

Evolution of Corporate Leverage on the JSE from 1994 to 2016

By

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Research Paper presented as a minor dissertation in the fulfilment of the requirements for the degree of Master's in Financial Management

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Abstract

In this paper, an attempt has been made to examine the evolution of corporate leverage of companies listed on the Johannesburg Stock Exchange (JSE) from 1994 to 2016. Analysis of the data set is organized around a sample of 126 listed companies across twelve sub-sector industries, namely, Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services. 621 delisted companies were also briefly analysed to eliminate survivorship bias. Results of multiple regressions using two primary leverage measures and six commonly used determinants of capital structure were varied. Tangibility and growth were negatively related to debt while cost of debt was positively related to debt. Firm size, profitability and corporate tax rate yielded a varied relationship with corporate leverage. Only the growth capital structure determinant showed statistical significance. The overall findings indicate a rise in corporate leverage that coincides in tandem with major local and international economic events.

Keywords:

Capital Structure Theory, Capital Structure Determinants, JSE, Capital Markets, Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment, Support Services.

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1. Introduction

This paper aims to shed light on the evolution and determination of corporate financial policy on South Africa's Johannesburg Stock Exchange (JSE) by formulating an analysis of a panel data set contained in annual reports and other public financial market information over the post-democratic period in South Africa, from 1994 to 2016. The data set is organized around a sample of 126 listed companies across twelve sub-sector industries in order to mainly examine changes in corporate capital structures over the post-democratic dispensation period within each sub-sector industry. The twelve sub-sector industries are Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services. 621 delisted firms were also analysed to examine the impact of survivorship bias. The study is based on a paper by Graham, Leary and Roberts (2014) titled "A century of capital structure: The leveraging of Corporate America", where the authors studied the last century's capital structure of listed firms on the NYSE, Nasdaq, Amex and Moody's Industrial Manual which included a large number of smaller firms listed on regional exchanges. Various measures of leverage for listed firms were utilized including total liabilities to assets, interest-bearing debt to capital and total debt to book value of equity/market value of equity. To adequately examine periodic trends, an emphasis was placed on sub-dividing the years into three five-year intervals and one four-year interval constituted as – 1994 to 1999, 2000 to 2005, 2006 to 2011 and 2012 to 2016 in order to capture the impact of local and international economic events and crises such as the East Asian Financial Crisis, dot-com bubble and the Global Financial Crisis, amongst others.

A regression model was applied for each of the leverage ratios, within the total sample and each of the twelve sub-sectors, namely, Total Debt over Market Value of Equity (TDMV) and Total Debt over Book Value of Equity (TDBV). This study explored descriptive statistics and capital structure determinants of firm size, tangibility of assets, profitability, growth, cost of debt and corporate tax rate, for the aggregate total sample and also for Banks, Financial Services, Life Insurance, Fixed Line

Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services sub-sectors. Share price and accounting data was obtained from three sources; data hand-collected from and emailed by JSE Limited, IRESS South Africa database and Bloomberg. Division of the data is based on the JSE sub-sector classification. This permits discovery of industry-specific dynamics in corporate leverage trends and for the research to be in-line with the JSE labelling structure. All ratios were computed using yearly financial statements data extracted from Iress Inet BFA for a sample consisting of 126 firms (which can be seen in Appendix 1), from 1994 until 2016 – or since the initial public offering (IPO) and Bloomberg. The South African prime interest rate extracted from Iress Inet BFA was used to measure the cost of raising capital together with the corporate tax rate.

The overall findings indicate a rise in corporate leverage with the average leverage closely hovering around the same percentages, around 31,26% for TBDV and 33,12% for TDMV. TDBV commenced at 6,55% in 1994 to 26,49% by the end of 2016. The highest TDBV recorded percentage for the period under review was 40,77% in 2009, coinciding with the year of the most pronounced impact of the Global Financial Crisis on the South African economy and capital markets. TDMV began at 11,93% in 1994 and rose to 38,31% by the end of 2016 with 2013 recording the highest percentage at 46,39%.

The paper is organised as follows. Section 2 covers the literature review which includes capital structure theories, determinants of capital structure, effects of corporate leverage on firm performance, corporate leverage trends in the United States, emergence of the South African bond market and South African interest rates. Data sources as well as methodology and research design are covered in section 3 and 4. Section 5 covers the results found and lastly section 6 concludes the paper.

2. Literature Review

2.1 Capital Structure Theories

2.1.1 The Modigliani-Miller Theorem of Capital Structure

Franco Modigliani and Merton Miller conceptualized and developed this theorem and wrote "The Cost of Capital, Corporation Finance and the Theory of Investment," which was published in the American Economic Review in the late 1950's. The cooperation between the university professors and Nobel Prize winners, Franco Modigliani and Merton Miller in 1958, resulted in what is today known as the first and one of the most important theories in the field of capital structure. (Pagano, 2005)

In their study "The cost of capital, corporation finance and the theory of investment" (1958), Franco Modigliani and Merton Miller represent what could possibly be the most important theory for the structure of capital, through which they explain the effect of the capital structure for the value of companies. (Prenaj, 2015)

Modigliani and Miller's approach to capital theory advocates capital structure irrelevancy theory. The crux of their hypothesis was that in perfect markets, it does not matter what capital structure a company uses to finance its operations. This suggests that the valuation of a firm is irrelevant to the capital structure of a company. Whether a firm is highly leveraged or has lower debt component, it has no bearing on its market value. In a world of symmetric information, the Modigliani-Miller theorem suggests that there will be no systematic relationship between the financing decision and the value of the firm. In a world with asymmetric information, that this will not always be the case. (Pyle, 1977)

The first proposition of the M&M theory was that the market capitalization of a firm was independent of its capital structure thus the debt-to-equity ratio had no bearing on its worth. The second proposition addressed whether a change in capital structure would affect the associated cost of capital, otherwise known as the rate of return required. 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). The third proposition looked at when should a firm should consider an investment opportunity. A firm should always execute an investment opportunity if the rate of return on the investment is equal or higher than the firm's average cost of capital.

In conclusion, Modigliani and Miller (1958) showed in fact that, if firms could be grouped into risk classes, then any change in the debt equity ratio of one firm could be completely offset by changes in the portfolio composition of the individual. Stiglitz (1969) extended the argument to show that the financial policy of the firm - its debt equity ratio, the maturity structure of its debt, its dividend retention ratio - was of no consequence under a much weaker set of assumptions. (Stiglitz, 1972)

2.1.2 Trade-Off Theory

Ever since Modigliani and Miller investigated an unexplored area of corporate finance with their seminal irrelevance theorem in 1958, extensive theoretical research into determinants of capital structure has been a popular field of empirical work. One of the dominating theories that emerged as a subsequent development of the Modigliani and Miller theorem was trade-off theory which studied the effects of taxes and bankruptcy costs on how firms make decision choices regarding their capital structure. Trade-off theory frictions have been used to establish "an interior optimum" for the financing decision (Kraus and Litzenberger, 1973).

The trade-off theory is centred around the idea that firms have an "optimal" capital structure that presupposes a target debt ratio and explains this target debt ratio as a trade-off between tax and other benefits against financial distress and other costs that are consequences of the use of debt (Bradley, Jarrell and Kim, 1984; Graham and Harvey, 2001; Harris and Raviv, 1991).

In the trade-off theory, a firm looks for a leverage ratio where it can take the maximum benefit of the tax shield from debt without affecting its financial distress (Shyam-Sunder and Myers, 1999; Fama and French, 2001). Which means that a firm will decide on the level of leverage and will deviate towards their target level of debt by

adjusting it accordingly on an ongoing basis. The optimal level is when the marginal value of the benefits associated with debt issues exactly offsets the increase in the present value of the costs associated with issuing more debt (Myers, 2001).

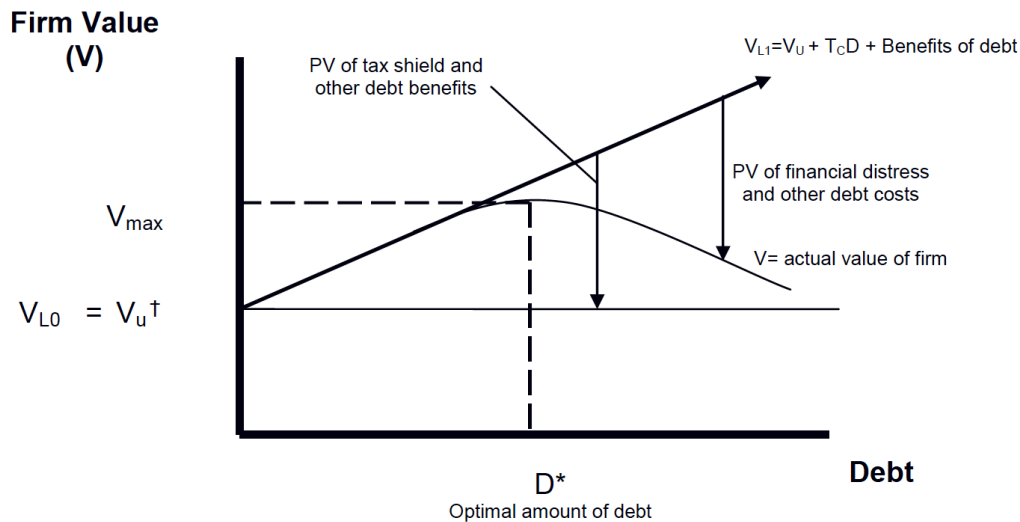
There are two forms of trade-off theories. The first is the static trade-off theory which was presented by Kraus and Litzenberger in 1973 and the dynamic trade-off theory which was later developed. Both trade-off theories predict an optimal capital structure that balances associated costs.

In their development of the static trade-off theory Kraus and Litzenberger (1973) propose to balance the bankruptcy costs and tax savings to be obtained from debt. According to the static trade-off hypothesis, a firm's performance affects its target debt ratio, which in turn is reflected in the firm's choice of securities issued and its observed debt ratios (Hovakimian et al., 2001).

However, other studies (DeAngelo and Masulis, 1980; Bradley, Jarrell and Kim, 1984) suggest that along with the trade-off of this set of costs and benefits, there are also other costs which have to be incorporated into the models. These are agency costs of debt, costs related to loss of non-debt tax shields, and costs related to differential personal tax rates between income from stocks and bonds.

Hennessy and Whited (2005) and Strebulaev (2007) focused on the existence of adjustment costs in the dynamic trade-off model to explain the observed negative relation between market leverage ratios and profitability, an approach that can also help overcome other empirical challenges inherent in tests of the static trade-off model. In essence, the dynamic trade-off theory takes into account costs of issuance and repurchasing of debt that is necessary to achieve the firm's target debt ratio in order to maximize firm value.

In addition, Hovakimian et al. (2001) found that the more profitable firms are, the more likely that they will issue debt over equity. Empirical evidence of the Dudley (2007) study supports the predictions of dynamic trade off theory, concluding that volatility increases the optimal leverage range and profitability and interest rates reduce the leverage range.



V_{max} occurs when marginal benefit of debt = marginal costs of debt.

† perfect market assumption

Figure. 1 Dynamic trade-off theory (accounting for additional benefits, costs, and taxes associated with debt)¹

2.1.3 Pecking Order Theory

Myers and Majluf (1984) posit that managers use private information to issue risky securities when they are overpriced. Investors are aware of this asymmetric information problem, and they discount the firm's new and existing risky securities when new issues are announced. Managers anticipate these price discounts, and they may forego profitable investments if they must be financed with new risky securities. To avoid this distortion of investment decisions, managers prefer to finance projects with retained earnings, which involve no asymmetric information problem, and with low-risk debt, for which the problem is negligible.

¹ Turner, JS. (2010). Business Risk and the Trade-off Theory of Capital Structure: Predicting the Use of Long-Term Debt in the Healthcare Sector. p11-p12.

In follow-up literature, Myers (1984) suggests that the costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model. The result is the pecking order. To minimize asymmetric information costs and other financing costs, firms finance investments first with retained earnings, then with safe debt, then with risky debt, and finally, under duress, with equity.

In a more complex view of the model, also offered by Myers (1984), firms are concerned with future as well as current financing costs. Balancing current and future costs, it is possible that firms with large expected investments maintain low-risk debt capacity to avoid either foregoing future investments or financing them with new risky securities. It is thus possible that, controlling for other effects, firms with larger expected investments have less current leverage.

Fama and French (2001) find that (as the pecking order model predicts) dividend payers tend to be firms with high earnings relative to investment. Thus, for dividend payers, the prediction that firms with larger expected investments have less current leverage may be on solid ground. On the other hand, Fama and French (2001) also find that firms that do not pay dividends typically have large investments relative to earnings. Thus, for nonpayers the negative relation between leverage and expected investment predicted by the complex pecking order is more tenuous, and the positive relation between leverage and investment of the simple pecking order may dominate. Fama and French (2002) used a simple pecking order model versus a complex pecking order model. Both models predicted that controlling for other effects, more profitable firms have higher dividend pay-outs, and firms with more investments have lower pay-outs. The complex pecking order model predicted a negative relation between expected investment and book leverage, if debt capacity is determined by the book value of assets. In the simple pecking order model, however, the relation between book leverage and investment is positive.

Numerous studies since the 1980's have investigated the implications of the pecking order theory in wide-ranging geographical markets and in varying time periods. The pecking order theory continues to be an influential theory that is widely studied but still remains largely controversial with tests conducted and evidence gathered in favour or

against the pecking theory. Most studies seem to be relatively scattered with no clear consensus.

2.1.4 Agency Theory

In finance, the agency theory attempts to address relationship behaviours of numerous agents such as owners and borrowers (shareholders, debtholders) and the custodians of their wealth which is the firm's management team. In view of the agency theory in finance, the relationship between the principal (owners) and the agent (management) evaluates theory influence on the firm's capital structure.

Agency theory is concerned with resolving two problems that can occur in agency relationships. The first is the agency problem that arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing. The problem here is that the principal cannot verify that the agent has behaved appropriately. The second is the problem of risk sharing that arises when the principal and agent have different attitudes toward risk. (Eisenhardt, 1989)

The relationship between a principal and the agent who acts on the principal's behalf contains the potential for conflict of interest. The principal-agent problem arises when this relationship involves misaligned incentives. The conflict of interest and agency cost arises due to the separation of ownership from control, different risk preferences, information asymmetry and moral hazard. Brigham and Gapenski (1993) define agency cost as all costs borne by shareholders to encourage managers to maximize shareholder wealth rather than act in their self-interest. Similar incentive problems exist within the financial services industry many of which were clearly illuminated by the 2008 financial crisis. (Shah, 2014)

Adam Smith (1937[1776]) is perhaps the first author to suspect the presence of agency problem. Smith forecasted in his work *The Wealth of Nations* that if an organization is managed by a person or group of persons who are not the real owners, then there is a chance that they may not work for the owners' benefit. Berle and Means (1932) later

fostered this concern in their thesis, where they argued that the agents might use the property of the firm for their own end, which will create the conflict between the principals and agents.

The financial literature in the 1960s and 1970s described the agency problem in the organizations through the problem of risk-sharing among the cooperating parties (Arrow, 1971; Wilson, 1968) involved in the organizations. There are individuals and groups in the firm having different risk tolerance and their action differs, accordingly. The principal or the owners, who invest their capital and take the risk to acquire the economic benefits, whereas the agents, who manage the firm are risk averse and concerned in maximizing their private benefits. Both the principal and agent are having opposite risk preferences and their problem in risk-sharing creates the agency conflict, which is broadly covered under the agency theory. (Leepsa, 2017)

Agency theory broadened this risk-sharing literature to include the so-called agency problem that occurs when cooperating parties have different goals and division of labor (Jensen & Meckling, 1976; Ross, 1973). Specifically, agency theory is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work. Agency theory attempts to describe this relationship using the metaphor of a contract (Jensen and Meckling, 1976).

Jensen and Meckling (1976) explored agency costs to both the principal and the agent and examined the impact of such costs on a number of other variables, including the ownership structure of the firm, the fair market value of the firm's stock, and the firm's use of debt and equity. In the later years, Harris and Raviv (1979) demonstrate the added value of monitoring in principal-agent relationships and explore the benefits of imperfect, or noisy, monitoring to the outcome of such arrangements. Fama (1980) added on to the agency theory literature by discussing the role of efficient capital and labor markets as information mechanisms that are used to control the self-serving behavior of top executives. Fama and Jensen (1983) described the role of the board of directors as an information system that the stockholders within large corporations could use to monitor the opportunism of top executives.

Eisenhardt (1989) categorised the agency theory into two models such as the positivist agency model and principal–agent model (Harris & Raviv, 1978). Both of these models are based upon the contractual relationship between the principal and agent but principal–agent model is more mathematical. Principal–agent model explains that principals are risk-neutral and profit seekers, while agents are risk averse and rent seekers. Positive agency theory explains the causes of agency problem and the cost involved in it. This theory proposes two propositions. First proposition explains that if the outcome of the contract is incentive based, then the agents act in the favour of principal. Second, if the principal is having information about the agents, then the action of the agents will be disciplined.

Empirical studies on the agency theory in the South Africa context were undertaken by JH Hall (1998) on firms listed on the Johannesburg Stock Exchange. The goal of the study was to investigate whether the agency problem exists among listed firms and responses indicated that the agency problem existed for a significant number of listed companies. Using questionnaires completed by firms listed on the Johannesburg Stock Exchange, responses received by the author displayed how shareholders at Annual General Meetings seem to concentrate more on statutory issues than on the goals of management. A significant number of companies pursued goals which could not be reconciled with an increase in shareholders' wealth. An analysis of the percentage of shares owned revealed relatively low percentage of shares owned by management and employees enhances the possibility for occurrence of the agency problem.

2.2 Determinants of Capital Structure

In this section, various research studies into determinants of capital structure will be examined. Previous academic literature exploring factors contributing to leverage decisions in both developed and developing markets and across various countries will be highlighted.

2.2.1. Determinants of Capital Structure – Developed Markets

Titman and Wessels (1988) investigated determinants of leverage choice using data from United States from 1974 to 1982. They reported that debt levels were negatively related to the “uniqueness” of a firm’s line of business. This evidence was consistent with the implications of Titman (1984) that firms could potentially impose high costs on their customers, workers, and suppliers in the event of liquidation have lower debt ratios. They concluded that transaction costs may be an important determinant of leverage choice.

Allen (1991) investigated the financial managers’ perceptions of the broad determinants of listed Australian company leverage decisions. The research method involved a series of field interviews undertaken with the company secretaries and senior financial personnel of 48 listed Australian companies. The results show that companies appear to follow a pecking order with respect to funding sources and also report policies of maintaining spare debt capacity.

Chevalier (1995) established an empirical link between firm capital structure and product-market competition using data from local supermarket competition. She first examined event-study analysis of US supermarket leveraged buyouts (LBO's) which suggested that an LBO announcement increases the market value of the LBO chain's local rivals. Thereafter, she showed that supermarket chains were more likely to enter and expand in a local market if a large share of the incumbent firms in the local market undertook LBO's. The study suggested that leverage increases in the late 1980's led to softer product-market competition in this industry.

Phillips (1995) tested for changes in firms' production and pricing decisions in four US industries in which firms sharply increased their financial leverage. The analysis of product price and quantity data showed that industry product market decisions are associated with capital structure. In three industries, output is negatively associated with the average industry debt ratio. In the one industry which showed a positive association between output and debt ratios, rival firms had low financial leverage and entry barriers were relatively low.

Gau and Wang (1990) were amongst the first to apply the theory of capital structure directly to real estate investment decisions. They developed and tested a capital structure model for US real estate investment. Their optimization model illustrated how certain characteristics of the property might affect the investor's choice of loan-to-value ratio. Based on a sample of 1,423 apartment and commercial property transactions in Vancouver between 1971 and 1985, Gau and Wang observed that the level of debt employed in a property acquisition is directly related to the cost of the investment and inversely to the size of its depreciation tax shield, expected costs of financial distress and market interest rates. Their results showed that the level of debt financing was negatively related to the amount of non-debt tax shields available, cost of financial distress and to the level of market interest rate.

Allen (1995) searched for capital structure determinants in US real estate limited partnerships. The paper modelled the capital structure decision facing partnerships and tested the implications using panel-data regression analysis for a sample of real estate limited partnerships. The model showed that if an optimal capital structure existed for non-taxed firms, it was a function of personal tax effects, costs of financial distress, and substitute tax shields. The empirical tests indicated a positive relationship between leverage and the proportion of real estate assets held, and a negative relationship between leverage and both growth rates and non-debt tax shields.

Bevan and Danbolt (2004) analysed the determinants of the leverage of 1,054 UK companies from 1991 to 1997 and the extent to which the influences of these determinants were affected by time-invariant firm-specific heterogeneity. They compared the results of pooled OLS and fixed effects panel estimation and found

significant differences in the results. While their OLS results are generally consistent with prior literature, the results of their fixed effects panel estimation contradicted many of the traditional theories of the determinants of corporate financial structure.

Barkham (1997) examined the financial structure and ethos of property companies in the UK. The main conclusion of the study was that the classification of property companies as property investment companies (PIC's) and property trading companies (PTC's) is valid. PTC's buy and develop property assets with a view to selling them on in the short term, while PICs engage in the acquisition and development of property assets to augment their portfolio which is held for long term. Due to their different ethos, the capital structures of property companies in the two categories are not the same. In particular, Barkham observed that during the study period (between 1987 and 1991) the PTC's were on average more highly-g geared than PIC's. This observation, however, contradicts the prediction of the conventional trade-off models of capital structure that risky firms should employ less debt in their capital structure.

Using data on U.S. corporate capital structures between 1965 and 2003, Arce (2015) argued that there is heterogeneity in the decision processes and strategies that managers follow and that they make adaptive adjustments to their strategies that are conditioned on the choices of other firms as well as their prior choices. They found that characterization of the evolution of corporate capital structures emphasized the roles of a firm's initial capital structure and its competitors' capital structure strategies.

A paper by Song (2005) analysed the explanatory power of some of the theories that have been proposed in the literature to explain variations in capital structures across firms. It investigated capital structure determinants of Swedish firms based on a panel data set from 1992 to 2000 comprising about 6000 companies as well as determinants of short-term and long-term debt ratios. The results indicate that most of the determinants of capital structure suggested by capital structure theories appear to be relevant for Swedish firms and that there are significant differences in the determinants of long and short-term forms of debt.

Frąckowiak et al. (2005) compared data from non-financial listed companies (1992-2002) and selected European countries (United Kingdom, Germany, and France;

1988- 2002) which indicated that enterprise growth perspectives negatively impact debt maturity structure. The authors concluded that enterprises adjust maturity deadlines of debt to the age structure of assets. Their study confirmed a negative impact of the size of an enterprise on the share of fixed assets. A negative relationship between liquidity and the share of long-term capital was also confirmed proving that higher liability is connected with higher share of long-term capital.

Chikolwa (2009) examined the determinants of capital structure in 34 Australia real estate investment trusts (A-REIT's) for the period 2003 to 2008. The results showed that tangibility and size positively influence leverage, with risk having a negative impact. No evidence was found to support A-REIT's issuance of debt when interest rates are low; however, they were less likely to default on their debt obligations in a strong real estate market. Real estate sector effects were mixed, stapled management structure and international operations had significant negative signs, showing that A-REIT's with these features should have lower gearing levels.

Goktan et al. (2009) demonstrated for a larger cross-section of firms that a firm's capital structure deviations from its industry's median capital structure significantly influences the odds of it either being acquired or going bankrupt.

Westgaard (2008) investigated determinants of capital structure in 308 UK real estate companies. Their data panel consisted of accounting data from the fiscal years 1998–2006. By using panel data regression, they found the significant factors that influenced the capital structure of the selected companies. Profitability, tangibility and size were positively related to leverage, while asset turnover and earnings variability were negatively related. The significant positive relation of profitability contradicted major findings in the capital structure literature.

Hammes and Chen (2004) analysed capital structure for 781 unlisted Swedish real estate companies and found positive relationship between tangibility and size-to-debt ratio but no significance to profit. They claim that banks and financial institutions lend more to profitable firms and firms with more tangible assets than otherwise.

Maris and Elayan (1990) and Allen (1995) study the financial structure of tax-exempt real estate investment trusts (REITs) and real estate limited partnerships (RELPs) respectively. Both studies yield results which indicate that the nature of the assets owned by an organization has a significant impact on its capital structure.

In summary, the various studies above present wide-ranging results of determinants of capital structure in developed markets. Based on the above papers, it could be argued that a firm's capital structure decision can be influenced by a multitude of determinants. Explaining capital structure determinants in developed countries using one determinant may be short of providing a holistic picture of a firm's capital structure decision.

2.2.2. Determinants of Capital Structure – Across Countries

Booth et al. (2001) analysed ten developing countries and found that capital structure decisions of firms in these countries are affected by the same firm-specific factors as in developed countries. They found that there are differences in the way leverage is affected by country-specific factors such as GDP growth and capital market development.

Deesomsak (2004) investigated the determinants of capital structure of firms operating in the Asia Pacific region, in four countries with different legal, financial and institutional environments, namely Thailand, Malaysia, Singapore and Australia. The results suggested that the capital structure decision of firms was influenced by the environment in which they operated in, as well as firm-specific factors.

Country-specific factors in determining cross country capital structure choice of firms was also acknowledged by Fan et al. (2006) who analyzed a larger sample of 39 countries and found a significant impact of a few additional country specific factors such as the degree of development in the banking sub-sector, and equity and bond markets.

In another study of 30 OECD countries, Song and Philippatos (2004) report that most

cross-sectional variation in international capital structure is caused by the heterogeneity of firm-, industry-, and country-specific determinants.

Giannetti (2003) argued that the failure to find a significant impact of country-specific variables may be due to the bias induced in many studies by including only large listed companies. She analyzed a large sample of unlisted firms from eight European countries and found a significant influence on the leverage of individual firms of a few institutional variables such as creditor protection, stock market development and legal enforcement.

Hall et al. (2004) analysed a large sample of unlisted firms from eight European countries. They observed cross-country variation in the determinants of capital structure and suggested that this variation could be due to different country-specific variables.

Lemmon, Roberts, and Zender (2008) found that the majority of variation in leverage ratios is driven by an unobserved time-invariant effect that generates surprisingly stable capital structures: High (low) levered firms tended to remain as such for over two decades. Variation in capital structures was primarily determined by factors that remain stable for long periods of time. Utilizing a primary sample consisting of all global nonfinancial firm-year observations in the annual Compustat database between 1965 and 2003, the results were shown to have important implications for empirical analysis attempting to understand capital structure heterogeneity.

DeAngelo (2015) analysed 15,096 industrial firms in the CRSP/Compustat file over 1950 to 2008 and found that capital structure stability is the exception, not the rule, and occurs primarily at low leverage, and is virtually always temporary, with many firms abandoning low leverage during the post-war boom. Industry-median leverage varied widely over time. They found that many firms have high and low leverage at different times, but few keep debt-to-assets ratios consistently above 0,500 and that target leverage models that place little or no weight on maintaining a particular ratio do a good job replicating the substantial instability of the actual leverage cross-section.

Jong, Kabir and Nguyen (2007) analysed the importance of firm-specific and country-specific factors in the leverage choice of firms from 42 countries around the world. They constructed a database of nearly 12,000 firms (about 60,000 firm-year observations) – large and small – and found that firm-specific determinants of leverage differ across countries, while prior studies implicitly assume equal impact of firm-specific factors. They also found that there is an indirect impact of country-specific factors on the capital structure of firms because country-specific factors also influence the roles of firm-specific determinants of leverage.

Investigation of seven advanced industrialized countries by Rajan and Zingales (1995) argue that although common firm-specific factors significantly influence the capital structure of firms across countries, several country-specific factors also play an important role.

Demirgü-Kunt and Maksimovic (1999) compared capital structure of firms from 19 developed countries and developing countries. They found that institutional differences between developed and developing countries explained a large portion of the variation in the use of long-term debt. They also observed that some institutional factors in developing countries influenced the leverage of large and small firms differently.

In conclusion, similar to the developed market capital structure determinants, developing markets had wide-ranging observations. This could largely be attributed to firm heterogeneity, industry-specific and country-specific determinants.

2.2.3. Determinants of Capital Structure – Developing Countries

E. Chojnacka (2011) studied Polish companies listed at the Warsaw Stock Exchange in the period 2002-2008. The author claims that the pecking order theory somehow explains changes observed in debt in groups of analysed companies. Results showed that the main explanatory variable of the change in debt is the shortage of internal sources of funding, however, the intensity of its impact is lower than suggested by the theory.

Kaźmierska-Jóźwiak (2015) examined capital structure determinants of non-financial Polish companies listed on the Warsaw Stock Exchange using five independent variables compatible with the up-to-date achievements in the field. Their results indicated that there was an evidence of a significant negative relationship among the size of a company, its growth rate, profitability, tangibility and the level of total debt. The study showed positive relationship between growth prospects of the company and the debt level. The results of the study indicated that the pecking order theory better explains the changes in indebtedness of analysed companies than other capital structure theories.

Sahu et. al., (1997) analysed the debt financing of corporate sector in India and concluded that debt constitutes an important segment of total finance throughout the period 1979-80 to 1990-91.

Baral (2004) examined the determinants of capital structure - size, business risk, growth rate, earning rate, dividend payout, debt service capacity, and degree of operating leverage of Nepalese companies listed on the Nepal Stock Exchange Ltd. Their study showed that size, growth rate and earning rate are statistically significant and played a major role in determinants of capital structure of the listed companies.

Gajdka (2002) analysed two groups of companies; the first one included 48 Polish companies (except for the financial sector) listed at the Warsaw Stock Exchange from 1995 until 1997, the second one included 106 companies, which in any year within the adopted period were listed at the Warsaw Stock Exchange. Gajdka's results demonstrated that profitability relatively well explains changes in the structure of capital.

Butt and Hasan (2009) explored the relationship between corporate governance and capital structure of listed companies in Pakistan. Their study covered the period 2002 to 2005 for which firm level data for 58 randomly selected non-financial listed companies from Karachi Stock Exchange had been examined by using multivariate regression analysis under fixed effect model approach. Results revealed that board size and managerial shareholding was significantly negatively correlated with debt to equity ratio. However, corporate's financing behavior was not found significantly

influenced by CEO/Chair duality and the presence of non-executive directors on the board. However, control variables firm size and return on assets were found to have a significant effect on capital structure.

Kibet et al. (2011) paper examined the determinants of leverage for 54 Kenyan firms listed at the Nairobi Stock Exchange (NSE). In summary, the findings were that firm leverage was positively associated with both asset tangibility, profit, macro-economic and size, and negatively associated with firm-level profitability and non-tax debt tax shield. Leverage across the sample was typically lower for alternative investment market segment.

Pandey (2004) examined the relationship between leverage and market structure using data from 208 Malaysian companies for the period from 1994 to 2000. The study provided new insights into the way in which leverage, and market power and leverage and profitability are related. Leverage and market power, as measured by Tobin's Q, were shown to have a cubic relationship, due to the complex interaction of market conditions, agency problems and bankruptcy costs. The study found a saucer shaped relation between leverage and profitability, due to the interplay of agency costs, costs of external financing and debt tax shield.

Pratomo and Ismail (2006), studied the Islamic bank performance and leverage based on 15 Malaysia Islamic Banks' Annual Report from 1997 until 2004. They considered the choice between debt and equity financing that had been directed to seek the optimal leverage. Under the agency costs hypothesis, a high leverage tended to have an optimal leverage and therefore led to produce a good performance, while the Modigliani-Miller theorem proved that it has no effect on the value of the firm.

Abor (2005) examined the effect of capital structure on the corporate profitability of listed firms in Ghana using a panel regression model. His measures of capital structure included short-term debt ratio, long-term debt ratio and total debt ratio. His findings showed a significantly positive relation between the short-term debt ratio and profitability. However, a negative relationship between long-term debt ratio and profitability was established. In terms of the relationship between total debt ratio and

profitability, the results of his study indicated a significantly positive association between total debt ratio and profitability.

Foo et al. (2015) examined the relationship between capital structure and corporate performance of public listed oil and gas companies in Malaysia using unbalanced panel data sets of 12 oil and gas companies. They tested, using panel data regression technique over the period of 2003-2013, the independent variable measured by three proxies namely short-term to total debt (STDTA), long-term to total debt (LTDTA) and total debt to total asset (TTDTA). The findings showed that capital structure was negatively related to firm's return on equity, suggesting that an increase in the firm's debt level would negatively affect its shareholders return. The effect of firm's debt level with ROA and GM on the other hand, showed no impact and appeared to be insignificant.

In conclusion, determinants of capital structure still remain contentious and a puzzle especially in transitionally developing economies. Most available literature focused on examples of corporate capital structures determinants from a developed country perspective and only until the mid-2000's was there a gradual proliferation of studies examining capital structure determinants in developing markets. As seen in the aforementioned studies, there is no uniformity amongst the various authors with regards to capital structure determinants in developing countries.

2.3 Effects of Corporate Leverage on Firm Performance

At some stage, each firm faces a pivotal financial decision of choosing the most appropriate capital structure to support their corporate goals and what debt policy is most applicable for boosting the value of the firm. Minimizing the cost of financing maximizes net returns for the firm, thereby improving its competitive advantage in the marketplace. Utilization of different levels of debt and equity in the firm's capital structure is one such firm-specific strategy used by managers in search for improved performance (Gleason et al., 2000).

2.3.1. Effects of Corporate Leverage on Firm Performance in Developed Markets

Champion (1999) pointed out that the use of leverage was one way to improve the performance of the firm. Below are two studies which have shown that a positive relationship exists between corporate leverage and firm performance.

Lewellen and Roden (1995) conducted a study on a sample of 48 United States firms that are involved in leveraged buyout transactions. It was discovered that total debt (a financing package used in leveraged buyout transactions) and the profitability of a firm were positively related. Lewellen and Roden (1995) established a significantly positive relation between profitability and total debt as a percentage of the total buyout-financing package. Research done by Hadlock and James (2002) using a sample of 500 non-financial United States firms concluded that companies prefer debt financing because they anticipate higher returns from a higher debt level. Hadlock and James (2002) also concluded that companies prefer debt financing because they anticipate higher returns. It is believed that large debt holders have an interest in seeing that managers take performance-improving measures.

Fama and French (1998) argued that the use of excessive debt creates agency problems among shareholders and creditors and that could result in negative relationship between leverage and profitability. Below are several studies of corporate leverage and firm performance in developed markets which have shown that a negative relationship exists between leverage and firm performance contrary to the above two studies. Kester (1986) found a negative relation between capital structure and corporate performance (profitability) for United States and Japanese manufacturing companies. Rajan and Zingales (1995) did a study on the determinant factors of capital structure, choosing a sample size of 4,557 corporations across the G-7 countries (United States, Japan, Germany, France, Italy, Britain and Canada) from the period of 1987 to 1991. One of the determinant factors of capital structure, profitability was concluded to be negatively correlated with financial leverage/debt level.

