	55,28%
2016	37,03%	103,80%	19,75%	64,33%
Average	35,74%	107,78%	23,97%	72,45%
Min	14,26%	76,59%	5,94%	29,08%
Max	142,19%	285,11%	46,53%	117,07%
Std Dev	25,44%	43,41%	10,94%	23,47%
Range	127,93%	208,52%	40,59%	87,99%

Table 14, 15 and 16 below summarises the descriptive statistics and the correlations between the four leverage ratios used as well as the capital structure determinants. The average leverage ratio ranges from 23.97% to 107.78% based on the measure of leverage used with a standard deviation of between 10.94% and 43.41%.

Firm size is negatively correlated to TDBV and TLBV and positively correlated to TDMV and TLMV. Tangibility is negatively correlated to all four leverage ratios. Profitability is positively correlated to TDBV and TLBV but negatively correlated TDMV and TLMV. Growth, cost of debt and corporate tax is negatively correlated to all four leverage ratios. None of the determinants showed any statistical significance to any of the four leverage ratios.

Table 14: Descriptive Statistics of Food Producers

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TDBV	23	14.26%	142.19%	35.74%	25.44%
TLBV	23	76.59%	285.11%	107.78%	43.41%
TDMV	23	5.94%	46.53%	23.97%	10.94%
TLMV	23	29.08%	117.07%	72.45%	23.47%
SIZE	23	12.81	15.20	14.15%	0.76%
TANG	23	34.01%	48.42%	41.21%	4.30%
PROF	23	5.98%	19.64%	11.60%	3.54%
GROW	23	13.56	15.05	14.22%	0.39%
CORD	23	8.50%	23.00%	13.36%	4.17%
TAX	23	28.00%	35.00%	29.96%	2.51%
Valid N	23				

Table 15: Regression Statistics of Food Producers

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.641[a]	.411	.190	22.90%

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5849.847	6	974.974	1.859	.151[b]
	Residual	8391.447	16	524.465		
	Total	14241.293	22			

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	914.434	319.957		2.858	.011
	SIZE	14.204	10.762	.422	1.320	.205
	TANG	.336	2.225	.057	.151	.882
	PROF	-1.546	1.896	-.215	-.815	.427
	GROW	-63.039	20.452	-.961	-3.082	.007
	CORD	-.993	1.901	-.163	-.522	.609
	TAX	-5.534	3.522	-.547	-1.571	.136

a. Dependent Variable: TDBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.695[a]	.483	.289	36.60952%

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20016.238	6	3336.040	2.489	.068[b]
	Residual	21444.113	16	1340.257		
	Total	41460.351	22			

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1769.254	511.478		3.459	.003
	SIZE	25.230	17.204	.439	1.466	.162
	TANG	.182	3.557	.018	.051	.960
	PROF	-2.560	3.031	-.209	-.845	.411
	GROW	-119.288	32.694	-1.066	-3.649	.002
	CORD	-1.514	3.039	-.145	-.498	.625
	TAX	-9.332	5.630	-.540	-1.658	.117

a. Dependent Variable: TLBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	.760	.670	6.29%

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2000.768	6	333.461	8.435	.000[b]
	Residual	632.555	16	39.535		
	Total	2633.323	22			

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	569.408	87.846		6.482	.000
	SIZE	4.076	2.955	.281	1.379	.187
	TANG	-.432	.611	-.170	-.708	.489
	PROF	-2.013	.521	-.652	-3.867	.001
	GROW	-33.231	5.615	-1.178	-5.918	.000
	CORD	-.324	.522	-.123	-.620	.544
	TAX	-2.838	.967	-.652	-2.935	.010

a. Dependent Variable: TDMV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.914[a]	.835	.773	11.18%

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10120.411	6	1686.735	13.492	.000[b]
	Residual	2000.259	16	125.016		
	Total	12120.670	22			

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, PROF, SIZE, CORD, GROW, TANG

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1259.246	156.213		8.061	.000
	SIZE	15.233	5.254	.490	2.899	.010
	TANG	-.619	1.086	-.113	-.570	.577
	PROF	-4.044	.926	-.610	-4.369	.000
	GROW	-79.235	9.985	-1.309	-7.935	.000
	CORD	.207	.928	.037	.223	.827
	TAX	-6.870	1.719	-.736	-3.996	.001

a. Dependent Variable: TLMV

b.

Table 16: Correlations between dependent variables and determinants of Food Producers

Correlations

		TDBV	TLBV	TDMV	TLMV	SIZE	TANG	PROF	GROW	CORD	TAX
TDBV	Pearson Correlation	1	.986**	.640**	.587**	-.044	-.088	.007	-.309	-.112	-.220
	Sig. (2-tailed)		.000	.001	.003	.841	.690	.975	.151	.610	.312
	N	23	23	23	23	23	23	23	23	23	23
TLBV	Pearson Correlation	.986**	1	.638**	.629**	-.084	-.059	.054	-.396	-.070	-.185
	Sig. (2-tailed)	.000		.001	.001	.702	.790	.806	.061	.751	.399
	N	23	23	23	23	23	23	23	23	23	23
TDMV	Pearson Correlation	.640**	.638**	1	.934**	.003	-.199	-.250	-.252	-.187	-.372
	Sig. (2-tailed)	.001	.001		.000	.988	.363	.250	.246	.393	.080
	N	23	23	23	23	23	23	23	23	23	23
TLMV	Pearson Correlation	.587**	.629**	.934**	1	.067	-.092	-.263	-.344	-.012	-.246
	Sig. (2-tailed)	.003	.001	.000		.761	.677	.225	.108	.957	.258
	N	23	23	23	23	23	23	23	23	23	23
SIZE	Pearson Correlation	-.044	-.084	.003	.067	1	-.362	-.560**	.624**	-.134	-.022
	Sig. (2-tailed)	.841	.702	.988	.761		.090	.005	.001	.541	.921
	N	23	23	23	23	23	23	23	23	23	23
TANG	Pearson Correlation	-.088	-.059	-.199	-.092	-.362	1	.011	-.545**	.716**	.727**
	Sig. (2-tailed)	.690	.790	.363	.677	.090		.960	.007	.000	.000
	N	23	23	23	23	23	23	23	23	23	23
PROF	Pearson Correlation	.007	.054	-.250	-.263	-.560**	.011	1	-.486*	-.003	.017
	Sig. (2-tailed)	.975	.806	.250	.225	.005	.960		.019	.989	.939
	N	23	23	23	23	23	23	23	23	23	23
GROW	Pearson Correlation	-.309	-.396	-.252	-.344	.624**	-.545**	-.486*	1	-.481*	-.433*
	Sig. (2-tailed)	.151	.061	.246	.108	.001	.007	.019		.020	.039
	N	23	23	23	23	23	23	23	23	23	23
CORD	Pearson Correlation	-.112	-.070	-.187	-.012	-.134	.716**	-.003	-.481*	1	.725**
	Sig. (2-tailed)	.610	.751	.393	.957	.541	.000	.989	.020		.000
	N	23	23	23	23	23	23	23	23	23	23
TAX	Pearson Correlation	-.220	-.185	-.372	-.246	-.022	.727**	.017	-.433*	.725**	1
	Sig. (2-tailed)	.312	.399	.080	.258	.921	.000	.939	.039	.000	
	N	23	23	23	23	23	23	23	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

5.4 Large Caps

The Large Caps comprise of 20 firms listed on the Johannesburg stock exchange. Average TDBV increase from 24.16% to 67.23% whilst average TDMV increased from 15.05% to 36.20%. Average TLBV increased from 101.66% to 129.20% whilst average TLMV of debt decreased from 83.52% to 67.87%.

Figure 25, 26, 27, 28 and 29 below present a graphical representation of the different leverage ratios under the period of consideration. Table 17 below presents the different leverage rations broken down into yearly increment.