Fosberg and Ghosh (2006) conducted a research on 1022 companies in the New York Stock Exchange (NYSE) and 244 companies in the America Stock Exchange (AMEX) to test for the relationship between profitability, as the independent variable and the debt level in capital structure as the dependent variable, the researchers used ROA and average ROA as measurements for financial performance and debt-to-asset ratio as the measure for debt level. Regression analysis was employed to establish the relationship, carried out separately on AMEX companies and NYSE companies. Results concluded that there is little or no relationship between profitability and the amount of debt in AMEX firms' capital structure. Nonetheless, strong negative relationship was proved to exist in the case of NYSE firms.

Goddard et al. (2005) used the system-generalized method of moments to test the determinants of profitability for manufacturing and service firms in Belgium, France, Italy and the UK over the 1993-2001 period. The relationship between a firm's financial leverage in terms of gearing ratio and its profitability was negative. However, firms with higher liquidity tended to be more profitable.

A few other studies of corporate leverage and firm performance in developed markets showed mixed results. A positive and negative relationship existed between leverage and firm performance which depended on various circumstances at hand. Simerly and Li (2000) performed a regression model to analyse the effects of financial leverage on the performance of a sample of 700 large US companies in a variety of industry sectors over the 1989-1993 period. The results suggested that the impact of financial leverage can be positive or negative, depending on whether the company is operating in a stable or a dynamic business environment.

Weill (2008) used maximum likelihood estimation to analyse the effect of financial leverage on the performance of 11,836 manufacturing firms operating in seven European countries during a three-year period from 1998 to 2000. The results indicated that financial leverage, defined as the ratio of total liabilities to total assets, is related to firm performance positively and significantly in Spain and Italy, but negatively and significantly in Germany, France, Belgium and Norway, and negatively and insignificantly in Portugal.

It can be concluded that the findings from the above empirical literature are not in agreement. Some studies found that corporate leverage and firm performance (profitability) were positively related, others found a negative relation between corporate leverage and firm performance, whilst others found mixed results and statistically insignificant correlation. Attributing factors for the mixed results obtained could be divergent structures used, disparate proxies for valuing firm performance, institutional frameworks and differences in socioeconomic contexts of the developed countries.

2.3.2. Effects of Corporate Leverage on Firm Performance in Developing Markets

In developing markets, a few studies have shown that a positive relationship exists between corporate leverage and firm performance. Abor (2005) used regression analysis to test the relationship between capital structure and performance in terms of profitability among 22 listed firms in Ghana over the 1998-2002 period. The study suggested that short-term and total debt positively and significantly influenced profitability. Kyereboah-Coleman (2007) examined the relationship between capital structure and performance of microfinance institutions in sub-Saharan Africa. Results showed that high leverage was positively related with performance (i.e. ROA and ROE).

Various empirical studies below also found a negative relationship between corporate leverage and firm performance in developing countries. Abor (2007) examined the effect of capital structure on the corporate profitability of listed firms by using a generalized least squares regression to study a sample of 160 Ghanaian and 200 South African SMEs over the 1998-2003 period. His measures of capital structure included short-term debt ratio, long-term debt ratio and total debt ratio. According to the results, long-term and total debt ratios were negatively related to the performance of the sampled firms.

Similar evidence was also reported by Wiwattanakantang (1999) where they reported a negative relationship between capital structure (measured by book and market debt value) and performance of 270 Thai firms (measured by ROA). All these researches were conducted in different countries with different results. This proves that the empirical results obtained cannot be applied directly into a target economy. Majumdar and Chhibber (1999) used a regression model to investigate the relationship between debt ratio and performance, proxied by return on net value of total assets, among 1,043 Indian companies in various industry sectors over the 1988-1994 period. The results indicated a significant negative relationship between debt ratio and firm performance.

Ebid (2009) extended the literature on the impact of capital structure on firm's performance by empirically examining the relationship between capital structure and firm's performance in Egypt. Ebid (2009) used multiple regression analysis to investigate the performance of 64 Egyptian-listed firms over the 1997-2005 period. The results suggested that short-term debt and total debt are negatively related to profitability in terms of return on assets (ROA). However, the study indicated no significant relationship between short- or long-term debts and profitability in terms of ROE or gross profit margin. Sheikh and Wang (2011) studied the influence of capital structure on the performance of 240 listed non-financial companies in Pakistan during the 2004-2009 period. Several methods, including OLS, fixed effects and random effects, were used. The empirical results indicated that long-term and short-term debt ratios are negatively related to ROA.

Hammes (2003) examined the relation between capital structure and performance by comparing Polish and Hungarian firms to a large sample of firms in industrialized countries. Hammes (2003) used panel data analysis to investigate the relation between total debt and performance as well as between different sources of debt namely, bank loans, and trade credits and firms' performance measured by profitability. Results showed a significant and negative effect for most countries. He found that the type of debt, bank loans or trade credit is not of major importance, what matters is debt in general. Chiang et al. (2002) examine the relationship between capital structure and performance of firms in property and construction sector in Hong Kong showing that high gearing is negatively related with performance (i.e. profit

margin). Zeitun and Tian (2007) examine the relationship between capital structure and performance of Jordan firms showing that debt level is negatively related with performance (both the accounting and market measures).

A few other studies of corporate leverage and firm performance in developing markets showed mixed results. In the Malaysian context, San and Heng (2011) carried out a study on the relationship between capital structure and corporate performance of the Malaysia construction sector. The study focused on 49 construction companies listed on Bursa Malaysia from the year 2005 to 2008. The companies were divided into three groups based on large, small and medium sizes according to their respective paid up capital. A pooling regression model was used for analysis of each group independently. The proxies for capital structure were long-term debt to capital ratio, total debt to capital ratio, total debt to asset ratio, total debt to equity in market value, total debt to common equity and long-term debt to common equity. On the other hand, the proxies used to measure corporate performance were return on capital, return on equity, return on asset, earnings per share, operating margin and net profit margin. The results were mixed according to the size of the firms. For large construction companies, return on capital and earnings per share indicated a positive relationship. Comparatively, return on capital possesses the strongest and also positive relationship with total debt to equity in market value in the case of large companies. However, earnings per share were negatively related to total debt to capital ratio. In the case of medium sized companies, results showed that only long-term debt to common equity has an impact on corporate performance, whilst other independent variable proxies do not affect corporate performance. Lastly, in the case of small companies, earnings per share were negatively related to total debt to capital ratio, which implies a negative relationship between profitability and capital structure.

Another study on this relationship was done by Salim and Yadav (2012). The study was conducted between the periods of 1995 to 2001 using panel data analysis for a sample of 237 Malaysian public listed companies. The data were divided into six groups according to industry which are consumer product, construction, industrial product, plantation, property, trading, and services. The dependent variables used in this study were return on equity (ROE), return on asset (ROA), Tobin's Q and earning per share (EPS). The independent variables on the other hand were short-term debt

to total asset (STDTA) ratio, long-term debt to total asset ratio (LTDTA) and total debt to total asset ratio (TTDTA). Firm size was included in the model to control the effects of firm size on the dependent variables. Final results indicated a negative relationship between capital structure (especially STDTA and TTDTA) and firm performance when measured by ROE. Furthermore, capital structure (especially LTDTA and TTDTA) has negative impact on firm performance when measured by ROA. The author attributed the negative relationship to the default risk associated with having higher debt level. However, results showed that Tobin's Q has a positive relationship with capital structure when measured by STDTA, LTDTA and TTDTA with size as the control variable.

Mesquita and Lara (2003), in their study found that the relationship between rates of return and debt indicates a negative relationship for long-term financing. They however, found a positive relationship for short-term financing and equity. Mesquita and Lara (2003) used the ordinary least squares (OLS) method to study the impact of long-term, short-term debt and the rate of equity capital on rate of return (return on equity [ROE]) among 70 Brazilian industrial and service companies over the 1995-2001 period. The results indicated that long-term debt negatively (although insignificantly) affected rate of return, though the effect of short-term debt and equity capital on rate of return was significantly positive. An explanation of the positive impact of short-term debt on profitability was that this kind of debt was a common practice among the most profitable companies who could easily finance their necessary working capital.

In general, it may thus be concluded that empirical studies regarding the relationship between capital structure and firm's performance in developing countries provided mixed and contradictory evidence. Although the examined literature has identified some potential factors for capital structure decisions in relation to corporate performance, there is lack of unanimity among researchers on the significance of these factors.

2.4 Corporate Leverage Trends in the United States

The Graham, Leary and Roberts (2014) “A century of capital structure: The leveraging of Corporate America” paper shed light on the evolution and determination of corporate financial policy over the last century in the US. It analysed primary data that included comprehensive sets of balance sheets, income statements and other financial market information for publicly traded US nonfinancial firms on CRSP dating back to the 1920's. This was in contrast with prior studies, such as (Sametz, 1964) and (Frank and Goyal, 2008) which noted a fairly stable leverage ratio over time but used aggregate data to examine broader trends and to explore issues relating to leverage. Other prior studies such as (Miller, 1977), (Taggart, 1985) and (McDonald, 1983) also used aggregate data. However, results obtained by the studies were noteworthy, displaying varying degrees of an increase in the leverage ratio of firms during the post-World War II era.

The Graham, Leary and Roberts (2014) paper studied the last century's capital structure of listed firms on the NYSE, Nasdaq, Amex and Moody's Industrial Manual which included a large number of smaller firms listed on regional exchanges. Various measures of leverage for listed firms were utilized including total liabilities to assets, interest-bearing debt to capital and total debt to book value of equity/market value of equity.

Taggart (1985) points out that aggregate leverage is determined by the interaction of the supply of securities by firms and demands for those securities by investors. Because we are interested in understanding the evolution and determination of aggregate corporate leverage on the Johannesburg Stock Exchange bourse, the Graham et al (2014) study forms a cogent point of departure highlighting changes in capital structure in an aggregate context.

From 1920 to 1945, leverage among unregulated firms was fairly stable and relatively low, with total debt-to- capital falling from 17% to 11% during this quarter century. From 1946 to 1970, leverage increased steadily and significantly - more than tripling - from approximately 11% in 1945 to almost 35% in 1970.

While much of the increase in financial leverage was due to long-term debt, a significant portion came from the increased use of short-term debt starting in the late 1960s, coinciding with the growth in commercial paper issuance by nonfinancial firms in the wake of the 1966 credit crunch (Hurley, 1977).

Variety of leverage measures observed showed a drastic and robust change in leverage in this period. The primary driver for this change was debt which was gradually being substituted for preferred equity between 1920 and 1960, when relatively little preferred equity remained. Graham et al (2014) found that cash holdings exhibited a secular decrease concomitant with the secular increase in debt usage.

Since 1970, leverage has remained constantly high but fairly stable. Graham et al. (2014) observed similar broad patterns of leverage stability when restricting their sample to firms listed on the NYSE or only include the 500 largest firms each year, both of which mitigate a changing sample composition. During the 1970's, total liabilities of US nonfinancial corporations grew at a compound annual rate of 8.7 percent and their total credit market debt outstanding grew at a 9.1 percent annual rate. Compared with the 10 percent annual growth rate in nominal GNP, the increase in corporate debt roughly kept pace with overall economic activity during this period (Taggart, 1990).

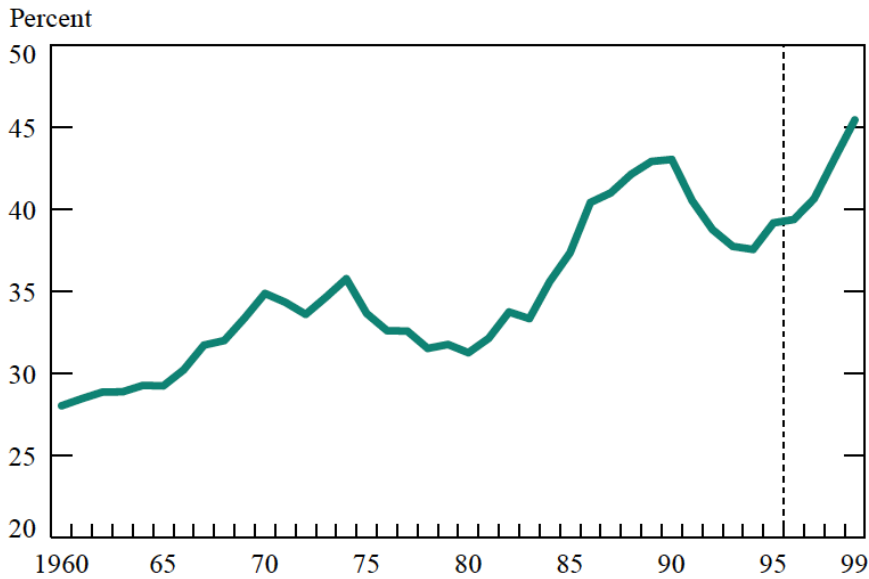
During 1980-88, by contrast, annual growth in corporations' total liabilities and credit market debt outstanding increased to 10.2 percent and 10.6 percent respectively. This rapid growth of corporate debt relative to economic activity was further reflected in the decline in interest coverage ratios for US nonfinancial corporations from 7.7 in 1970 and 7.4 in 1980 to 5.7 by the end of 1988. Interest payments consumed 35 percent of corporate earnings before interest and taxes in 1988, compared with 23 percent in 1970. Overall, debt ratios have been consistently higher in both the 1970's and 1980's than they were in the 1950's and 1960's. The interest-coverage ratio and book value debt-to-equity reveal a similar picture of the rising debt burdens in the 1980's. From 1984 to 1988, the debt-equity ratio rose from 36 percent to 52 percent. From 1984 to 1989, interest payment's share of each dollar of cash flow rose from 15 to 21 cents (Faust, 1990).

By the end of the 1980's, the amount of defaulting issues had reached a new high of \$8 billion, representing 4.3% of the then \$190 billion market. That default rate was almost twice the historical average of 2.2% from 1978-1988. And another \$4.8 billion had already defaulted in the first six months of 1990. With defaults high and still rising, the yield spreads over Treasuries of high yield bonds had skyrocketed to more than 700 basis points and the new issue market had all but dried up. Drexel Burnham Lambert, by far the leading market maker and underwriter of these bonds, had recently filed for Chapter 11 bankruptcy and Michael Milken had been indicted. (Altman, 2000) Financial deregulation of the 1980's saw Drexel Burnham Lambert's Michael Milken come to the fore and characterised the rise of the junk bond market which led to a private equity leverage buy-out boom and corporate share repurchases. Despite the financial excess by US corporations in the 1980's, corporate leverage did not seem to be out of line with global leverage trends as witnessed in parts of Europe and Japan. Corporate leverage among listed US corporations continued the same historical upward trajectory that began in the early 1920's.

Following the huge debt-financed takeovers in the 1980's, non-financial firms entered the 1990's with debt equal to about 40 percent of GDP, up 10 percentage points from the previous decade. Corporate leverage remained above 35%, peaking at 47% in 1992. Combined with an increase in non-debt liabilities, the aggregate corporate balance sheet shifted from 25% liabilities in the 1930's to over 65% liabilities by 1990. Towards the end of the millennium, the average corporate leverage for nonfinancial firms declined fairly steadily - from 46 percent to 35 percent in late 1995 to 22 percent in September 1999 - despite the concurrent rise in overall corporate debt.²

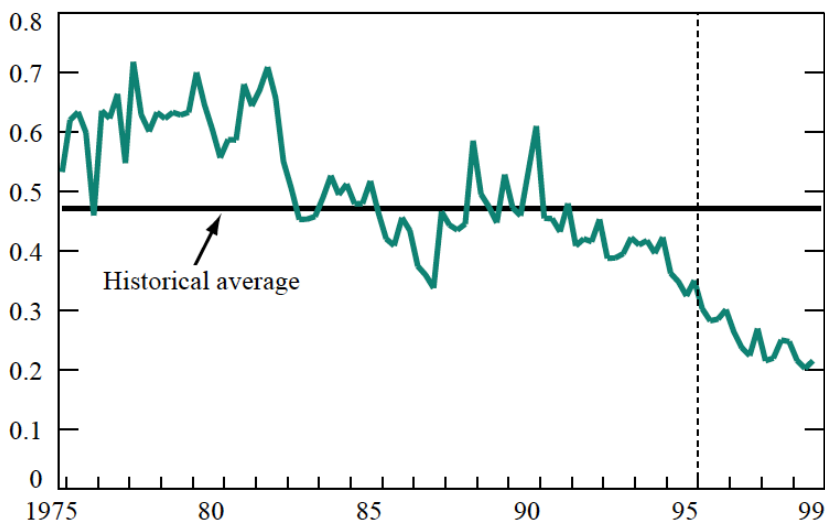
Figure. 2 Debt of U.S. Nonfinancial Firms as a Share of GDP

² Current Issues in Economics and Finance is published by the Research and Market Analysis Group of the Federal Reserve Bank of New York. Central measure used was a firm's long- plus short- term debt as a share of its stock market value. Individual firms' leverage ratios were aggregated into a sector wide average-weight divided by stock market values.



Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

Figure. 3 Average Leverage of U.S. Nonfinancial Firms³



Source: Compustat.

The bankruptcy of Lehman Brothers in the summer of 2008 set off a global liquidity crunch with started the first global recession since World War II and planted the seeds of a sovereign debt crisis in the eurozone.⁴ It was the worst financial crisis in two

³ The Average Leverage of U.S. Nonfinancial Firms chart depicts the ratio of the long- plus short-term debt of nonfinancial firms to the firms' stock market value.
⁴ McKinsey Global Initiative "A decade after the global financial crisis: What has (and hasn't) changed? Briefing note September 2018

generations, erasing \$14.5 trillion, or 33 percent, of the value of the world's companies.⁵

Around the world, central banks, regulators, and policy makers were forced to take extraordinary measures. The US government rolled-out bailout programmes such as Troubled Asset Relief Program (TARP) for the US financial sector to repress the severe credit crises and liquidity stresses suffered by US banks.

The road to recovery has been a long one since September 2008. Historically, it has taken an average of eight years to recover from debt crises, a pattern that held true in this case (Reinhardt and Rogoff, 2009). Since the global financial crisis, borrowing in corporate debt markets has risen sharply. The key driver for the loosening up and rapid growth of credit markets has been liquidity injections by major central banks. US corporations have justifiably taken advantage of this demand to lengthen the term of their debt, refinance bank lending via capital markets and enhance shareholder returns by issuing debt at record low yields to buy-back shares or increase dividends.

Corporate debt rose to 45% of GDP at the peak of the global financial crisis, the same level it reached at the height of the dot.com bubble in 2000/01. Immediately after the crisis, corporate debt fell back to 40% of GDP by the end of 2012. However, over the past five years, corporate leverage debt has grown again and exceeded its previous peaks of the 1980's Junk-bond era – reaching 47% of GDP in by the end of 2017.

2.5 Interest Rates and the Emergence of the South African Bond Market

Up until the late 1980's, a corporate public debt market was practically non-existent in South Africa. Consequently, when considering external financing, firms had two choices. They either issued equity or they borrowed privately from a bank or a non-bank private lender (Ojah, 2009). The growth in the bond market enticed the private

⁵ Agency Theory in Banking -'Lessons from the 2007-2010 Financial Crisis' by Wanda Rutledge and John Donnellan International Journal of Business and Applied Social Science Vol.2, No.3 , March , 2016

sector into participating in bond issuance. In 1996 over 80% of bond issuances were contributed to government issuance. (Mboweni, 2006)

A salient feature of the South African bond market is that the South Africa's equity and public debt markets are unusually large relative to the size of the economy even by developed countries' standards.⁶ Similar to other emerging markets, the South African bond market comprises mostly of government bonds while the corporate bond market is relatively underdeveloped. South Africa's secondary markets are relatively illiquid, offering relatively low quality of bonds and the bond issuance sizes are also small.⁷

By 2008, the total volume of bonds traded in South Africa was over R19 trillion. The government issued bonds dominate South Africa's domestic bond market and there is a centralized exchange in place to monitor, regulate and modify the bond market in South Africa, known as the Bond Exchange of South Africa Limited (BESA).

Since the first corporate bond was issued in 1992, more than 1 700 corporate debt instruments have been listed on the JSE Debt Market. Despite liquidity remaining seemingly low as compared for example with government debt, issuance of corporate debt instruments keeps on growing gradually. More than half of the debt listed on the JSE is placed by the South African government. Other issuers include South African state-owned companies, corporates, banks and other African countries.

The JSE Repo Market is an active and liquid funding market, with daily funding exceeding R25 billion. It has seen daily spikes in excess of R200 billion, which bears testimony to the liquidity and efficiency of the 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.

As of 2016, there are more than R1 trillion listed government bonds and these currently account for 90% of all liquidity reported to the JSE Debt Market. Current bond nominal value was up at 22% in 2016 from 21% in 2015 with 858 new bonds issued (2015: 942). Total nominal value of listed bonds was R27 trillion (2015: R23 trillion). In 2016,

⁶ (RMB, 2001) Rand Merchant Bank. (2001). *The development of the South African (2001). The development of the South African Corporate Bond Markets*. Online: www.oecd.org/dataoecd/30/47/29878705.pdf

⁷ International Organization of Securities Commissions (IOSCO). (2011). *The development of corporate bond markets in emerging markets*. Online: <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD360.pdf>

bond market activity by all market participants resulted in a record turnover for the year, while the holdings of bonds by non-residents proved more resilient, despite occasional market tantrums resulting in substantial outflows. (JSE Report, 2016)

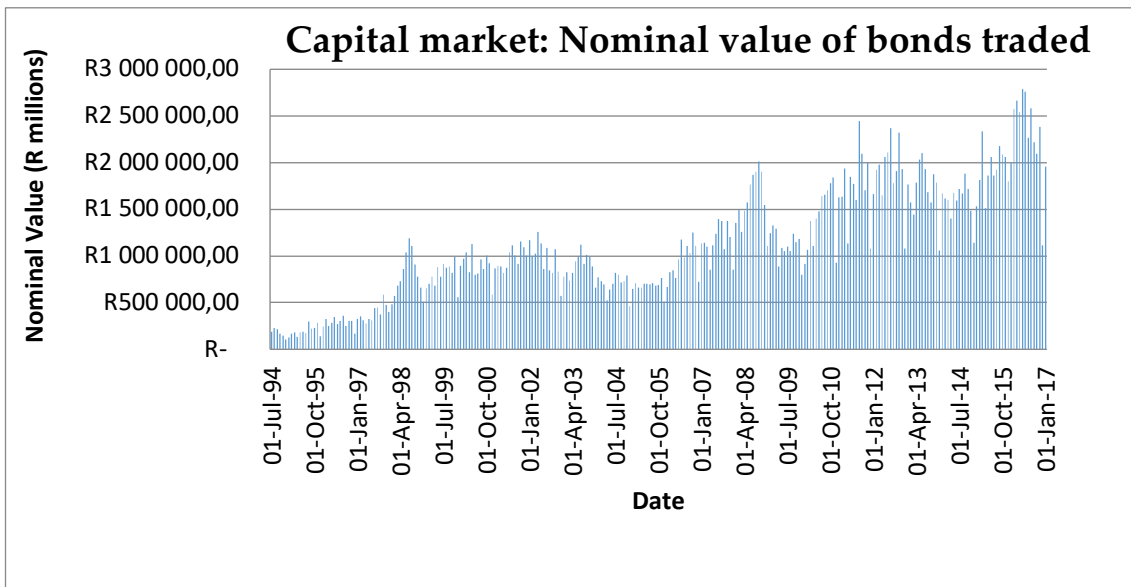
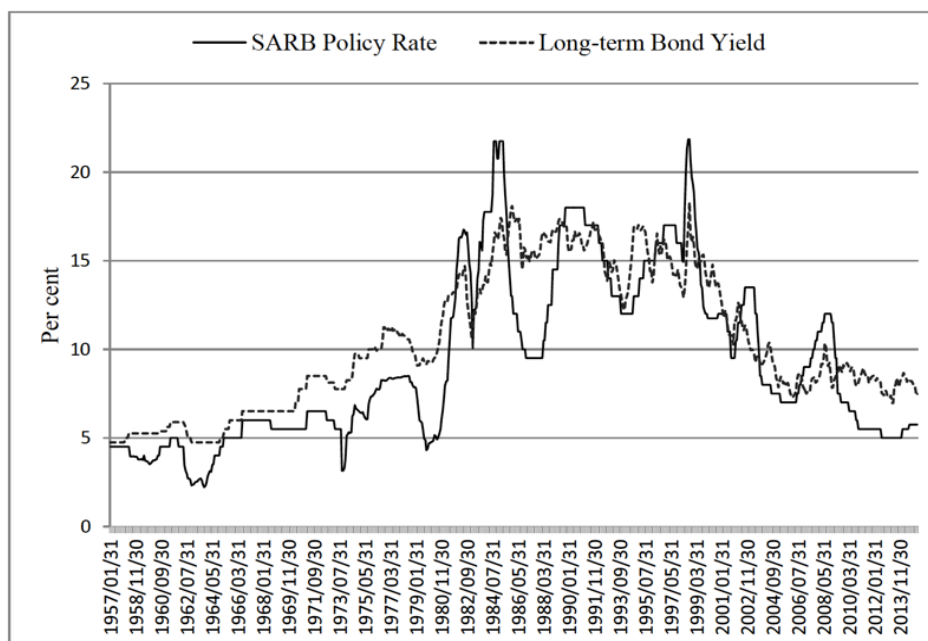


Figure. 4: Nominal Value of Bonds Traded in South Africa from 1994 to 2016 (Source: Inet BFA 2017)



Source: The International Financial Statistics, IMF (2015).

Figure. 5: South African Reserve Bank Policy Rate and Yield on Long-Term Government Bonds

Figure 5 above shows data on the two interest-rate series extracted from the International Financial Statistics (IFS) database compiled by the International Monetary Fund. The SARB policy rate is labelled as South Africa – Central Bank Policy

Rates: Central Bank Policy Rate (EOP) (Percent Per Annum), and the yield on long-term government bonds is labelled as South Africa - Government Bonds Yields: Government Bonds Yield (Percent Per Annum) in the IFS database. The sample period spans January 1957 to February 2015 (lyke, 2015).

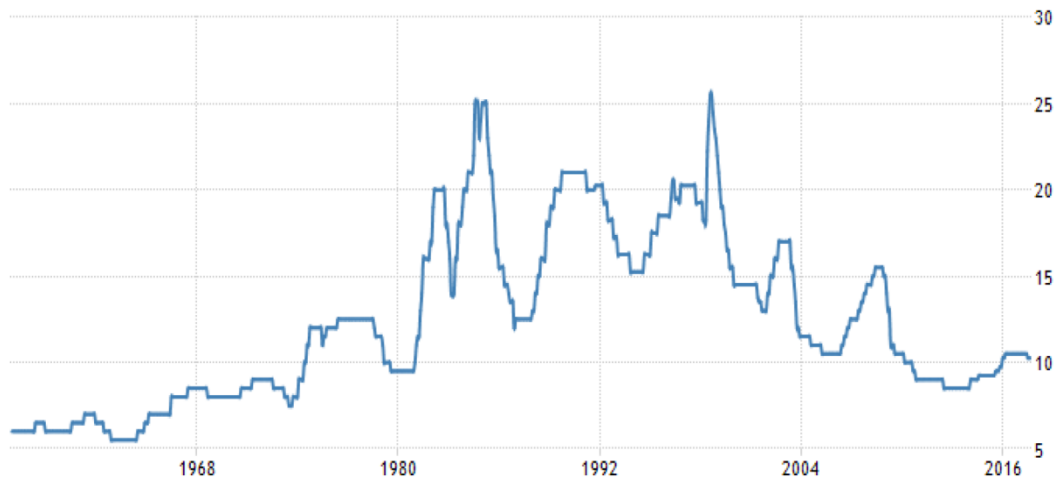


Figure. 6: South African Prime Lending Rate: (Source: Trading Economics, 2016)

The changeover of the South African political system to a democratic dispensation with the country's first non-racial election on 27th April 1994 removed the political barriers that had prevented successful economic adjustment during the 1980's. The abolition of sanctions and disinvestment actions against South Africa opened markets to foreign goods, services and financial flows. Reserve Bank had very low reserve levels in the early-to-mid 1990's, in supporting the rand, monetary authorities used interest rates as a tool of attracting capital that chased after interest rate differentials. (Njindan lyke, B and Odhiambo, 2015). However, the greater degree of openness of the economy increased South Africa's vulnerability to international financial market instability, as was experienced with the East Asian and Russian crises of 1998. This resulted in a sharp depreciation of the rand and tightening of monetary policy. (Kahn and Farrell, 2002)

After the 1998 interest rate shock, it had become clear that monetary policy required some adjustment. Figure 6 shows that interest rates were reduced sharply from late-

1998 to early 2000, with prime overdraft rates falling from a peak of 25.5% in the third quarter of 1998 to 14.5% by January 2000.

By February 2000, then Minister of Finance, Trevor Manuel, announced a shift to official inflation targeting which took effect from 2002. The target was based on a new index called the CPIX (Consumer Price Index excluding the effect of interest rates on housing mortgage bonds), and the inflation target range was set between 3% to 6%. The CPIX inflation target was missed in 2002, but since September 2003, the rate has continuously moved within the 3% to 6% range until 2016.

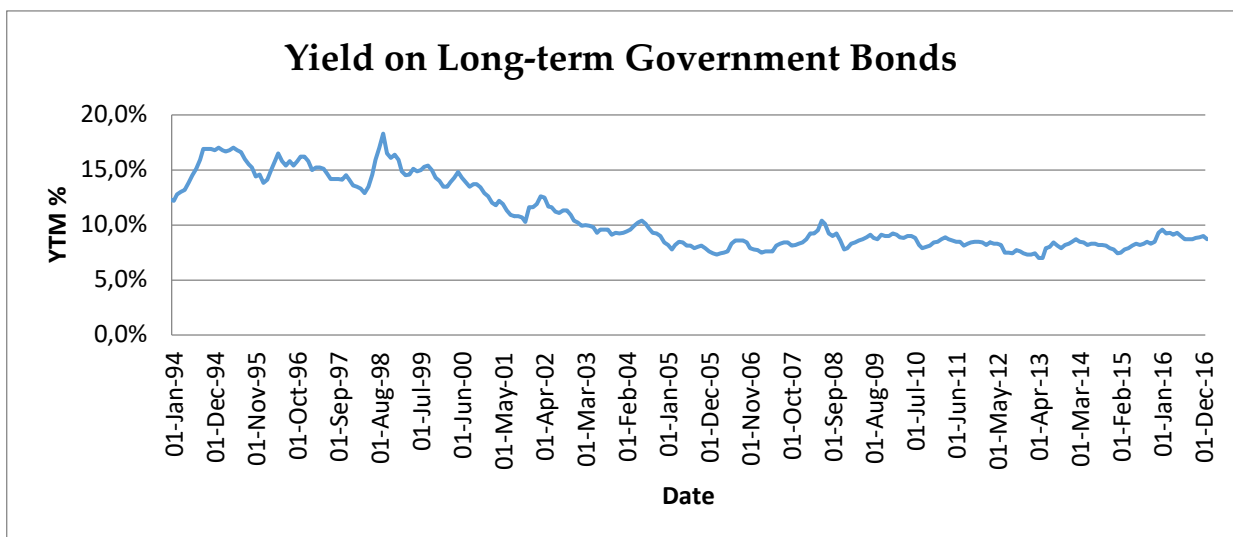


Figure. 7: Yield on Long-term Government Bonds from 1994 to 2016 (Source: Inet BFA 2017)

2.6. Survivorship Bias

Researchers should be wary of exclusion of delisted shares when evaluating an empirical analysis of listed firms as this could lead to a possible survivorship bias.

In a working paper titled “Does Survivorship Bias Really Matter?: An Empirical Investigation into its Effects on the Mean Reversion of Share Returns on the JSE Securities Exchange (1984-2006)” by Evan Gilbert and Dave Strugnell, extensive efforts were made to include all delisted shares in the study to avoid the effects of survivorship bias. The Gilbert and Strugnell (2008) study added to survivorship bias literature in two ways: firstly, by testing for the effects of survivorship bias in a mean reversion context; and secondly, by using data for South African listed firms for the first time.

The results of the Gilbert and Strugnell (2008) study confirm that the effects of survivorship bias are present and material. While patterns of mean reversion are detected, the returns earned on portfolios selected from currently listed shares were significantly higher than the corresponding returns on portfolios selected from all shares. Survivorship bias was therefore confirmed to be a significant issue in such studies, which researchers should be careful to avoid; although it does not affect the conclusion of the patterns of mean reversion revealed in the earlier studies.

Banz and Breen (1986) presented the first comprehensive, direct test of the size and impact of survivorship bias on the COMPUSTAT database. In a very similar vein to Gilbert and Strugnell paper, they compared the nature of the properties of two separate populations of firms – a complete and a partially complete (currently listed only) COMPUSTAT list of firms. They pointed out that this difference in returns was actually the combined effects of the survivorship and "look ahead" biases. The differences in returns were statistically significant.

Brown, Goetzmann, Ibbotson and Ross (1992) concluded that survivorship bias will definitely have an effect on the results, but the size of this effect is an empirical question. Their study interrogated whether past mutual fund performance predicted future performance by analysing the relationship between volatility and returns in a sample that was truncated by survivorship. Truncation by survivorship gave rise to an apparent persistence in performance where there was dispersion of risk among money managers. Their article found that where inclusion in a sample depended in part on the rate of return, survivorship bias often led to obvious biases in first and second moments and cross moments of return.

Carpenter and Lynch (1999) indicated that 0.14% to 0.27% of gross management outperformance (alpha) returns could be attributed to survivorship bias. Carpenter and Lynch (1999) simulated standard tests of performance persistence using alternative return-generating processes, survival criteria, and test methodologies. When survival depended on performance over several periods, survivorship bias induced spurious reversals, despite the presence of cross-sectional heteroskedasticity in performance. Their results suggested that the delisting biases in the Center for Research in Security Prices (CRSP) data caused empirical work to understate the level of persistence in stock returns.

Kothari, Shanken and Sloan (1995) confirmed the importance of the effects of survivorship. They firstly established that the returns to the share excluded from the COMPUSTAT database (but on the CRSP data series) are on average 9 to 10 percentage points lower than the shares included in the database. This emphasized the systematic difference of the nature of the excluded shares. They also showed that the significant Book to Market Value (B/M) result of Fama and French (1992) can, in part, be explained by the survivorship bias in the data set they used.

Davis (1996) tested for the effects of survivorship bias on the results of his earlier study (Davis, 1994) that used COMPUSTAT data in part. He found that the nature of the excluded firms is systematically different in terms of relative size (the excluded firms are smaller) and monthly returns (the excluded firms have lower returns). While the inclusion of the shares listed in the Moody's database (but not in the COMPUSTAT

database) did not change the conclusions of his previous study, it did lead to non-trivial difference in the regression results, both in terms of economic and statistical significance.

In conclusion, the Gilbert and Strugnell (2008) study and several other survivorship bias studies addressed above prove that any research that excludes delisted shares is likely to be subject to survivorship bias. This study, “Evolution of Corporate Leverage on the JSE from 1994 to 2016”, noted and recognized that exclusion of data for delisted shares may not materially affect the outcomes of the study but might likely have a significant effect on the total results reached.