Figure 25: Leverage Ratios' of Large Caps

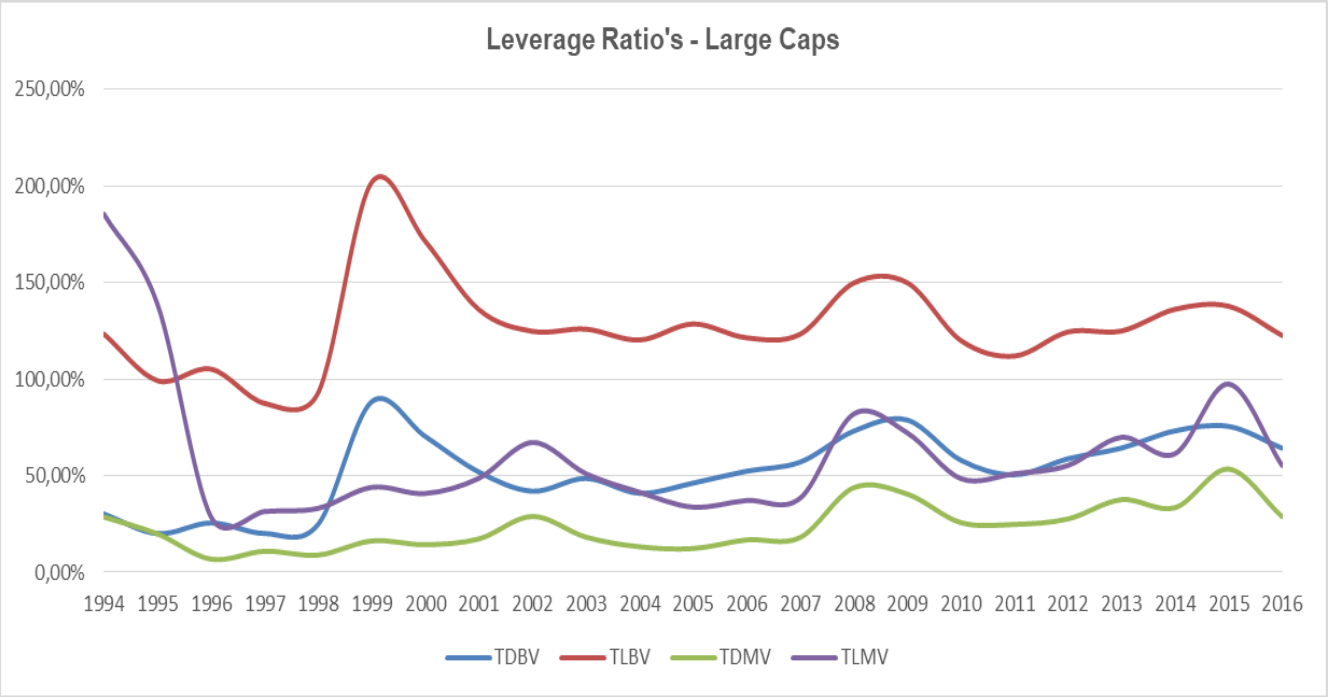


Figure 26: Total Debt to Book Value of Large Caps

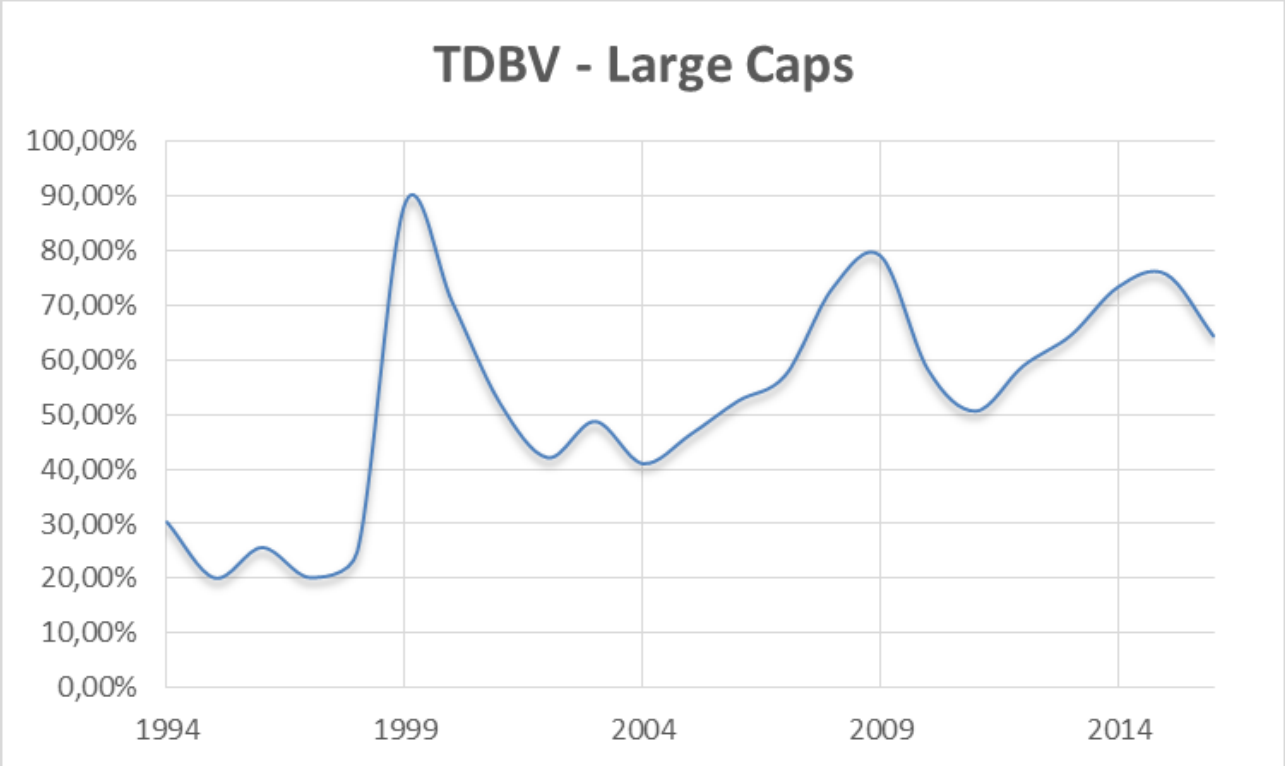


Figure 27: Total Liabilities to Book Value of Large Caps

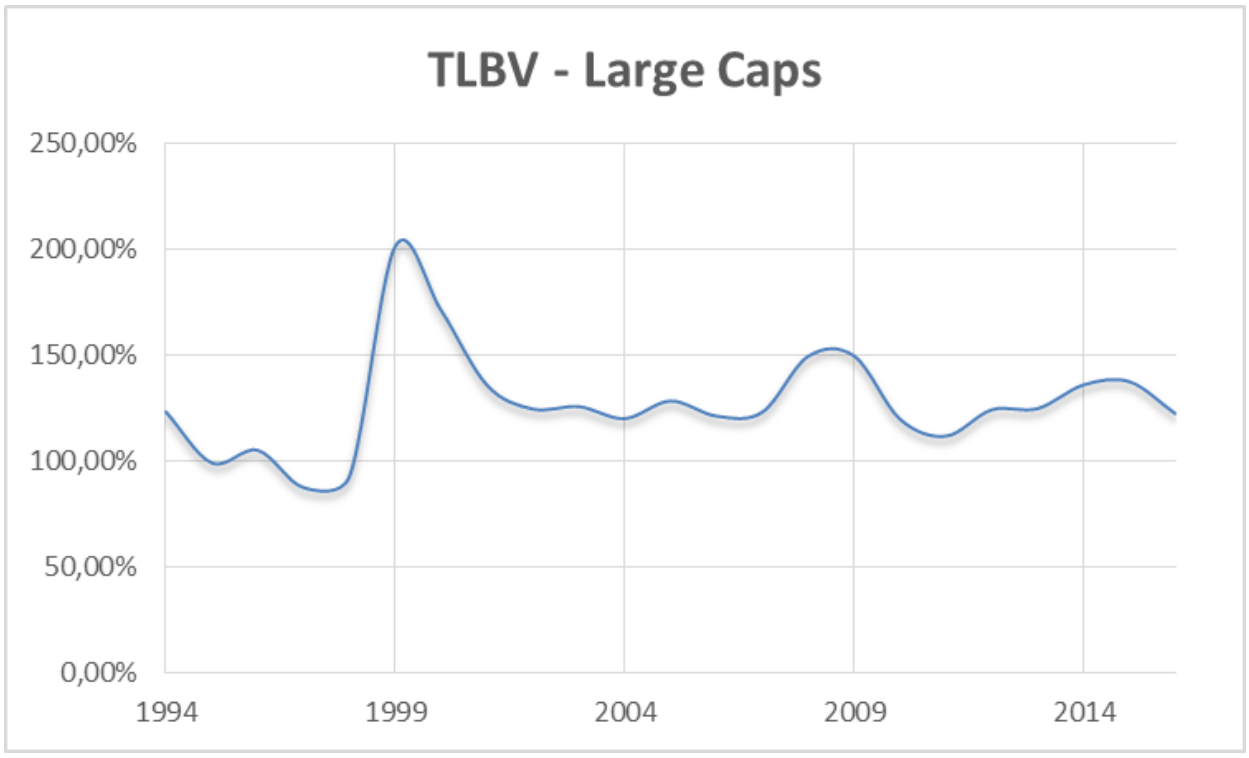


Figure 28: Total Debt to Market Value of Large Caps

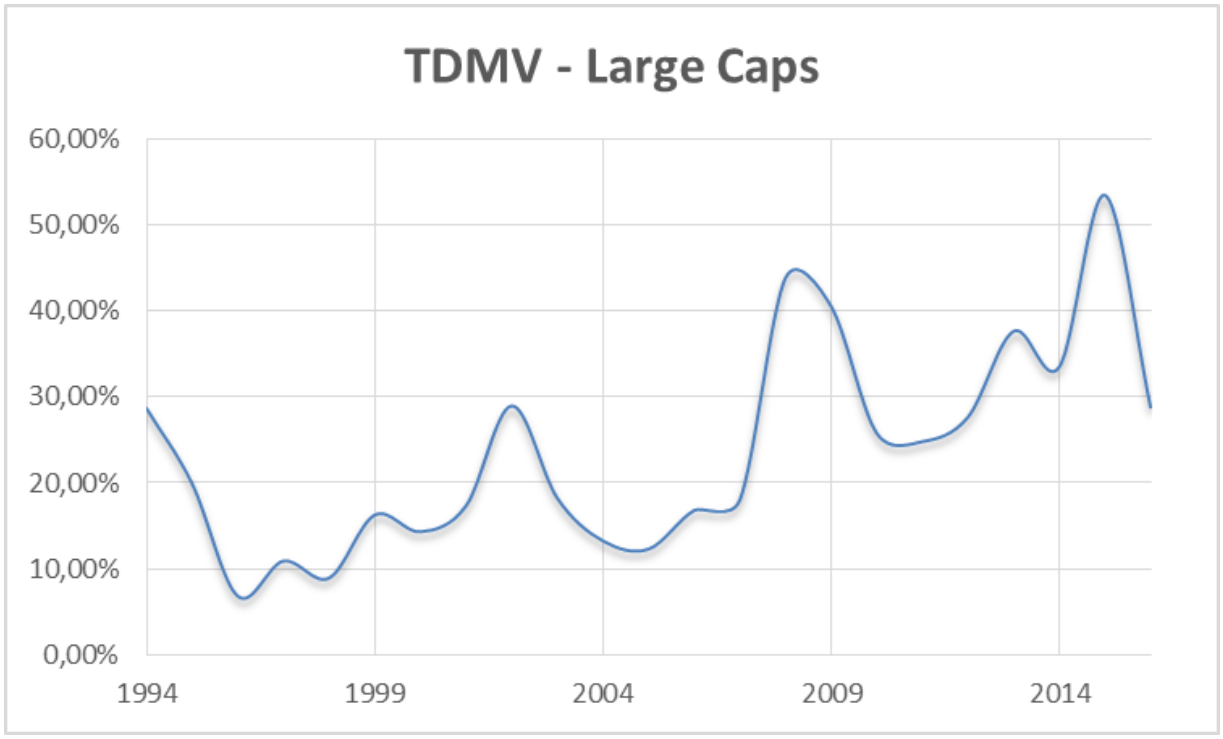


Figure 29: Total Liabilities to Market Value of Large Caps

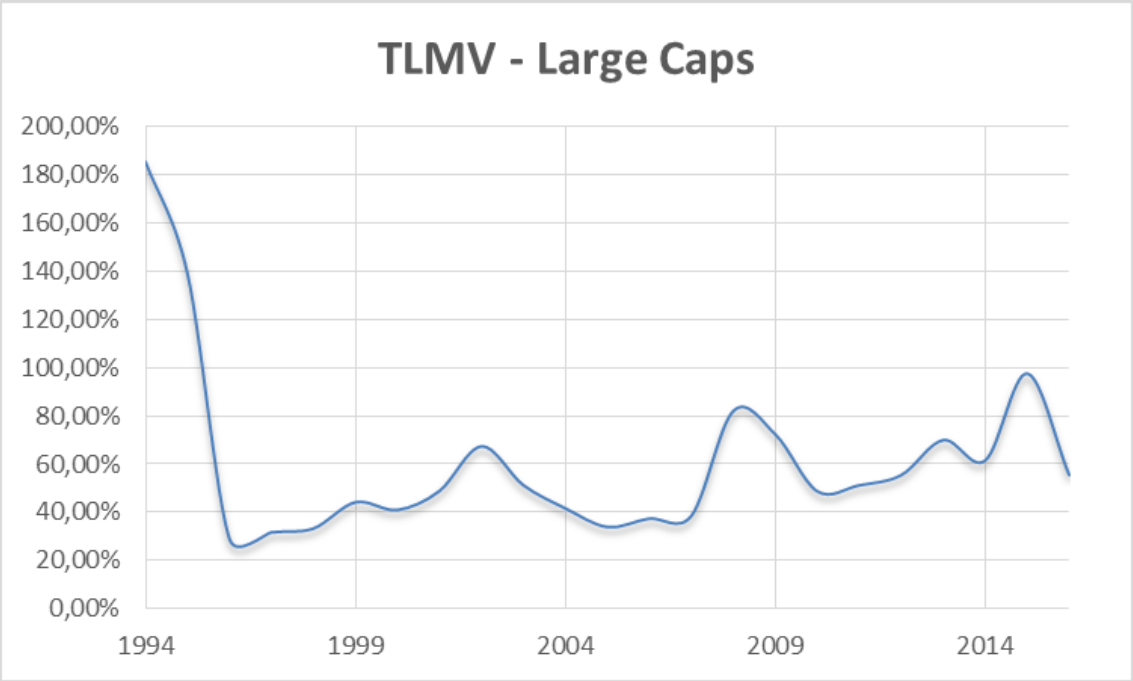


Table 17: Yearly Leverage for Large Caps

	TDBV	TLBV	TDMV	TLMV
1994	**30,24%**	**123,41%**	**28,67%**	**185,50%**
1995	**20,04%**	**99,22%**	**19,90%**	**138,79%**
1996	**25,58%**	**105,22%**	**6,82%**	**28,69%**
1997	**20,11%**	**87,52%**	**10,91%**	**31,50%**
1998	**24,81%**	**92,94%**	**8,93%**	**33,13%**
1999	**88,33%**	**201,88%**	**16,26%**	**44,02%**
2000	**70,35%**	**171,40%**	**14,30%**	**40,81%**
2001	**51,95%**	**136,01%**	**17,31%**	**48,69%**
2002	**42,01%**	**124,76%**	**28,95%**	**67,23%**
2003	**48,62%**	**125,92%**	**18,24%**	**51,08%**

2004	**40,93%**	**120,28%**	**13,25%**	**41,46%**
2005	**46,21%**	**128,59%**	**12,29%**	**33,75%**
2006	**52,35%**	**121,43%**	**16,80%**	**37,20%**
2007	**57,07%**	**123,28%**	**18,02%**	**38,36%**
2008	**73,09%**	**149,77%**	**43,81%**	**81,96%**
2009	**78,86%**	**149,92%**	**40,52%**	**72,21%**
2010	**58,04%**	**120,03%**	**25,76%**	**48,55%**
2011	**50,52%**	**111,95%**	**24,79%**	**51,07%**
2012	**58,78%**	**124,45%**	**27,65%**	**55,31%**
2013	**64,35%**	**124,96%**	**37,64%**	**69,88%**
2014	**73,24%**	**136,18%**	**33,48%**	**61,40%**
2015	**75,56%**	**137,75%**	**53,44%**	**97,49%**
2016	**64,23%**	**122,64%**	**28,80%**	**55,29%**
Average	**52,84%**	**127,80%**	**23,76%**	**61,45%**
Min	**20,04%**	**87,52%**	**6,82%**	**28,69%**
Max	**88,33%**	**201,88%**	**53,44%**	**185,50%**
Std Dev	**19,59%**	**24,56%**	**12,01%**	**36,75%**
Range	**68,30%**	**114,36%**	**46,61%**	**156,81%**

Table 18, 19 and 20 below summarises the descriptive statistics and the correlations between the four leverage ratios used as well as the capital structure determinants. The average leverage ratio ranges from 23.76% to 127.80% based on the measure of leverage used with a standard deviation of between 12.01% and 36.75%.

Firm size is positively correlated to TDBV, TLBV and TDMV but negatively correlated to TLMV. TDBV and TDMV showed statistical significance at a 0.01 level. Tangibility is positively correlated to TDBV and TLBV and negatively correlated to TDMV and TLMV, all with very low statistical significance. Profitability is negatively correlated to all four leverage ratios also with very little statistical significance. Growth is positively correlated to TDBV, TLBV and TDMV and negatively correlated to TLMV. TDBV and TDMV showed statistical significance at the 0.01 level. Cost of debt as well as corporate tax rate is negatively correlated to TDBV, TLMV and TDMV and negatively correlated to TLMV. Both leverage ratios showed statistical significance under the TDBV and TDMV leverage ratio.

Table 18: Descriptive Statistics of Large Caps

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TDBV	23	20.04%	88.33%	52.84%	19.59%
TLBV	23	87.52%	201.88%	127.80%	24.56%
TDMV	23	6.82%	53.44%	23.76%	12.01%
TLMV	23	28.69%	185.50%	61.45%	36.75%
SIZE	23	14.73	18.71	16.83%	1.35%
TANG	23	35.07%	44.13%	38.37%	2.08%
PROF	23	6.87%	16.98%	12.30%	2.84%
GROW	23	14.69	19.16	17.01%	1.48%
CORD	23	8.50%	23.00%	13.36%	4.17%
TAX	23	28.00%	35.00%	29.96%	2.51%
Valid N	23				

Table 19: Regression Statistics of Large Caps

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.798[a]	.637	.501	13.84%

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5375.552	6	895.925	4.674	.006[b]
	Residual	3066.794	16	191.675		
	Total	8442.346	22			

a. Dependent Variable: TDBV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	212.036	212.265		.999	.333
	SIZE	-58.853	67.354	-4.045	-.874	.395
	TANG	2.287	1.764	.243	1.297	.213
	PROF	.367	1.467	.053	.250	.806
	GROW	53.401	60.512	4.025	.882	.391
	CORD	-.989	1.274	-.210	-.776	.449
	TAX	-5.216	2.434	-.669	-2.144	.048

a. Dependent Variable: TDBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619[a]	.383	.152	22.61%

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5088.516	6	848.086	1.659	.195[b]
	Residual	8180.613	16	511.288		
	Total	13269.129	22			

a. Dependent Variable: TLBV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	718.907	346.681		2.074	.055
	SIZE	-120.004	110.005	-6.580	-1.091	.291
	TANG	3.340	2.881	.283	1.160	.263
	PROF	.642	2.396	.074	.268	.792
	GROW	94.064	98.830	5.655	.952	.355
	CORD	-2.502	2.081	-.425	-1.202	.247
	TAX	-9.159	3.975	-.937	-2.305	.035

a. Dependent Variable: TLBV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775[a]	.601	.451	8.90%

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1907.798	6	317.966	4.015	.012[b]
	Residual	1267.231	16	79.202		
	Total	3175.029	22			

a. Dependent Variable: TDMV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-19.018	136.447		-.139	.891
	SIZE	-33.904	43.296	-3.800	-.783	.445
	TANG	-.475	1.134	-.082	-.419	.681
	PROF	-.979	.943	-.231	-1.038	.315
	GROW	36.699	38.898	4.511	.943	.359
	CORD	-.284	.819	-.099	-.347	.733
	TAX	.771	1.564	.161	.493	.629

a. Dependent Variable: TDMV

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.614[a]	.377	.144	34.01%

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11208.074	6	1868.012	1.615	.207[b]
	Residual	18511.893	16	1156.993		
	Total	29719.967	22			

a. Dependent Variable: TLMV

b. Predictors: (Constant), TAX, PROF, TANG, CORD, GROW, SIZE

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.504	521.510		.043	.966
	SIZE	28.582	165.480	1.047	.173	.865
	TANG	-4.190	4.333	-.238	-.967	.348
	PROF	-6.378	3.604	-.493	-1.770	.096
	GROW	-26.054	148.670	-1.047	-.175	.863
	CORD	-3.874	3.131	-.440	-1.237	.234
	TAX	9.752	5.979	.667	1.631	.122

a. Dependent Variable: TLMV

Table 20: Correlations between dependent variables and determinants of Large Caps