3. Data Sources

All ratios were computed using yearly financial statements data extracted from Iress Inet BFA for a sample consisting of 126 listed firms (which can be seen in Appendix 1), and 621 delisted firms from 1994 until 2016 – or since the initial public offering (IPO) and Bloomberg. Firms with limited data or that have been suspended were removed from the sample. The total sample consists of the 126 listed companies across twelve sub-sector industries. The twelve sub-sector industries are Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services. The South African prime interest rate extracted from Iress Inet BFA was used to measure the cost of raising capital together with the corporate tax rate. Data analysis was done using Microsoft Excel and Stata software package.

4. Methodology and Research Design

Table. 1 below explores different calculations of corporate leverage ratios that several authors have used in their various studies.

Table 1: Authors and Leverage Ratios

Authors	Leverage Ratio
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
Titman & Wesels (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
Pandey (2001)	Short Term Debt over Capital Long Term Debt over Capital Total Debt over Capital

Graham, Leary and Roberts (2015)	Total Debt over Capital
Psillaki and Daskalakis (2009)	Total Liabilities over Total Assets
Toy, Stonehill, Remmers et al. (1974)	Total Debt over Total Assets (at Book Value)
Rajan and Zingales (1995)	Non-equity Liabilities over Total Assets Debt over Total Assets Debt over Net Assets Debt over Capital Interest Coverage Ratio
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
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

This study will focus on only two leverage ratios, TBDV (Total Debt over Book Value of Equity) and TDMV (Total Debt over Market Value of Equity) as exhibited by Table 2 below.

Table 2: Measures of Corporate Leverage

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

Variables will be computed according to the International Financial Reporting Standards (IFRS) as expressed in Table 3 below.

Table 3: Leverage Ratio Variables Definitions

Variables	Definition
Total Debt	Interest-bearing long- and short-term debt
Interest-Bearing Debt	Debt that requires an interest fee
Book Value of Equity	Value of equity per the firm's statement of financial position
Market Value of Equity	Current market capitalisation value on issued equity

5. Results

5.1. Summary

This section sheds light on the evolution and determination of corporate financial policy on South Africa's JSE by formulating an analysis of data contained in annual reports and other public financial market information in South Africa, from 1994 to 2016.

The data set is organized around a sample of 126 listed companies across twelve sub-sector industries in order to mainly examine changes in corporate capital structures within each sub-sector industry. Included in the data set is a sample of 621 delisted companies across all sub-sectors that were delisted from the JSE as a result of acquisitions, liquidations and listing terminations. To adequately examine periodic trends, an emphasis will be placed on sub-dividing the years into three five-year intervals and one four-year interval constituted as – 1994 to 1999, 2000 to 2005, 2006 to 2011 and 2012 to 2016. The twelve sub-sector industries are Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services.

A regression model will be applied for each of the leverage ratios, within the total sample and each of the twelve sub-sectors, namely; TDMV and TDBV. We will explore descriptive statistics and capital structure determinants of firm size, tangibility of assets, profitability, growth, cost of debt and corporate tax rate, for the total sample and also for Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services sub-sectors.

In the initial period between 1994 and 1999, the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) of all twelve sub-sector industries was low and stable, generally varying between 0% and 15%. The only exception was the Software and Computer Services sub-sector which exhibited a drastic jump of 32% in 1998. In terms of the balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital), the debt-to-capital was also relatively low and stable varying between 0% and 15%. The Technology Hardware and Equipment sub-sector was the only exception, peaking at 38% in 1999.

Between the advent of the millennium to the mid-2000's, there was steady incline in the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) with the Bank sub-sector leaping from 3% to a peak 25% then remaining steady just below 15% by the end 2005. In contrast to the rest of the sub-sectors, which showed the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) below 25%, the Software and Computer Services sub-sector continued to showcase higher leverage levels peaking at 82% in 2002. The balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital) shows strikingly similar characteristics to the TDMV, showing steady incline in leverage. The majority of book value debt-to-capital /TDBV results generally peaks below 25% with only the Support Services sub-sector surpassing the 25% leverage threshold with a 36% book value debt-to-capital/TDBV in 2005 from 20% in 2000. The interest rate shock of 1998 could have had a bearing on the rise of leverage in this time period.

From the mid-2000's to 2009, the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital equity market value) for more sub-sectors begins to break the previously mentioned 25% threshold. Analysis within this period shows robust change in leverage observable within sub-sectors which generally had low levels of leverage at the turn of the century. The Electronic and Electrical Equipment sub-sector, for example, had the highest recorded market-based debt-to-capital/TDMV since 1994 at 134% in 2007. There were drastic volatility ranges of leverage within this specific sub-sector with the lowest leverage level recorded at 38% in 2008 which is still comparatively higher. The Support Services sub-sector continued with the upward trend in leverage with the highest recorded level at 41% in 2009, the

highest since 1994. The Software and Computer Services sub-sector continued to showcase higher leverage levels, however, on average not as high as the previous periods with the highest year being 2009 at 56%. The balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital) moved in tandem with the market-based debt-to-capital/TDMV with the Support Services sub-sector upward trend in leverage mirroring the market-based debt-to-capital/TDMV trend. The average book value debt-to-capital leverage/TDBV of the Support Services sub-sector was above 40% in this period. The Banks book value debt-to-capital equity sub-sector leverage rose above the 25% threshold for the first time in this period. This rise in leverage early on in the period started as South Africa shifted to official inflation targeting and the decline and stabilisation of interest rates.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) rose again moderately in tandem, specifically in the Electronic and Electrical Equipment, Support Services and the Software and Computer Services sub-sectors. The Electronic and Electrical Equipment sub-sector average market-based debt-to-capital/TDMV leverage was at 25% in the classified period. The lowest range was at 13% in 2012 and the highest range was at 67% in 2011. For the Support Services sub-sectors, the average debt-to-capital equity market value/TDMV leverage was at 28% with the lowest range was at 25% in 2015 and the highest range was at 33% in 2012. Software and Computer Services still proved to be the most leveraged of the sub-sectors examined with 65% debt-to-capital equity market value/TDMV in 2014, the third highest since 1994. In respect of balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital), Software and Computer Services continued the trend of being the most leveraged sub-sector with the average leverage in the period under analysis at 179%, the highest since 1994. The Electronic and Electrical Equipment and Support Services sub-sectors averaged 39% and 63% respectively in this period. The majority of the sub-sectors including Financial Services and Media were way below 15% in the post-Global Financial Crisis era.

In conclusion, the market-based debt-to-capital/TDMV for all the sub-sectors under analysis increased from an average of 3% from 1994-1999 to an average of 8% from 2011 to 2016. That equates to a market-based debt-to-capital leverage ratio/TDMV

that has almost tripled over the period under review. The book value debt-to-capital/TDBV increased from an average of 5% from 1994-1999 to 18% from 2011 to 2016. That equates to leverage that has more than tripled over the period under review.

5.2. Sample Selection and Summary Statistics

The sample frame on the evolution and determination of corporate financial policy on the JSE bourse is focused on the following sub-sector industries: Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services. In addition, the sample frame also included all 621 companies that were delisted from the JSE between 1994 and 2016 across all sectors as a result of acquisitions, liquidations and listing terminations.

This sample frame includes 126 listed companies across twelve sub-sector industries listed pre- and post-1994. Another data set of 621 delistings from liquidations, terminations, de-registration and mergers and acquisitions is succinctly examined. The delisting data set will briefly examine the type of delisting, whether a delisting occurred by a private equity group or by a corporate entity, or whether by a domestic or international player. The sample excludes companies listed on the Johannesburg Stock Exchange bourse during and after 2016. Re-listings subsequent to private equity buy-outs within the time period such as Alexander Forbes Group Holdings Limited (AFH) will be included in the sample data. Share price and accounting data was obtained from three sources; data hand-collected from and emailed by the JSE Limited, IRESS South Africa database and Bloomberg. Division of listed data set is based on the JSE sub-sector classification. This permits the discovery of industry-specific dynamics in corporate leverage trends and allows for the research to be in-line with the JSE labelling structure. Delisted companies will be dealt separately in the last part of the results section.

5.3. Trends in JSE Corporate Leverage

5.3.1. Aggregate leverage trends

The Figure 8 graph below distinctly examines the corporate leverage behaviour of companies listed on the JSE in 1994 to 2016. The graph presents an aggregate time-series from for two measures of leverage, namely, balance sheet aggregate leverage/TDBV (i.e., book value debt-to-capital) and market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital). As seen by the graph below, both the TDBV and TDMV graphs began rising in leverage in the early 2000's. The TDBV rose until the financial crisis of 2008 when it dipped slightly in 2009, thereafter reaching a plateau and maintaining a consistent level. Meanwhile, the TDMV reached its highest level before the financial crisis and subsequently declined gradually until the end of the period under review.

The blue line represents the ratio of all interest-bearing debt (i.e., Total debt) to financial capital as per balance sheet capital expressed as the sum of total debt and the book value of equity. The green line represents the ratio of all interest-bearing debt (i.e., Total debt) to financial capital as per market value capital expressed as the sum of total debt and the market value of equity as of financial year-end.

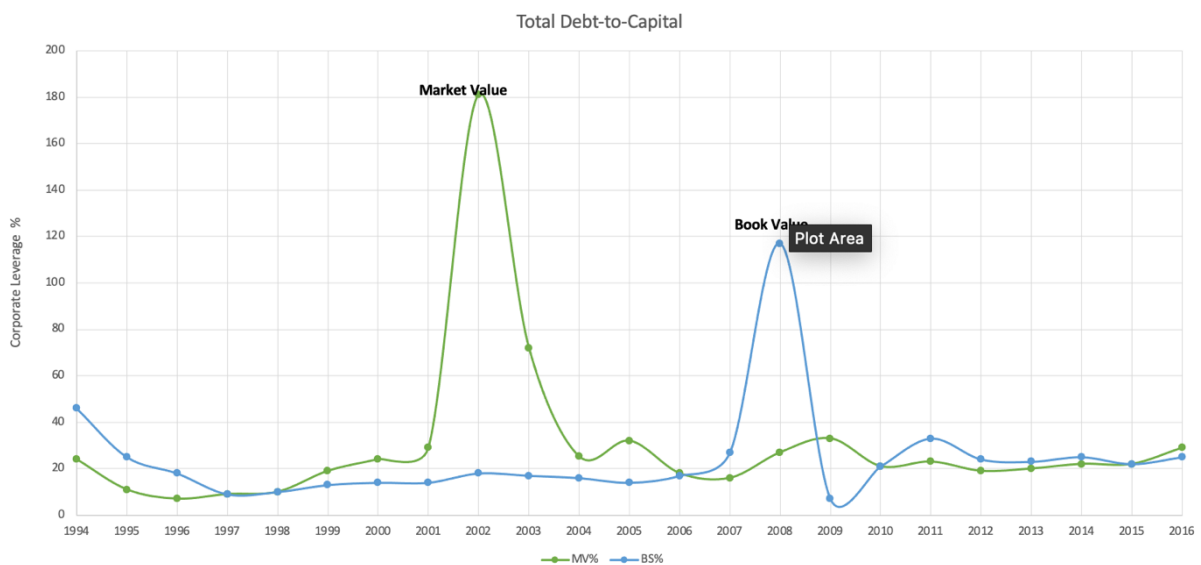


Figure. 8 This debt-to-capital graph presents the annual ratio of balance sheet aggregate leverage/TDBV (i.e., book value debt-to-capital) (blue-line) and market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) (green-line).

Table 5: Yearly Leverage for the Total Sample

Years	TDBV	TDMV
1994	45,60%	23,71%
1995	24,87%	10,72%
1996	18,36%	7,00%
1997	8,54%	8,52%
1998	10,43%	10,33%
1999	13,06%	19,26%
2000	14,28%	23,86%
2001	13,75%	29,93%
2002	181,51%	20,18%
2003	16,77%	72,31%
2004	16,24%	252,92%
2005	14,24%	32,20%
2006	17,16%	18,55%
2007	26,63%	15,69%
2008	117,63%	27,37%
2009	7,39%	32,94%
2010	21,03%	21,39%
2011	33,17%	23,20%
2012	23,59%	18,82%
2013	23,00%	20,37%
2014	25,39%	22,11%
2015	21,66%	21,58%
2016	24,75%	28,86%
Average	31,26%	33,12%
Min	7,39%	7,00%
Max	181,51%	252,92%
Std. Dev	39,45%	49,60%
Range	174,12%	245,91%

Table 5 above, in conjunction with Table 6 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used. Capital structure determinants and regression analysis for the total sample TDBV and TDMV leverage ratios are presented in Appendix A-2 Total Sample and Appendix B-1. The results of the total

sample varied, and statistical significance was also limited. The average leverage ratio closely hovers around the same percentages, around 31,26% for TBDV and 33,12% for TDMV with a standard deviation of 39% and 50% for TBDV and TDMV respectively.

Firm size, growth, tangibility of assets and corporate tax rate capital structure determinants were negatively correlated for TBDV while profitability and cost of debt were positively correlated for TBDV. None of these determinants of capital structure showed any statistical significance.

Firm size, corporate tax rate and cost of debt were positively correlated for TDMV. Tangibility of assets, profitability and growth were negatively correlated with TDMV. None of these correlations showed statistical significance in the normal regression except for the growth determinant which showed statistical significance at the 5%, but however, not at the 1% level of statistical significance when adjusted for autocorrelation and heteroscedasticity.

Table 6: Descriptive Statistics of Total Sample

Descriptive Statistics

Total Sample - Descriptive Statistics				
	Mean	Minimum	Maximum	Std. Dev.
TDBV	31,26%	7,39%	181,51%	39,45%
TDMV	33,12%	7,00%	252,92%	49,60%
SIZE	6,88	4,18	7,60	0,72
TANG	10,60%	7,30%	17,55%	2,32%
PROF	15,04%	3,61%	40,56%	9,26%
GROW	7,58	6,53	8,49	0,08
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Banks

The Banking analysis comprises of six firms listed on the JSE under the Banking industry sub-sector. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 15,34% in 1994 to 24,88% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 6,73% in 1994 and significantly increased to 18,52% in 2016.

In the formative years of the analysis, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Banking sub-sector industry was low in the single digit percentages at 6,73% to around 0,21% by 1999, the lowest ratio in the period under review. In comparison, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, was more than double at 15,34% in 1994, but however, gradually declined to 2,69% by 1999. This was by far the lowest TDBV for the period under review.

With the advent of the millennium, a gradual shift began to take place where the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV drastically rose from 3,03% to 14,01% in the mid-2000's, after recording the highest percentage ratio in 2003 of 24,63% in period under review. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV showed strikingly similar characteristics with the market-based debt-to-capital)/TDMV following a steady incline in leverage. The book value debt-to-capital)/TDBV was initially at 7,63% and sharply increased to 27,63% by the end of the mid-2000's. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV in 2003 was at 33,75%, exhibiting the highest percentage ratio in period under review.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV was at 13,53% and continued the steady momentum in the mid-10 percentages and low 20 percentages but ended with a steep decline in 2009 to around 12,98%. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV also suffered the same fate beginning at 29,70% and then dropping by approximately 10% to 19,61% after lingering steadily between high 20 and low 30 percentages.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV rose again to 20,70% and maintained a moderately steady level ending at 18,52%. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, rose to 32,27% and continued a steady decline thereafter.

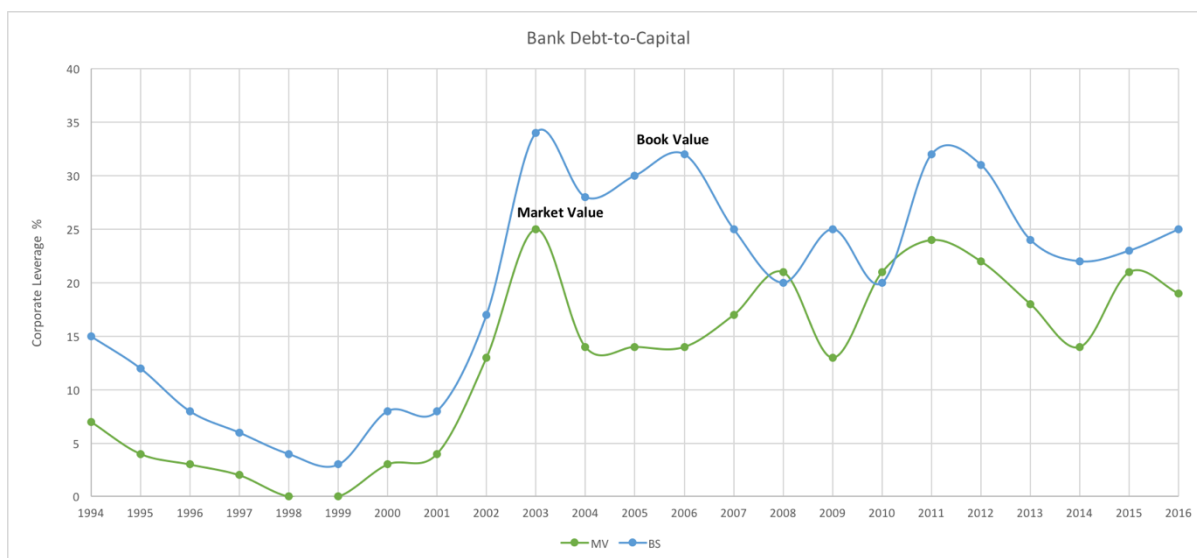


Figure. 9 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Banking sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Banking sub-sector.

Table 11: Yearly Leverage for Banking

Years	TDBV	TDMV
1994	15,34%	6,73%
1995	12,09%	4,35%
1996	8,49%	3,24%
1997	5,09%	2,08%
1998	3,82%	0,35%
1999	2,69%	0,21%
2000	7,63%	3,03%
2001	7,56%	4,41%
2002	17,37%	12,83%
2003	33,75%	24,63%
2004	27,63%	14,01%
2005	29,70%	13,53%
2006	30,38%	13,74%
2007	31,57%	16,55%
2008	25,19%	20,68%
2009	19,61%	12,98%
2010	32,27%	20,70%
2011	31,15%	23,51%
2012	32,11%	21,71%
2013	24,11%	17,50%
2014	21,81%	14,25%
2015	23,24%	21,43%
2016	24,88%	18,52%

Average	20,33%	12,65%
Min	2,69%	0,21%
Max	33,75%	24,63%
Std. Dev	10,44%	7,98%
Range	31,06%	24,42%

Table 11 above, in conjunction with Table 12 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used. Capital structure determinants and regression analysis for the Banking industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-3 Banks and Appendix B-2. The average leverage ratio is slightly higher of TDBV at around 20,33% and 12,63% for TDMV with a standard deviation of 11% and 8% for TDBV and TDMV respectively.

Firm size and the cost of debt capital structure determinants were negatively correlated for TDBV under the normal regression but positively correlated for firm size when adjusted for autocorrelation and heteroscedasticity. Tangibility of assets, growth, profitability and corporate tax rate were positively correlated for TDBV with the profitability capital structure determinant showing negative correlation when adjusted for autocorrelation and heteroscedasticity. None of these capital structure determinants for the Banking sub-sector in the TDBV regression showed any statistical significance.

Similar to the TDBV regression, firm size and cost of debt were negatively correlated for TDMV in the Banking sub-sector under the normal regression with the corporate tax rate determinant also negatively correlated when adjusted for autocorrelation and heteroscedasticity. Tangibility of assets, growth, profitability and corporate tax rate capital structure determinants were positively correlated with TDMV. None of these correlations showed statistical significance in the normal regression model except for the growth determinant which showed statistical significance at the 5%, but however, not at the 1% level, when adjusted for autocorrelation and heteroscedasticity.

Table 12: Descriptive Statistics of Banking**Descriptive Statistics**

	Banking - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	20,33%	2,69%	33,75%	10,44%
TDMV	12,65%	0,21%	24,63%	7,98%
SIZE	8,18	1,82	10,08	1,71
TANG	2,89%	0,99%	8,81%	2,41%
PROF	3,98%	2,61%	6,54%	1,31%
GROW	10,55	8,75	12,53	1,14
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Life Insurance

The Life Insurance analysis comprises of seven firms listed on the JSE under the Life Insurance industry sub-sector. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 25,97% in 1998 and declined to around 12,48% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 20,12% in 1998 and significantly decreased to 5,08% in 2016.

In the formative years of the analysis, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Banking sub-sector industry began on a high with double digit percentages at 20,12% to around 12,75% by 1999, with only just two listed Life Insurance firms – Clientele Limited and Sanlam Limited - under review. In comparison, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, was slightly higher at 25,97% in 1998, however sharply declined to 15,30% by 1999.

By the turn of the century, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV hovered in the mid-teens from 12,19% at the dawn of the millennium to 14,19% in the mid-2000's. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV showed strikingly similar characteristics

with the market-based debt-to-capital/TDMV hovering in the higher mid-teens. The book value debt-to-capital/TDBV began at 18,81% and levelled around 20,95% by the end of the mid-2000's.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV decreased to 9,05% and continued to decline to a single-digit percentage range of 4,89% in 2006 which was the second lowest TDMV in the period under review. The market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV rose to its peak value in 2009 to around 21,94%. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was relatively steady at 14,27% in the beginning and remained steady to 17,34% by the end of 2009.

Following its highest peak value in the previous year, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV plummeted to 8,71% and continued a downward path to reach its lowest level in the period under review of 3,22% in 2015, ending at 5,08% in 2016. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV remained steady as opposed to the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV but also reached its lowest level at 7,38% in 2015 and ending the total period under review at 12,48% in 2016.

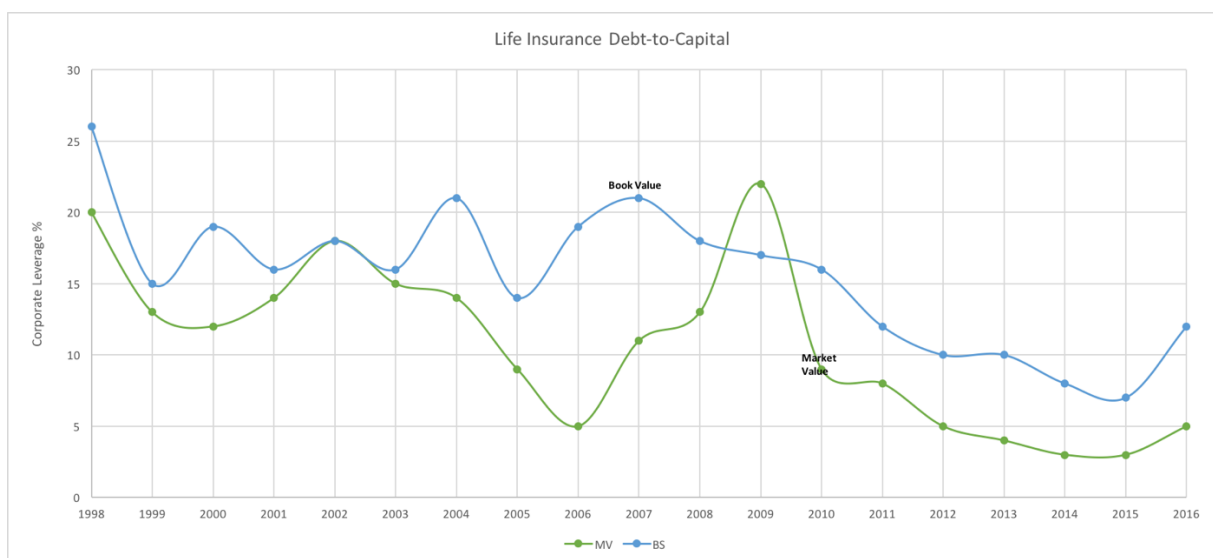


Figure. 10 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Life Insurance sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Life Insurance sub-sector.

Table 17: Yearly Leverage for Life Insurance Firms

Years	TDBV	TDMV
1998	25,97%	20,12%
1999	15,30%	12,72%
2000	18,81%	12,19%
2001	15,75%	13,62%
2002	18,08%	17,74%
2003	16,37%	15,25%
2004	20,95%	14,19%
2005	14,26%	9,05%
2006	19,47%	4,89%
2007	21,47%	10,92%
2008	18,29%	13,23%
2009	17,34%	21,94%
2010	15,57%	8,71%
2011	12,13%	7,70%
2012	9,52%	4,79%
2013	9,59%	4,16%
2014	8,48%	3,35%
2015	7,38%	3,22%
2016	12,48%	5,08%
Average	15,64%	10,68%
Min	7,38%	3,22%
Max	25,97%	21,94%
Std. Dev	4,88%	5,71%
Range	18,59%	18,72%

Table 17 above, in conjunction with Table 18 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used. Capital structure determinants and regression analysis for the Life Insurance industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-4 Life Insurance and Appendix B-3. The average leverage ratio is slightly higher for TDBV at around 15,64% and 12,63% for TDMV with a standard deviation of 5% and 6% for TDBV and TDMV respectively.

Firm size and the tangibility of assets capital structure determinants were negatively correlated for TDBV under the normal regression with the growth determinant also negatively correlated when adjusted for autocorrelation and heteroscedasticity. Growth, profitability, cost of debt and corporate tax rate were positively correlated for TDBV. Only the tangibility of assets and corporate tax rate in TDBV regression model showed statistical significance at the 5% but not at 1% levels.

Analysis of the TDMV regression model showed haphazard results under the normal regression and also when adjusted for autocorrelation and heteroscedasticity. Firm size, tangibility of assets, profitability and growth capital structure determinants were all negatively correlated except for the cost of debt and corporate tax rate capital structure determinants which showed a positive correlation trend. When adjusted for autocorrelation and heteroscedasticity, the corporate tax rate and the cost of debt correlated in the opposite direction, negatively correlating with the firm size. This time around, tangibility of assets, profitability and growth capital structure determinants showed a positive correlation in the TDMV model that was adjusted for autocorrelation and heteroscedasticity. None of these correlations in the Life Insurance sub-sector showed any statistical significance.

Table 18: Descriptive Statistics of Life Insurance Firms

Descriptive Statistics

	Life Insurance - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	15,64%	7,38%	25,97%	4,88%
TDMV	10,68%	3,22%	21,94%	5,71%
SIZE	9,73	8,93	10,24	0,38
TANG	1,53%	0,24%	3,26%	0,91%
PROF	7,60%	1,50%	12,01%	2,19%
GROW	10,88	10,03	11,78	0,54
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Financial Services

The Financial Services analysis comprises of 52 firms listed on the Johannesburg Stock Exchange JSE under the Financial Service industry sub-sector with 30 of those listed firms considered under review. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 9,12% in 1994 to 23,95% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at a very low 1,82% in 1994 and ended at 7,47% in 2016.

The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Financial Service sub-sector industry began in single digit percentages at 1,82% to around 0,84% in 1998 and 0,86% by 1999, the lowest and second lowest ratios respectively in the total period under review. In comparison, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, was much higher beginning at 9,12% in 1994 despite a gradual decline to 0,71% by 1999. Between 1995 and 1997 the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV averaged at 30,75% and declined drastically after the introduction of FirstRand Limited to the JSE. FirstRand Limited was merger between Anglo American Plc and RMB Holdings Limited. The listing contributed to the sharp decline due to its sheer size and market capitalization.

By the turn of the century, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began showing signs of volatile outcomes, drastically leaping to 7,58% following a low of 0,86% in the previous year to 1,15% by the mid-2000's, with each covered annual period either moving upwards or lowering in random pattern. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV showed similar characteristics with the market-based debt-to-capital)/TDMV, exhibiting volatile ups and downs in leverage. The book value debt-to-capital)/TDBV jumped to 25,01% in 2000 and ended at 6,10% by the end of the mid-2000's.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV was still in the low single-digit percentages at 5,86% and continued around the same percentages ending higher at 9,29% in 2009. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was almost double that of market value aggregate leverage ratio (i.e.,

market-based debt-to-capital equity market value)/TDMV at 11,76% and ended roughly around the same value at 11,09% by the end of 2009.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV rose again to 5,23% and maintained a moderately steady level ending at 7,47% by 2016. In respect of balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, the leverage was at a single-digit percentage around 7,62% began a rapid climb to 23,95% by the end of the period under review.

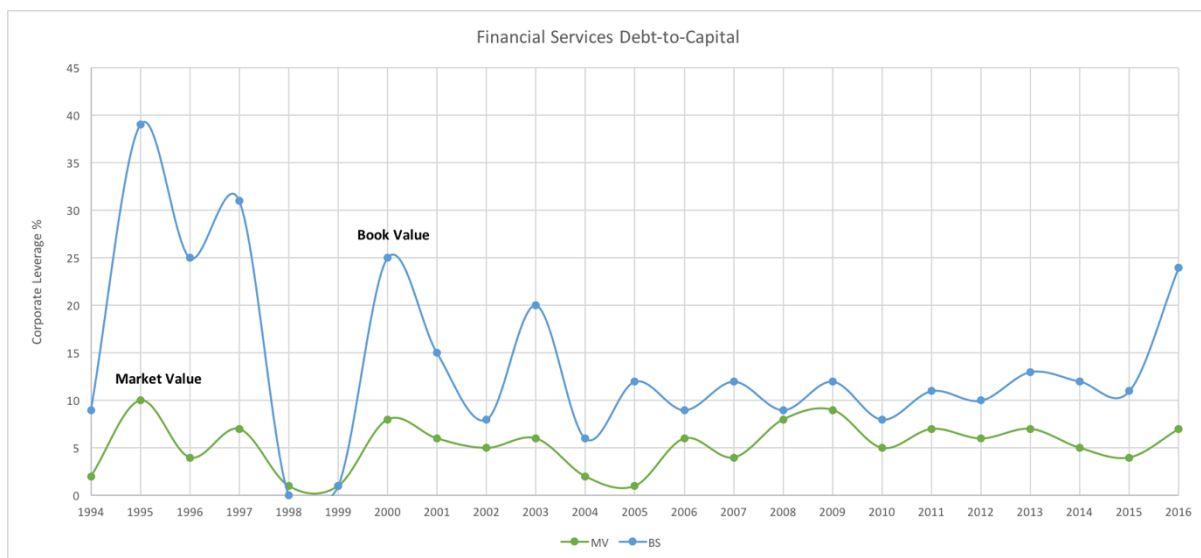


Figure. 11 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Financial Services sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green-line) for the Financial Services sub-sector.

Table 23: Yearly Leverage for Financial Services Firms

Years	TDBV	TDMV
1994	9,12%	1,82%
1995	38,72%	10,42%
1996	24,51%	4,33%
1997	30,56%	7,36%
1998	0,26%	0,84%
1999	0,71%	0,86%
2000	25,01%	7,58%
2001	14,99%	5,72%
2002	7,98%	4,84%

2003	19,94%	6,24%
2004	7,37%	1,57%
2005	6,10%	1,15%
2006	11,76%	5,86%
2007	9,47%	4,31%
2008	11,69%	8,29%
2009	11,09%	9,29%
2010	7,62%	5,23%
2011	10,71%	7,31%
2012	10,26%	5,75%
2013	13,43%	7,01%
2014	12,22%	5,21%
2015	10,94%	4,38%
2016	23,95%	7,47%
Average	13,84%	5,34%
Min	0,26%	0,84%
Max	38,72%	10,42%
Std. Dev	9,30%	2,69%
Range	38,46%	9,58%

Table 23 above, in conjunction with Table 24 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Financial Services firms. Capital structure determinants and regression analysis for the Financial Services industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-5 Financial Services and Appendix B-4. The average leverage ratio was much higher for TDBV at around 13,84% than for TDMV which was at 5,34% with a standard deviation of 9% and 3% for TDBV and TDMV respectively.

Firm size, tangibility of assets, cost of debt and profitability capital structure determinants were negatively correlated for TDBV under the normal regression with the growth determinant also negatively correlated when adjusted for autocorrelation and heteroscedasticity. The major exception was the positive correlation of the profitability determinant. Growth and corporate tax rate were positively correlated for TDBV. None of the capital structure determinants for the TDBV regression model showed statistical significance.

Analysis of the TDMV regression model revealed that all the capital structure determinants were negatively correlated with the exception of the growth capital structure determinant. When adjusted for autocorrelation and heteroscedasticity, once again, all the capital structure determinants with the exception of the growth and profitability capital structure determinants (which were positively correlated with TDMV) were negatively correlated. None of the capital structure determinants for the TDMV regression model showed statistical significance for the Financial Services sub-sector.

Table 24: Descriptive Statistics of Financial Services Firms

Descriptive Statistics

	Financial Services - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	13,84%	0,26%	38,72%	9,30%
TDMV	5,34%	0,84%	10,42%	2,69%
SIZE	5,37	-0,66	7,11	1,76
TANG	5,12%	1,79%	18,98%	3,37%
PROF	11,19%	-2,83%	72,53%	16,31%
GROW	7,43	3,19	8,93	1,30
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Fixed Line Telecommunications

The Fixed Line Telecommunications analysis comprises of only three firms listed on the JSE under the Fixed Line Telecommunications industry sub-sector with just two of those – Huge Group Limited and Cognition Holdings Limited - under review. Cognition Holdings Limited was listed in 2015 while Huge Group Limited was listed in the following year, the last year permissible under review. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began was at 2,79% in 2015 and ended at 6,01% in 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 1,72% in 2015 and ended around 3,44% by the end of 2016.

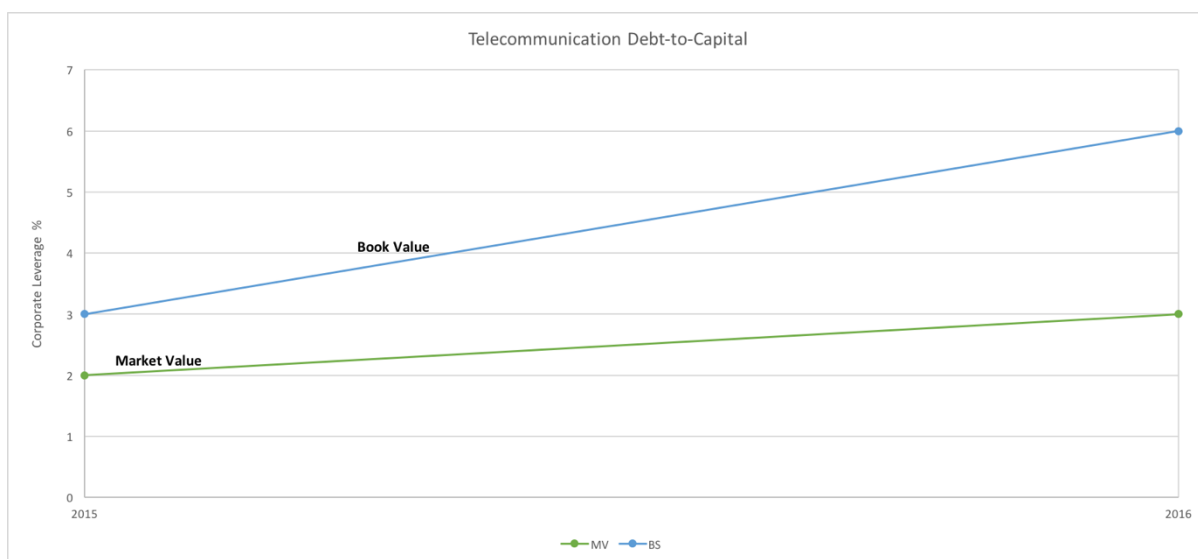


Figure. 12 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Fixed Line Telecommunication sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Fixed Line Telecommunication sub-sector.

Table 29: Yearly Leverage for Fixed Line Telecommunications Firms

Years	TDBV	TDMV
2015	1,62%	2,79%
2016	3,44%	6,01%
Average	2,53%	4,40%
Min	1,62%	2,79%
Max	3,44%	6,01%
Std. Dev	1,29%	2,28%
Range	1,82%	3,22%

Table 29 above and Table 30 below summarises the yearly leverage and the descriptive statistics of the Fixed Line Telecommunications sub-sector. The average leverage ratio was much lower for the TDBV at around 2,53% than for TDMV which was at 4,40% with a standard deviation of 1,29% and 2,28% for TDBV and TDMV respectively. Capital structure determinants for the Fixed Line Telecommunications sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-6.

The TDBV and TDMV regression analysis performed on the Fixed Line Telecommunications sub-sector data set created a multicollinearity output. The

regression model outputs presented a type of disturbance in the data caused by the high inter-associations and intercorrelations among the independent variables. Due to the presence of multicollinearity in the coefficients, the regression analysis for the Fixed Line Telecommunications sub-sector cannot be reliably relied upon. Upon further inspection of the data, it was evident that the fact that only two inputs i.e. two years of leverage data inputs for two similar Fixed Line Telecommunications firms (Huge Group Limited and Cognition Holdings Limited) might be the cause for the disturbance in the regression output.

Table 30: Descriptive Statistics of Fixed Line Telecommunications Firms

Descriptive Statistics

	Telco's - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	2,53%	1,62%	3,44%	1,29%
TDMV	4,40%	2,79%	6,01%	2,28%
SIZE	5,29	5,27	5,32	0,04
TANG	27,39%	26,48%	28,31%	1,30%
PROF	9,33%	7,17%	11,49%	3,05%
GROW	5,65	5,53	5,77	0,17
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Nonlife Insurance

The Nonlife Insurance analysis comprises of three firms listed on the JSE under the Financial Service industry sub-sector. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 0,00% in 1994 to 12,55% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV also began at a 0,00% in 1994 and ended at 3,65% in 2016.

Both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 0,00% in 1994 and ended at 0,00% in 1999 with Santam Limited being the only listed firm under review.

The listing of Indequity Group Limited on the Johannesburg Stock Exchange (JSE) moved the leverage ratio for both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV to a meagre 0,01% by the end of 2001. By the end of mid-2000's leverage ratios for both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV drastically moved up to 19,92% and 29,71% respectively.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV dropped to higher single-digit percentages at 8,89% and continued around the same percentages ending lower at 6,54% in 2009. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was started lower in the mid-2000's at 14,19% despite ending higher 16,62% by the end of 2009.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was teetering around 5,96% in the beginning of the period under review and maintained a moderately steady level ending at 3,65% by 2016. In respect of balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, the leverage was at 17,20% began a rapid decline to 12,55% by the end of the period under review.

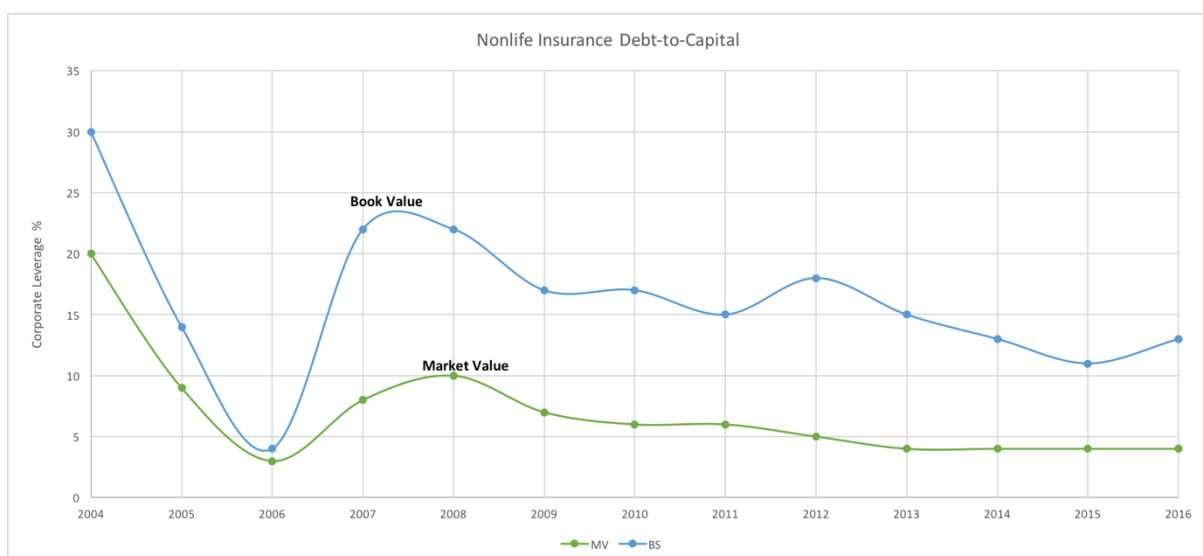


Figure. 13 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Nonlife Insurance sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Nonlife Insurance sub-sector.

Table 31: Yearly Leverage for Nonlife Insurance Firms

Years	TDBV	TDMV
1994	0,00%	0,00%
1995	0,00%	0,00%
1996	0,00%	0,00%
1997	0,00%	0,00%
1998	0,00%	0,00%
1999	0,00%	0,00%
2000	0,00%	0,00%
2001	0,01%	0,01%
2002	0,02%	0,02%
2003	0,02%	0,01%
2004	29,71%	19,92%
2005	14,19%	8,89%
2006	4,10%	2,68%
2007	22,41%	7,86%
2008	21,55%	10,28%
2009	16,62%	6,54%
2010	17,20%	5,96%
2011	15,08%	5,62%
2012	17,52%	4,51%
2013	14,53%	4,43%
2014	12,66%	3,84%
2015	10,79%	4,39%
2016	12,55%	3,65%
Average	9,08%	3,85%
Min	0,00%	0,00%
Max	29,71%	19,92%
Std. Dev	9,34%	4,80%
Range	29,71%	19,92%

Table 31 above, in conjunction with Table 32 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Nonlife Insurance firms. Capital structure determinants and regression analysis for the Nonlife Insurance industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-7 Nonlife

Insurance and Appendix B-5. The average leverage ratio is slightly higher for TDBV at around 9,08% and 3,85% for TDMV with a standard deviation of 9,34% and 4,80% for TDBV and TDMV respectively.

Similar to the aforementioned sub-sector regression models above, the TDBV regression for Nonlife Insurance firms, only has positive correlation for the growth and corporate tax rate capital structure determinants. The rest of the capital structure determinants are negatively correlated. None of these correlations in the Nonlife Insurance sub-sector showed statistical significance at both at the 5% and 1% levels under the normal regression model. When adjusted for autocorrelation and heteroscedasticity, the same correlation results were found. Firm size, profitability, tangibility of assets and cost of debt were negatively correlated with TDBV and corporate tax rate and growth positively correlated with TDBV. Tangibility of assets was strongly correlated at 1% statistical significance level and the cost of debt and corporate tax rate in TDBV regression model showed statistical significance at the 5% level.

Similar to the TDBV regression model, TDMV had firm size, profitability, tangibility of assets and cost of debt negatively correlated while corporate tax rate and growth were positively correlated. When adjusted for autocorrelation and heteroscedasticity, TDMV regression output had identical results with tangibility of assets showing strong correlation at the 1% statistical significance level.

Table 32: Descriptive Statistics of Nonlife Insurance Firms

Descriptive Statistics

Nonlife Insurance - Descriptive Statistics				
	Mean	Minimum	Maximum	Std. Dev.
TDBV	9,08%	0,00%	29,71%	9,34%
TDMV	3,85%	0,00%	19,92%	4,80%
SIZE	6,32	4,24	8,17	0,97
TANG	1,66%	0,54%	2,79%	0,59%
PROF	7,84%	-18,57%	27,01%	10,56%
GROW	6,66	5,70	7,95	0,66

COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Healthcare Equipment and Services

The Healthcare Equipment and Services analysis comprises of only six firms listed on the JSE under the Healthcare Equipment and Services industry sub-sector with just two of those – Advanced Health Limited and Bid Corp Limited - under review. Advanced Health Limited was listed in 2014 while Bid Corp Limited in 2016, the last year permissible under review. Four other firms under the Healthcare Equipment and Services industry sub-sector were either listed after 2016 such as RH Bophelo Limited or dual-listed and therefore impermissible. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began was at 11,87% in 2014 and ended significantly higher at 32,72% in 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at the low 4,59% in 2014 and ended even lower at around 0,09% by the end of 2016.

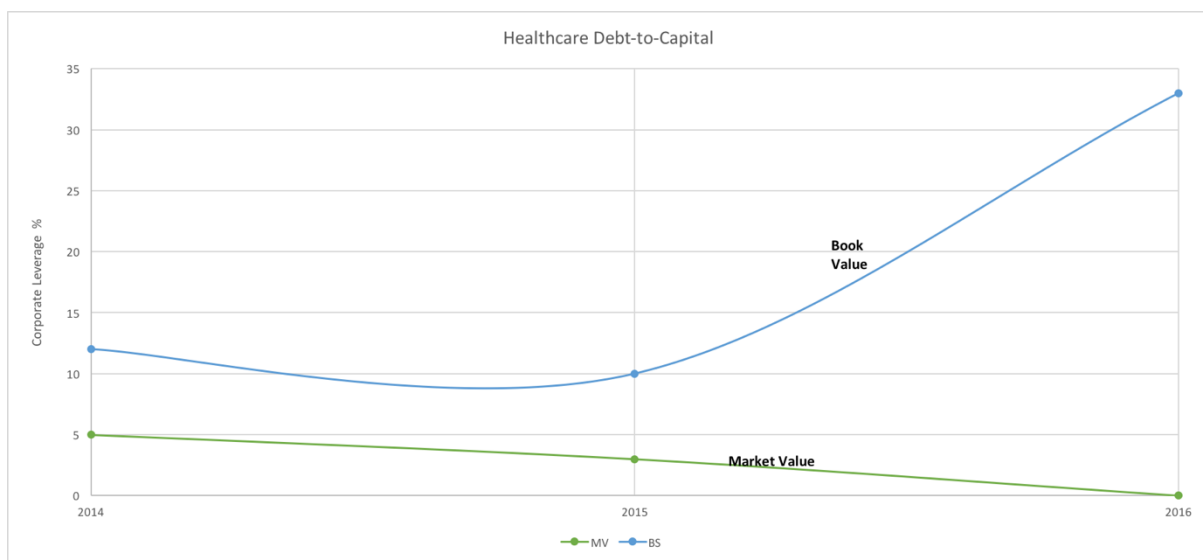


Figure. 14 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Healthcare Equipment and Services sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Healthcare Equipment and Services sub-sector.

Table 37: Yearly Leverage for Healthcare Equipment and Services

Years	TDBV	TDMV
2014	11,87%	4,59%
2015	9,59%	3,45%
2016	32,72%	0,09%
Average	18,06%	2,71%
Min	9,59%	0,09%
Max	32,72%	4,59%
Std. Dev	12,75%	2,34%
Range	23,13%	4,50%

Table 37 above and Table 38 below summarise the yearly leverage and the descriptive statistics of the Healthcare Equipment and Services sub-sector. The average leverage ratio was way higher for the TDBV at around 18,06%, as opposed to TDMV which was at 2,71%. Standard deviation was at 12,75% and 2,34% for TDBV and TDMV respectively. Capital structure determinants for the Healthcare Equipment and Services sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-8.

Similar to the Fixed Line Telecommunications sub-sector, the TDBV and TDMV regression analysis performed on the Healthcare Equipment and Services sub-sector data set created a multicollinearity output. Due to the presence of multicollinearity in the coefficients, the regression analysis for the Healthcare Equipment and Services sub-sector cannot be reliably relied upon.

Table 38: Descriptive Statistics of Health Equipment and Services Firms**Descriptive Statistics**

	Health Equipment - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	18,06%	9,59%	32,72%	12,75%
TDMV	2,71%	0,09%	4,59%	2,34%
SIZE	6,30	5,05	8,65	2,04
TANG	30,61%	20,18%	47,17%	14,51%

PROF	5,50%	1,93%	9,69%	3,92%
GROW	6,57	5,51	8,51	1,68
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Pharmaceuticals and Biotechnology

The Pharmaceuticals and Biotechnology analysis comprises of only two firms listed on the JSE under the Pharmaceuticals and Biotechnology analysis sub-sector – Adcock Ingram Holdings and Ascendis Health Limited. Adcock Ingram Holdings Limited was relisted in 2008 after the unbundling of Tiger Brands Limited while Ascendis Health Limited was listed in 2014. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 26,57% in 2008 and reached its highest level at 41,08% in 2010. A dramatic downswing occurred in the following year where the leverage ratio dropped to 26,15%, continuing up to the lowest levels in 2013 of 3,72%. The following year another dramatic upswing occurred where the leverage ratio reached the second highest percentage of 40,69% and thereafter stabilizing at 33,78% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 7,53% in 2008, reaching its lowest leverage ratio at 1,02% in 2013 and subsequently climbing up to end at 24,82% in 2016.

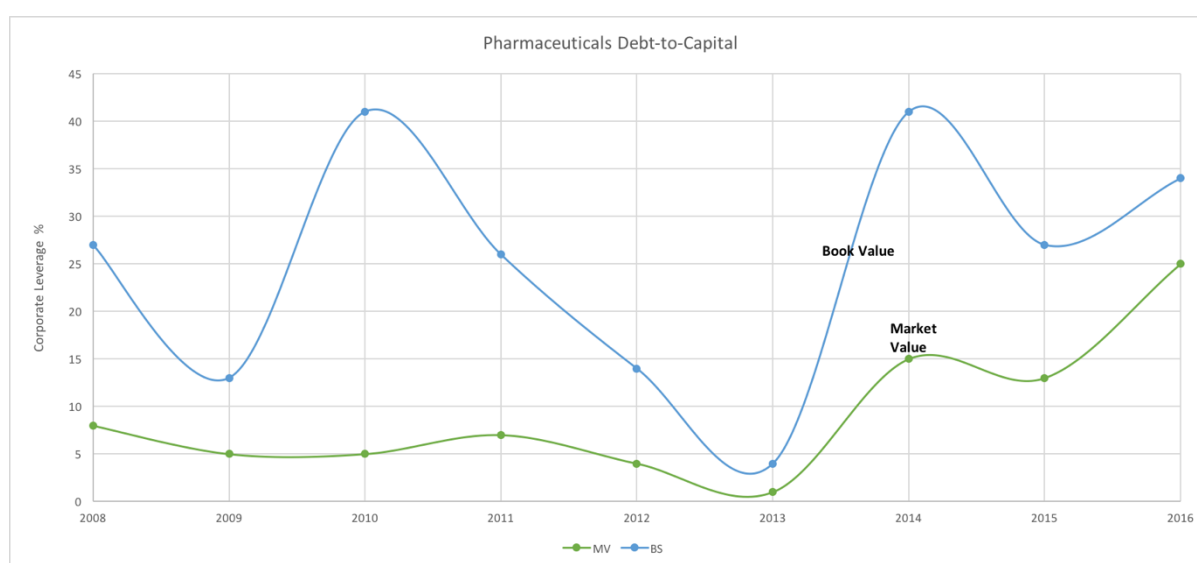


Figure. 15 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Pharmaceuticals and Biotechnology sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green-line) for the Pharmaceuticals and Biotechnology sub-sector.

Table 39: Yearly Leverage for Pharmaceuticals and Biotechnology Firms

Years	TDBV	TDMV
2008	26,59%	7,53%
2009	13,39%	5,32%
2010	41,08%	4,57%
2011	26,15%	7,00%
2012	14,04%	4,19%
2013	3,72%	1,02%
2014	40,69%	15,09%
2015	27,33%	13,04%
2016	33,78%	24,82%
Average	25,19%	9,17%
Min	3,72%	1,02%
Max	41,08%	15,09%
Std. Dev	9,34%	4,80%
Range	29,71%	19,92%

Table 39 above, in conjunction with Table 40 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Pharmaceuticals and Biotechnology firms. Capital structure determinants and regression analysis for the Pharmaceuticals and Biotechnology industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-9 Pharmaceuticals and Biotechnology and Appendix B-6. The average leverage ratio is slightly higher for TDBV at around 9,08% and 3,85% for TDMV with a standard deviation of 9,34% and 4,80% for TDBV and TDMV respectively.

The TDBV regression model for Pharmaceuticals and Biotechnology firms only had positive correlation for the growth and profitability capital structure determinants. Firm size, tangibility of assets and cost of debt were negatively correlated with none of the capital structure determinants showing any statistical significance. When adjusted for autocorrelation and heteroscedasticity, the same correlation results were found to have no statistical significance.

The TDMV regression model had firm size, cost of debt and growth positively correlated with profitability and tangibility of assets and cost of debt negatively correlated. When adjusted for autocorrelation and heteroscedasticity, TDMV regression output had identical results with no statistical significance.

Table 40: Descriptive Statistics of Pharmaceutical and Biotechnology Firms

Descriptive Statistics

	Pharma Biotechnology - Descriptive Stats			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	25,20%	3,72%	41,08%	12,74%
TDMV	9,18%	1,02%	24,82%	7,33%
SIZE	7,77	3,69	8,60	1,56
TANG	19,86%	16,19%	29,54%	4,91%
PROF	16,45%	4,10%	30,84%	8,21%
GROW	8,42	7,91	8,83	0,28
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Media

The Media analysis comprises of only two firms listed on the Johannesburg Stock Exchange (JSE) under the Media industry sub-sector – African Media Entertainment Limited and Caxton CTP Publishers & Printers Limited. Caxton CTP Publishers & Printers Limited was listed in 1996 while African Media Entertainment Limited was listed in 1998.

The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began was at 4,25% in 1996 and continued below 4% until its lowest leverage levels of 0,29% in 2004. Thereafter, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV remained at 0,00% until 2016, the end of the period under review. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at the low 1,12% in 1996 and ended even lower at around 0,18% by the end of 2004. Thereafter, the market value aggregate leverage ratio (i.e., market-

based debt-to-capital)/TDMV remained at 0,00% until 2016 in a similar pattern to the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV.



Figure. 16 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Media sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Media sub-sector.

Table 45: Yearly Leverage for Media Firms

Years	TDBV	TDMV
1996	4,25%	1,12%
1997	1,67%	0,44%
1998	2,06%	0,58%
1999	1,78%	1,41%
2000	1,08%	0,80%
2001	1,79%	1,67%
2002	1,15%	1,21%
2003	0,42%	0,34%
2004	0,29%	0,18%
2005	0,00%	0,00%
2006	0,01%	0,01%
2007	0,01%	0,01%
2008	0,01%	0,01%
2009	0,01%	0,01%
2010	0,01%	0,01%
2011	0,01%	0,00%
2012	0,00%	0,00%
2013	0,00%	0,00%
2014	0,00%	0,00%

2015	0,00%	0,00%
2016	0,00%	0,00%
Average	0,69%	0,37%
Min	0,00%	0,00%
Max	4,25%	1,67%
Std. Dev	1,10%	0,54%
Range	4,25%	1,67%

Table 45 above, in conjunction with Table 46 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Media firms. Capital structure determinants and regression analysis for the Media industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-10 Media and Appendix B-7. The average leverage ratio was significantly low, at less than 1% for Media firms when compared to other JSE sub-sectors. TDBV average leverage ratio was measured at 0,69% while TDMV average leverage ratio was at 0,37%. Standard deviation was also relatively low at 1,10% and 0,54% for TDBV and TDMV respectively.

Firm size, tangibility of assets, growth and profitability capital structure determinants for Media firms were negatively correlated for TDBV under the normal regression while the corporate tax rate and cost of debt capital structure determinants were positively correlated. Identical results were obtained when the TDBV regression model was adjusted for autocorrelation and heteroscedasticity. Corporate tax rate showed statistical significance at the 5% level under the normal regression while the both the corporate tax rate and profitability showed strong correlations at the 1% statistical significance when adjusted for autocorrelation and heteroscedasticity.

Analysis of the TDMV regression model revealed that the firm size, corporate tax rate and cost of debt capital structure determinants were positively correlated while tangibility of assets, growth and profitability capital structure determinants were negatively correlated. Profitability showed strong correlation at the 1% statistical significance level. When adjusted for autocorrelation and heteroscedasticity, correlations were indistinguishable under the normal regression model with the exception of the growth determinant which was positively correlated. Profitability

showed strong correlation at the 1% statistical significance level when adjusted for autocorrelation and heteroscedasticity.

Table 46: Descriptive Statistics of Media Firms

Descriptive Statistics

	Media - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	0,69%	0,00%	4,25%	1,10%
TDMV	0,37%	0,00%	1,67%	0,54%
SIZE	6,79	5,95	8,30	0,61
TANG	19,86%	20,92%	40,58%	4,44%
PROF	15,69%	6,35%	26,99%	5,70%
GROW	6,77	5,82	8,65	0,74
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Technology Hardware and Equipment

The Technology Hardware and Equipment analysis comprises of seven firms listed on the JSE under the Technology Hardware and Equipment industry sub-sector. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV commenced at 2,73% in 1997 and reached 10,24% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at a very low 0,35% in 1997 and ended at 3,13% in 2016.

In the formative years of the analysis, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Technology Hardware and Equipment sub-sector industry began on a low single-digit percentage at 0,35% in 1997 to around 1,52% in 1999, with only just two Technology Hardware and Equipment listed firms – Mustek Limited and Datatec Limited - under review. In comparison, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began equally low at 2,73% in 1997, however sharply reached 38,20% by 1999.

The dawn of the millennium began at a low 1,47% for the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and gradually rose to around 7,87% by the mid-2000's. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was contrastingly high beginning at the highest leverage ratio level of 53,72% and levelled around 29,36% by the end of the mid-2000's.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TBMV increased to 14,41% by the end of 2009. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV remained relatively at 29,49% by the end of 2009.

The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV plummeted to single digit levels at 8,71% and continued a downward path to reach its lowest level in the period under review of 2,95% in 2015, ending at 3,19% in 2016. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at a low level at 13,07% in 2010 and ended the total period under review at 10,24% in 2016.

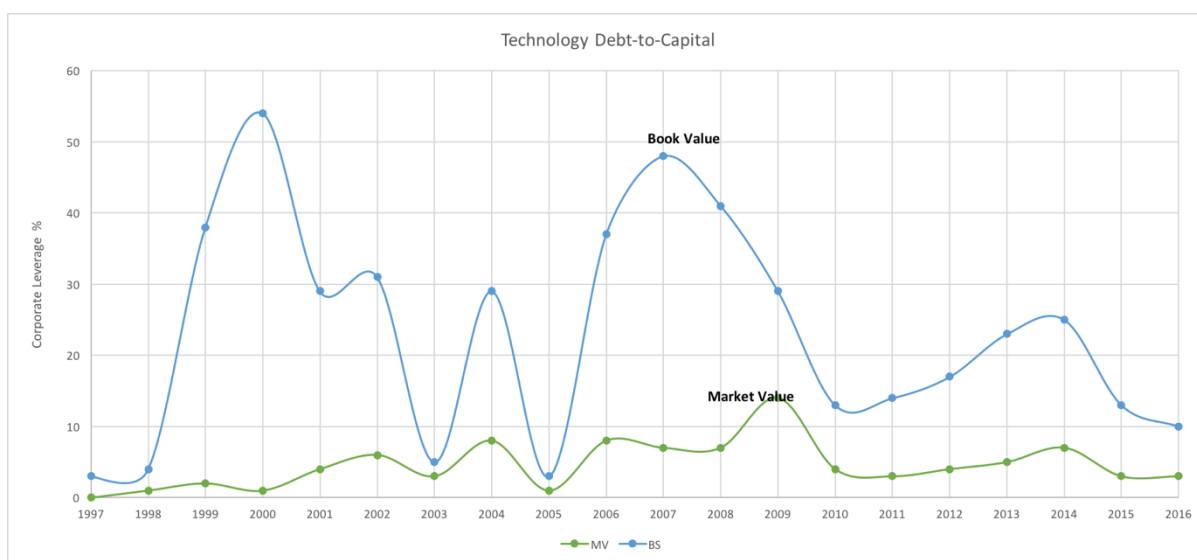


Figure. 17 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Technology Hardware and Equipment sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Technology Hardware and Equipment sub-sector.

Table 51: Yearly Leverage for Technology Hardware and Equipment Firms

Years	TDBV	TDMV
1997	2,73%	0,35%
1998	3,72%	1,03%
1999	38,20%	1,52%
2000	53,72%	1,47%
2001	29,38%	4,44%
2002	30,81%	6,26%
2003	5,20%	2,74%
2004	29,36%	7,87%
2005	3,35%	0,97%
2006	37,39%	7,62%
2007	48,43%	6,82%
2008	40,68%	7,49%
2009	29,42%	14,41%
2010	13,07%	3,71%
2011	13,83%	3,47%
2012	17,10%	3,75%
2013	23,45%	4,73%
2014	25,01%	6,89%
2015	13,06%	2,95%
2016	10,24%	3,19%
Average	23,41%	4,58%
Min	2,73%	0,35%
Max	53,72%	14,41%
Std. Dev	15,37%	3,34%
Range	50,99%	14,05%

Table 51 above, in conjunction with Table 52 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Technology Hardware and Equipment firms. Capital structure determinants and regression analysis for the Technology Hardware and Equipment industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-11 Technology Hardware and Equipment and Appendix B-8. TDBV average leverage ratio was measured at 23,41%, significantly higher than the TDMV average leverage ratio which was at 4,58%. Standard deviation was measured at 15,37% and 3,34% for TDBV and TDMV respectively.

The TDBV regression model for Technology Hardware and Equipment firms indicated positive correlation for the firm size, growth and cost of debt capital structure determinants and exhibited negative correlation for tangibility of assets, profitability and corporate tax rate. These were the exact same results obtained for the TDBV regression model when adjusted for autocorrelation and heteroscedasticity. Only the profitability determinant was statistically significant at the 5% level for both regression models.

The TDMV regression model had firm size and cost of debt positively correlated while profitability, tangibility of assets, growth, corporate tax rate negatively correlated. The profitability determinant was statistically significant at the 5% level and firm size was strongly correlated at the 1% statistical significance level. When adjusted for autocorrelation and heteroscedasticity, TDMV regression output yielded exactly the same results, with growth and profitability capital structure determinants statistically significant at the 5% level and firm size strongly correlated at the 1% level.

Table 52: Descriptive Statistics of Technology Hardware and Equipment Firms

Descriptive Statistics

	Technology Hardware - Descriptive Stats			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	23,41%	2,73%	53,72%	15,37%
TDMV	4,58%	0,35%	14,41%	3,34%
SIZE	8,17	6,77	8,87	0,61
TANG	6,43%	2,53%	10,07%	4,44%
PROF	10,12%	6,78%	14,59%	1,90%
GROW	7,51	5,95	8,51	0,70
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Software and Computer Services

The Software and Computer Services analysis comprises of 11 firms listed on the JSE under the Software and Computer industry sub-sector with 8 of those listed firms considered under review. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 8,23% in 1994 to 51,26% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 14,55% in 1994 and ended at 28,83% in 2016.

The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Software and Computer industry sub-sector industry began in a double-digit percentage at 14,55% dropping to a single-digit percentage the following year at 4,93% in 1999. In comparison, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, was much lower in beginning at 8,23% in 1994 despite a gradual decline by the end of 1999.

By the turn of the century, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV sharply increased to 25,88% and thereafter escalated by more than double to 52,06% in 2001. The average leverage ratio for this period was at 54,15% and recorded the highest ratio for the total period under review of 81,97% in 2002 reaching 61,58% by the end of the mid-2000's. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV jumped to 17,85% in 2000 and ended marginally higher at 20,60% by the end of the mid-2000's.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV decreased considerably to 28,46% but significantly ascended again to 55,56% by the end of 2009. In contrast, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV showed no dramatic up or downswings beginning at 25,78% and ending roughly around the same value at 21,50% by the end of 2009.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV rose again to 45,43% and maintained a moderately steady level ending at 28,83% by 2016. In respect of balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, the leverage began closer to where it ended at around 25,47% began a rapid ascend to 51,26% by the

end of the period under review. This was the highest peak of the leverage ratio in the total period under review.

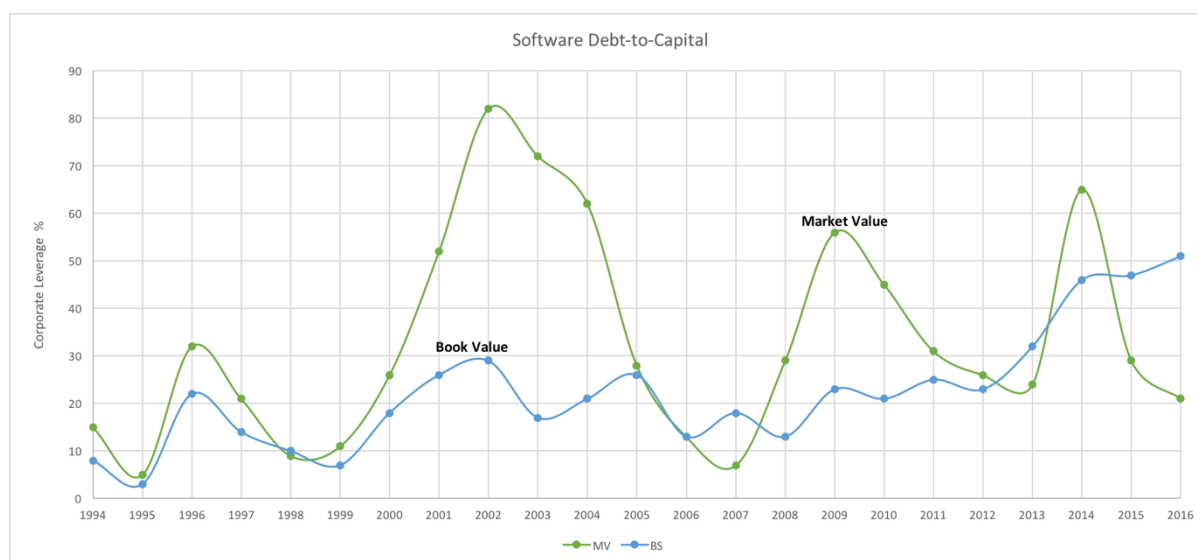


Figure. 18 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Software and Computer Services sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Software and Computer Services sub-sector.

Table 57: Yearly Leverage for Software and Computer Services Firms

Years	TDBV	TDMV
1994	8,23%	14,55%
1995	3,03%	4,93%
1996	21,94%	32,50%
1997	13,89%	21,39%
1998	10,21%	8,67%
1999	7,08%	10,61%
2000	17,85%	25,88%
2001	25,52%	52,06%
2002	29,14%	81,97%
2003	17,06%	72,48%
2004	20,60%	61,58%
2005	25,78%	28,46%
2006	17,76%	12,75%
2007	12,59%	6,55%
2008	22,70%	28,54%
2009	21,50%	55,56%
2010	25,47%	45,43%

2011	23,21%	31,24%
2012	25,90%	25,97%
2013	32,50%	23,71%
2014	46,19%	65,37%
2015	46,57%	20,51%
2016	51,26%	28,83%
Average	22,87%	33,02%
Min	3,03%	4,93%
Max	51,26%	81,97%
Std. Dev	12,38%	22,07%
Range	48,23%	77,04%

Table 57 above, in conjunction with Table 58 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Software and Computer Services firms. Capital structure determinants and regression analysis for the Software and Computer Services industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-12 Software and Computer Services and Appendix B-9. The average leverage ratio was significantly higher as compared to other JSE sub-sectors. The average leverage ratio TDBV was around 22,87% and 33,02% for TDMV with a standard deviation of 12% and 22% for TDBV and TDMV respectively.

Firm size, profitability and cost of debt capital structure determinants were negatively correlated while tangibility of assets, growth and corporate tax rate were positively correlated for TDBV under the normal regression in the Software and Computer Services sub-sector. Firm size, tangibility of assets and corporate tax rate determinant were positively correlated while profitability, growth and cost of debt were negatively correlated when adjusted for autocorrelation and heteroscedasticity. None of the TDBV capital structure determinants for Software and Computer Services firms showed any statistical significance.

Analysis of the TDMV regression model yielded positive correlation for firm size and corporate tax rate and negative correlation for the tangibility of assets, profitability, growth and cost of debt capital structure determinants. Only firm size recorded a positive correlation when the TDMV regression model was adjusted for autocorrelation

and heteroscedasticity. Tangibility of assets, profitability, cost of debt, growth and the corporate tax rate determinant were all negatively correlated. Similar to the TDBV models, none the correlations in the Software and Computer Services sub-sector showed statistical significance.

Table 58: Descriptive Statistics of Software and Computer Services Firms

Descriptive Statistics

	Software - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	22,87%	3,03%	51,26%	12,38%
TDMV	33,02%	4,93%	81,97%	22,07%
SIZE	6,24	5,60	7,06	0,37
TANG	16,45%	9,90%	27,40%	4,11%
PROF	11,11%	-27,46%	22,66%	10,70%
GROW	6,26	5,52	7,78	0,61
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Electronic and Electrical Equipment/Electricity

The Electronic and Electrical Equipment/Electricity analysis comprises of only six firms listed on the JSE of which three will be under review in the Electronic and Electrical Equipment analysis sub-sector – Delta EMD Limited, Jasco Electronics Holdings Limited and South Oceans Holdings Limited and one under the Electricity sub-sector – Montauk Holdings Limited. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 27,77% in 2007 before reaching its lowest level at 6,41% in 2012. A dramatic upswing occurred in the following year where the leverage ratio rose to 18,85% and continued up until reaching the highest leverage ratio level in the total period under review of 55,56% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began at 133,56% in 2008, the highest leverage ratio in this sub-sector and the total sampled under review. Subsequently reaching its lowest leverage ratio at 13,22% in 2012 and climbing up to end at 45,97% in 2016.