Correlations

		TDBV	TLBV	TDMV	TLMV	SIZE	TANG	PROF	GROW	CORD	TAX
TDBV	Pearson Correlation	1	.826**	.579**	-.118	.674**	.108	-.075	.673**	-.615**	-.754**
	Sig. (2-tailed)		.000	.004	.593	.000	.624	.733	.000	.002	.000
	N	23	23	23	23	23	23	23	23	23	23
TLBV	Pearson Correlation	.826**	1	.261	-.020	.163	.233	-.002	.161	-.277	-.386
	Sig. (2-tailed)	.000		.228	.929	.457	.284	.994	.463	.200	.069
	N	23	23	23	23	23	23	23	23	23	23
TDMV	Pearson Correlation	.579**	.261	1	.482*	.679**	-.130	-.340	.692**	-.504*	-.487*
	Sig. (2-tailed)	.004	.228		.020	.000	.555	.112	.000	.014	.018
	N	23	23	23	23	23	23	23	23	23	23
TLMV	Pearson Correlation	-.118	-.020	.482*	1	-.138	-.025	-.360	-.128	.049	.339
	Sig. (2-tailed)	.593	.929	.020		.529	.909	.091	.560	.823	.114
	N	23	23	23	23	23	23	23	23	23	23
SIZE	Pearson Correlation	.674**	.163	.679**	-.138	1	-.176	-.076	.999**	-.806**	-.859**
	Sig. (2-tailed)	.000	.457	.000	.529		.422	.732	.000	.000	.000
	N	23	23	23	23	23	23	23	23	23	23
TANG	Pearson Correlation	.108	.233	-.130	-.025	-.176	1	-.411	-.180	.144	.103
	Sig. (2-tailed)	.624	.284	.555	.909	.422		.051	.410	.511	.640
	N	23	23	23	23	23	23	23	23	23	23
PROF	Pearson Correlation	-.075	-.002	-.340	-.360	-.076	-.411	1	-.096	-.100	-.046
	Sig. (2-tailed)	.733	.994	.112	.091	.732	.051		.663	.649	.836
	N	23	23	23	23	23	23	23	23	23	23
GROW	Pearson Correlation	.673**	.161	.692**	-.128	.999**	-.180	-.096	1	-.797**	-.852**
	Sig. (2-tailed)	.000	.463	.000	.560	.000	.410	.663		.000	.000
	N	23	23	23	23	23	23	23	23	23	23
CORD	Pearson Correlation	-.615**	-.277	-.504*	.049	-.806**	.144	-.100	-.797**	1	.725**
	Sig. (2-tailed)	.002	.200	.014	.823	.000	.511	.649	.000		.000
	N	23	23	23	23	23	23	23	23	23	23
TAX	Pearson Correlation	-.754**	-.386	-.487*	.339	-.859**	.103	-.046	-.852**	.725**	1
	Sig. (2-tailed)	.000	.069	.018	.114	.000	.640	.836	.000	.000	
	N	23	23	23	23	23	23	23	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 21 below summarise the analysis of the different measures of leverage and how each sector under consideration has changed. Larges capitalisation stocks reflected the highest increase in TDBV, TDMV as well as TLBV whilst food producers reflected the highest increase in TLMV.

Table 21: Summary of leverage measures

Total Sample	**Average (1994 to 1998)**	**Average (2012 to 2016)**	**Increase/Decrease**
TDBV	19,36%	47,65%	146,13%
TDMV	13,40%	26,26%	95,97%
TLBV	94,41%	127,50%	35,05%
TLMV	68,56%	71,63%	4,48%
Retail	**Average (1994 to 1998)**	**Average (2012 to 2016)**	**Increase/Decrease**
TDBV	19,70%	43,58%	121,22%
TDMV	9,45%	15,77%	66,88%
TLBV	129,90%	148,87%	14,60%
TLMV	88,28%	66,90%	-24,22%
Food Producers	**Average (1994 to 1998)**	**Average (2012 to 2016)**	**Increase/Decrease**
TDBV	18,97%	32,61%	71,90%
TDMV	15,55%	19,20%	23,47%
TLBV	79,87%	98,27%	23,04%
TLMV	59,26%	61,16%	3,21%
Large Caps	**Average (1994 to 1998)**	**Average (2012 to 2016)**	**Increase/Decrease**
TDBV	24,16%	67,23%	178,27%
TDMV	15,05%	36,20%	140,53%
TLBV	101,66%	129,20%	27,09%
TLMV	83,52%	67,87%	-18,74%

5.5 Debt and Liabilities

Table 22 as well as Figures 30 and 31 below illustrate the change in the use of short term versus long term debt as well as the change in current versus non-current liabilities. The results include the total sample of 68 firms as well as the subcategories.

There has been a clear move on the balance sheet of these listed firms over the last two decades. Short term to long term debt has been equally distributed from 1994 to 208 but since the financial crisis in 2008 there has been a clear shift to the use of long term debt over short term debt. Food producing firms have however seen a shift back to their inherit equilibrium of 50% short term to long term debt since the financial crises of 2008. This has been the only subsection that has shown this trend.

Current to Non-Current liabilities has seen a narrowing of dispersion over the last two decades from 80:20 current to non-current in 1994, to 55:45 current to non-current in 2016. This has been evident in all subcategories and this change seems to be robust except for Large Cap stocks which are illustrating some dispersion since the end of the financial crises.

Table 22: Change in the use of Debt and Liabilities on balance sheet

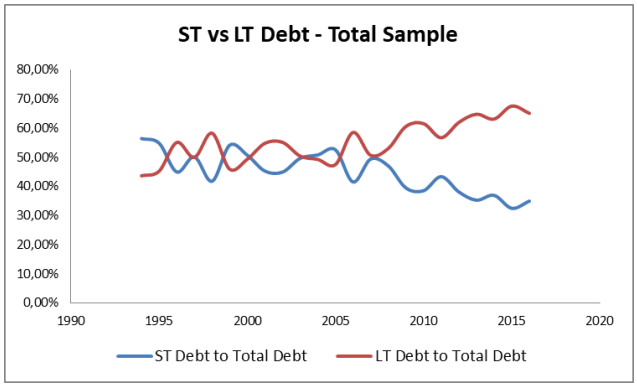
Total Sample				
	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	56,40%	43,60%	80,79%	19,21%
1995	54,79%	45,21%	82,07%	17,93%
1996	44,94%	55,06%	80,64%	19,36%
1997	50,09%	49,91%	79,00%	21,00%
1998	41,75%	58,25%	75,94%	24,06%
1999	54,11%	45,89%	73,90%	26,10%
2000	50,69%	49,31%	71,96%	28,04%
2001	45,23%	54,77%	71,34%	28,66%
2002	44,89%	55,11%	67,19%	32,81%
2003	49,62%	50,38%	69,05%	30,95%
2004	50,78%	49,22%	67,69%	32,31%
2005	52,55%	47,45%	67,21%	32,79%
2006	41,50%	58,50%	64,17%	35,83%
2007	49,36%	50,64%	66,45%	33,55%
2008	47,00%	53,00%	64,20%	35,80%
2009	39,43%	60,57%	60,02%	39,98%
2010	38,49%	61,51%	61,00%	39,00%
2011	43,33%	56,67%	60,63%	39,37%
2012	38,06%	61,94%	59,04%	40,96%
2013	35,27%	64,73%	57,23%	42,77%
2014	36,93%	63,07%	58,35%	41,65%
2015	32,46%	67,54%	55,20%	44,80%
2016	34,94%	65,06%	54,87%	45,13%
Average	44,90%	55,10%	67,30%	32,70%
Min	32,46%	43,60%	54,87%	17,93%
Max	56,40%	67,54%	82,07%	45,13%
Std Dev	6,96%	6,96%	8,48%	8,48%
Range	23,94%	23,94%	27,20%	27,20%

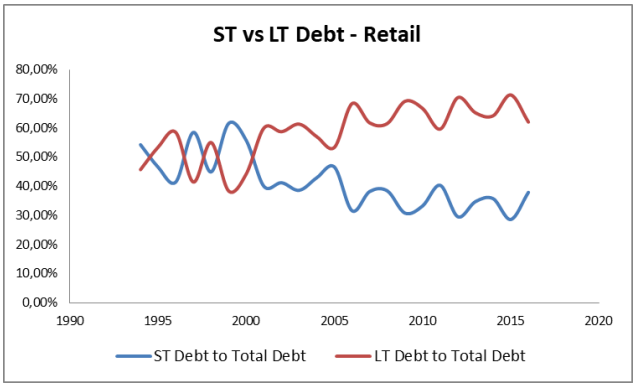
Retail Firms				
	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	54,28%	45,72%	86,92%	13,08%
1995	46,55%	53,45%	88,99%	11,01%
1996	41,49%	58,51%	89,73%	10,27%
1997	58,54%	41,46%	89,38%	10,62%
1998	44,94%	55,06%	85,94%	14,06%
1999	61,60%	38,40%	83,91%	16,09%
2000	55,73%	44,27%	82,92%	17,08%
2001	40,01%	59,99%	80,88%	19,12%
2002	41,25%	58,75%	76,10%	23,90%
2003	38,64%	61,36%	78,20%	21,80%
2004	42,96%	57,04%	78,97%	21,03%
2005	46,61%	53,39%	76,66%	23,34%
2006	31,60%	68,40%	77,11%	22,89%
2007	38,23%	61,77%	79,09%	20,91%
2008	38,45%	61,55%	75,70%	24,30%
2009	30,83%	69,17%	73,54%	26,46%
2010	33,27%	66,73%	74,37%	25,63%
2011	40,36%	59,64%	73,54%	26,46%
2012	29,56%	70,44%	70,12%	29,88%
2013	34,78%	65,22%	71,43%	28,57%
2014	35,79%	64,21%	69,06%	30,94%
2015	28,64%	71,36%	66,68%	33,32%
2016	37,94%	62,06%	65,64%	34,36%
Average	41,39%	58,61%	78,04%	21,96%
Min	28,64%	38,40%	65,64%	10,27%
Max	61,60%	71,36%	89,73%	34,36%
Std Dev	9,13%	9,13%	7,17%	7,17%
Range	32,96%	32,96%	24,09%	24,09%