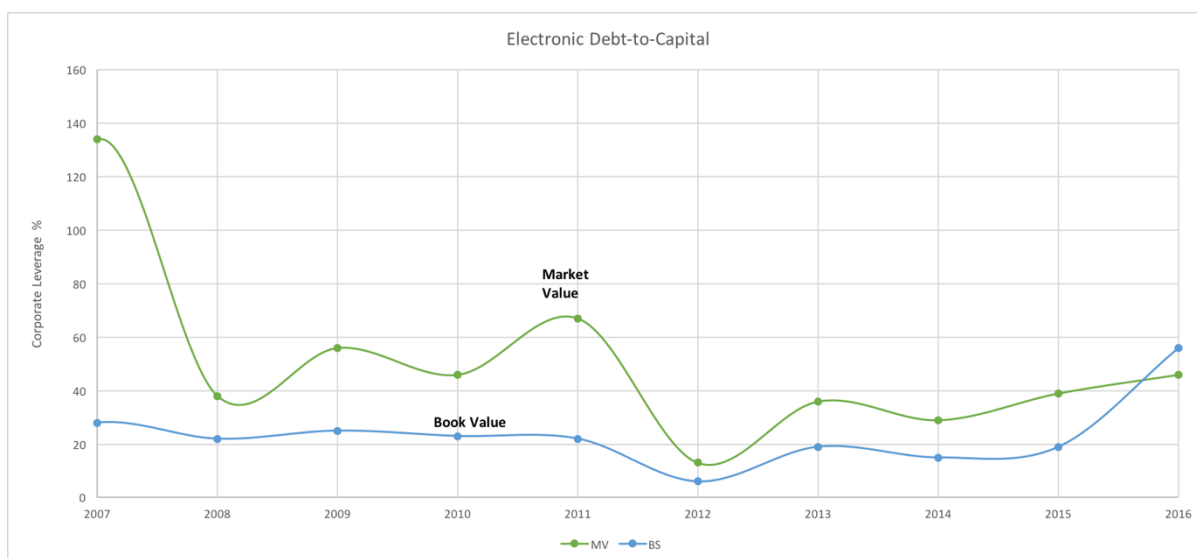


Figure. 19 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Electronic and Electrical Equipment/Electricity sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Electronic and Electrical Equipment/Electricity sub-sector.

Table 63: Yearly Leverage for Electronic and Electrical Equipment / Electricity Firms

Years	TDBV	TDMV
2007	27,77%	133,56%
2008	22,13%	37,60%
2009	25,31%	56,19%
2010	22,82%	45,87%
2011	6,41%	13,22%
2012	21,71%	66,67%
2013	18,85%	36,12%
2014	14,74%	28,55%
2015	19,19%	38,57%
2016	55,66%	45,97%
Average	23,46%	50,23%
Min	6,41%	13,22%
Max	55,66%	133,56%
Std. Dev	12,78%	32,70%
Range	49,24%	120,34%

Table 63 above, in conjunction with Table 64 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Electronic and Electrical Equipment/Electricity firms. Capital structure determinants and regression analysis for the Electronic and Electrical Equipment/Electricity industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-13 Electronic and Electrical Equipment/Electricity and Appendix B-10. The average leverage ratio was dramatically high for the TDMV at 50,23% and the average leverage ratio was at 23,46%. Standard deviation was also relatively high at 12,78% and 32,70% for TDBV and TDMV respectively.

Firm size, tangibility of assets, corporate tax rate capital structure determinants for Electronic and Electrical Equipment/Electricity firms were negatively correlated for TDBV under the normal regression while the profitability, growth and cost of debt capital structure determinants were positively correlated. Firm size, profitability and corporate tax rate showed statistical significance at the 5% level. Analysis of the TDBV regression model when adjusted for autocorrelation and heteroscedasticity yielded the same results with firm size, tangibility of assets, corporate tax rate capital structure determinants negatively correlated and profitability, growth and cost of debt capital structure determinants positively correlated. Firm size, profitability and corporate tax rate also showed statistical significance at the 5% level.

Analysis of the TDMV regression model revealed that the firm size, profitability, tangibility of assets and cost of debt capital structure determinants were negatively correlated while growth and corporate tax rate capital structure determinants were positively correlated. Firm size and tangibility of assets showed statistical significance at the 5% level. When adjusted for autocorrelation and heteroscedasticity, firm size, profitability and tangibility of assets were negatively correlated while growth, cost of debt and corporate tax rate positively correlated. Firm size and tangibility of assets showed strong correlations at the 1% statistical significance level and corporate tax rate revealed statistical significance at the 5% level when adjusted for autocorrelation and heteroscedasticity.

Table 64: Descriptive Statistics of Electronic and Electrical Equipment / Electricity Firms

Descriptive Statistics

	Electronic - Descriptive Statistics			
	Mean	Minimum	Maximum	Std. Dev.
TDBV	23,46%	6,41%	55,66%	12,78%
TDMV	50,23%	13,22%	133,56%	32,70%
SIZE	6,47	5,20	6,89	0,55
TANG	7,86%	1,39%	24,85%	7,72%
PROF	358,40%	225,13%	684,26%	125,40%
GROW	6,73	6,26	7,01	0,21
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

Support Services

The Support Services analysis comprises of 19 firms listed on the JSE under the Support Services industry sub-sector. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV began at 11,93% in 1994 to 38,31% by the end of 2016. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was initially at 6,55% in 1994 and significantly increased to 26,49% by the end of the period under review.

In the formative years of the analysis, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of the Support Services sub-sector industry was low in the single digit percentages at 6,55% and ended up ascending to around 23,63% by 1999. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was more than double at 11,98% in 1994, however gradually increasing to 20,55% by the end of 1999.

With the advent of the millennium, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV began not too far from the previous year at

18,26% to 18,06% in the mid-2000's. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was initially at 22,59% and sharply increased to 36,53% by the end of the mid-2000's.

From the mid-2000's to 2009, the market value aggregate leverage ratio (i.e., market-based debt-to-capital equity market value)/TDMV was at 18,06% and continued the steady momentum and ended with a steep incline in 2009 to around 40,77%, the highest peak in the period under review. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV exhibited the same pattern with a steady momentum beginning at 38,51% and then lingering around the same percentages until reaching 42,16%.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV declined to 31,07% and maintained a moderately steady level ending at 26,49%. In respect of the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV, results showed a leap to 36,83%, reaching its highest peak in the period under review at 46,39 in 2013 before settling at 38,31% by the end of 2016.

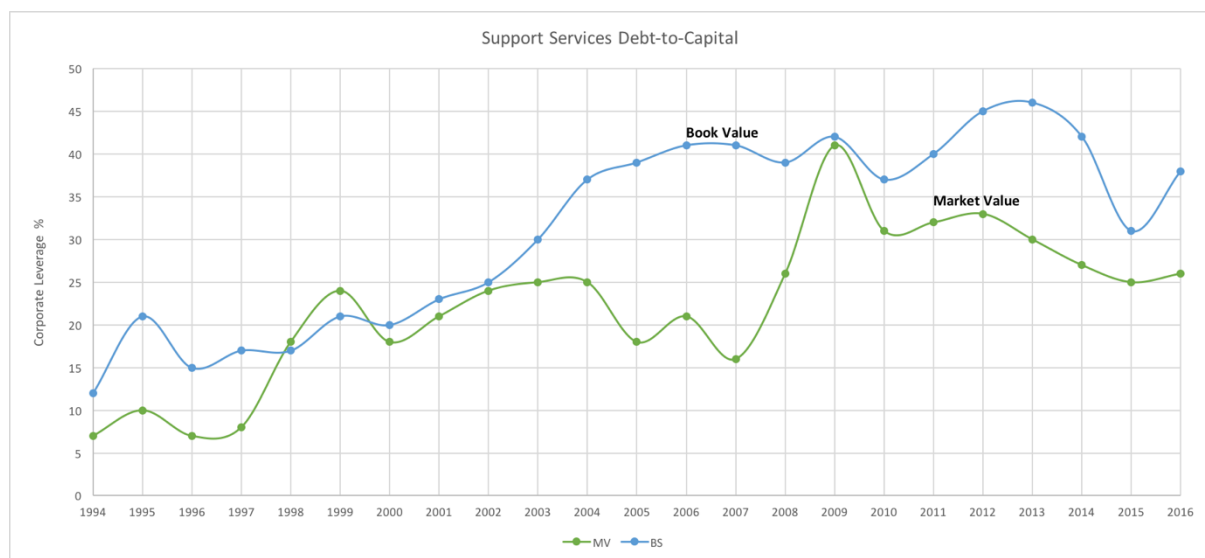


Figure. 20 represents the annual ratio of balance sheet aggregate leverage/TDBV for the Support Services sub-sector (blue-line) and market value aggregate leverage ratio/TDMV (green- line) for the Support Services sub-sector.

Table 69: Yearly Leverage for Support Services Firms

Years	TDBV	TDMV
1994	11,93%	6,55%
1995	20,54%	9,53%
1996	14,78%	7,33%
1997	16,71%	7,64%
1998	16,78%	18,12%
1999	20,55%	23,63%
2000	20,38%	18,26%
2001	22,59%	21,39%
2002	24,87%	23,89%
2003	29,75%	24,83%
2004	36,53%	24,62%
2005	38,51%	18,06%
2006	41,39%	21,41%
2007	40,58%	15,71%
2008	39,30%	25,58%
2009	42,16%	40,77%
2010	36,83%	31,02%
2011	39,80%	32,18%
2012	45,20%	32,55%
2013	46,39%	29,76%
2014	42,02%	27,02%
2015	30,63%	25,02%
2016	38,31%	26,49%
Average	31,15%	22,23%
Min	11,93%	6,55%
Max	46,39%	40,77%
Std. Dev.	11,03%	8,78%
Range	34,46%	34,22%

Table 69 above, in conjunction with Table 70 below, summarise descriptive statistics between the TDBV and TDMV leverage ratios used for Support Services firms. Capital structure determinants and regression analysis for the Support Services industry sub-sector TDBV and TDMV leverage ratios are presented in Appendix A-14 Support Services and Appendix B-11. The average leverage ratio for TDBV was at 31,15%

and the average leverage ratio was at 22,23%. Standard deviation was also relatively high at 11,03% and 8,78% for TDBV and TDMV respectively.

All capital structure determinants for Support Services firms were negatively correlated for TDBV under the TDBV normal regression model with the exception of the growth determinant. Cost of debt was strongly correlated and showed statistical significance at the 1% level. Analysis of the TDBV regression model when adjusted for autocorrelation and heteroscedasticity revealed negative correlation for tangibility of assets, corporate tax rate, growth and cost of debt capital structure determinants while firm size and profitability capital structure determinants exhibited positive correlation. Tangibility of assets and cost of debt showed statistical significance at the 5% level.

Analysis of the TDMV regression model revealed that firm size was the only positively correlated determinant with rest being negatively correlated. The corporate tax rate capital structure determinant showed statistical significance at the 5% level. When adjusted for autocorrelation and heteroscedasticity, the same results were revealed with the corporate tax rate at the 5% statistical significance.

Table 70: Descriptive Statistics of Support Services Firms

Descriptive Statistics

Support Services - Descriptive Statistics				
	Mean	Minimum	Maximum	Std. Dev.
TDBV	31,15%	11,93%	46,39%	11,03%
TDMV	22,23%	6,55%	40,77%	8,78%
SIZE	7,12	4,96	7,94	0,68
TANG	16,87%	10,72%	28,99%	4,00%
PROF	11,15%	7,01%	14,52%	2,15%
GROW	6,67	4,83	7,52	0,68
COD	13,36%	8,50%	23,00%	4,17%
TAX	29,96%	28,00%	35,00%	2,51%

5.4. Trends in JSE Delisted Corporate Leverage

Gilbert and Strugnell (2008) study and several other survivorship bias studies concluded that any research that excludes delisted shares is likely to be subject to survivorship bias. This study, “Evolution of Corporate Leverage on the JSE from 1994 to 2016”, notes and recognizes that exclusion of data for delisted shares may not materially affect the outcomes of the study per se but might likely have a significant effect on the total results reached.

There were 621 delisted firms between 1996 and 2016 across all sub-sectors. 77% of the delisted firms provided the reason for delisting to be either the costs associated with being a listed entity or the onerous listing compliance requirements by the JSE. Covered herein is a succinct examination of firms that were delisted as a result of liquidations, terminations and mergers and acquisitions. Categorisation of the type of delisted firm was on the basis of whether the delisting occurred through a private equity group or by a corporate entity, or whether by a domestic or international firm, or whether it was a BEE delisting or a liquidation related solvency issue. Corporate leverage of the sample of selected delisted firms in the final financial year end is covered prior to the delisting. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV and market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV leverage ratios for the sample of selected delisted firms are presented in Appendix C-1.

5.4.1. Broad-Based Black Economic Empowerment delisted firms

MTN Zakhele

MTN Zakhele was a broad-based black economic empowerment (B-BBEE) scheme originally traded over the counter at R20 per share back in 2010, before it listed on the JSE's black economic empowerment segment in November 2015. It was contractually unwounded on 24 November 2016 close to R59,08 per share.

MTN Zakhele received R964,6 million in dividend income from MTN Group, up from R836,5 million in 2014. The remainder of the dividend income was used to pay dividends owed to preference shareholders and to reduce MTN Zakhele's notional vendor financing (NVF) debt. In the 2015 financial year, MTN Zakhele paid preference shareholders R211,3 million, up from R201,8 million in 2014, and partly settled the NVF with a payment of R688,8 million (compared to a payment of R581,8 million in 2014).

The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 53,35% in the financial year end before the delisting of the B-BEE scheme. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 53,07% in the financial year end before the delisting of the B-BEE scheme. Both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV were considerably high in 2015 as opposed to the previous financial year end at 30,03% and 36,29 respectively due to the drastic drop in share price, and in turn, market capitalisation. At the end of 2015, the MTN Zakhele share closed at R73,90, down 32% from the closing price of R108,50 in the previous 2014 financial year end. This, however, still represented a 270% gain on the initial investment of R20 per share investors paid for each MTN Zakhele share in 2010.

Set Point Technologies Holdings

Initiators of the delisting proposal for Set Point were its BEE shareholders, the Haroon Habib family Trust and Mineworkers Investment Company (Proprietary) Limited and JSE-listed investment company Sabvest, which held 101,6 million shares. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 10,36% in 2009, the financial year before the delisting of the B-BEE buyout offer. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 5,83% in 2009, the financial year before the delisting of the B-BEE buyout offer. Both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-

to-capital)/TDBV remained relatively unchanged when compared to the previous financial year of 2008 at 5,21% and 10,61% respectively.

Rebserve Holdings Limited

A new BEE entity with a R600 million share trust giving 32 000 historically disadvantaged individuals a share of between 20% called Mvelaphanda Group, with an initial value of R3 billion, was created in July 2004 after the reverse takeover of Rebserve Holdings by Mvelaphanda Holdings.

Rebserve issued 213,775 million of its shares to Mvelaphanda Holdings and assumed R50 million of debt. The merger had Rebserve acquiring all of the businesses and assets of Mvelaphanda Holdings for a total purchase price of R1,546-billion. A total value of R8,60 was ascribed to each Rebserve share, including the special cash dividend of R1,10 a share. This resulted in Mvelalaphanda Holdings owning a 53% equity stake in Rebserve.

The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 24,11% in 2003, the financial year end before the delisting of the B-BEE reverse merger takeover. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 16,68%.

5.4.2. Liquidated delisted firms

Saambou Holdings Limited

Saambou bank was placed under curatorship in 2002 after a decision by then Minister of Finance Trevor Manuel, declaring a loss of R300 000 after posting a profit of R9,5 million in the previous financial year. Trading was suspended at 200c before the delisting.

FirstRand, through its subsidiary, First National Bank bought Saambou's deposit liabilities of R13 billion and mortgage book worth R8 billion. Saambou's personal loan book, worth 1,25 billion was bought by African Bank. Total shareholder interest was reduced from R50,6 million to R5,4 million and cash from R127,7 million to R58,2

million. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 36,29% in 2001 with the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV at 30,03%.

In the follow financial year end predating the liquidation and subsequent delisting of the bank, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 53,07% in 2002 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was 53,35%.

Gijima Limited

The JSE suspended Gijima Limited after it failed to submit an interim report within the three-month period stipulated in the JSE's listings requirements in 2015. Yebo Guma, the majority shareholder, offered to acquire all the remaining shares after the share price tumbled from a high of R340 in February 2011 to an opening low of R1.22 due to poor financial performance after Gijima Limited posted a full-year loss of R152.4 million.

Gijima's market capitalisation was as low as R89.8 million and entered into deals with its financiers rolling over R213 million debt to 2020. The company's leverage headed to unprecedentedly high levels in 2013. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 351,05% in 2013 with the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV at 110,14%.

In the financial year end predating the Yebo Guma's buyout offer delisting, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 205,88% in 2014 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 102,54%. Of all the companies investigated in this study, Gijima Limited has the highest recorded leverage prior to delisting.

Afribrand Limited

Snack food manufacturer Afribrand was suspended in 2002 by the JSE after it was placed into liquidation following inconclusive negotiations with its bankers. Absa Group

Limited held debt amounting to R32 million, the largest exposure amongst the banks owed to by Afribrand Limited. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 27,01% in 2001, the financial year end before the liquidation and suspension by the JSE. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 99,46% in 2001. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was much higher in the previous financial year-end of 2002 at 265,60% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was relatively high at 229,91% in 2002.

5.4.3. International private equity delisted firms

Alexander Forbes Group Holdings

A consortium including Ethos Private Equity and Canada's Ontario Teachers' Pension Plan led by UK's Actis made a R9.1 billion bid for financial services firm Alexander Forbes in 2007. The offer was at a 16% premium on Alexander Forbes closing share price at the time of the announcement, making it the largest private equity deal in South Africa at that time.

The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 42,03% in 2006, the financial year end before the internationally-led private equity buyout. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 9,58% in 2006. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was much higher in the previous financial year of 2005 at 14,18% as compared to the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV which was relatively lower at 36,24% in 2005.

Edgars Consolidated Limited

US firm Bain Capital successfully acquired the entire ordinary share capital of Edcon at R46 per share for R25 billion. According to the Irish Stock Exchange where the bond

was issued, Edcon accrued R17.3 billion in debt in the private equity takeover and delisting.

It had generated cash of R2.9 billion in the following financial year, of which R2.3 billion was swallowed solely by interest payments. In the final year prior to the private equity takeover bid, interest-bearing debt was only at R176 million, relatively low in comparison to other ratio measurements such as the market capitalisation of R21,5 billion. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was significantly low in the 2005 financial year at 0,81% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was also relatively low at 3,81%. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained mostly unchanged at 0,82% in the 2005 financial year while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV proved to still be relatively low at 4,87% when compared to the previous year.

5.4.4. Domestic private equity delisted firms

Kwikspace Modular Buildings

A consortium of private equity investors led by Absa Capital Private Equity and Vantage Capital, which also included the Kwikspace management team, acquired the entire issued ordinary share capital of Kwikspace Modular Buildings for R478 million and subsequently delisted the company. The transaction represented a premium of 44,9% on the share price at the time of the announcement of the private equity takeover offer but was still, however, lower than the company's listing share price of R9,75. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at an alarmingly high 795,21% in 2007 primarily due to low total equity of R17 million which was mostly retained income and R100 issued share capital during its initial listing. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 33,63% in 2007. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained mostly unchanged at 2,14% in the 2008 financial year

while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV dropped substantially to 6,58%.

Tiger Automotive Limited

Ethos Private Equity acquired all the shares in Tiger Automotive (TiAuto) for R1.5 billion. The offer price of R17.51 a share represented a 33 percent premium to the 30-day volume-weighted average precautionary price of R13.15. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was significantly low in the 2006 financial year at 4,74% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was also relatively low at 3,77%. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained mostly unchanged at 0,45% in the 2007 financial year while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV proved to still be relatively low at 0,45% when compared to the previous year.

Vox Telecom Limited

A consortium composed of the Lereko Metier Capital Growth Fund, Investec Bank and Rand Merchant Bank made a R499 million buyout of Vox Telecom and subsequently delisted the telecommunications company from the JSE. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 23,58% in 2010, the financial year-end before the delisting of the private equity buyout offer. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 33,17% in 2010, the financial year-end before the delisting of the private equity buyout offer. Both the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV remained relatively unchanged when compared to the previous financial year of 2009 at 29,07% and 17,34% respectively.

Consol Limited

In another private to public delisting transaction, glass manufacturer Consol Limited received an offer of R19.50 a share from Brait SA for R6,16 billion, narrowly outcompeting Ethos Private Equity's R6,08 billion tendered offer. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 18,21% in 2005. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 7,84% in 2005. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained mostly unchanged at 5,50% in the 2006 financial year while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV dropped marginally lower to 14,73%.

Universal Industries

Another consortium led by Ethos Private Equity acquired and delisted investment holding firm Universal Industries Group in a R1.3bn deal at a price of R2.50 per share. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 21,32% in 2009 with the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV at 24,01%. In the following financial year end predating the Universal Industries Group private equity buyout offer and finalisation of the delisting, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 49,18% in 2010 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 29,62%.

5.4.5. International corporate buyout delisted firms

Dimension Data

Japan-based Nippon Telegraph and Telephone Corporation acquired South Africa's Dimension Data Holdings for R24,4 billion at a premium of 20% and withdrew the company from the local bourse. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 0,88% in 2008 with the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV at 1,30%. In the following financial year-end predating the Dimension Data takeover offer and finalisation of the delisting, the balance sheet aggregate leverage ratio (i.e., book value

debt-to-capital)/TDBV was at 1,88% in 2009 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 0,19%.

Cipla Medpro South Africa Limited

Cipla India effected a 100% buyout takeover of South Africa's third-biggest pharmaceutical company, Cipla Medpro, for R5 billion at R10 a Cipla Medpro share. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV in the 2011 financial year end was at 7,23% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was slightly higher at 10,96%. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained mostly unchanged at 7,02% in the 2012 financial year end while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV went higher to 14,29%.

Illovo Sugar Limited

United Kingdom's Associated British Foods which had owned a 51% stake in Illovo since 2006, acquired the remaining 48,65% stake at R25 a share, representing R5,6 billion. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 29,28% in 2015 with the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV at 21,59%. In the following financial year-end predating the Associated British Food takeover offer and finalisation of the delisting, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 31,10% in 2016 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 51,10%.

SAB Miller Limited

Anheuser-Busch InBev completed a R1,4 trillion acquisition of rival SABMiller at a 22 percent premium for R890 a share. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was significantly low in the 2014 financial year at 30,32% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was significantly high at 62,07%. In the subsequent financial year-end

preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV lowered to 25,89% in the 2015 financial year end while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was also relatively lower around 51,50%.

Grintek Group Limited

Swedish group Saab's made a takeover buyout of local defence and telecommunications manufacturer Grintek for R316 million and delisted the company from the JSE. Saab had previously owned 21,1% of Grintek, which it had acquired for R106 million. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV for Grintek in 2004 was at 31,48% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 35,10%. In the following financial year-end predating the Saab takeover offer and finalisation of the delisting, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 17,66% in 2004 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 19,72%.

5.4.6. Domestic corporate buyout delisted firms

Business Connexion Limited

A R6,60 per ordinary scheme share merger deal between Telkom Limited and Business Connexion for R2,67 billion terminated Business Connexion's listing on the main board of the JSE. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV for Business Connexions in 2013 was at 11,06% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was 9,63%. In the financial year end prior to the delisting and corporate takeover by Telkom Limited, the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was at 16,01% in 2014 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was at 14,57%.

Unitrans Limited

Steinhoff Group, which already owned 60,76% of transport, distribution and logistics group Unitrans, acquired shares it did not already own amounting to R1,66 billion. After Steinhoff made the purchase consideration, Unitrans was later delisted from JSE. The debt to equity ratios were very low, lower than 1% for all the measures. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV in the 2004 financial year was at 0,46%, while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was slightly higher at 0,74%. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained below 1% again, at 0,55% in the 2005 financial year while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV went higher to around 0,89%.

JD Group Limited

Steinhoff Group also made another takeover buyout of JD Group by acquiring shares it did not already own for R1,2 billion, which valued JD Group at R8,8 billion. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV for JD Group in 2013 was 37,84% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV was 83,82%. The balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV in the year of the delisting was 40,70% in 2014 and the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV was 24,98%.

Cadiz Holdings Limited

Acting through Friedshelf 1678 Limited ("Bidco"), Stellar Capital acquired 97.21% in Bidco, which in turn held the entire issued ordinary share capital in Cadiz Holdings Limited. The value of the net assets of Cadiz, 100% held by Bidco were R396 million. During the last two financial year ends, Cadiz did not incur any interest-bearing liabilities. Therefore, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV and balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV were 0% for both financial year ends.

Illiad Africa Limited

Steinhoff International Holdings Limited acquired Illiad Africa for R1,3 billion through a R10 a share plus a 24c special dividend scheme. The market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV in the 2013 financial year was at 1,43% while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV had a minuscule difference at 1,61%. In the subsequent financial year-end preceding the delisting, the market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV remained below 1% again at 0,71% in the 2014 financial year while the balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV went higher to 1,00%.

6. Conclusion

The changeover of the South African political system to a democratic dispensation with the country's first non-racial election on 27th April 1994 removed the political barriers that had prevented successful economic adjustment. The abolition of sanctions and disinvestment actions against South Africa opened markets to foreign goods, services and financial flows. Greater degree of openness of the economy increased South Africa's vulnerability to international financial market instability, as was experienced with the East Asian crisis of 1998 and Global Financial Crisis in 2008.

The aim of this paper was to shed light on the evolution of corporate leverage on the Johannesburg Stock Exchange (JSE) bourse by formulating an analysis of a panel data set contained in annual reports and other public financial market information over the post-democratic period in South Africa, from 1994 to 2016. The data set was organized around a sample of 126 listed companies across twelve sub-sector industries in order to mainly examine changes in corporate capital structures over the post-democratic dispensation period within each sub-sector industry. The twelve sub-sector industries probed were Banks, Financial Services, Life Insurance, Fixed Line Telecommunications, Nonlife Insurance, Health Care Equipment and Services, Pharmaceuticals and Biotechnology, Media, Technology Hardware and Equipment, Software and Computer Services, Electronic and Electrical Equipment and Support Services. Another data set consisting of 621 delisted companies from liquidations, terminations, de-registration and mergers and acquisitions was briefly examined to eliminate survivorship bias. The delisting data set was examined by the type of listing, whether delistings occurred via a private equity group or by a corporate entity, or whether by a domestic or international player.

An emphasis was placed on sub-dividing the period under review into half-decade timespans for capturing effects of local and international economic events and crises such as the East Asian Financial Crisis, dot-com bubble and the Global Financial Crisis, amongst others. To adequately examine periodic trends, an emphasis was placed on sub-dividing the years into three five-year intervals and one four-year interval constituted as – 1994 to 1999, 2000 to 2005, 2006 to 2011 and 2012 to 2016.

Two primary measures of corporate leverage, namely; balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital) and market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) were utilized in conjunction with six capital structure determinants, namely; firm size, tangibility of assets, profitability, growth, cost of debt and corporate tax rate to measure their significance in capital structure decision-making for the twelve JSE sub-sectors under review.

In the initial period between 1994 and 1999, the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) of all twelve sub-sector industries was low and stable, generally varying between 0% and 15%. The only exception was the Software and Computer Services sub-sector which exhibited a drastic jump of 32% in 1998. In terms of the balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital), the debt-to-capital was also relatively low and stable varying between 0% and 15%. The Technology Hardware and Equipment sub-sector was the only exception, peaking at 38% in 1999.

In the period between the years 2000 and 2005, there was steady incline in the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) with the Bank sub-sector leaping from 3% to a peak 25% then remaining steady just below 15% by the end 2005. In contrast to the rest of the other sub-sectors, which showed the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) below 25%, the Software and Computer Services sub-sector continued to showcase higher leverage levels peaking at 82% in 2002. The balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital) showed strikingly similar characteristics to the TDMV, showing steady incline in leverage. The majority of book value debt-to-capital /TDBV results were generally below 25% with only the Support Services sub-sector surpassing 36% book value debt-to-capital/TDBV in 2005 from 20% in 2000. The interest rate shock of 1998 could potentially have had a bearing on the rise of leverage in this time period.

Analysis from the mid-2000's to 2009 shows robust change in leverage observable within sub-sectors which generally had low levels of leverage at the turn of the century. The Electronic and Electrical Equipment sub-sector, for example, had the highest recorded market-based debt-to-capital/TDMV since 1994 at 134% in 2007. There were

drastic volatility ranges of leverage within this specific sub-sector with the lowest leverage level recorded at 38% in 2008, which is still comparatively higher. The Support Services sub-sector continued with the upward trend in leverage with the highest recorded level at 41% in 2009, the highest since 1994. The Software and Computer Services sub-sector continued to showcase higher leverage levels, however, on average not as high as the previous periods with the highest year being 2009 at 56%. The balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital) moved in tandem with the market-based debt-to-capital/TDMV with the Support Services sub-sector upward trend in leverage mirroring the market-based debt-to-capital/TDMV trend. The average book value debt-to-capital leverage/TDBV of the Support Services sub-sector was above 40% in this period. The Banks book value debt-to-capital equity sub-sector leverage rose above 25% for the first time in this period. This rise in leverage early on in the period started as South Africa shifted to official inflation targeting and the decline and stabilisation of interest rates.

In the final period of analysis, from 2010 to 2016, the market value aggregate leverage ratio/TDMV (i.e., market-based debt-to-capital) rose again moderately in tandem, specifically in the Electronic and Electrical Equipment, Support Services and the Software and Computer Services sub-sectors. The Electronic and Electrical Equipment sub-sector average market-based debt-to-capital/TDMV leverage was at 25% in the classified period. The lowest range was at 13% in 2012 and the highest range was at 67% in 2011. For the Support Services sub-sectors, the average debt-to-capital equity market value/TDMV leverage was at 28% with the lowest range was at 25% in 2015 and the highest range was at 33% in 2012. Software and Computer Services still proved to be the most leveraged of the sub-sectors examined with 65% debt-to-capital equity market value/TDMV in 2014, the third highest since 1994. In respect of balance sheet aggregate leverage ratio/TDBV (i.e., book value debt-to-capital), Software and Computer Services continued the trend of being the most leveraged sub-sector with the average leverage in the period under analysis at 179%, the highest since 1994. The Electronic and Electrical Equipment and Support Services sub-sectors averaged 39% and 63% respectively in this period. The majority of the sub-sectors including Financial Services and Media were way below 15% in the post-Global Financial Crisis era. Overall, the market-based debt-to-capital/TDMV for all the sub-sectors under analysis increased from an average of 3% from 1994-1999 to an

average of 8% from 2011 to 2016. That equates to a market-based debt-to-capital leverage ratio/TDMV that has almost tripled over the period under review. The book value debt-to-capital/TDBV increased from an average of 5% from 1994-1999 to 18% from 2011 to 2016. That equates to leverage that has more than tripled over the period under review.

77% of the delisted firms provided the reason for delisting to be either the rising costs associated with being a listed entity and the onerous listing compliance requirements by the JSE. Categorisation of the type of delisted firm was on the basis of whether the delisting occurred through a private equity group or by a corporate entity, or whether by a domestic or international firm, or whether it was a BEE delisting or a plain vanilla liquidation related to solvency issues. As expected, the corporate leverage from several delisted firms was unprecedentedly high. Delisted firms such as Gijima Limited had market value aggregate leverage ratio (i.e., market-based debt-to-capital)/TDMV of as high as 351,05% in 2013 balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV of 205,88% in 2014. Afribrand Limited had a balance sheet aggregate leverage ratio (i.e., book value debt-to-capital)/TDBV which was relatively high at 229,91% in 2002. These were the corporate leverage results in the financial year prior to delisting and proved to be highest corporate leverage levels in the entire study.

A regression model was applied to each of the leverage ratio sample of 126 listed companies across twelve sub-sector industries and the total aggregate sample yielded the following results;

- Firm size was negatively correlated for TDBV but positively correlated for TDMV. Firm size was, however, not statistically significant.
- Tangibility of assets was negatively correlated for both TDBV and TDMV. The tangibility of assets determinant showed no statistical significance.
- Profitability was positively correlated for TDBV, with no statistical significance. The profitability determinant was, however, negatively correlated for TDMV with no statistical significance. Profitability that is generally negatively related with debt-to-equity ratio is consistent with the pecking order hypothesis.

- The growth determinant was negatively correlated for both TDBV and TDMV. Under the TDMV regression model, the growth capital structure determinants showed statistical significance at the 5% level when adjusted for autocorrelation and heteroscedasticity.
- Cost of debt was positively correlated for both TDBV and TDMV. None of these capital structure determinants showed any statistical significance.
- The corporate tax rate capital structure determinant was negatively correlated for TDBV but positively correlated for TDMV and showed no statistical significance.

The overall findings indicate a rise in corporate leverage with the average leverage closely hovering around the same percentages, around 31,26% for TDBV and 33,12% for TDMV. TDBV commenced at 6,55% in 1994 to 26,49% by the end of 2016. The highest TDBV recorded percentage for the period under review was 40,77% in 2009, coinciding with the year of the most pronounced impact of the Global Financial Crisis on the South African economy and capital markets. TDMV began at 11,93% in 1994 and rose to 38,31% by the end of 2016 with 2013 recording the highest percentage at 46,39%.

7. References

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8. Appendix

Appendix A-1 Sample of Stocks

No.	COMPANY NAME	TICKER	INDUSTRY
1	ABSA Bank Limited	ABSP	Banks
2	Sasfin Holdings Limited	SFN	Banks
3	Old Mutual Plc	OML	Life Insurance
4	Discovery Limited	DSY	Life Insurance
5	Brait SE	BAT	Financial Services
6	MMI Holdings Limited	MMI	Life Insurance
7	Rand Merchant Investment Holdings Ltd	RMI	Life Insurance
8	Reinet Investments SCA	REI	Financial Services
9	PSG Group Limited	PSG	Financial Services
10	RMB Holdings Limited	RMH	Financial Services
11	Capitec Bank Holdings Limited	CPI	Banks
12	Nedbank Group Limited	NED	Banks
13	Sanlam Limited	SLM	Life Insurance
14	Investec Limited	INL	Financial Services
15	Barclays Africa Group Limited	BGA	Banks
16	Remgro Limited	REM	Financial Services
17	Firststrand Limited	FSR	Financial Services
18	Standard Bank Group Limited	SBK	Banks
19	African Bank Investments Limited	ABL	Financial Services
20	African Dawn Capital Limited	ADW	Financial Services
21	African Equity Empowerment Investments Limited	AEE	Financial Services
22	Afrocentric Investment Corp Limited	ACT	Financial Services
23	Alexander Forbes Group Holdings Limited	AFH	Financial Services
24	Anchor Group Limited	ACG	Financial Services
25	Astoria Investments Limited	ARA	Financial Services
26	BK One Limited	BK1P	Financial Services
27	Blue Financial Services Limited	BFS	Financial Services
28	Brimstone Investment Corporation Ltd	BRT	Financial Services
29	Capital Appreciation Limited	CTA	Financial Services
30	Coronation Fund Managers Limited	CML	Financial Services
31	Deneb Investments Limited	DNB	Financial Services
32	Ecsponent Limited	ECS	Financial Services
33	Efficient Group Limited	EFG	Financial Services
34	EPE Capital Partners Limited (Ethos Capital)	EPE	Financial Services
35	Finbond Group Limited	FGL	Financial Services
36	GAIA Infrastructure Capital Limited	GAI	Financial Services
37	Global Asset Management Limited	GAM	Financial Services
38	Greenbay Properties Limited	GRP	Financial Services
39	JSE Limited	JSE	Financial Services
40	London Finance & Investment Group Plc	LNF	Financial Services

Appendix A-1 Sample of Stocks (Continued)

No.	COMPANY NAME	TICKER	INDUSTRY
41	MICROmega Holdings Limited	MMG	Financial Services
42	Nictus Beperk	NCS	Financial Services
43	Niveus Investments Ltd	NIV	Financial Services
44	NVest Financial Holdings Limited	NVE	Financial Services
45	Oasis Crescent Property Fund	OAS	Financial Services
46	Pallinghurst Resources Limited	PGL	Financial Services
47	Peregrine Holdings Limited	PGR	Financial Services
48	Prescient Limited	PCT	Financial Services
49	PSG Konsult Limited	KST	Financial Services
50	Purple Group Limited	PPE	Financial Services
51	RECM And Calibre Limited	RACP	Financial Services
52	Reveren Limited	REN	Financial Services
53	Sabvest Limited	SBV	Financial Services
54	Sacoven Plc	SCV	Financial Services
55	StratCorp Limited	STA	Financial Services
56	Sygnia Limited	SYG	Financial Services
57	Tiso Blackstar Group SE	TBG	Financial Services
58	Transaction Capital Limited	TCP	Financial Services
59	Trematon Capital Investments Ltd	TMT	Financial Services
60	Trustco Group Holdings Limited	TTO	Financial Services
61	Universal Partners Limited	UPL	Financial Services
62	VestIN Holdings Limited	VIN	Financial Services
63	Vunani Limited	VUN	Financial Services
64	Zeder Investments Limited	ZED	Financial Services
65	Cognition Holdings Limited	CGN	Fixed Line Telecommunications
66	Huge Group Limited	HUG	Fixed Line Telecommunications
67	Telemasters Holdings Limited	TLM	Fixed Line Telecommunications
68	Conduit Capital Limited	CND	Nonlife Insurance
69	Indequity Group Limited	IDQ	Nonlife Insurance
70	Santam Limited	SNT	Nonlife Insurance
71	Clientele Limited	CLI	Life Insurance
72	Liberty Holdings Limited	LBH	Life Insurance
73	Advanced Health Limited	AVL	Health Care Equipment & Services
74	Bid Corp Limited	BID	Health Care Equipment & Services
75	Go Life International PCC	GLI	Health Care Equipment & Services
76	Adcock Ingram Holdings Limited	AIP	Pharmaceuticals & Biotechnology
77	Ascendis Health Limited	ASC	Pharmaceuticals & Biotechnology
78	African Media Entertainment Limited	AME	Media
79	Caxton CTP Publishers & Printers Ltd	CAT	Media

Appendix A-1 Sample of Stocks (Continued)

No.	COMPANY NAME	TICKER	INDUSTRY
80	Cartrack Holdings Limited	CTK	Technology Hardware & Equipment
81	Datatec Limited	DTC	Technology Hardware & Equipment
82	Ellies Holdings Limited	ELI	Technology Hardware & Equipment
83	Labat Africa Limited	LAB	Technology Hardware & Equipment
84	Mustek Limited	MST	Technology Hardware & Equipment
85	Net 1 UEPS Technologies Inc	NT1	Technology Hardware & Equipment
86	Alviva Holdings Limited	PNC	Technology Hardware & Equipment
87	Adapt It Holdings Limited	AVV	Software & Computer Services
88	Allied Electronics Corporation	AEL	Software & Computer Services
89	Datacentrix Holdings Limited	DCT	Software & Computer Services
90	EOH Holdings Limited	EOH	Software & Computer Services
91	ISA Holdings Limited	ISA	Software & Computer Services
92	M-FiTEC International Limited	MFI	Software & Computer Services
93	Metrofile Holdings Limited	MFL	Software & Computer Services
94	Moneyweb Holdings Limited	MNY	Software & Computer Services
95	Silverbridge Holdings Limited	SVB	Software & Computer Services
96	Stellar Capital Partners Limited	SCP	Software & Computer Services
97	Total Client Services Limited	TCS	Software & Computer Services
98	Amalgamated Electronic Corp	AER	Electronic & Electrical Equipment
99	CAFCA Limited	CAC	Electronic & Electrical Equipment
100	Delta EMD Limited	DTA	Electronic & Electrical Equipment
101	Jasco Electronics Holdings Limited	JSC	Electronic & Electrical Equipment
102	South Ocean Holdings Limited	SOH	Electronic & Electrical Equipment
103	Montauk Holdings Limited	MNK	Electricity
104	Adcorp Holdings Limited	ADR	Support Services
105	ARB Holdings Limited	ARH	Support Services
106	Argent Industrial Limited	ART	Support Services
107	Barloworld Limited	BAW	Support Services
108	Blue Label Telecoms Limited	BLU	Support Services
109	CSG Holdings Limited	CSG	Support Services
110	Distribution And Warehousing Network Ltd	DAW	Support Services
111	ELB Group Limited	ELR	Support Services
112	enX Group Limited	ENX	Support Services
113	Eqstra Holdings Limited	EQS	Support Services
114	Hudaco Industries Limited	HDC	Support Services
115	Insimbi Refractory and Alloy Supplies Limited	ISB	Support Services
116	Interwaste Holdings Limited	IWE	Support Services
117	Invicta Holdings Limited	VT	Support Services
118	Kaydav Group Limited	KDV	Support Services
121	Mix Telematics Limited	MIX	Support Services
122	Novus Holdings Limited	NVS	Support Services
123	Primeserv Group Limited	PMV	Support Services
125	Torre Industries Limited	TOR	Support Services
126	Wescoal Holdings Limited	WSL	Support Services

Appendix A-2 Total Sample

TOTAL SAMPLE												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
1994	45,60%	23,71%	4,175656	4,074474	15,47%	8,26%	6,7403949	16,25%	35,00%	64,30%	24,59%	
1995	24,87%	10,72%	6,022919	4,34041	14,32%	10,97%	6,5652358	18,50%	35,00%	53,26%	37,64%	
1996	18,36%	7,00%	6,115762	4,440248	17,55%	13,32%	6,5340014	20,25%	35,00%	40,72%	45,95%	
1997	8,54%	8,52%	6,34831	10,80022	12,07%	9,54%	6,807899	19,25%	35,00%	49,84%	44,28%	
1998	10,43%	10,33%	6,957224	7,335343	9,82%	9,20%	7,6808658	23,00%	30,00%	43,61%	46,19%	
1999	13,06%	19,26%	6,723583	18,71427	9,28%	10,56%	7,3220457	15,50%	30,00%	44,07%	40,36%	
2000	14,28%	23,86%	6,709518	6,901624	10,36%	8,62%	7,3529376	14,50%	30,00%	38,58%	43,64%	
2001	13,75%	29,93%	7,060568	23,63859	9,04%	8,07%	7,5541588	13,00%	30,00%	46,28%	43,37%	
2002	181,51%	20,18%	7,001699	22,68527	9,32%	6,14%	7,4771614	17,00%	30,00%	39,75%	43,83%	
2003	16,77%	72,31%	6,806622	9,332847	9,62%	3,61%	7,1873474	11,50%	30,00%	32,09%	48,53%	
2004	16,24%	252,92%	6,903224	15,33531	10,13%	7,23%	7,2387463	11,00%	30,00%	34,81%	50,81%	
2005	14,24%	32,20%	6,998906	17,37797	10,03%	5,25%	7,4207805	10,50%	29,00%	33,42%	53,45%	
2006	17,16%	18,55%	7,062278	20,63459	9,03%	9,91%	7,7161795	12,50%	29,00%	38,57%	41,87%	
2007	26,63%	15,69%	6,97926	27,14743	7,30%	26,69%	7,8057739	14,50%	29,00%	35,44%	42,92%	
2008	117,63%	27,37%	7,056315	8,906237	9,15%	24,02%	7,7602515	15,00%	28,00%	41,24%	47,74%	
2009	7,39%	32,94%	7,361472	11,33011	10,04%	23,25%	7,8463288	10,50%	28,00%	46,15%	47,17%	
2010	21,03%	21,39%	7,267961	27,15116	11,09%	28,84%	7,7868388	9,00%	28,00%	35,80%	52,48%	
2011	33,17%	23,20%	7,363051	22,43494	10,39%	40,56%	7,967463	9,00%	28,00%	34,99%	51,81%	
2012	23,59%	18,82%	7,267961	15,51625	9,11%	19,89%	8,0398433	8,50%	28,00%	39,66%	46,46%	
2013	23,00%	20,37%	7,592784	24,07074	9,88%	25,17%	8,173199	8,50%	28,00%	41,43%	44,28%	
2014	25,39%	22,11%	7,354365	4,154393	8,82%	16,02%	8,3996199	9,25%	28,00%	41,93%	45,14%	
2015	21,66%	21,58%	7,595363	17,38836	10,71%	16,68%	8,470163	9,75%	28,00%	40,81%	42,91%	
2016	24,75%	28,86%	7,403677	17,0659	11,20%	14,26%	8,4911995	10,50%	28,00%	40,90%	41,09%	
Average	31,26%	33,12%	6,875151	14,81638	10,60%	15,04%	7,579932	13,36%	29,96%	41,64%	44,63%	
Min	7,39%	7,00%	4,175656	4,07447	7,30%	3,61%	6,534001	8,50%	28,00%	32,09%	24,59%	
Max	181,51%	252,92%	7,595363	27,15116	17,55%	40,56%	8,491199	23,00%	35,00%	64,30%	53,45%	
Std Dev	39,45%	49,60%	71,99%	772,85%	2,32%	9,26%	56,75%	4,17%	2,51%	7,13%	5,90%	
Range	174,12%	245,91%	3,419707	23,07668	10,26%	36,95%	1,957198	14,50%	7,00%	32,21%	28,86%	

Appendix A-3 - Banks

BANKS													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1994	15,34%	6,73%	1,819212	-0,457075	1,16%	3,48%	8,749353	16,25%	35,00%	3,4485499	0,045109		
1995	12,09%	4,35%	6,332733	-0,389257	0,99%	3,53%	8,913542	18,50%	35,00%	4,9844116	0,032357		
1996	8,49%	3,24%	6,679251	-0,229374	2,59%	2,77%	9,209794	20,25%	35,00%	7,8839627	0,078796		
1997	5,09%	2,08%	7,453223	-0,277259	2,29%	2,91%	9,528407	19,25%	35,00%	13,811412	0,061853		
1998	3,82%	0,35%	7,759498	0	2,29%	4,76%	9,698489	23,00%	30,00%	46,184174	0,014125		
1999	2,69%	0,21%	7,954447	0	2,10%	4,57%	9,884638	15,50%	30,00%	198,08921	0,216117		
2000	7,63%	3,03%	8,086548	0	1,72%	2,67%	10,26485	14,50%	30,00%	2,7000308	0,402499		
2001	7,56%	4,41%	8,151426	0	1,64%	2,61%	10,56879	13,00%	30,00%	3,6593622	0,348638		
2002	17,37%	12,83%	7,566335	2,790458	8,81%	5,44%	9,600044	17,00%	30,00%	1,1526324	0,394561		
2003	33,75%	24,63%	7,816298	0	8,76%	4,75%	9,711796	11,50%	30,00%	0,7889933	0,548093		
2004	27,63%	14,01%	8,05794	0	8,01%	5,70%	9,873099	11,00%	30,00%	0,7692347	0,549382		
2005	29,70%	13,53%	8,312011	0	4,27%	6,29%	10,11789	10,50%	29,00%	0,5715907	0,552383		
2006	30,38%	13,74%	8,507115	0	3,47%	6,54%	10,31779	12,50%	29,00%	0,9383039	0,31661		
2007	31,57%	16,55%	8,71925	-0,141033	2,76%	5,62%	10,58809	14,50%	29,00%	1,4666158	0,292615		
2008	25,19%	20,68%	8,780407	0,076442	3,34%	5,31%	10,77052	15,00%	28,00%	1,5151958	0,519028		
2009	19,61%	12,98%	8,889776	0,129854	2,96%	4,24%	10,98091	10,50%	28,00%	1,5977215	0,668272		
2010	32,27%	20,70%	8,980653	0,181196	2,25%	2,97%	11,2709	9,00%	28,00%	1,3970124	0,692893		
2011	31,15%	23,51%	9,15946	0,252761	1,41%	3,03%	11,40979	9,00%	28,00%	1,7452107	0,68111		
2012	32,11%	21,71%	9,79339	0,287208	1,27%	3,09%	11,59764	8,50%	28,00%	1,4556903	0,683262		
2013	24,11%	17,50%	9,364524	0,26397	1,10%	2,71%	12,21671	8,50%	28,00%	1,0439957	0,659566		
2014	21,81%	14,25%	9,9321	0,383259	1,07%	2,73%	12,34104	9,25%	28,00%	1,322471	0,63192		
2015	23,24%	21,43%	10,0028	0,351794	1,07%	2,91%	12,44582	9,75%	28,00%	1,5780786	0,599845		
2016	24,88%	18,52%	10,07992	0,300502	1,13%	2,87%	12,52953	10,50%	28,00%	1,5824289	0,517692		
Average	20,33%	12,65%	8,18254	0,153193	2,89%	3,98%	10,54737	13,36%	29,96%	1302,98%	41,33%		
Min	2,69%	0,21%	1,81921	-0,457075	0,99%	2,61%	8,749353	8,50%	28,00%	57,16%	1,41%		
Max	33,75%	24,63%	10,07992	2,790458	8,81%	6,54%	12,52953	23,00%	35,00%	19808,92%	69,29%		
Std Dev	0,104421	0,079781	1,70962	0,617519	2,41%	1,31%	1,13626	4,17%	2,51%	4145,29%	23,86%		
Range	31,06%	24,42%	8,26070	3,24753	7,82%	3,92%	3,78017	14,50%	7,00%	19751,76%	67,88%		

LIFE INSURANCE													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1994								16,25%	35,00%				
1995								18,50%	35,00%				
1996								20,25%	35,00%				
1997								19,25%	35,00%				
1998	25,97%	20,12%	9,87038	0	0,24%	1,50%	11,7765798	23,00%	30,00%	0,021831	0,978169		
1999	15,30%	12,72%	9,2806	0	2,98%	9,02%	10,0251066	15,50%	30,00%	0,00696	0,659707		
2000	18,81%	12,19%	9,332464	0,5371553	2,65%	7,82%	10,1909286	14,50%	30,00%	0	0,666667		
2001	15,75%	13,62%	9,478251	122,72247	2,70%	5,06%	10,409782	13,00%	30,00%	0	0,666667		
2002	18,08%	17,74%	9,577501	171,29054	3,26%	7,86%	10,4098452	17,00%	30,00%	0,244605	0,422061		
2003	16,37%	15,25%	9,557067	16,179581	2,61%	6,76%	10,5934975	11,50%	30,00%	0,274734	0,725266		
2004	20,95%	14,19%	9,891228	49,659766	2,07%	8,40%	10,758657	11,00%	30,00%	0	0,666667		
2005	14,26%	9,05%	10,17525	56,255295	1,59%	8,49%	11,0444378	10,50%	29,00%	0,333333	0,666667		
2006	19,47%	4,89%	10,24095	40,993033	0,32%	8,76%	11,252195	12,50%	29,00%	0,453183	0,546817		
2007	21,47%	10,92%	9,302702	27,770108	0,67%	12,01%	10,3158721	14,50%	29,00%	0,351873	0,398127		
2008	18,29%	13,23%	8,928993	12,077763	1,36%	9,31%	10,3878191	15,00%	28,00%	0,354613	0,395387		
2009	17,34%	21,94%	9,431313	35,658373	1,27%	8,89%	10,5344608	10,50%	28,00%	0,620771	0,379229		
2010	15,57%	8,71%	9,631429	108,68225	1,23%	10,15%	10,6829116	9,00%	28,00%	0,615098	0,384902		
2011	12,13%	7,70%	9,790215	31,260811	1,12%	7,70%	11,2088642	9,00%	28,00%	0,476696	0,323304		
2012	9,52%	4,79%	10,05206	22,353633	0,98%	6,93%	11,3929745	8,50%	28,00%	0,454439	0,345561		
2013	9,59%	4,16%	10,00934	18,871381	1,09%	6,36%	11,2904389	8,50%	28,00%	0,55542	0,277914		
2014	8,48%	3,35%	10,10234	24,601666	0,98%	6,06%	11,3991694	9,25%	28,00%	0,552958	0,280375		
2015	7,38%	3,22%	10,10577	55,557704	0,88%	6,62%	11,5286237	9,75%	28,00%	0,551357	0,281976		
2016	12,48%	5,08%	10,17758	38,697024	1,03%	6,65%	11,5964656	10,50%	28,00%	0,542582	0,290752		
Average	15,64%	10,68%	9,733444	43,850976	1,53%	7,60%	10,8841384	13,36%	29,96%	33,74%	49,24%		
Min	7,38%	3,22%	8,928993	0,000000	0,24%	1,50%	10,0251066	8,50%	28,00%	0,00%	27,79%		
Max	25,97%	21,94%	10,240950	171,290537	3,26%	12,01%	11,7765798	23,00%	35,00%	62,08%	97,82%		
Std Dev	0,048757	0,05713	0,377859	45,007443	0,0091	0,0218667	0,53623015	0,04170259	0,0251321	0,229631	0,199484		
Range	18,59%	18,72%	1,311958	171,290537	3,02%	10,51%	1,7514732	14,50%	7,00%	62,08%	70,03%		

Appendix A-5 – Financial Services

FINANCIAL SERVICES													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1994	9,12%	1,82%						16,25%	35,00%				
1995	38,72%	10,42%						18,50%	35,00%				
1996	24,51%	4,33%	-0,661649	0	18,98%	21,32%	3,1893646	20,25%	35,00%	0,125137	0,874863		
1997	30,56%	7,36%	1,910047	0,404129264	2,26%	3,09%	5,4402713	19,25%	35,00%	0,199551	0,800449		
1998	0,26%	0,84%	5,142352	2,17922257	1,79%	2,73%	7,8381377	23,00%	30,00%	0,511439	0,177546		
1999	0,71%	0,86%	5,009851	0,856438402	3,49%	10,29%	7,1680234	15,50%	30,00%	0,399206	0,359864		
2000	25,01%	7,58%	4,663963	1,514797285	4,71%	6,22%	6,9380229	14,50%	30,00%	0,368121	0,438983		
2001	14,99%	5,72%	5,344093	107,1762072	3,63%	6,38%	7,0603051	13,00%	30,00%	0,415355	0,584645		
2002	7,98%	4,84%	5,526785	-145,797751	3,32%	2,09%	7,2005458	17,00%	30,00%	0,38904	0,444294		
2003	19,94%	6,24%	5,162212	-1028,32674	4,23%	-2,83%	6,5503476	11,50%	30,00%	0,448192	0,426808		
2004	7,37%	1,57%	5,338735	159,1484163	5,31%	3,74%	6,6127974	11,00%	30,00%	0,448402	0,551598		
2005	6,10%	1,15%	5,295708	9,503136563	4,23%	5,08%	6,9515055	10,50%	29,00%	0,349133	0,650867		
2006	11,76%	5,86%	6,013853	5,339859837	5,11%	3,52%	7,797519	12,50%	29,00%	0,385773	0,432409		
2007	9,47%	4,31%	5,73528	-1,68210282	4,69%	6,74%	7,8554485	14,50%	29,00%	0,336654	0,330013		
2008	11,69%	8,29%	5,758423	-2,5069079	5,48%	8,62%	8,0595002	15,00%	28,00%	0,451397	0,394756		
2009	11,09%	9,29%	6,235656	0,370556361	4,80%	7,20%	8,2289913	10,50%	28,00%	0,406527	0,493089		
2010	7,62%	5,23%	6,196789	0,151641956	6,53%	32,38%	2101,1871	9,00%	28,00%	0,326748	0,584506		
2011	10,71%	7,31%	6,242914	8686,166446	4,82%	72,53%	1403,147	9,00%	28,00%	0,140258	0,651014		
2012	10,26%	5,75%	6,528324	1117,807472	4,42%	4,92%	1439,4004	8,50%	28,00%	0,194944	0,662589		
2013	13,43%	7,01%	6,733426	32,94257674	4,90%	25,22%	1454,0333	8,50%	28,00%	0,159581	0,660646		
2014	12,22%	5,21%	6,83782	1,840866394	4,49%	4,08%	1350,9073	9,25%	28,00%	0,265603	0,62879		
2015	10,94%	4,38%	7,111682	37,91209628	6,26%	7,07%	1312,9243	9,75%	28,00%	0,314841	0,553288		
2016	23,95%	7,47%	6,643104	22,257191	4,01%	4,59%	1327,6762	10,50%	28,00%	0,388318	0,458266		
Average	13,84%	5,34%	5,369970	428,917026	5,12%	11,19%	499,34125	13,36%	29,96%	33,45%	53,14%		
Min	0,26%	0,84%	-0,661649	-1028,326744	1,79%	-2,83%	3,18936	8,50%	28,00%	12,51%	17,75%		
Max	38,72%	10,42%	7,111682	8686,166446	18,98%	72,53%	2101,18706	23,00%	35,00%	51,14%	87,49%		
Std Dev	0,092963	0,026932	1,760826	1922,944359	0,033712	0,1630976	729,58402	0,041703	0,025132	0,112177	0,162238		
Range	38,46%	9,58%	7,773331	9714,493190	17,19%	75,36%	2097,99769	14,50%	7,00%	38,63%	69,73%		

Appendix A-6 – Fixed Line Telecommunications

TELECOMMUNICATION													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
2015	1,62%	2,79%	5,321002	5,889426	28,31%	7,17%	5,766691	9,75%	28,00%	96,89%	3,11%		
2016	3,44%	6,01%	5,268055	19,349268	26,48%	11,49%	5,525189	10,50%	28,00%	76,58%	23,42%		
Average	2,53%	4,40%	5,294528	12,619347	27,39%	9,33%	5,64594	10,13%	28,00%	86,73%	13,27%		
Min	1,62%	2,79%	5,268055	5,889426	26,48%	7,17%	5,525189	9,75%	28,00%	76,58%	3,11%		
Max	3,44%	6,01%	5,321002	19,349268	28,31%	11,49%	5,766691	10,50%	28,00%	96,89%	23,42%		
Std Dev	1,29%	2,28%	0,037439	9,517546	1,30%	3,05%	0,170767	0,53%	0,00%	14,36%	14,36%		
Range	1,82%	3,22%	0,052947	13,459842	1,84%	4,32%	0,241501	0,75%	0,00%	20,31%	20,31%		

Appendix A-7 – Nonlife Insurance

NONLIFE INSURANCE												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
1994	0,00%	0,00%		0	1,69%	7,27%	7,4300294	16,25%	35,00%	0	0	
1995	0,00%	0,00%	7,434779	0	1,86%	9,69%	7,5860335	18,50%	35,00%	0	0	
1996	0,00%	0,00%	7,624251	0	1,61%	9,26%	7,7995077	20,25%	35,00%	0	0	
1997	0,00%	0,00%	7,793269	0	1,56%	10,07%	7,9527537	19,25%	35,00%	0	0	
1998	0,00%	0,00%	8,174657	0	1,12%	12,63%	7,8179832	23,00%	30,00%	0	0	
1999	0,00%	0,00%	4,235385	0	2,79%	5,29%	5,704139	15,50%	30,00%	0	0	
2000	0,00%	0,00%	5,061505	9,7282609	2,59%	4,89%	6,1652583	14,50%	30,00%	0	0	
2001	0,01%	0,01%	5,724309	30,462963	2,05%	9,67%	6,1473181	13,00%	30,00%	0	0,5	
2002	0,02%	0,02%	5,250166	5,306391	2,57%	-18,57%	5,9549083	17,00%	30,00%	0	0,5	
2003	0,02%	0,01%	5,539595	-15,265524	2,79%	-11,90%	5,9062683	11,50%	30,00%	0	0,343696	
2004	29,71%	19,92%	5,444494	76,751419	2,09%	1,28%	5,9235656	11,00%	30,00%	0,156304	0,5	
2005	14,19%	8,89%	5,757988	88,465693	1,44%	1,69%	6,2616622	10,50%	29,00%	0	0,5	
2006	4,10%	2,68%	6,051705	174,37198	1,12%	11,13%	6,3188221	12,50%	29,00%	0	0,5	
2007	22,41%	7,86%	6,436433	11,792341	0,54%	27,01%	6,639752	14,50%	29,00%	0	0,703946	
2008	21,55%	10,28%	5,442647	-42,924199	1,63%	-12,92%	6,3836147	15,00%	28,00%	0,296054	0,5	
2009	16,62%	6,54%	6,461269	6,9429825	1,09%	9,06%	6,4162477	10,50%	28,00%	0,513905	0,486095	
2010	17,20%	5,96%	6,476219	10,354167	1,09%	15,16%	6,3280626	9,00%	28,00%	0,012645	0,487355	
2011	15,08%	5,62%	6,560553	10,106383	1,32%	17,90%	6,4067566	9,00%	28,00%	0,012146	0,487854	
2012	17,52%	4,51%	6,466962	83,727763	1,39%	14,48%	6,6167666	8,50%	28,00%	0,007561	0,659105	
2013	14,53%	4,43%	6,781104	92,211459	1,57%	12,82%	6,7626594	8,50%	28,00%	0,007835	0,658831	
2014	12,66%	3,84%	6,736783	-68,756657	1,35%	9,66%	6,8265934	9,25%	28,00%	0,00782	0,325513	
2015	10,79%	4,39%	6,864078	12,961207	1,32%	20,24%	6,9157577	9,75%	28,00%	0,008016	0,325317	
2016	12,55%	3,65%	6,798038	-4,9630975	1,67%	14,43%	7,003677	10,50%	28,00%	0,007793	0,32554	
Average	9,08%	3,85%	6,323463	20,924936	1,66%	7,84%	6,66383205	13,36%	29,96%	4,48%	33,93%	
Min	0,00%	0,00%	4,235385	-68,756657	0,54%	-18,57%	5,70413895	8,50%	28,00%	0,00%	0,00%	
Max	29,71%	19,92%	8,174657	174,371982	2,79%	27,01%	7,95275370	23,00%	35,00%	51,39%	70,39%	
Std Dev	0,093438	0,047966	0,965205	51,349182	0,0058718	0,10564447	0,66054164	0,041703	0,025132	0,122596	0,249025	
Range	29,71%	19,92%	3,939272	243,128639	2,25%	45,58%	2,24861475	14,50%	7,00%	51,39%	70,39%	

Appendix A-8 – Healthcare Equipment and Services

HEALTH CARE EQUIPMENT & SERVICES												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
2014	11,87%	4,59%	5,048515	0	24,48%	9,69%	5,511552	9,25%	28,00%	66,25%	33,75%	
2015	9,59%	3,45%	5,193757	7,956787	20,18%	4,87%	5,686412	9,75%	28,00%	45,25%	54,75%	
2016	32,72%	0,09%	8,651299	7,818059	47,17%	1,93%	8,511775	10,50%	28,00%	40,82%	59,18%	
Average	18,06%	2,71%	6,297857	5,258282	30,61%	5,50%	6,569913	13,36%	29,96%	50,78%	49,22%	
Min	9,59%	0,09%	5,048515	0	20,18%	1,93%	5,511552	8,50%	28,00%	40,82%	33,75%	
Max	32,72%	4,59%	8,651299	7,956787	47,17%	9,69%	8,511775	23,00%	35,00%	66,25%	59,18%	
Std Dev	12,75%	2,34%	2,039434	4,554334	14,51%	3,92%	1,683973	4,17%	2,51%	13,59%	13,59%	
Range	23,13%	4,50%	3,602783	7,956787	27,00%	7,76%	3,000223	14,50%	7,00%	25,43%	25,43%	

Appendix A-9 – Pharmaceuticals and Biotechnology

PHARMACEUTICALS AND BIOTECHNOLOGY												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
2008	26,59%	7,53%	7,472392	8,127345	16,66%	18,54%	7,905766	15,00%	28,00%	0,382153	0,617847	
2009	13,39%	5,32%	8,295337	8,839725	17,70%	30,84%	8,127847	10,50%	28,00%	0,624398	0,375602	
2010	41,08%	4,57%	8,326054	30,80085	18,02%	24,56%	8,467445	9,00%	28,00%	0,218366	0,781634	
2011	26,15%	7,00%	8,401461	35,3561	22,19%	20,41%	8,56321	9,00%	28,00%	0,588715	0,411285	
2012	14,04%	4,19%	8,433648	32,61707	29,54%	16,45%	8,572114	8,50%	28,00%	0,804802	0,195198	
2013	3,72%	1,02%	8,60257	10,79711	25,91%	13,06%	8,827443	8,50%	28,00%	0,99643	0,00357	
2014	40,69%	15,09%	3,694457	1,954994	16,33%	4,10%	8,231599	9,25%	28,00%	0,344104	0,655896	
2015	27,33%	13,04%	8,245903	8,066777	16,19%	9,76%	8,40435	9,75%	28,00%	0,24112	0,75888	
2016	33,78%	24,82%	8,446593	6,375827	16,21%	10,29%	8,641368	10,50%	28,00%	0,1933	0,8067	
Average	25,20%	9,18%	7,768713	15,88176	19,86%	16,45%	8,415682	10,00%	28,00%	48,82%	51,18%	
Min	3,72%	1,02%	3,694457	1,954994	16,19%	4,10%	7,905766	8,50%	28,00%	19,33%	0,36%	
Max	41,08%	24,82%	8,60257	35,3561	29,54%	30,84%	8,827443	15,00%	28,00%	99,64%	80,67%	
Std Dev	0,127385	0,073263	1,561265	13,05214	0,049127	8,21%	0,284226	0,020194	0	0,282848	0,282848	
Range	37,36%	23,80%	490,81%	3340,11%	13,34%	26,75%	92,17%	6,50%	0,00%	80,31%	80,31%	

Appendix A-10 – Media

MEDIA												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
1996	4,25%	1,12%	6,872964	9,686177	31,50%	19,73%	6,500181	20,25%	35,00%	0,726043	0,273957	
1997	1,67%	0,44%	7,020338	17,40403	32,37%	19,29%	6,610355	19,25%	35,00%	0,735402	0,264598	
1998	2,06%	0,58%	6,158794	17,77444	25,23%	20,25%	5,824638	23,00%	30,00%	0,44385	0,55615	
1999	1,78%	1,41%	6,668653	16,32092	20,92%	12,31%	6,375166	15,50%	30,00%	0,671153	0,328847	
2000	1,08%	0,80%	6,618054	16,17529	29,44%	8,48%	6,287897	14,50%	30,00%	0,221552	0,278448	
2001	1,79%	1,67%	6,47371	45,56571	26,62%	9,37%	6,262099	13,00%	30,00%	0,33098	0,16902	
2002	1,15%	1,21%	5,952035	46,66861	26,31%	6,35%	6,234073	17,00%	30,00%	0,374149	0,125851	
2003	0,42%	0,34%	6,128708	86,41655	26,81%	9,69%	6,01277	11,50%	30,00%	0,211832	0,288168	
2004	0,29%	0,18%	6,182224	42,9313	25,33%	23,44%	6,04844	11,00%	30,00%	0,486623	0,013377	
2005	0,00%	0,00%	6,262893	438,405	25,84%	26,99%	6,123315	10,50%	29,00%	0,183365	0,316635	
2006	0,01%	0,01%	6,448287	375,649	25,35%	23,19%	6,425334	12,50%	29,00%	0	0,5	
2007	0,01%	0,01%	6,604359	713,0617	24,13%	22,86%	6,659744	14,50%	29,00%	0,093186	0,406814	
2008	0,01%	0,01%	8,301059	112,6413	40,58%	12,89%	8,47751	15,00%	28,00%	0	0	
2009	0,01%	0,01%	8,301059	62,77097	36,01%	7,65%	8,65401	10,50%	28,00%	0	0	
2010	0,01%	0,01%	6,690294	574,6812	28,38%	16,60%	6,837787	9,00%	28,00%	0,123711	0,376289	
2011	0,01%	0,00%	6,776971	350,8203	29,56%	15,16%	6,934335	9,00%	28,00%	0,231806	0,268194	
2012	0,00%	0,00%	6,904292	49518,4	30,40%	16,22%	7,017874	8,50%	28,00%	0,211055	0,288945	
2013	0,00%	0,00%	6,963276	39653,14	29,50%	15,16%	7,147325	8,50%	28,00%	0,321739	0,178261	
2014	0,00%	0,00%	7,041659	2005,616	28,05%	14,89%	7,162583	9,25%	28,00%	0	0	
2015	0,00%	0,00%	7,140986	5548,709	31,47%	14,84%	7,274359	9,75%	28,00%	0	0	
2016	0,00%	0,00%	7,119188	11682,38	33,99%	14,06%	7,281902	10,50%	28,00%	0	0	
Average	0,69%	0,37%	6,791895	5301,677	28,94%	15,69%	6,769128	12,98%	29,48%	25,55%	22,06%	
Min	0,00%	0,00%	5,952035	9,686177	20,92%	6,35%	5,824638	8,50%	28,00%	0,00%	0,00%	
Max	4,25%	1,67%	8,301059	49518,4	40,58%	26,99%	8,65401	23,00%	35,00%	73,54%	55,61%	
Std Dev	0,01099	0,005439	0,610543	13429,06	0,044363	0,05702332	0,739585	0,041517	0,020401	0,243283	0,171732	
Range	4,25%	1,67%	2,349024	49508,71	19,66%	20,64%	2,829372	14,50%	7,00%	73,54%	55,61%	