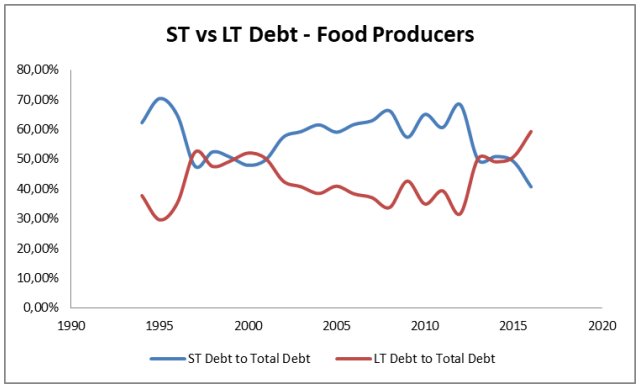
Food Producers				
	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	62,25%	37,75%	87,39%	12,61%
1995	70,39%	29,61%	85,98%	14,02%
1996	64,73%	35,27%	82,22%	17,78%
1997	47,64%	52,36%	82,59%	17,41%
1998	52,44%	47,56%	77,75%	22,25%
1999	50,62%	49,38%	75,15%	24,85%
2000	47,95%	52,05%	72,39%	27,61%
2001	49,80%	50,20%	70,72%	29,28%
2002	57,44%	42,56%	68,34%	31,66%
2003	59,26%	40,74%	70,83%	29,17%
2004	61,53%	38,47%	62,28%	37,72%
2005	59,09%	40,91%	61,68%	38,32%
2006	61,68%	38,32%	61,83%	38,17%
2007	62,91%	37,09%	62,15%	37,85%
2008	66,26%	33,74%	64,39%	35,61%
2009	57,38%	42,62%	63,89%	36,11%
2010	65,05%	34,95%	69,27%	30,73%
2011	60,65%	39,35%	64,07%	35,93%
2012	68,33%	31,67%	67,77%	32,23%
2013	49,83%	50,17%	57,84%	42,16%
2014	50,89%	49,11%	63,45%	36,55%
2015	49,27%	50,73%	56,67%	43,33%
2016	40,70%	59,30%	55,48%	44,52%
Average	57,22%	42,78%	68,88%	31,12%
Min	40,70%	29,61%	55,48%	12,61%
Max	70,39%	59,30%	87,39%	44,52%
Std Dev	7,81%	7,81%	9,24%	9,24%
Range	29,69%	29,69%	31,91%	31,91%

Large Caps				
	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	62,40%	37,60%	70,90%	29,10%
1995	56,39%	43,61%	74,91%	25,09%
1996	39,14%	60,86%	72,69%	27,31%
1997	48,52%	51,48%	70,21%	29,79%
1998	41,83%	58,17%	68,49%	31,51%
1999	43,16%	56,84%	62,23%	37,77%
2000	47,18%	52,82%	63,79%	36,21%
2001	47,80%	52,20%	62,83%	37,17%
2002	44,85%	55,15%	61,00%	39,00%
2003	51,29%	48,71%	63,50%	36,50%
2004	48,24%	51,76%	61,83%	38,17%
2005	41,71%	58,29%	58,43%	41,57%
2006	39,39%	60,61%	55,79%	44,21%
2007	50,22%	49,78%	59,80%	40,20%
2008	41,76%	58,24%	53,54%	46,46%
2009	33,65%	66,35%	50,71%	49,29%
2010	31,22%	68,78%	49,25%	50,75%
2011	35,06%	64,94%	51,45%	48,55%
2012	32,24%	67,76%	49,69%	50,31%
2013	24,40%	75,60%	46,77%	53,23%
2014	28,00%	72,00%	46,79%	53,21%
2015	22,32%	77,68%	42,35%	57,65%
2016	26,99%	73,01%	43,77%	56,23%
Average	40,77%	59,23%	58,29%	41,71%
Min	22,32%	37,60%	42,35%	25,09%
Max	62,40%	77,68%	74,91%	57,65%
Std Dev	10,35%	10,35%	9,59%	9,59%
Range	40,07%	40,07%	32,56%	32,56%

Figure 30: Change in Short Term vs. Long Term Debt







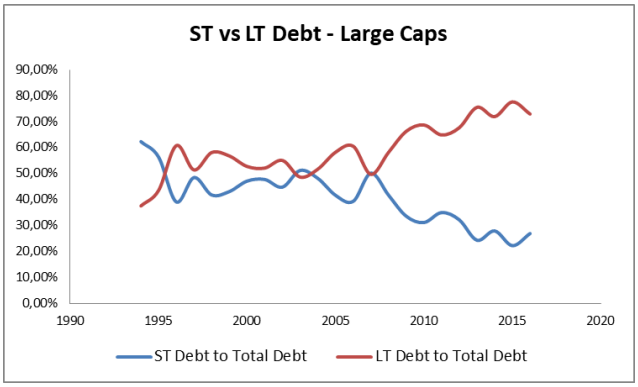
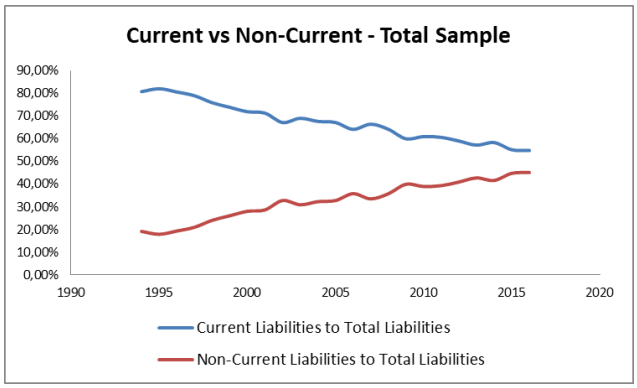
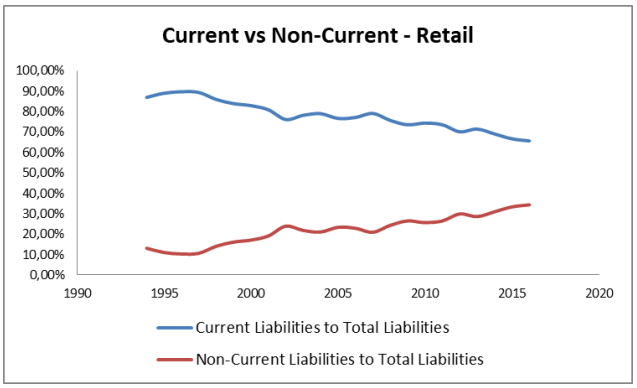
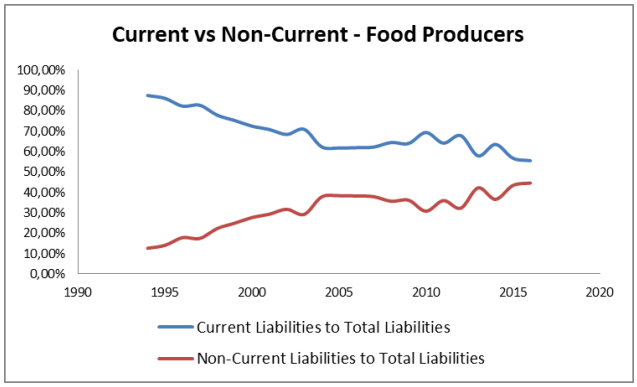
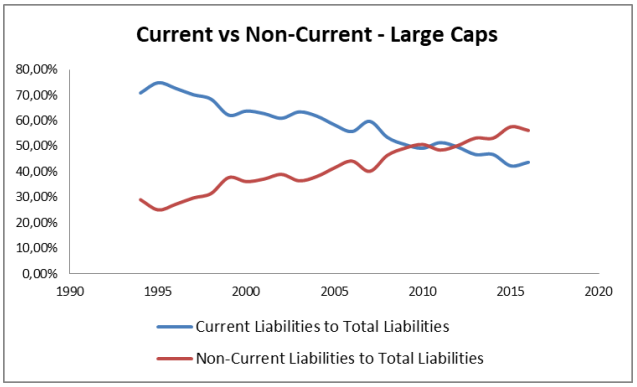


Figure 31: Change in Current vs. Non-Current Liabilities









6. Conclusion

The purpose of this paper was to determine how corporate debt levels have changed in South Africa from 1994 through 2016 given the drastic changes in the South African economic climate over the past three decades, as well as to determine which drivers of capital structure are most significant. A total of 68 firms from three different sectors namely large capitalisation stocks, retail firms and food producers, were sampled. This paper forms part of a larger study thus other sectors will be covered by different authors.

This paper made use of four different measures of leverage namely debt to book value of equity, debt to market value of equity, total liabilities to book values of equity and lastly debt to market value of equity. Six determinants of capital structure namely size, tangibility of assets, profitability, growth, cost of raising debt and the corporate tax rate were used to measure their significance in the capital structure decision making of South African corporates.