Appendix A-11 – Technology Hardware and Equipment

TECHNOLOGY HARDWARE & EQUIPMENT													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1997	2,73%	0,35%	6,871633	5,803845	2,87%	10,04%	5,952999	19,25%	35,00%	0,904378	0,095622		
1998	3,72%	1,03%	6,771786	9,378273	2,53%	14,59%	6,096813	23,00%	30,00%	0,035041	0,964959		
1999	38,20%	1,52%	7,874325	6,379566	3,91%	10,06%	7,402001	15,50%	30,00%	0,951142	0,048858		
2000	53,72%	1,47%	7,41803	2,990547	8,65%	8,48%	6,886727	14,50%	30,00%	0,825542	0,174458		
2001	29,38%	4,44%	7,729703	2,19552	8,81%	7,77%	7,013006	13,00%	30,00%	0,840306	0,159694		
2002	30,81%	6,26%	7,91922	3,082892	7,94%	9,43%	7,169786	17,00%	30,00%	0,619213	0,380787		
2003	5,20%	2,74%	7,982401	2,674561	9,64%	10,02%	7,079608	11,50%	30,00%	0,389066	0,610934		
2004	29,36%	7,87%	7,931764	2,641795	8,29%	7,97%	7,103112	11,00%	30,00%	0,536536	0,463464		
2005	3,35%	0,97%	8,066707	4,727972	7,89%	9,12%	7,23183	10,50%	29,00%	0,579348	0,420652		
2006	37,39%	7,62%	8,281216	6,529349	4,94%	7,81%	7,594629	12,50%	29,00%	0,538531	0,461469		
2007	48,43%	6,82%	8,512197	6,921241	5,09%	10,22%	7,746173	14,50%	29,00%	0,394767	0,605233		
2008	40,68%	7,49%	8,736438	6,92602	5,56%	9,95%	8,00642	15,00%	28,00%	0,399818	0,600182		
2009	29,42%	14,41%	8,869336	7,058476	6,75%	9,80%	8,056985	10,50%	28,00%	0,421293	0,578707		
2010	13,07%	3,71%	8,389403	52,74543	5,52%	11,01%	7,706663	9,00%	28,00%	0,515105	0,484895		
2011	13,83%	3,47%	8,502235	12,37426	6,09%	11,23%	7,8217	9,00%	28,00%	0,658816	0,341184		
2012	17,10%	3,75%	8,700866	8,420934	5,15%	12,80%	8,089697	8,50%	28,00%	0,795901	0,204099		
2013	23,45%	4,73%	8,847962	7,150165	5,85%	12,02%	8,319575	8,50%	28,00%	0,665196	0,334804		
2014	25,01%	6,89%	8,642013	4,140894	5,62%	6,78%	8,509293	9,25%	28,00%	0,830001	0,169999		
2015	13,06%	2,95%	8,554964	64,83802	7,34%	11,55%	8,13859	9,75%	28,00%	0,684852	0,315148		
2016	10,24%	3,19%	8,706092	18,10851	10,07%	11,73%	8,221687	10,50%	28,00%	0,60107	0,39893		
Average	23,41%	4,58%	8,165414	11,75441	6,43%	10,12%	7,507365	12,61%	29,20%	60,93%	39,07%		
Min	2,73%	0,35%	6,771786	2,19552	2,53%	6,78%	5,952999	8,50%	28,00%	3,50%	4,89%		
Max	53,72%	14,41%	8,869336	64,83802	10,07%	14,59%	8,509293	23,00%	35,00%	95,11%	96,50%		
Std Dev	0,153725	0,033362	0,613461	16,62808	0,021224	0,0189686	0,697678	0,039013	0,016416	0,220363	0,220363		
Range	50,99%	14,05%	2,097551	62,6425	7,54%	7,81%	2,556294	14,50%	7,00%	91,61%	91,61%		

Appendix A-12 – Software and Computer Services

SOFTWARE & COMPUTER SERVICES													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1994	8,23%	14,55%		22,4485191	18,12%	12,45%	7,660934	16,25%	35,00%	0,902004	0,097996		
1995	3,03%	4,93%		23,6044337	17,84%	13,27%	7,7827418	18,50%	35,00%	0,938059	0,061941		
1996	21,94%	32,50%	6,131971	9,16340163	27,40%	22,66%	5,6374448	20,25%	35,00%	0,051703	0,448297		
1997	13,89%	21,39%	6,623993	63,0880818	16,54%	15,65%	6,2986598	19,25%	35,00%	0,416359	0,583641		
1998	10,21%	8,67%	6,911853	17,1706175	17,74%	12,60%	6,9209907	23,00%	30,00%	0,127105	0,872895		
1999	7,08%	10,61%	6,07869	139,083904	13,60%	18,92%	5,9163073	15,50%	30,00%	0,4041	0,5959		
2000	17,85%	25,88%	6,340849	27,0097871	14,56%	16,61%	6,1814129	14,50%	30,00%	0,503933	0,496067		
2001	25,52%	52,06%	6,765211	38,5345141	11,23%	12,19%	6,6571936	13,00%	30,00%	0,620532	0,379468		
2002	29,14%	81,97%	7,064881	7,53117714	12,24%	10,06%	6,8911806	17,00%	30,00%	0,292745	0,702755		
2003	17,06%	72,48%	6,132071	7,53117714	14,63%	-4,42%	5,9639789	11,50%	30,00%	0,281032	0,468968		
2004	20,60%	61,58%	6,019991	18,423687	19,19%	-4,11%	5,7122381	11,00%	30,00%	0,137974	0,612026		
2005	25,78%	28,46%	5,953158	12,7034862	24,81%	-27,46%	5,5183773	10,50%	29,00%	0,265224	0,484776		
2006	17,76%	12,75%	5,596276	11,482987	20,18%	19,59%	5,6027667	12,50%	29,00%	0,318261	0,281739		
2007	12,59%	6,55%	5,748138	16,1253243	12,73%	17,67%	5,8785334	14,50%	29,00%	0,158279	0,622928		
2008	22,70%	28,54%	5,923814	14,7774664	13,57%	17,15%	5,5851155	15,00%	28,00%	0,220357	0,558539		
2009	21,50%	55,56%	6,037597	13,8370663	15,00%	13,39%	5,9039667	10,50%	28,00%	0,273963	0,51001		
2010	25,47%	45,43%	6,163402	40,9973774	17,42%	18,20%	5,9807373	9,00%	28,00%	0,302014	0,484022		
2011	23,21%	31,24%	6,321939	20,4604552	16,39%	15,22%	6,2023788	9,00%	28,00%	0,418512	0,381488		
2012	25,90%	25,97%	6,274685	21,4101528	15,83%	14,11%	6,1001933	8,50%	28,00%	0,307489	0,359178		
2013	32,50%	23,71%	6,366892	1047,77785	19,41%	15,34%	6,1355001	8,50%	28,00%	0,395882	0,270785		
2014	46,19%	65,37%	6,483042	15,6335227	17,40%	13,21%	6,340608	9,25%	28,00%	0,390275	0,473294		
2015	46,57%	20,51%	6,135188	6,84481802	12,55%	8,44%	6,69834	9,75%	28,00%	0,27418	0,331706		
2016	51,26%	28,83%	5,898408	31,750459	9,90%	4,72%	6,4957084	10,50%	28,00%	0,148652	0,351348		
Average	22,87%	33,02%	6,236764	70,756098	16,45%	11,11%	6,26370904	13,36%	29,96%	35,45%	45,35%		
Min	3,03%	4,93%	5,596276	6,844818	9,90%	-27,46%	5,51837729	8,50%	28,00%	5,17%	6,19%		
Max	51,26%	81,97%	7,064881	1047,777849	27,40%	22,66%	7,78274182	23,00%	35,00%	93,81%	87,29%		
Std Dev	0,123806	0,220722	0,371414	214,787691	0,041059	0,1070156	0,6127952	0,041703	0,025132	0,220721	0,182794		
Range	48,23%	77,04%	1,468606	1040,933031	17,50%	50,12%	2,26436453	14,50%	7,00%	88,64%	81,10%		

ELECTRONICS & ELECTRICAL EQUIPMENT												
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt	
2007	27,77%	133,56%	6,748283	0,041005	1,39%	684,26%	6,842641	14,50%	29,00%	18,75%	81,25%	
2008	22,13%	37,60%	6,638601	5,820566	5,77%	351,67%	6,259202	15,00%	28,00%	53,24%	46,76%	
2009	25,31%	56,19%	6,626814	1,568039	3,92%	348,74%	6,540248	10,50%	28,00%	43,67%	56,33%	
2010	22,82%	45,87%	6,670686	1,356395	4,27%	352,51%	6,612155	9,00%	28,00%	26,16%	73,84%	
2011	6,41%	13,22%	6,888793	1,077916	7,86%	352,51%	6,806175	9,00%	28,00%	35,41%	64,59%	
2012	21,71%	66,67%	6,680399	0,750892	1,96%	349,00%	6,818371	8,50%	28,00%	55,10%	11,56%	
2013	18,85%	36,12%	6,801505	0,257677	3,85%	345,28%	6,815367	8,50%	28,00%	40,69%	25,97%	
2014	14,74%	28,55%	6,679511	0,757044	5,99%	346,76%	6,763699	9,25%	28,00%	43,84%	22,83%	
2015	19,19%	38,57%	5,734977	-26,59053	18,78%	225,13%	6,849393	9,75%	28,00%	24,29%	50,71%	
2016	55,66%	45,97%	5,198422	13,1449	24,85%	228,11%	7,013261	10,50%	28,00%	25,40%	49,60%	
Average	23,46%	50,23%	6,466799	-0,181609	7,86%	358,40%	6,732051	10,45%	28,10%	36,66%	48,34%	
Min	6,41%	13,22%	5,198422	-26,59053	1,39%	225,13%	6,259202	8,50%	28,00%	18,75%	11,56%	
Max	55,66%	133,56%	6,888793	13,1449	24,85%	684,26%	7,013261	15,00%	29,00%	55,10%	81,25%	
Std Dev	0,127799	0,326953	0,547849	10,11083	0,077247	1,2540042	0,211007	0,02377	0,003162	0,126685	0,225455	
Range	49,24%	120,34%	1,690371	39,73543	23,46%	459,13%	0,754059	6,50%	1,00%	36,36%	69,69%	

SUPPORT SERVICES													
	Debt to BV of Equity	Debt to MV of Equity	Firm Size	Interest Cover	Tangibility	Profitability	Growth	Cost of Debt (Prime Rate)	SA Corporate Tax Rate	Short-term Debt to Total Debt	Long-term Debt to Total Debt		
1994	11,93%	6,55%	4,961137	3,898243	28,99%	11,05%	4,831133	16,25%	35,00%	50,51%	49,49%		
1995	20,54%	9,53%	5,554659	4,217974	22,48%	14,52%	5,018032	18,50%	35,00%	33,64%	66,36%		
1996	14,78%	7,33%	6,514166	5,611267	21,23%	13,69%	5,945242	20,25%	35,00%	34,13%	65,87%		
1997	16,71%	7,64%	6,686898	4,8918971	17,71%	10,93%	6,165013	19,25%	35,00%	39,80%	60,20%		
1998	16,78%	18,12%	6,911788	10,484609	16,00%	11,61%	6,51026	23,00%	30,00%	48,15%	51,85%		
1999	20,55%	23,63%	6,998508	5,4786133	17,39%	11,54%	6,487764	15,50%	30,00%	43,90%	56,10%		
2000	20,38%	18,26%	7,099923	6,8055321	17,92%	11,29%	6,589857	14,50%	30,00%	39,34%	60,66%		
2001	22,59%	21,39%	7,417443	6,0813503	15,68%	10,68%	6,84909	13,00%	30,00%	56,17%	43,83%		
2002	24,87%	23,89%	7,192176	5,2093393	13,22%	12,32%	6,549769	17,00%	30,00%	55,31%	44,69%		
2003	29,75%	24,83%	7,297372	6,1714438	13,01%	12,28%	6,550818	11,50%	30,00%	40,68%	46,82%		
2004	36,53%	24,62%	7,370701	10,423736	13,41%	13,87%	6,668041	11,00%	30,00%	52,50%	47,50%		
2005	38,51%	18,06%	7,471102	14,159189	13,47%	14,02%	6,818835	10,50%	29,00%	50,99%	49,01%		
2006	41,39%	21,41%	7,411124	19,308359	12,49%	11,68%	6,85901	12,50%	29,00%	56,97%	43,03%		
2007	40,58%	15,71%	7,1707	76,648101	10,72%	12,20%	7,052069	14,50%	29,00%	53,13%	38,54%		
2008	39,30%	25,58%	7,425584	18,003625	13,19%	13,46%	7,023283	15,00%	28,00%	50,43%	49,57%		
2009	42,16%	40,77%	7,377216	14,75718	16,11%	11,09%	6,953792	10,50%	28,00%	54,72%	39,40%		
2010	36,83%	31,02%	7,294428	34,434978	17,85%	7,52%	6,946425	9,00%	28,00%	44,46%	43,77%		
2011	39,80%	32,18%	7,409478	55,043916	18,20%	7,32%	7,041715	9,00%	28,00%	46,92%	47,20%		
2012	45,20%	32,55%	7,549688	19,370559	15,12%	9,83%	7,073113	8,50%	28,00%	57,98%	42,02%		
2013	46,39%	29,76%	7,496096	21,955043	17,92%	10,58%	7,053615	8,50%	28,00%	66,25%	33,75%		
2014	42,02%	27,02%	7,30598	71,882267	15,89%	8,00%	7,356985	9,25%	28,00%	63,16%	36,84%		
2015	30,63%	25,02%	7,939954	131,25035	19,51%	9,96%	7,522569	9,75%	28,00%	60,39%	34,35%		
2016	38,31%	26,49%	7,9812	21,987792	20,55%	7,01%	7,608742	10,50%	28,00%	57,29%	37,45%		
Average	31,15%	22,23%	7,123362	24,698929	16,87%	11,15%	6,6728335	13,36%	29,96%	50,30%	47,32%		
Min	11,93%	6,55%	4,961137	3,898243	10,72%	7,01%	4,8311327	8,50%	28,00%	33,64%	33,75%		
Max	46,39%	40,77%	7,939954	131,250353	28,99%	14,52%	7,5225685	23,00%	35,00%	66,25%	66,36%		
Std Dev	0,11035	0,087805	0,679935	31,184803	0,040046	0,02151565	0,675208	0,041703	0,025132	0,088397	0,093871		
Range	34,46%	34,22%	2,978817	127,352110	18,27%	7,50%	2,6914358	14,50%	7,00%	32,61%	32,61%		

Appendix B-1-1: Regression Statistics of Total Sample

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,46984764	6	0,78307941
Residual	2,95466093	16	0,18466631
Total	3,42450857	22	0,15565948

No. of Obs	=	23
F(6, 16)	=	0,42
Prob > F	=	0,8523
R-squared	=	0,1372
Adj. R-squared	=	-0,1863
Root MSE	=	0,42973

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,1927613	0,239509	-0,80	0,433	-0,7004973	0,647775
TANG	-0,268839	7,242452	-0,05	0,960	-15,72215	16,78558
PROF	0,1839349	1,200772	0,15	0,880	2,361589	1,250894
GROW	-0,689567	0,373655	-0,18	0,856	-0,8610696	0,237293
CORD	4,547111	3,402976	1,34	0,200	-2,666875	2,419638
TAX	-11,88387	12,83687	-0,93	0,368	-39,09682	22,37256
Constant	5,124552	6,025639	0,85	0,408	-7,649231	23,02758

TDBV	Beta
SIZE	-0,351711
TANG	-0,216937
PROF	0,431927
GROW	-0,991789
CORD	0,48063
TAX	-0,757004

Appendix B-1-2: Regression Statistics of Total Sample Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,43597588	6	0,72662647
Residual	2,9485914	16	0,18428696
Total	3,38456728	22	0,15384397

No. of Obs	=	23
F(6, 16)	=	0,39
Prob > F	=	0,8719
R-squared	=	0,1288
Adj. R-squared	=	-0,1979
Root MSE	=	0,42929

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-1,912999	0,239264	-0,80	0,4360	-0,6985172	0,315917
TANG	-0,5588121	7,323254	-0,08	0,940	-16,08342	14,96579
PROF	0,1557921	1,171121	0,13	0,8960	-2,326873	2,638457
GROW	-0,0693583	0,363165	-0,19	0,851	-0,8392327	0,700516
CORD	4,222711	3,390539	1,25	0,231	-2,964911	11,41033
TAX	-11,4555	12,92784	-0,89	0,389	-38,8613	15,95029
Constant	5,056794	5,923594	0,85	0,406	-7,500665	17,61425

rho	-0,051704
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Appendix B-1-3:: Regression Statistics of Total Sample

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	1,59841477	6	0,26640246
Residual	3,81839318	16	0,23837073
Total	5,41234652	22	0,24601575

No. of Obs	=	23
F(6, 16)	=	1,12
Prob > F	=	0,3953
R-squared	=	0,2953
Adj. R-squared	=	0,0311
Root MSE	=	0,48823

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,709151	0,272116	0,26	0,798	-8,202403	0,647775
TANG	-0,6579599	8,228454	-0,08	0,937	-2,972178	16,78558
PROF	-1,641182	1,364248	-1,20	0,246	-0,570563	1,250894
GROW	-0,66266	0,424525	-1,56	0,138	-11,97181	0,237293
CORD	5,776475	3,866264	-1,49	0,155	-1,064906	2,419638
TAX	8,545218	14,58451	-0,59	0,566	-23,11786	22,37256
Constant	8,514745	6,845981	1,24	0,232	-16,45439	23,02758

TDMV	Beta
SIZE	0,102923
TANG	-0,307824
PROF	-0,306556
GROW	-0,758123
CORD	-0,485674
TAX	-0,432982

Appendix B-1-4:: Regression Statistics of Total Sample Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	3,24064745	6	0,540107909
Residual	3,48831588	16	0,218019742
Total	6,72896333	22	0,30586197

No. of Obs	=	23
F(6, 16)	=	2,48
Prob > F	=	0,0689
R-squared	=	0,4816
Adj. R-squared	=	0,2872
Root MSE	=	0,46693

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,988827	0,2592652	0,38	0,708	-0,4507349	0,648500
TANG	-0,2179122	8,383193	-0,03	0,980	-17,98949	17,55366
PROF	-2,094924	1,129524	-1,85	0,082	-4,489409	0,29956
GROW	-0,7553194	0,3448113	-2,19	0,044	-1,486287	-0,243521
CORD	-7,000293	3,617456	-1,94	0,071	-14,66896	0,668372
TAX	-9,397901	14,63482	-0,64	0,530	-40,42232	21,62652
Constant	9,46239	6,025473	1,57	0,136	-3,311043	22,23582

rho	-0,3179578
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Appendix B-2-1: Regression Statistics of Banking

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,174031181	6	0,029005197
Residual	0,065851796	16	0,004115737
Total	0,239882977	22	0,010903772

No. of Obs	=	23
F(6, 16)	=	7,05
Prob > F	=	0,0008
R-squared	=	0,7255
Adj. R-squared	=	0,6225
Root MSE	=	0,06415

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0064317	0,016776	-0,38	0,706	-0,0419961	0,029133
TANG	0,691791	0,846937	0,82	0,426	-1,103636	2,487218
PROF	4,056902	1,760317	2,30	0,035	0,3251963	7,788609
GROW	0,0447203	0,041546	1,08	0,298	-0,0433528	0,132793
CORD	-1,873687	0,585124	-3,20	0,006	-3,114093	-0,633281
TAX	1,4192	1,454217	0,98	0,344	-1,663603	4,502003
Constant	-0,5720441	0,813101	-0,70	0,492	-2,295742	1,151654

TDBV	Beta
SIZE	-0,105302
TANG	0,1593734
PROF	0,5102058
GROW	0,4866245
CORD	-0,748293
TAX	0,3415729

Appendix B-2-2: Regression Statistics of Banking Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,015306679	6	0,002551113
Residual	0,059547788	16	0,003731737
Total	0,074854467	22	0,003402476

No. of Obs	=	23
F(6, 16)	=	0,69
Prob > F	=	0,6642
R-squared	=	0,2045
Adj. R-squared	=	-0,0938
Root MSE	=	0,06101

TDBV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0013986	0,014333	0,1	0,923	-0,0289862	0,031783
TANG	1,082854	0,941807	1,15	0,267	-0,9136883	3,079396
PROF	-0,8985506	2,279302	-0,39	0,699	-5,730454	3,933353
GROW	-0,261878	0,055855	-0,47	0,645	-0,1445954	0,0922198
CORD	-0,8588426	0,58859	-1,46	0,164	-2,106597	0,3889119
TAX	-1,245677	1,651177	-0,75	0,462	-4,746017	2,254662
Constant	0,9675576	1,042658	0,93	0,367	-1,242779	3,177894

rho	0,7525606
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Appendix B-2-3: Regression Statistics of Banking

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,09878002	6	0,016463337
Residual	0,041251298	16	0,002578206
Total	0,140031318	22	0,00636506

No. of Obs	=	23
F(6, 16)	=	6,39
Prob > F	=	0,0014
R-squared	=	0,7054
Adj. R-squared	=	0,5949
Root MSE	=	0,05078

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]
SIZE	-0,0108228	0,013278	-0,82	0,427	-0,038971 0,017325
TANG	1,293763	0,670326	1,93	0,072	-0,1272656 2,714791
PROF	1,076229	1,39324	0,77	0,451	-1,877309 4,029766
GROW	0,0553335	0,032882	1,68	0,112	-0,0143738 0,125041
CORD	-0,8249527	0,463108	-1,78	0,094	-1,806698 0,156793
TAX	0,393601	1,150971	0,34	0,737	-2,046348 2,83355
Constant	-0,4564733	0,643546	-0,71	0,488	-1,82073 0,907783

TDMV	Beta
SIZE	-0,2319207
TANG	0,3901062
PROF	0,1771505
GROW	0,7880701
CORD	-0,431212
TAX	0,123989

Appendix B-2-4: Regression Statistics of Banking Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,042488792	6	0,007081465
Residual	0,038446804	16	0,002402925
Total	0,080935596	22	0,003678891

No. of Obs	=	23
F(6, 16)	=	2,95
Prob > F	=	0,0392
R-squared	=	0,5250
Adj. R-squared	=	0,3468
Root MSE	=	0,04902

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0084521	0,012179	-0,69	0,498	-0,0342723	0,017368
TANG	1,389078	0,728533	1,91	0,075	-0,1553439	2,9335
PROF	0,2379524	1,645611	0,14	0,887	-3,250587	3,726492
GROW	0,418208	0,036561	1,14	0,270	-0,0356855	0,119327
CORD	-0,6253719	0,461763	-1,35	0,194	-1,6042265	0,3535215
TAX	-0,2241911	1,257433	-0,18	0,861	-2,889831	2,441449
Constant	-0,440681	0,736206	-0,20	0,847	-1,704754	1,416618

rho	0,330275
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Appendix B-3-1: Regression Statistics of Life Insurance Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,03553031	6	0,05921718
Residual	0,007260026	12	0,00605002
Total	0,042790337	18	0,002377241

No. of Obs	=	19
F(6, 16)	=	9,79
Prob > F	=	0,0005
R-squared	=	0,8303
Adj. R-squared	=	0,7455
Root MSE	=	0,0246

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0433429	0,058667	-0,74	0,474	-0,171167	0,084481
TANG	-3,399363	1,51501	-2,24	0,044	-6,700287	-0,098439
PROF	0,6010596	0,6699473	0,90	0,387	-0,8586303	2,060749
GROW	0,0059748	0,0650986	0,90	0,928	-0,135863	0,147813
CORD	0,3706223	0,3466944	1,07	0,306	-0,3847598	1,126004
TAX	4,348263	1,730479	2,51	0,027	0,577873	8,118654
Constant	-0,7822973	0,6439347	1,20	0,255	-2,207099	0,643504

TDBV	Beta
SIZE	-0,335901
TANG	-0,634448
PROF	0,269565
GROW	0,065711
CORD	0,279185
TAX	0,83527

Appendix B-3-2: Regression Statistics of Life Insurance Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,013472224	6	0,005787039
Residual	0,007077224	12	0,000589769
Total	0,041799459	18	0,002322192

No. of Obs	=	19
F(6, 12)	=	9,81
Prob > F	=	0,0005
R-squared	=	0,8307
Adj. R-squared	=	0,746
Root MSE	=	0,02429

TDBV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]
SIZE	-0,0261711	0,0569176	-0,46	0,654	-0,1501839 0,097842
TANG	-3,415959	1,483946	-2,30	0,040	-6,649199 -0,182719
PROF	0,4309439	0,6638947	0,65	0,528	-1,01558 1,877446
GROW	-0,0039191	0,0651028	-0,06	0,953	-0,145766 0,1379278
CORD	0,4931409	0,3273672	1,51	0,158	-0,2201309 1,2064130
TAX	3,882856	1,736474	2,24	0,045	-0,0994035 7,666309
Constant	-0,7089277	0,6979884	-1,02	0,330	-2,229714 0,811858

rho	0,2715861
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Appendix B-3-3: Regression Statistics of Life Insurance Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,035217526	6	0,005869588
Residual	0,023530511	12	0,001960876
Total	0,058748037	18	0,00326378

No. of Obs	=	19
F(6, 12)	=	2,99
Prob > F	=	0,0501
R-squared	=	0,5995
Adj. R-squared	=	0,3992
Root MSE	=	0,04428

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,05034	0,1056183	-0,48	0,642	-0,2804625	0,179783
TANG	-0,5138787	2,727484	-0,19	0,854	-6,456555	5,428798
PROF	-0,6362539	1,206111	-0,53	0,607	-3,264144	1,991636
GROW	-0,0293526	0,1171975	-0,25	0,806	-0,2847041	0,225999
CORD	0,4151484	0,6241563	0,67	0,519	-0,9447713	1,775507
TAX	1,134514	3,115394	0,36	0,722	-5,653346	7,922374
Constant	0,5937034	1,177283	0,50	0,623	-1,971376	3,158783

TDMV	Beta
SIZE	-0,332953
TANG	-0,081853
PROF	-0,243530
GROW	-0,27551
CORD	0,266894
TAX	0,185993

Appendix B-3-4: Regression Statistics of Life Insurance Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,042488792	6	0,007081465
Residual	0,038446804	16	0,002402925
Total	0,080935596	22	0,003678891

No. of Obs	=	23
F(6, 16)	=	2,95
Prob > F	=	0,0392
R-squared	=	0,5250
Adj. R-squared	=	0,3468
Root MSE	=	0,04902

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0084521	0,012179	-0,69	0,498	-0,0342723	0,017368
TANG	1,389078	0,728533	1,91	0,075	-0,1553439	2,9335
PROF	0,2379524	1,645611	0,14	0,887	-3,250587	3,726492
GROW	0,418208	0,036561	1,14	0,270	-0,0356855	0,119327
CORD	-0,6253719	0,461763	-1,35	0,194	-1,6042265	0,3535215
TAX	-0,2241911	1,257433	-0,18	0,861	-2,889831	2,441449
Constant	-0,440681	0,736206	-0,20	0,847	-1,704754	1,416618

rho	0,330275
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Appendix B-4-1: Regression Statistics of Financial Services Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,56944335	6	0,009490656
Residual	0,67133417	14	0,004795244
Total	1,24077351	20	0,006203868

No. of Obs	=	21
F(6, 14)	=	1,98
Prob > F	=	0,1372
R-squared	=	0,4589
Adj. R-squared	=	0,2271
Root MSE	=	0,06925

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0404549	0,055307	-0,73	0,477	-0,1590773	0,078168
TANG	-0,5571971	0,9648421	-0,58	0,573	-2,626578	1,512184
PROF	-0,1142426	0,1241555	-0,92	0,373	-0,3805297	0,152045
GROW	0,0000307	0,0000342	0,90	0,384	-0,0000426	0,000104
CORD	-1,062844	0,640536	-1,66	0,119	-2,436657	0,310969
TAX	1,044706	3,764213	0,28	0,785	-7,028727	9,11814
Constant	0,2020387	1,441675	0,14	0,891	-2,890047	3,294124

TDBV	Beta
SIZE	-0,904391
TANG	-0,238488
PROF	-0,236562
GROW	0,284154
CORD	-0,560232
TAX	0,270588

Appendix B-4-2: Regression Statistics of Financial Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,057557884	6	0,009592981
Residual	0,065083995	14	0,004648849
Total	0,122641768	20	0,006132088

No. of Obs	=	21
F(6, 14)	=	2,06
Prob > F	=	0,1239
R-squared	=	0,4693
Adj. R-squared	=	0,2419
Root MSE	=	0,06818

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0303159	0,0583377	-0,52	0,611	-0,1554378	0,094806
TANG	-0,194391	1,017188	-0,19	0,851	-2,376042	1,98726
PROF	-1,482266	0,1352732	-1,10	0,292	-0,4383587	0,141906
GROW	0,000357	0,0000337	1,06	0,308	-0,0000366	0,000108
CORD	0,8915513	0,6282694	-1,42	0,178	-2,239055	0,4559526
TAX	1,395986	3,894635	0,36	0,725	-6,957175	9,749147
Constant	-0,0037141	1,502197	0,00	0,998	-3,218178	3,225606

rho	0,2501275
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Appendix B-4-3: Regression Statistics of Financial Services Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,001406868	6	0,000234478
Residual	0,010719199	14	0,000765657
Total	0,012126067	20	0,000606303

No. of Obs	=	21
F(6, 14)	=	0,31
Prob > F	=	0,9233
R-squared	=	0,1160
Adj. R-squared	=	-0,2628
Root MSE	=	0,02767

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0112129	0,221001	-0,51	0,620	-0,0586129	0,036187
TANG	-0,1880471	0,3855388	-0,49	0,633	-1,014945	0,638851
PROF	-0,0099644	0,049611	0,20	0,844	-0,0964406	0,116369
GROW	2,690006	0,000137	0,2	0,847	-0,0000266	0,000032
CORD	-0,2323842	2,559501	-0,91	0,379	-0,7813426	0,316574
TAX	-0,5647946	1,504132	-0,38	0,713	-3,790837	2,661248
Constant	0,3166805	0,5760752	0,55	0,591	-0,9188778	1,552239

TDMV	Beta
SIZE	-0,801840
TANG	-0,25746
PROF	0,066001
GROW	0,07956
CORD	-0,391824
TAX	-0,467942

Appendix B-4-4: Regression Statistics of Financial Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,00128039	6	0,000213398
Residual	0,01054289	14	0,000753064
Total	0,01182328	20	0,000591164

No. of Obs	=	21
F(6, 14)	=	0,28
Prob > F	=	0,9353
R-squared	=	0,1083
Adj. R-squared	=	-0,2739
Root MSE	=	0,02744

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,010331	0,020811	-0,49	0,634	-0,0547677	0,034502
TANG	-0,2280733	0,3646276	-0,63	0,542	-1,010122	0,553975
PROF	0,133357	0,0458467	0,29	0,775	-0,0849957	0,111667
GROW	7,416708	0,0000137	0,01	0,996	-0,0000293	0,000030
CORD	-0,278342	0,2508294	-1,11	0,286	-0,8163175	0,259634
TAX	-0,3778573	1,431589	-0,26	0,796	-3,448311	2,692596
Constant	0,2649229	0,5463081	0,48	0,635	-0,9067914	1,436637

rho	0,1678383
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Appendix B-5-1: Regression Statistics of Nonlife Insurance Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,113274174	6	0,01887903
Residual	0,70173042	15	0,004678203
Total	1,183447221	21	0,008735582

No. of Obs	=	22
F(6, 15)	=	4,04
Prob > F	=	0,0132
R-squared	=	0,6175
Adj. R-squared	=	0,4645
Root MSE	=	0,0684

TDBV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0618735	0,059277	-1,04	0,313	-0,1882211	0,064474
TANG	-12,80938	4,574742	-2,80	0,013	-22,56021	-3,058549
PROF	-0,2376529	0,20376	-1,17	0,262	-0,671958	0,1966522
GROW	0,0527503	0,09379	0,56	0,582	-1,471577	0,2526582
CORD	-1,234231	0,628747	-1,96	0,068	-2,574374	0,1059129
TAX	1,1474244	1,182643	0,12	0,902	-2,373319	2,668168
Constant	0,487521	0,287839	1,69	0,111	-0,125994	1,101036

TDBV	Beta
SIZE	-0,6389668
TANG	-0,8236193
PROF	-0,2749261
GROW	0,3691754
CORD	-0,5571823
TAX	0,036486

Appendix B-5-2: Regression Statistics of Nonlife Insurance Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,160668318	6	0,026778053
Residual	0,068265195	15	0,004551013
Total	0,228933513	21	0,010901596

No. of Obs	=	22
F(6, 15)	=	5,88
Prob > F	=	0,0025
R-squared	=	0,7018
Adj. R-squared	=	0,5825
Root MSE	=	0,06746

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0607699	0,05745	-1,06	0,307	-0,1832221	0,0616823
TANG	-13,02107	4,032017	-3,23	0,006	-21,61511	-4,427034
PROF	-0,2905408	0,196152	-1,48	0,159	-0,708628	0,1275465
GROW	0,0558653	0,090137	0,62	0,545	-0,136258	0,247989
CORD	-1,357418	0,598307	-2,27	0,038	-2,263268	-0,0821565
TAX	0,2318751	1,113473	0,21	0,838	-2,141436	2,605186
Constant	0,4585054	0,268082	1,71	0,108	-0,1129908	1,029908

rho	-0,1830197
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Appendix B-5-3: Regression Statistics of Nonlife Insurance Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,021111192	6	0,003518532
Residual	0,02795262	15	0,001863508
Total	0,049063812	21	0,002336372

No. of Obs	=	22
F(6, 15)	=	1,89
Prob > F	=	0,1489
R-squared	=	0,4303
Adj. R-squared	=	0,2024
Root MSE	=	0,04317

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0269329	0,037413	-0,72	0,483	-0,106676	0,0528102
TANG	-6,810433	2,887305	-2,36	0,032	-12,96458	-0,656287
PROF	-0,1688959	0,128602	-1,31	0,209	-0,4430035	0,1052116
GROW	0,004212	0,059195	0,07	0,944	-0,121958	0,1303821
CORD	-0,5345772	0,396828	-1,35	0,198	-1,380396	0,3112418
TAX	0,5861555	0,746414	0,79	0,445	1,004788	2,177099
Constant	0,2055712	0,181667	1,13	0,276	-0,1816431	0,59278524

TDMV	Beta
SIZE	-0,5378134
TANG	-0,846736
PROF	-0,3778043
GROW	0,0569998
CORD	-0,4666447
TAX	0,2805079

Appendix B-5-4: Regression Statistics of Nonlife Insurance Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,027164032	6	0,004527339
Residual	0,027602293	15	0,001840153
Total	0,054766325	21	0,00260792

No. of Obs	=	22
F(6, 15)	=	2,46
Prob > F	=	0,0737
R-squared	=	0,4960
Adj. R-squared	=	0,2944
Root MSE	=	0,0429

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0286129	0,036777	-0,78	0,449	-0,1070019	0,049776
TANG	-6,90506	2,654981	-2,62	0,019	-12,60956	-1,291641
PROF	-0,1894689	0,1258172	-1,51	0,153	-0,4576419	0,787041
GROW	0,0076488	0,0578056	0,13	0,896	0,1155609	0,130858
CORD	-0,6016496	0,3849577	-1,56	0,139	-1,422167	0,218868
TAX	0,6565691	0,7186893	0,91	0,375	0,8752809	2,188419
Constant	0,1852296	0,1735072	1,07	0,303	-1,845923	0,5550515

rho	-0,125348
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Appendix B-6-1: Regression Statistics of Pharmaceutical and Biotechnology Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,075826681	5	0,015165336
Residual	0,053989644	3	0,017996548
Total	1,129816325	8	0,016227041

No. of Obs	=	9
F(5, 3)	=	0,84
Prob > F	=	0,5967
R-squared	=	0,5841
Adj. R-squared	=	-0,109
Root MSE	=	0,13415

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0346305	0,0675966	-0,51	0,644	-0,2497531	0,1804921
TANG	-1,897073	1,231327	-1,54	0,221	-5,815705	2,021559
PROF	0,1643534	1,09987	0,15	0,891	-3,335923	3,66463
GROW	0,1437848	0,5034985	0,29	0,794	-1,458572	1,746142
CORD	-0,2167648	5,159761	-0,04	0,969	-16,63743	16,2039
TAX	0					
Constant	-0,3176231	4,353144	-0,07	0,946	-14,17127	13,53602

TDBV	Beta
SIZE	-0,4244399
TANG	-0,731617
PROF	0,1059767
GROW	0,3208166
CORD	-0,034364
TAX	

Appendix B-6-2: Regression Statistics of Pharmaceutical and Biotechnology Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,16128072	5	0,032256144
Residual	0,034097617	3	0,011365872
Total	0,195378336	8	0,024422292