Over the period of consideration we have seen some structural changes in the South African economy which forms the backdrop of this study. Since the end of apartheid we have seen a lifting of sanctions against South Africa by some of the world's largest economies such as USA, Japan and Europe. This has allowed South African firms to compete again on a global scale and in turn has drastically increased the possibilities and scope for South African corporates.

Secondly we have seen the BESA receive their licence in 1996 and in turn have grown to the largest bond exchange on the continent with over R2 trillion bonds in issue. This has drastically increased the accessibility to capital for South African corporates.

Thirdly we have seen a drastic decrease in the cost of lending in South Africa. The yield on South African long term bonds has decreased from 18.3% in 1998 to an average yield of

8.3% from 2010 onwards. This has made raising capital in terms of bond issuance much more attractive for these corporates.

The analysis of the results nonetheless confirmed the hypnotises that these structural changes in the South African economy would drastically increase the attractiveness as well as willingness for South African Corporates to increase their use of debt. It is however evident by the results that all firms have increased their use of debt using some aggregate measure of leverage. Large capitalisation stocks have seen the largest increase in their use of debt. This is in line with the Frank and Goyal (2009) study which showed that larger firms with more diverse income streams tend to have a greater appetite for debt. Further reiterating this hypothesis is the fact that South African corporates have been granted much broader opportunities since the end of apartheid and lifting of sanctions which would have benefited the capabilities and financial strength of larger firms.

The analysis of the study also revealed that South African corporates have increased their use of long term debt in respect to short term debt under the period of consideration. This change has been rather robust after the 2008 financial crises. The decrease in the long bond rate of South Africa could possibly explain this trend but deeper study into the different maturities of corporate debt would be needed to get to an accurate conclusion.

Current liabilities in respect to non-Current liabilities have seen a convergence to a more equal distribution between these two balance sheet sections. This again confirms the analysis that firms have drastically increased their use of long term debt in respect to short term debt. Shorter term maturities have been swapped for longer term maturities which in turn has increased non-current liabilities and decreased current liabilities resulting in the convergence that the results have shown.

The analysis of capital structure determinants yielded the following results:

- Firm size showed statistical significance under TDBV, TLBV, TDMV but limited significance under TLMV. It is thus possible to conclude that large firms tend to use more debt. This is in line with the study conducted by Frank and Goyal (2009). Larger firms tend to have more diversified income streams therein decreasing their risk. Larger firms also have increased opportunities domestically and globally which should increase their appetite for debt to fund these projects.
- Tangibility of assets was found to be negatively correlated to all leverage measures but none showed statistical significance. This contradicts the trade-off theory as alluded to by Jense and Mekling (1976) as well as Pandy (2001) but is in agreement with the pecking order theory.
- Profitability reflected mixed results with no statistical significance. Profitability also showed a positive correlation to both book value ratios and negative correlation to market value ratios.
- Growth reflected a positive correlation and showed statistical significance to all leverage measures. This supports the Pandy (2001) study. Firms in a high growth phase need to fund their underlying asset base to keep up with demand.
- Cost of debt showed a negative correlation as well as statistical significance. This supports the hypothesis that if cost of debt decreases it increases the attractiveness of debt financing and vice versa.
- Corporate tax rate reflected a negative correlation as well as statistical significance. This is not aligned with the Gropp and Ebril (1997) study which showed that an increase in corporate tax rate would increase leverage as firms would put more emphasis on interest deduction to shield profits from tax.

To conclude this study it was found that corporates have increased their use of debt since 1994. The main drivers of this reform were the lifting of sanctions against South African corporates, the founding of the Bond Exchange of South Africa which increased the accessibility to capital as well as the decrease in cost associated to raising capital.

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7. References

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8. Appendix

Appendix A-1 Sample of Stocks

Share name	Ticker	Industry	Share name	Ticker	Industry
British American Tobacco	BTI	Tobacco	Truw orths International Limited	TRU	General Retailers
AB InBev	ANB	Beverages	Imperial Holdings Limited	IPL	General Retailers
Naspers Limited	NPN	Media	Pick N Pay Stores Limited	PIK	Food & Drug Retailers
Glencore Plc	GLN	Mining	Advtech Limited	ADH	General Retailers
Compagnie Financiere Richemont SA	CFR	Personal Goods	African And Overseas Enterprises Limited	AOO	General Retailers
BHP Billiton Plc	BIL	Industrial Metals & Mining	Alert Steel Holdings Limited	AET	General Retailers
Anglo American Plc	AGL	Mining	Cashbuild Limited	CSB	General Retailers
Steinhoff International Holdings NV	SNH	Personal Goods	Choppies Enterprises Limited	CHP	General Retailers
MTN Group Limited	MTN	Mobile Telecommunications	Combined Motor Holdings Limited	CMH	General Retailers
Vodacom Group Limited	VOD	Mobile Telecommunications	Command Holdings Limited	CMA	General Retailers
Sasol Limited	SOL	Oil & Gas Producers	Curro Holdings Limited	COH	General Retailers
South32 Limited	S32	Industrial Metals & Mining	Holdsport Limited	HSP	General Retailers
Aspen Pharmacare Holdings	APN	Pharmaceuticals	Homechoice International Plc	HIL	General Retailers
Mediclinic International Limited	MEI	Health Care	Italtile Limited	ITE	General Retailers
Mondi Limited	MND	Forestry & Paper	Lew is Group Limited	LEW	General Retailers
Shoprite Holdings Limited	SHP	Food & Drug Retailers	Rex Trueform Clothing Company Ltd	RTO	General Retailers
Anglo American Platinium Limited	AMS	Mining	Super Group Limited	SPG	General Retailers
Tiger Brands Limited	TBS	Food Producers	Verimark Holdings Limited	VMK	General Retailers
Woolw orths Holdings Limited	WHL	General Retailers	Massmart Holdings Limited	MSM	Food & Drug Retailers
Anglogold Ashanti Limited	ANG	Mining	Pick N Pay Holdings Limited	PWK	Food & Drug Retailers
Kumba Iron Ore Limited	KIO	Industrial Metals & Mining	AH-Vest Limited	AHL	Food Producers
The Bidvest Group Limited	BVT	General Industrials	Dis-Chem Pharmacies	DCP	Food & Drug Retailers
Sappi Limited	SAP	Forestry & Paper	Astral Foods Limited	ARL	Food Producers
Netcare Limited	NTC	Health Care	AVI Limited	AVI	Food Producers
Mr Price Group Limited	MRP	General Retailers	Aw ethu Brew eries Limited	AWT	Food Producers
Assore Limited	ASR	Industrial Metals & Mining	Clover Industries Limited	CLR	Food Producers
Pioneer Food Group Limited	PFG	Food Producers	Crookes Brothers Limited	CKS	Food Producers
Gold Fields Limited	GFI	Mining	Nutritional Holdings Limited	NUT	Food Producers
Telkom SA SOC Limited	TKG	Fixed Line Telecommunications	Oceana Group Limited	OCE	Food Producers
Impala Platinum Holdings Limited	IMP	Mining	Quantum Food Holdings Limited	QFH	Food Producers
Life Healthcare Group Holdings Ltd	LHC	Health Care	RCL Foods Limited	RCL	Food Producers
The SPAR Group Limited	SPP	Food & Drug Retailers	Rhodes Food Group Holdings Limited	RFG	Food Producers
Mondi Plc	MNP	General Industrials	Sovereign Food Investments Limited	SOV	Food Producers
The Foschini Group Limited	TFG	General Retailers	Tongaat Hulett Limited	TON	Food Producers

Total Sample															
	Debt to BV of Equity	Total Liabilities to BV Equity	Debt to MV of Equity	Total Liabilities to MV Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	21,11%	106,30%	16,68%	96,75%	13,87	44,27	35,93%	12,57%	13,69	16,25%	35,00%	56,40%	43,60%	80,79%	19,21%
1995	18,22%	97,33%	10,44%	56,20%	14,17	77,80	35,08%	11,09%	13,89	18,50%	35,00%	54,79%	45,21%	82,07%	17,93%
1996	18,40%	96,94%	6,64%	46,05%	14,19	56,56	36,36%	13,52%	14,00	20,25%	35,00%	44,94%	55,06%	80,64%	19,36%
1997	18,83%	84,52%	13,74%	64,99%	14,32	63,92	39,18%	9,75%	14,24	19,25%	35,00%	50,09%	49,91%	79,00%	21,00%
1998	20,26%	88,48%	19,47%	78,82%	14,59	38,99	40,23%	10,07%	14,51	23,00%	30,00%	41,75%	58,25%	75,94%	24,06%
1999	48,23%	134,88%	22,17%	86,17%	14,85	18,02	42,44%	9,64%	14,73	15,50%	30,00%	54,11%	45,89%	73,90%	26,10%
2000	54,70%	158,74%	26,25%	105,94%	14,79	79,25	37,90%	11,59%	14,61	14,50%	30,00%	50,69%	49,31%	71,96%	28,04%
2001	36,11%	127,59%	21,78%	100,14%	14,88	88,96	35,90%	12,63%	14,68	13,00%	30,00%	45,23%	54,77%	71,34%	28,66%
2002	37,69%	124,15%	26,37%	101,30%	15,03	86,56	36,50%	11,85%	14,86	17,00%	30,00%	44,89%	55,11%	67,19%	32,81%
2003	38,14%	123,93%	22,04%	94,71%	15,16	48,20	36,76%	15,26%	14,96	11,50%	30,00%	49,62%	50,38%	69,05%	30,95%
2004	49,84%	141,34%	16,18%	67,58%	15,30	99,68	38,75%	15,19%	15,04	11,00%	30,00%	50,78%	49,22%	67,69%	32,31%
2005	31,62%	122,78%	10,49%	53,87%	15,37	34,85	37,53%	18,61%	15,13	10,50%	29,00%	52,55%	47,45%	67,21%	32,79%
2006	56,41%	167,15%	17,45%	57,85%	15,92	51,74	35,85%	17,23%	15,68	12,50%	29,00%	41,50%	58,50%	64,17%	35,83%
2007	46,66%	153,09%	18,14%	59,38%	16,09	92,12	35,35%	17,67%	15,87	14,50%	29,00%	49,36%	50,64%	66,45%	33,55%
2008	60,59%	165,61%	41,67%	107,02%	16,34	34,03	34,85%	14,98%	16,17	15,00%	28,00%	47,00%	53,00%	64,20%	35,80%
2009	61,35%	161,55%	57,09%	141,39%	16,43	42,95	36,25%	12,72%	16,21	10,50%	28,00%	39,43%	60,57%	60,02%	39,98%
2010	49,25%	134,74%	28,12%	80,02%	16,42	49,90	36,04%	16,18%	16,24	9,00%	28,00%	38,49%	61,51%	61,00%	39,00%
2011	45,75%	127,70%	26,05%	74,26%	16,44	58,75	37,04%	15,92%	16,32	9,00%	28,00%	43,33%	56,67%	60,63%	39,37%
2012	38,98%	116,52%	23,59%	64,34%	16,59	30,77	35,85%	13,97%	16,48	8,50%	28,00%	38,06%	61,94%	59,04%	40,96%
2013	47,28%	125,51%	28,26%	74,58%	16,69	16,04	35,91%	11,12%	16,62	8,50%	28,00%	35,27%	64,73%	57,23%	42,77%
2014	51,20%	134,54%	23,90%	67,22%	16,66	14,63	36,23%	11,23%	16,62	9,25%	28,00%	36,93%	63,07%	58,35%	41,65%
2015	52,57%	133,50%	31,54%	80,53%	16,74	72,98	36,41%	9,79%	16,80	9,75%	28,00%	32,46%	67,54%	55,20%	44,80%
2015	48,21%	127,42%	24,01%	71,46%	16,86	27,85	35,92%	10,06%	16,88	10,50%	28,00%	34,94%	65,06%	54,87%	45,13%
Average	41,36%	128,45%	23,13%	79,59%	15,55	53,43	36,88%	13,16%	15,40	13,36%	29,96%	44,90%	55,10%	67,30%	32,70%
Min	18,22%	84,52%	6,64%	46,05%	13,87	14,63	34,85%	9,64%	13,69	8,50%	28,00%	32,46%	43,60%	54,87%	17,93%
Max	61,35%	167,15%	57,09%	141,39%	16,86	99,68	42,44%	18,61%	16,88	23,00%	35,00%	56,40%	67,54%	82,07%	45,13%
Std Dev	13,95%	23,37%	10,65%	22,16%	0,98	25,48	1,78%	2,76%	1,02	4,17%	2,51%	6,96%	6,96%	8,48%	8,48%
Range	43,13%	82,63%	50,45%	95,33%	2,99	85,05	7,59%	8,97%	3,18	14,50%	7,00%	23,94%	23,94%	27,20%	27,20%

Retail															
	Debt to BV of Equity	Total Liabilities to BV Equity	Debt to MV of Equity	Total Liabilities to MV Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	25,38%	144,96%	20,46%	134,75%	13,58	20,77	21,08%	11,37%	12,89	16,25%	35,00%	54,28%	45,72%	86,92%	13,08%
1995	19,28%	133,56%	10,25%	82,10%	12,92	45,05	19,64%	8,00%	13,02	18,50%	35,00%	46,55%	53,45%	88,99%	11,01%
1996	17,21%	142,96%	3,35%	55,30%	14,06	19,23	20,11%	8,21%	13,37	20,25%	35,00%	41,49%	58,51%	89,73%	10,27%
1997	19,28%	114,56%	7,87%	85,63%	14,16	40,36	24,84%	8,51%	13,71	19,25%	35,00%	58,54%	41,46%	89,38%	10,62%
1998	17,38%	113,47%	5,29%	83,65%	14,31	9,52	25,19%	9,75%	13,84	23,00%	30,00%	44,94%	55,06%	85,94%	14,06%
1999	22,93%	114,80%	11,29%	104,92%	14,47	8,82	26,88%	6,85%	14,13	15,50%	30,00%	61,60%	38,40%	83,91%	16,09%
2000	17,12%	127,59%	19,69%	145,63%	14,43	18,18	22,52%	8,24%	14,16	14,50%	30,00%	55,73%	44,27%	82,92%	17,08%
2001	15,15%	118,96%	13,86%	136,95%	14,40	133,31	22,01%	6,99%	14,02	13,00%	30,00%	40,01%	59,99%	80,88%	19,12%
2002	29,73%	128,42%	15,34%	124,67%	14,51	122,18	22,66%	1,75%	14,29	17,00%	30,00%	41,25%	58,75%	76,10%	23,90%
2003	26,88%	129,72%	12,28%	123,49%	14,67	72,62	22,45%	11,71%	14,42	11,50%	30,00%	38,64%	61,36%	78,20%	21,80%
2004	62,69%	182,67%	9,20%	82,84%	14,90	180,60	22,03%	11,59%	14,53	11,00%	30,00%	42,96%	57,04%	78,97%	21,03%
2005	29,73%	148,14%	10,03%	74,52%	14,97	38,56	22,44%	14,36%	14,64	10,50%	29,00%	46,61%	53,39%	76,66%	23,34%
2006	39,23%	195,07%	12,71%	68,63%	15,77	54,63	22,75%	17,24%	15,16	12,50%	29,00%	31,60%	68,40%	77,11%	22,89%
2007	30,41%	196,31%	10,69%	72,43%	15,94	173,06	23,16%	16,66%	15,31	14,50%	29,00%	38,23%	61,77%	79,09%	20,91%
2008	41,94%	188,01%	26,95%	117,98%	16,18	33,71	21,51%	15,48%	15,65	15,00%	28,00%	38,45%	61,55%	75,70%	24,30%
2009	44,18%	187,77%	66,61%	203,08%	16,25	84,59	22,40%	14,46%	15,67	10,50%	28,00%	30,83%	69,17%	73,54%	26,46%
2010	30,08%	151,35%	13,74%	86,68%	16,26	73,24	23,13%	14,90%	15,73	9,00%	28,00%	33,27%	66,73%	74,37%	25,63%
2011	32,38%	143,64%	15,66%	75,78%	16,19	92,44	25,90%	15,56%	15,76	9,00%	28,00%	40,36%	59,64%	73,54%	26,46%
2012	33,71%	136,67%	12,88%	57,70%	16,25	48,03	24,30%	15,85%	15,85	8,50%	28,00%	29,56%	70,44%	70,12%	29,88%
2013	40,60%	141,96%	15,66%	63,92%	16,37	17,39	25,64%	13,48%	16,00	8,50%	28,00%	34,78%	65,22%	71,43%	28,57%
2014	49,22%	159,02%	16,58%	67,15%	16,38	18,30	25,48%	13,32%	16,07	9,25%	28,00%	35,79%	64,21%	69,06%	30,94%
2015	49,14%	155,44%	15,14%	65,85%	16,47	161,79	25,35%	13,24%	16,22	9,75%	28,00%	28,64%	71,36%	66,68%	33,32%
2016	45,22%	151,27%	18,61%	79,86%	16,64	52,18	25,02%	12,61%	16,36	10,50%	28,00%	37,94%	62,06%	65,64%	34,36%
Average	32,12%	148,10%	15,83%	95,37%	15,22	66,03	23,33%	11,75%	14,82	13,36%	29,96%	41,39%	58,61%	78,04%	21,96%
Min	15,15%	113,47%	3,35%	55,30%	12,92	8,82	19,64%	1,75%	12,89	8,50%	28,00%	28,64%	38,40%	65,64%	10,27%
Max	62,69%	196,31%	66,61%	203,08%	16,64	180,60	26,88%	17,24%	16,36	23,00%	35,00%	61,60%	71,36%	89,73%	34,36%
Std Dev	12,64%	26,07%	12,20%	35,85%	1,09	53,83	1,94%	3,89%	1,07	4,17%	2,51%	9,13%	9,13%	7,17%	7,17%
Range	47,55%	82,84%	63,26%	147,78%	3,71	171,78	7,24%	15,49%	3,47	14,50%	7,00%	32,96%	32,96%	24,09%	24,09%

Food Producers															
	Debt to BV of Equity	Total Liabilities to BV Equity	Debt to MV of Equity	Total Liabilities to MV Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	21,30%	82,09%	18,33%	67,13%	14,26	10,96	48,42%	7,36%	14,08	16,25%	35,00%	62,25%	37,75%	87,39%	12,61%
1995	18,45%	77,68%	5,94%	29,08%	14,44	11,31	47,69%	11,58%	14,18	18,50%	35,00%	70,39%	29,61%	85,98%	14,02%
1996	20,84%	79,00%	15,05%	50,67%	14,15	4,05	46,58%	13,19%	13,94	20,25%	35,00%	64,73%	35,27%	82,22%	17,78%
1997	14,26%	76,59%	10,26%	55,66%	14,33	26,24	43,37%	11,68%	14,08	19,25%	35,00%	47,64%	52,36%	82,59%	17,41%
1998	20,02%	83,99%	28,15%	93,79%	14,42	33,94	45,46%	8,14%	14,20	23,00%	30,00%	52,44%	47,56%	77,75%	22,25%
1999	22,88%	81,28%	28,15%	88,97%	14,45	30,60	47,88%	8,07%	14,20	15,50%	30,00%	50,62%	49,38%	75,15%	24,85%
2000	142,19%	285,11%	46,53%	117,07%	13,94	162,88	43,81%	12,75%	13,56	14,50%	30,00%	47,95%	52,05%	72,39%	27,61%
2001	51,20%	150,10%	28,17%	98,39%	14,09	34,59	41,47%	11,94%	13,71	13,00%	30,00%	49,80%	50,20%	70,72%	29,28%
2002	41,13%	133,16%	32,86%	103,61%	14,26	69,55	38,41%	12,92%	13,84	17,00%	30,00%	57,44%	42,56%	68,34%	31,66%
2003	40,93%	126,36%	38,32%	108,30%	14,40	40,62	38,01%	15,11%	13,93	11,50%	30,00%	59,26%	40,74%	70,83%	29,17%
2004	33,56%	104,49%	33,23%	82,87%	12,92	68,32	44,36%	13,16%	13,93	11,00%	30,00%	61,53%	38,47%	62,28%	37,72%
2005	22,14%	93,92%	12,29%	48,82%	12,90	45,00	44,39%	16,88%	13,94	10,50%	29,00%	59,09%	40,91%	61,68%	38,32%
2006	22,71%	89,25%	12,09%	48,00%	12,93	88,85	42,48%	17,90%	14,09	12,50%	29,00%	61,68%	38,32%	61,83%	38,17%
2007	25,56%	87,38%	11,16%	40,40%	12,81	39,60	39,28%	19,64%	13,97	14,50%	29,00%	62,91%	37,09%	62,15%	37,85%
2008	54,07%	130,76%	28,53%	73,19%	13,27	32,22	41,00%	10,10%	14,23	15,00%	28,00%	66,26%	33,74%	64,39%	35,61%
2009	36,67%	109,62%	40,63%	95,91%	13,39	15,20	39,70%	5,98%	14,31	10,50%	28,00%	57,38%	42,62%	63,89%	36,11%
2010	38,36%	101,70%	37,52%	87,44%	14,69	60,24	36,43%	11,66%	14,35	9,00%	28,00%	65,05%	34,95%	69,27%	30,73%
2011	32,71%	95,09%	28,08%	71,23%	14,72	50,48	36,66%	11,85%	14,44	9,00%	28,00%	60,65%	39,35%	64,07%	35,93%
2012	22,42%	80,78%	17,86%	56,17%	14,83	32,69	36,09%	13,03%	14,56	8,50%	28,00%	68,33%	31,67%	67,77%	32,23%
2013	33,58%	95,57%	22,91%	65,64%	14,90	13,52	34,01%	7,56%	14,76	8,50%	28,00%	49,83%	50,17%	57,84%	42,16%
2014	32,72%	104,02%	18,72%	64,37%	15,03	9,39	37,27%	7,06%	14,77	9,25%	28,00%	50,89%	49,11%	63,45%	36,55%
2015	37,28%	107,19%	16,76%	55,28%	15,11	15,95	37,23%	9,74%	14,97	9,75%	28,00%	49,27%	50,73%	56,67%	43,33%
2016	37,03%	103,80%	19,75%	64,33%	15,20	16,55	37,85%	9,49%	15,05	10,50%	28,00%	40,70%	59,30%	55,48%	44,52%
Average	35,74%	107,78%	23,97%	72,45%	14,15	39,69	41,21%	11,60%	14,22	13,36%	29,96%	57,22%	42,78%	68,88%	31,12%
Min	14,26%	76,59%	5,94%	29,08%	12,81	4,05	34,01%	5,98%	13,56	8,50%	28,00%	40,70%	29,61%	55,48%	12,61%
Max	142,19%	285,11%	46,53%	117,07%	15,20	162,88	48,42%	19,64%	15,05	23,00%	35,00%	70,39%	59,30%	87,39%	44,52%
Std Dev	25,44%	43,41%	10,94%	23,47%	0,76	34,71	4,30%	3,54%	0,39	4,17%	2,51%	7,81%	7,81%	9,24%	9,24%
Range	127,93%	208,52%	40,59%	87,99%	2,39	158,83	14,41%	13,66%	1,49	14,50%	7,00%	29,69%	29,69%	31,91%	31,91%

Large Caps																
	Debt to BV of Equity	Total Liabilities to BV Equity	Debt to MV of Equity	Total Liabilities to MV Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	ST Debt to Total Debt	LT Debt to Total Debt	Current Liabilities to Total Liabilities	Non-Current Liabilities to Total Liabilities
1994	30,24%	123,41%	28,67%	185,50%	14,73	15,91	39,68%	11,42%	14,69	16,25%	35,00%	62,40%	37,60%	70,90%	29,10%
1995	20,04%	99,22%	19,90%	138,79%	14,95	7,46	37,42%	8,89%	15,00	18,50%	35,00%	56,39%	43,61%	74,91%	25,09%
1996	25,58%	105,22%	6,82%	28,69%	14,96	71,63	37,05%	16,10%	14,99	20,25%	35,00%	39,14%	60,86%	72,69%	27,31%
1997	20,11%	87,52%	10,91%	31,50%	15,15	58,46	40,82%	10,61%	15,22	19,25%	35,00%	48,52%	51,48%	70,21%	29,79%
1998	24,81%	92,94%	8,93%	33,13%	15,46	14,79	41,39%	8,49%	15,49	23,00%	30,00%	41,83%	58,17%	68,49%	31,51%
1999	88,33%	201,88%	16,26%	44,02%	15,68	14,83	44,13%	10,92%	15,74	15,50%	30,00%	43,16%	56,84%	62,23%	37,77%
2000	70,35%	171,40%	14,30%	40,81%	15,88	99,99	39,66%	12,05%	15,96	14,50%	30,00%	47,18%	52,82%	63,79%	36,21%
2001	51,95%	136,01%	17,31%	48,69%	15,98	47,98	35,07%	15,94%	16,15	13,00%	30,00%	47,80%	52,20%	62,83%	37,17%
2002	42,01%	124,76%	28,95%	67,23%	16,14	24,60	36,23%	14,47%	16,27	17,00%	30,00%	44,85%	55,15%	61,00%	39,00%
2003	48,62%	125,92%	18,24%	51,08%	16,27	11,82	36,72%	11,31%	16,36	11,50%	30,00%	51,29%	48,71%	63,50%	36,50%
2004	40,93%	120,28%	13,25%	41,46%	16,41	10,01	37,97%	11,87%	16,51	11,00%	30,00%	48,24%	51,76%	61,83%	38,17%
2005	46,21%	128,59%	12,29%	33,75%	16,55	12,98	38,36%	15,16%	16,68	10,50%	29,00%	41,71%	58,29%	58,43%	41,57%
2006	52,35%	121,43%	16,80%	37,20%	17,28	18,21	37,28%	16,98%	17,44	12,50%	29,00%	39,39%	60,61%	55,79%	44,21%
2007	57,07%	123,28%	18,02%	38,36%	17,47	18,98	35,87%	14,98%	17,66	14,50%	29,00%	50,22%	49,78%	59,80%	40,20%
2008	73,09%	149,77%	43,81%	81,96%	17,80	24,18	35,15%	11,66%	18,17	15,00%	28,00%	41,76%	58,24%	53,54%	46,46%
2009	78,86%	149,92%	40,52%	72,21%	17,87	8,77	38,97%	13,38%	18,06	10,50%	28,00%	33,65%	66,35%	50,71%	49,29%
2010	58,04%	120,03%	25,76%	48,55%	17,88	11,94	39,31%	14,71%	18,08	9,00%	28,00%	31,22%	68,78%	49,25%	50,75%
2011	50,52%	111,95%	24,79%	51,07%	18,00	14,95	39,35%	15,50%	18,29	9,00%	28,00%	35,06%	64,94%	51,45%	48,55%
2012	58,78%	124,45%	27,65%	55,31%	18,30	10,94	37,73%	12,51%	18,57	8,50%	28,00%	32,24%	67,76%	49,69%	50,31%
2013	64,35%	124,96%	37,64%	69,88%	18,47	9,46	38,36%	10,46%	18,79	8,50%	28,00%	24,40%	75,60%	46,77%	53,23%
2014	73,24%	136,18%	33,48%	61,40%	18,60	9,51	37,67%	11,14%	18,94	9,25%	28,00%	28,00%	72,00%	46,79%	53,21%
2015	75,56%	137,75%	53,44%	97,49%	18,59	4,92	39,78%	6,87%	19,12	9,75%	28,00%	22,32%	77,68%	42,35%	57,65%
2016	64,23%	122,64%	28,80%	55,29%	18,71	5,41	38,62%	7,51%	19,16	10,50%	28,00%	26,99%	73,01%	43,77%	56,23%
Average	52,84%	127,80%	23,76%	61,45%	16,83	22,95	38,37%	12,30%	1701,49%	13,36%	29,96%	40,77%	59,23%	58,29%	41,71%
Min	20,04%	87,52%	6,82%	28,69%	14,73	4,92	35,07%	6,87%	1469,23%	8,50%	28,00%	22,32%	37,60%	42,35%	25,09%
Max	88,33%	201,88%	53,44%	185,50%	18,71	99,99	44,13%	16,98%	1915,75%	23,00%	35,00%	62,40%	77,68%	74,91%	57,65%
Std Dev	19,59%	24,56%	12,01%	36,75%	1,35	23,91	2,08%	2,84%	147,66%	4,17%	2,51%	10,35%	10,35%	9,59%	9,59%
Range	68,30%	114,36%	46,61%	156,81%	3,98	95,06	9,06%	10,11%	446,52%	14,50%	7,00%	40,07%	40,07%	32,56%	32,56%