No. of Obs	=	9
F(5, 3)	=	2,84
Prob > F	=	0,2099
R-squared	=	0,8255
Adj. R-squared	=	0,5346
Root MSE	=	0,10661

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0016299	0,0620826	-0,03	0,981	-0,1992043	0,1959446
TANG	-2,229112	0,81371	-2,74	0,071	-4,8187	0,3604763
PROF	0,152438	0,8634938	0,18	0,871	-2,595588	2,900457
GROW	0,0422964	0,5170406	0,08	0,940	-1,603158	1,68775
CORD	-3,074794	5,297163	-0,58	0,602	-19,93273	13,78314
TAX	0					
Constant	0,6271427	4,474894	0,14	0,897	-13,61397	14,86825

rho	-0,6271427
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Appendix B-6-3: Regression Statistics of Pharmaceutical and Biotechnology Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,029697554	5	0,005939511
Residual	0,013241864	3	0,004413955
Total	0,042939419	8	0,005367427

No. of Obs	=	9
F(5, 3)	=	1,35
Prob > F	=	0,4294
R-squared	=	0,6916
Adj. R-squared	=	0,1776
Root MSE	=	0,06644

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,00475	0,0334768	0,14	0,896	-0,1017883	0,1112882
TANG	-1,062558	0,6098074	-1,74	0,180	-3,003237	0,8781216
PROF	-0,4463004	0,5447041	-0,82	0,473	-2,179792	1,287191
GROW	0,0781346	0,2493547	0,31	0,775	-0,7154232	0,8716924
CORD	0,4013426	2,555341	0,16	0,885	-7,730894	8,53358
TAX	0					
Constant	-0,3583839	2,155869	-0,17	0,879	-7,219321	6,502553

TDMV	Beta
SIZE	0,102238
TANG	-0,712507
PROF	-0,500375
GROW	0,3031263
CORD	0,1106273
TAX	

Appendix B-6-4: Regression Statistics for Pharmaceutical and Biotechnology Firms adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,099598876	5	0,019919775
Residual	0,002172807	2	0,001086403
Total	0,010177168	7	0,014538812

No. of Obs	=	8
F(5, 2)	=	18,34
Prob > F	=	0,0525
R-squared	=	0,9787
Adj. R-squared	=	0,9253
Root MSE	=	0,03296

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0454564	0,015395	2,95	0,098	-0,020782	0,111696
TANG	-0,8473375	0,205032	-4,13	0,054	-1,729519	0,034844
PROF	-0,9044548	0,213617	-4,23	0,052	-1,1823576	0,146663
GROW	-0,2053632	0,14326	-1,43	0,288	-0,821763	0,411037
CORD	-2,090311	1,46453	-1,43	0,29	-8,391716	4,211093
TAX	0					
Constant	1,986788	1,240621	1,59	0,252	-3,374409	7,347986

rho	-1,313703
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Appendix B-7-1: Regression Statistics of Media Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,001942838	6	0,000323806
Residual	0,000472892	14	0,000033778
Total	0,000472892	20	0,000120787

No. of Obs	=	21
F(6, 14)	=	9,59
Prob > F	=	0,0003
R-squared	=	0,8042
Adj. R-squared	=	0,7203
Root MSE	=	0,00581

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0093661	0,0106444	0,88	0,394	-0,0134638	0,0321959
TANG	-0,0371938	0,0581102	-0,64	0,533	-0,1617377	0,0875301
PROF	-0,0394212	0,0245196	-1,61	0,130	-0,0920105	0,0131681
GROW	-0,0076428	0,0099235	-0,77	0,454	-0,0289266	0,013641
CORD	0,0872428	0,0466566	1,87	0,083	0,0128258	0,1873113
TAX	0,2762499	0,1180057	2,34	0,035	0,0231529	0,529347
Constant	-0,0807721	0,0371703	-2,17	0,047	-0,1604945	-0,0010498

TDBV	Beta
SIZE	0,5203118
TANG	-0,1497726
PROF	-0,2045376
GROW	0,5143186
CORD	0,3295716
TAX	0,5127894

Appendix B-7-2: Regression Statistics of Media Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,003361505	6	0,000560251
Residual	0,000345075	14	0,000024648
Total	0,00370658	20	0,000185329

No. of Obs	=	21
F(5, 3)	=	22,73
Prob > F	=	0,000
R-squared	=	0,9069
Adj. R-squared	=	0,867
Root MSE	=	0,00496

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,0123634	0,0080775	-1,53	0,148	-0,0049611	0,0296879
TANG	-0,0507643	0,057453	-0,88	0,392	-0,1739887	0,07246
PROF	-0,0513204	0,0157245	-3,26	0,006	-0,0850462	-0,0175946
GROW	-0,0091541	0,0080313	-1,14	0,273	-0,0263795	0,0080713
CORD	0,454219	0,0376317	1,21	0,247	-0,0352901	0,1261339
TAX	0,3360298	0,10055745	3,18	0,007	0,1095951	0,5624645
Constant	-0,0975181	0,033251	-2,93	0,011	-1,688344	-0,0262017

rho	-0,4874956
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Appendix B-7-3: Regression Statistics of Media Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,000467187	6	0,000077864
Residual	0,000124424	14	8,887484706
Total	0,000591611	20	0,005367427

No. of Obs	=	21
F(6, 14)	=	8,76
Prob > F	=	0,0004
R-squared	=	0,7897
Adj. R-squared	=	0,6996
Root MSE	=	0,00298

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0056646	0,00546	1,04	0,317	-0,0060459	0,0173751
TANG	-0,056312	0,0298073	-1,89	0,080	-1,202424	0,0076184
PROF	-0,0605294	0,0125772	-4,81	0,000	-0,0875049	-0,033554
GROW	-0,0051016	0,0050902	-1,00	0,333	-0,016019	0,0058159
CORD	0,0311396	0,0239323	1,30	0,214	-0,0201901	0,0824694
TAX	0,0754859	0,0605305	1,25	0,233	-0,0543391	0,2053109
Constant	-0,0007319	0,0190663	-0,04	0,970	-0,041625	0,0401614

TDMV	Beta
SIZE	0,63589
TANG	-0,4593255
PROF	-0,6346233
GROW	-0,6937257
CORD	0,2377061
TAX	0,2831451

Appendix B-7-4: Regression Statistics of Media Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,000721287	6	0,000120215
Residual	0,000115166	14	8,22619806
Total	0,000836453	20	0,000041823

No. of Obs	=	21
F(6, 14)	=	14,61
Prob > F	=	0,0000
R-squared	=	0,8623
Adj. R-squared	=	0,8033
Root MSE	=	0,00287

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0059961	0,004990	1,20	0,249	-0,0047052	0,016697
TANG	-0,0491709	0,031648	-1,55	0,143	-0,1170491	0,187073
PROF	-0,0639826	0,010204	-6,27	0,000	-0,0858677	-0,420975
GROW	0,0059765	0,004823	-1,24	0,236	-0,0163211	0,004368
CORD	0,0288282	0,022489	1,28	0,221	-0,0194055	0,770619
TAX	0,0681048	0,060071	1,13	0,276	-0,0607348	0,1969444
Constant	0,0038484	0,018874	0,20	0,841	-0,0366326	0,0443294

rho	-0,2802613
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Appendix B-8-1: Regression Statistics of Technology Hardware and Equipment Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,22494776	6	0,037491293
Residual	0,2240472	13	0,0172344
Total	0,44899496	19	0,023631314

No. of Obs	=	20
F(6, 13)	=	2,18
Prob > F	=	0,1131
R-squared	=	0,5010
Adj. R-squared	=	0,2707
Root MSE	=	0,13128

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0767478	0,2009718	0,38	0,709	-0,3574255	0,5109211
TANG	-0,2376213	1,773288	-0,13	0,895	-4,068576	3,593334
PROF	-5,228015	1,853133	-2,82	0,014	-9,231465	-1,224566
GROW	0,501493	1,421335	0,27	0,795	-0,3585187	0,4588174
CORD	3,131536	1,421335	2,20	0,046	0,060929	6,202143
TAX	-3,154727	3,80589	-0,83	0,422	-11,37685	5,067399
Constant	0,3014592	1,977871	0,15	0,881	-3,971471	4,57439

TDBV	Beta
SIZE	0,3062730
TANG	-0,0328075
PROF	-0,6451018
GROW	0,2276021
CORD	0,7947381
TAX	-0,3368806

Appendix B-8-2: Regression Statistics of Technology Hardware and Equipment Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,201874716	6	0,033645786
Residual	0,222989087	13	0,017153007
Total	0,424863803	19	0,022361253

No. of Obs	=	20
F(5, 3)	=	1,96
Prob > F	=	0,145
R-squared	=	0,4552
Adj. R-squared	=	0,2329
Root MSE	=	0,13097

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0815062	0,2114677	0,39	0,706	-0,3753419	0,5383543
TANG	-0,164701	1,827589	-0,09	0,930	-4,112967	3,783565
PROF	-5,062025	1,875967	-2,70	0,018	-9,114806	-1,009245
GROW	0,0523533	0,1996102	0,26	0,797	-0,3788783	0,4835849
CORD	3,083777	1,455979	2,12	0,054	-0,0616748	6,229228
TAX	-2,769418	3,744484	-0,74	0,473	-10,85888	5,320047
Constant	0,1173829	1,960826	0,06	0,953	-4,118724	4,35349

rho	-0,0783042
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Appendix B-8-3: Regression Statistics of Technology Hardware and Equipment Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,013731115	6	0,002288519
Residual	0,007416227	13	0,000570479
Total	0,021147342	19	0,001113018

No. of Obs	=	20
F(6, 13)	=	4,01
Prob > F	=	0,0171
R-squared	=	0,6493
Adj. R-squared	=	0,4874
Root MSE	=	0,02388

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1108176	0,0365643	3,03	0,010	0,0318253	0,1898099
TANG	-0,222874	0,3226271	-0,69	0,502	-0,9198677	0,4741196
PROF	-0,9058654	0,3371539	-2,69	0,019	-1,634242	-0,1774886
GROW	-0,0638311	0,0344163	-1,85	0,086	-1,138183	0,0105209
CORD	0,04610953	0,2585938	1,78	0,098	-0,0975626	1,019753
TAX	-0,6516132	0,6924334	-0,94	0,364	-2,147525	0,8442983
Constant	-0,1417222	0,3598485	-0,39	0,700	-0,9191276	0,6356833

TDMV	Beta
SIZE	2,037719
TANG	-0,1417882
PROF	-0,5150482
GROW	-1,334861
CORD	0,5392004
TAX	-0,3206247

Appendix B-8-4: Regression Statistics of Technology Hardware and Equipment Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,025137808	6	0,004189635
Residual	0,006023477	13	0,000463344
Total	0,031161285	19	0,001640068

No. of Obs	=	20
F(6, 13)	=	9,04
Prob > F	=	0,0005
R-squared	=	0,8067
Adj. R-squared	=	0,7175
Root MSE	=	0,02153

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1120392	0,025105	4,46	0,001	0,0578029	0,166276
TANG	-0,1654409	0,243735	-0,68	0,509	-0,6919988	0,3611169
PROF	-0,7578076	0,271977	-2,79	0,015	-1,345377	-0,1702381
GROW	-0,0602342	0,023442	-2,57	0,023	-0,1108766	-0,009592
CORD	0,4261956	0,19215	2,22	0,045	0,110811	0,841310
TAX	-0,3472149	0,705368	-0,49	0,631	-1,871271	1,176441
Constant	-0,2815708	0,337332	-0,83	0,419	-1,1010331	0,4471878

rho	-0,4557179
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Appendix B-9-1: Regression Statistics of Software and Computer Services Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,161290923	6	0,02688182
Residual	0,109472043	14	0,007819432
Total	0,270762965	20	0,013538148

No. of Obs	=	21
F(6, 13)	=	3,44
Prob > F	=	0,0267
R-squared	=	0,5957
Adj. R-squared	=	0,4224
Root MSE	=	0,08843

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,1721823	0,1015964	-1,69	0,112	-0,3900849	0,457203
TANG	0,8612309	0,6577112	1,31	0,211	-0,5494192	2,271881
PROF	-0,0378133	0,1889103	-0,20	0,844	-0,4429855	0,3673589
GROW	0,2928925	0,0996324	2,94	0,011	0,0792024	0,5065827
CORD	-1,874915	0,7523083	-2,49	0,026	-3,488456	-0,2612741
TAX	0,82356	1,585207	0,52	0,612	-2,57637	4,22349
Constant	-0,6106703	0,5480513	-1,11	0,284	-1,786123	0,56478

TDBV	Beta
SIZE	-0,5496254
TANG	0,3165133
PROF	-0,03644248
GROW	1,067497
CORD	-0,6690084
TAX	0,1443982

Appendix B-9-2: Regression Statistics of Software and Computer Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,024258209	6	0,004043035
Residual	0,066034131	14	0,004716724
Total	0,09029234	20	0,004514617

No. of Obs	=	21
F(6, 14)	=	0,86
Prob > F	=	0,549
R-squared	=	0,2687
Adj. R-squared	=	-0,0448
Root MSE	=	0,06868

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1190935	0,084845	1,40	0,182	-0,062881	0,3010679
TANG	0,3971999	0,4563063	0,87	0,399	-0,5814799	1,37588
PROF	-0,033554	0,1399813	-0,24	0,814	-0,333784	0,266676
GROW	-0,0413253	0,07885	-0,52	0,608	-0,2104418	0,1277912
CORD	-0,0460062	0,752122	-0,06	0,952	-1,659147	1,567135
TAX	0,4030191	1,458452	0,28	0,786	-2,725049	3,531087
Constant	-0,3244448	0,6345174	-0,51	0,617	-1,685349	1,03646

rho	0,9653522
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Appendix B-9-3: Regression Statistics of Software and Computer Services Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,420826091	6	0,070137682
Residual	0,527605596	14	0,037686114
Total	0,948431688	20	0,047421584

No. of Obs	=	21
F(6, 14)	=	1,86
Prob > F	=	0,1586
R-squared	=	0,4437
Adj. R-squared	=	0,2053
Root MSE	=	0,19413

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,5363603	0,2230393	2,40	0,031	0,0579886	1,014732
TANG	-1,793371	1,443904	-1,24	0,235	-4,890237	1,303494
PROF	-0,4939012	0,4147235	-1,19	0,253	-1,383395	0,3955922
GROW	-0,3114712	0,2187276	-1,42	0,176	-0,7805952	0,1576528
CORD	-2,782602	1,651577	-1,68	0,114	-6,324883	0,7596792
TAX	2,601939	3,480078	0,75	0,467	-4,862086	10,06596
Constant	-1,144539	1,203163	-0,95	0,358	-3,725066	1,435988

TDMV	Beta
SIZE	0,9148008
TANG	-0,3521553
PROF	-0,2542051
GROW	-0,606552
CORD	-0,5305089
TAX	0,2437559

Appendix B-9-4: Regression Statistics of Software and Computer Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,097574861	6	0,016262477
Residual	0,02913147	16	0,001820717
Total	0,126706332	22	0,005759379

No. of Obs	=	23
F(6, 16)	=	8,93
Prob > F	=	0,0002
R-squared	=	0,7701
Adj. R-squared	=	0,6839
Root MSE	=	0,04267

TDMV	Coeffecient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1045657	0,061262	1,71	0,107	-0,0253033	0,234435
TANG	-0,0588478	0,4081681	-0,14	0,887	-0,9241255	0,8064299
PROF	-0,9744177	0,7671895	-1,27	0,222	-2,600787	0,6519514
GROW	-0,15248	0,0765207	-1,99	0,064	-0,3146967	0,009737
CORD	-0,3556022	0,3607286	-0,99	0,339	-1,120313	0,40911
TAX	-3,405424	0,9659706	-3,53	0,003	-5,45319	-1,357657
Constant	1,6080848	0,517051	3,25	0,005	0,584749	2,776947

rho	0,1562952
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Appendix B-10-1: Regression Statistics of Electronic and Electrical Equipment / Electricity Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,139899338	6	0,023316556
Residual	0,007092951	3	0,002364317
Total	0,146992289	9	0,016332477

No. of Obs	=	10
F(6, 13)	=	9,86
Prob > F	=	0,0437
R-squared	=	0,9517
Adj. R-squared	=	0,8552
Root MSE	=	0,04862

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,6696365	0,1227888	-5,45	0,012	-1,060405	0,457203
TANG	-0,8773313	0,9793764	-0,90	0,436	-3,994144	2,271881
PROF	0,429572	0,1353617	3,17	0,050	-0,0012094	0,8603533
GROW	0,1040951	0,2663326	0,39	0,722	-0,7434941	0,9516842
CORD	0,4775188	2,552931	0,19	0,864	-7,647046	8,602083
TAX	-139,544	42,11751	-3,13	0,045	273,5807	-5,507281
Constant	41,55561	11,73212	3,54	0,038	4,218787	78,89244

TDBV	Beta
SIZE	-2,8706080
TANG	-0,5302939
PROF	4,211511
GROW	0,1718706
CORD	0,088155
TAX	-3,452909

Appendix B-10-2: Regression Statistics of Electronic and Electrical Equipment / Electricity Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,169643383	6	0,028273897
Residual	0,001740507	2	0,000870254
Total	0,17138389	8	0,021422986

No. of Obs	=	9
F(6, 14)	=	32,49
Prob > F	=	0,0302
R-squared	=	0,9898
Adj. R-squared	=	0,9594
Root MSE	=	0,0295

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,9045313	0,1157677	-7,81	0,016	-1,402639	-0,4064232
TANG	-1,237061	0,4987098	-2,48	0,131	-3,382836	0,9087145
PROF	0,6466312	0,1365855	4,73	0,042	0,0589511	1,234311
GROW	0,214674	0,1300267	1,65	0,241	-0,3447859	0,7741340
CORD	0,8448537	1,244613	0,68	0,567	-4,510286	6,199993
TAX	-216,3072	48,00924	-4,51	0,046	-422,8743	-9,740076
Constant	63,11548	13,02988	4,84	0,040	7,05243	119,1785

rho	-1,03226
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Appendix B-10-3: Regression Statistics of Electronic and Electrical Equipment / Electricity Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,947133305	6	0,157855551
Residual	0,014948801	3	0,004982934
Total	0,962082106	9	0,106898012

No. of Obs	=	10
F(6, 3)	=	31,68
Prob > F	=	0,0083
R-squared	=	0,9845
Adj. R-squared	=	0,9534
Root MSE	=	0,07059

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,8248912	0,1782577	-4,63	0,019	1,392187	-0,2575955
TANG	-6,206572	1,421803	-4,37	0,022	-10,73138	-1,681762
PROF	-0,02225854	0,1965104	-0,11	0,916	-0,6479692	0,6027984
GROW	0,556151	0,3866464	0,14	0,895	-1,174866	1,286097
CORD	-0,0472403	3,706199	-0,01	0,991	-11,84202	11,74754
TAX	81,42767	61,1438	1,33	0,275	-113,1592	276,0145
Constant	-16,84493	17,03202	-0,99	0,396	-71,0484	37,35855

TDMV	Beta
SIZE	-1,382205
TANG	-1,466378
PROF	-0,0866248
GROW	0,0358926
CORD	-0,0034344
TAX	0,7875664

Appendix B-10-4: Regression Statistics of Electronic and Electrical Equipment / Electricity Firms Adjusted for Autocorrelation and Heteroscedasticity

Source	Sum of Squares	df	Mean Squared
Model	1,54681216	6	0,257802026
Residual	0,011062843	3	0,003687614
Total	1,557875	9	0,173097222

No. of Obs	=	10
F(6, 3)	=	69,91
Prob > F	=	0,0026
R-squared	=	0,9929
Adj. R-squared	=	0,9787
Root MSE	=	0,06073

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,7665395	0,107194	-7,15	0,006	-1,107679	-0,425400
TANG	-7,044476	1,005685	-7,00	0,006	-10,24502	-3,843936
PROF	-0,1747198	0,125949	-1,39	0,259	-0,5755447	0,226105
GROW	0,4470385	0,345213	1,29	0,286	-0,6515835	1,54566
CORD	2,463523	2,896229	0,85	0,457	-6,753571	11,68062
TAX	107,5987	33,89979	3,17	0,05	-0,2855252	215,483
Constant	-26,86821	9,907775	-2,17	0,073	-58,39917	4,662755

rho	0,8524437
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Appendix B-11-1: Regression Statistics of Support Services Firms

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,224919714	6	0,023316556
Residual	0,042976752	16	0,002364317
Total	0,267896466	22	0,012177112

No. of Obs	=	23
F(6, 16)	=	13,96
Prob > F	=	0,0000
R-squared	=	0,8396
Adj. R-squared	=	0,7794
Root MSE	=	0,05183

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	-0,1436532	0,0720034	-1,99	0,063	-0,2962836	0,0089973
TANG	-0,7341809	0,4922505	-1,49	0,155	-1,777705	0,3093435
PROF	1,114245	0,9076553	1,23	0,237	-0,8090979	3,038389
GROW	0,1571462	0,0882716	1,78	0,094	-0,0299812	0,3442736
CORD	-1,749189	0,4223604	-4,14	0,001	-2,644553	-0,8538246
TAX	-0,7322145	1,171072	-0,63	0,541	-3,214777	1,750348
Constant	0,7388004	0,5999092	1,23	0,236	-0,5329503	2,01055

TDBV	Beta
SIZE	-0,8850757
TANG	-0,2664373
PROF	0,2172517
GROW	0,961544
CORD	-0,6610396
TAX	-0,1667609

Appendix B-11-2: Regression Statistics of Support Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDBV

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

Source	Sum of Squares	df	Mean Squared
Model	0,010498001	6	0,001749667
Residual	0,03083621	16	0,001927263
Total	0,041334211	22	0,001878828

No. of Obs	=	23
F(6, 16)	=	0,91
Prob > F	=	0,5137
R-squared	=	0,2540
Adj. R-squared	=	-0,0258
Root MSE	=	0,0439

TDBV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,0093087	0,0587387	0,16	0,876	-0,1152117	0,133829
TANG	-1,263028	0,4528062	-2,79	0,013	-2,222934	-0,3031215
PROF	0,024311	0,7020776	0,03	0,977	-1,467907	1,508769
GROW	-0,051999	0,0763287	-0,68	0,505	-0,2138086	0,1098106
CORD	-0,8640046	0,4073589	-2,12	0,050	-1,727567	-0,004422
TAX	-0,9983855	0,9383891	-1,06	0,303	-2,987682	0,9909105
Constant	1,232083	0,531838	2,32	0,034	0,21046373	2,35953

rho	0,8773149
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Appendix B-11-3: Regression Statistics of Support Services Firms

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,139909501	6	0,02331825
Residual	0,029704482	16	0,00185653
Total	0,169613983	22	0,007709727

No. of Obs	=	23
F(6, 3)	=	12,56
Prob > F	=	0,0000
R-squared	=	0,8249
Adj. R-squared	=	0,7592
Root MSE	=	0,04309

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1043593	0,598615	1,74	0,100	-0,0225413	0,23126
TANG	-0,0139896	0,4092421	-0,03	0,973	-0,8815442	0,8535649
PROF	-1,053869	0,7545971	-1,40	0,182	-2,653543	0,5458055
GROW	-0,155094	0,0733863	-2,11	0,051	-0,3106661	0,000478
CORD	-0,3130869	0,3511376	-0,89	0,386	-1,057465	0,4312915
TAX	-3,532068	0,9735941	-3,64	0,002	-5,605996	-1,478141
Constant	1,736646	0,4987463	3,48	0,003	0,6793506	2,793941

Appendix B-11-4: Regression Statistics of Support Services Firms Adjusted for Autocorrelation and Heteroscedasticity

Dependent Variable: TDMV

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

Source	Sum of Squares	df	Mean Squared
Model	0,097574861	6	0,016262477
Residual	0,02913147	16	0,001820717
Total	0,126706332	22	0,005759379

No. of Obs	=	23
F(6, 16)	=	8,93
Prob > F	=	0,0002
R-squared	=	0,7701
Adj. R-squared	=	0,6839
Root MSE	=	0,04267

TDMV	Coefficient	Std. Error	t	P> t	[95% Confidence Interval]	
SIZE	0,1045657	0,061262	1,71	0,107	-0,0253033	0,234435
TANG	-0,0588478	0,4081681	-0,14	0,887	-0,9241255	0,8064299
PROF	-0,9744177	0,7671895	-1,27	0,222	-2,600787	0,6519514
GROW	-0,15248	0,0765207	-1,99	0,064	-0,3146967	0,009737
CORD	-0,3556022	0,3607286	-0,99	0,339	-1,120313	0,40911
TAX	-3,405424	0,9659706	-3,53	0,003	-5,45319	-1,357657
Constant	1,6080848	0,517051	3,25	0,005	0,584749	2,776947

rho	0,1562952
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Appendix C-1 Sample of Delisted Stocks

DELIST DATE	TICKER	COMPANY NAME
1994/01/18	BSG	BASIL STARKE GROUP LIMITED
1994/01/18	BSI	BASIL STARKE INVESTMENTS LIMITED
1994/02/04	DXL	DEXTRAL INDUSTRIES LIMITED
1994/02/04	OKO	O.K. BAZAARS (1929) LIMITED
1994/02/25	DSA	DISA DEVELOPMENT CORPORATION LIMITED
1994/02/25	RUH	RUBENSTEIN HOLDINGS LIMITED
1994/03/07	AMS	AMALGAMATED SHOES LIMITED
1994/03/10	TFB	TAFELBERG FURNITURE STORES LIMITED
1994/03/11	UCS.	THE UNION COLD STORAGE OF SOUTH AFRICA LIMITED
1994/03/19	RCY	RACY GROUP HOLDINGS LIMITED
1994/03/25	SFT	SAFETY TECHNOLOGIES LIMITED
1994/04/11	MIM	MIDMACOR INDUSTRIES LIMITED
1994/04/15	OSL	ORANGE FREE STATE INVESTMENTS LIMITED
1994/05/02	RMA	ROMANO FURNITURE LIMITED
1994/05/06	DIN	DINETTE INDUSTRIES LIMITED
1994/06/29	TMK	TOMKOR LIMITED
1994/07/26	OHI	OHIO GROUP LIMITED
1994/08/05	FNR	FENNER GROUP SOUTH AFRICA LIMITED
1994/08/12	ELC	ELCENTRE CORPORATION LIMITED
1994/09/02	KLY	KEELEY GROUP HOLDINGS LIMITED
1994/09/07	PRC	PERSETECH LIMITED
1994/09/13	DPF	DPF INVESTMENTS LIMITED
1994/09/15	RLE	RALE HOLDINGS LIMITED
1994/10/18	MRX	MERITEX HOLDINGS LIMITED
1994/11/09	RMS	ROMENS HOLDINGS LIMITED
1994/11/14	FAG	FARM-AG LIMITED
1994/12/06	RAP	RAPTOR MOTOR HOLDINGS LIMITED
1994/12/12	VRX	VAREX CORPORATION LIMITED
1994/12/27	RAB	RABIE INVESTMENT HOLDINGS LIMITED
1995/01/05	DMG	DARMAG LIMITED
1995/02/20	CLM	CARLTON PAPER CORPORATION LIMITED
1995/03/13	ABS	ABS HOLDINGS LIMITED
1995/03/13	SPL	SPL LIMITED
1995/05/09	HCN	HICKSON CHEMICAL HOLDINGS LIMITED
1995/06/02	LDK	LANDMARKS BERHAD S.A. LIMITED
1995/06/30	FSG	F S GROUP LIMITED
1995/06/30	WAA	W AND A INVESTMENT CORPORATION LIMITED
1995/06/30	WAC	WAICOR LIMITED
1995/07/01	BIL	BROADACRES INVESTMENTS LIMITED

1995/07/03	FSI	FSI CORPORATION LIMITED
1995/07/29	MXM	MAXMECH MECHANICAL SEALS LIMITED
1995/08/04	CTY	CITY INVESTMENT HOLDINGS LIMITED
1995/08/10	BST	BESTER BELEGGINGS BEPERK
1995/09/08	CLG	CLEGG HOLDINGS LIMITED
1995/09/22	ACA	AFRICAN CABLES LIMITED
1995/10/06	SDR	STANDARD ENGINEERING LIMITED
1995/10/13	DTR	DATAKOR LIMITED
1995/10/17	DCV	DECOVO INVESTMENTS LIMITED
1995/10/21	BRT.	BARNETTS GROUP LIMITED
1995/11/03	DOR	DOORNFONTEIN GOLD MINING COMPANY LIMITED
1995/11/10	CMS	CORPORATE MANAGEMENT SERVICES LIMITED
1995/11/16	WPH	WHOLESALE PHARMACEUTICAL HOLDINGS LIMITED
1995/12/01	SNS	SUN INTERNATIONAL (CISKEI) LIMITED
1995/12/01	TSN	TRANSKEI SUN INTERNATIONAL LIMITED
1995/12/22	UCN	U-CONTROL LIMITED
1996/01/10	LNR	LONGRAIL LIMITED
1996/01/16	SLK	SILVEROAK INDUSTRIES LIMITED
1996/01/19	PRD	PRESMED HOLDINGS LIMITED
1996/01/26	SEH	SECHOLD LIMITED
1996/02/02	BGR	BERGERS GROUP LIMITED
1996/02/02	KOP	KOPP ELECTRONICS LIMITED
1996/02/21	CLK	THE CLICKS GROUP LIMITED
1996/03/02	BLR	BOLTON PROPERTIES LIMITED
1996/04/16	MCH	METCLICK HOLDINGS LIMITED
1996/04/16	MCK	METCLICK LIMITED
1996/04/23	BOY	BOYMANS LIMITED
1996/04/23	CST	CREST HOLDINGS LIMITED
1996/04/23	VKT	VEKTRA CORPORATION P L C
1996/04/26	NTT	NATRUST LIMITED
1996/05/24	ABY	ABBAY HOLDINGS LIMITED
1996/06/21	SAF	SAFICON INVESTMENTS LIMITED
1996/06/21	SKR	SAKERS FINANCE AND INVESTMENT CORPORATION LIMITED
1996/09/06	GPI	GYPSUM INDUSTRIES LIMITED
1996/09/27	PGR.	PROGRESS INDUSTRIES LIMITED
1996/10/18	JAD	DJI CLOTHING INVESTMENT HOLDINGS LTD
1996/10/18	KET	KETTER GRANITE HOLDINGS LIMITED
1996/11/01	EVT	EVERITE GROUP LIMITED
1996/11/01	EVH	EVERITE HOLDINGS LIMITED
1996/11/01	SRC	SEARDEL CONSOLIDATED HOLDINGS LIMITED
1996/12/06	MRD	MERHOLD INVESTMENT CORPORATION LIMITED
1996/12/06	SBH	SABHOLD GROUP LIMITED
1996/12/13	HTR	HORTORS LIMITED

1996/12/30	BTD	BERGERS TRADING HOLDINGS LIMITED
1997/01/03	PAS	PROTEA ASSURANCE COMPANY LIMITED
1997/01/17	COR	CORPORATE AFRICA LIMITED
1997/01/17	TRH	TRADEHOLD LIMITED.
1997/02/03	PRP	THE PREMIER PHARMACEUTICAL COMPANY LIMITED
1997/02/07	SEF	SEEFF HOLDINGS LIMITED
1997/02/10	MVT	MESSINA INVESTMENTS LIMITED
1997/04/04	MAH	MATHIESON AND ASHLEY HOLDINGS LIMITED
1997/04/25	ATK	AUTOMAKERS LIMITED
1997/05/23	BLA	BOLAND BANK HOLDINGS LIMITED
1997/05/30	RDX	RANDEX LIMITED
1997/06/03	VTR	VESTACOR LIMITED
1997/06/20	BCR	BID CORPORATION LIMITED
1997/07/11	LSU	LONRHO SUGAR CORPORATION LIMITED
1997/08/01	MAC	MACPHAIL HOLDINGS LIMITED
1997/08/09	TEJ	TOWLES,EDGAR JACOBS LIMITED
1997/08/29	fra	ALLWEAR LIMITED
1997/09/19	WAL	WALTONS STATIONERY COMPANY LIMITED
1997/09/22	SLC	SOLCHEM INVESTMENT HOLDINGS LIMITED
1997/09/25	SAI	S.A. BIAS INDUSTRIES LIMITED
1997/09/26	CLF	CRUSADER LIFE ASSURANCE CORPORATION LIMITED
1997/09/26	ITL	INTERLEISURE LIMITED
1997/09/30	NBB	NBS BOLAND GROUP LIMITED
1997/11/14	AKJ	ARTHUR KAPLAN JEWELLERY HOLDINGS LIMITED
1997/11/14	SRT	SMART GROUP HOLDINGS LIMITED
1997/12/05	HNC	HUNTCOR LIMITED
1997/12/05	KUD	KUDU GRANITE HOLDINGS LIMITED
1997/12/13	CAR	CARRIG DIAMONDS LIMITED
1997/12/19	QDT	Q DATA LIMITED
1997/12/23	RGL	REGIONAL RESOURCES LIMITED
1998/01/14	SCM	SENTRACHEM LIMITED
1998/01/16	CHU	CHUBB HOLDINGS LIMITED
1998/01/30	CGW	CONSOL LIMITED.
1998/01/30	OTS	OTIS ELEVATOR COMPANY LIMITED
1998/02/06	MSH	MARSHAL LIMITED
1998/04/01	COM.	CHROMECORP HOLDINGS LIMITED
1998/04/18	SCF	SHO-CRAFT LIMITED
1998/04/28	FDC	FOODCORP LIMITED
1998/05/11	POT	BRIAN PORTER HOLDINGS LIMITED
1998/05/18	RHE	RHOEX LIMITED
1998/05/20	MPR	METBOARD PROPERTY FUND
1998/05/22	FSB	FIRST NATIONAL BANK HOLDINGS LIMITED
1998/05/22	SON	THE SOUTHERN LIFE ASSOCIATION LIMITED

1998/06/19	BPR	BARPROP LIMITED
1998/07/24	BZK	BERZACK BROTHERS (HOLDINGS) LIMITED
1998/07/24	CHR	CHARTER PLC.
1998/07/24	MCR	MC CARTHY GROUP LIMITED
1998/07/24	TCH	TECHNIHIRE LIMITED (1989)
1998/07/31	GFN	GRIFFIN SHIPPING HOLDINGS LIMITED
1998/07/31	HGT	HIGATE PROPERTY FUND
1998/07/31	HST	HIGHSTONE PROPERTY FUND
1998/07/31	MNO	MAIN STREET PROPERTY FUND
1998/07/31	NBB	NBS BOLAND GROUP LIMITED
1998/07/31	ORH	ORION SELECTIONS HOLDINGS LIMITED
1998/07/31	ORS	ORION SELECTIONS LIMITED
1998/07/31	TAM	TAMBOTI PROPERTY FUND
1998/07/31	UMN	UMDONI PROPERTY FUND
1998/08/07	KOH	KOHLER LIMITED
1998/08/14	CMI	CONSOLIDATED METALLURGICAL INDUSTRIES LIMITED
1998/08/14	PCR	PROPERTY CORPORATION OF SOUTH AFRICA LIMITED
1998/08/21	IBM	IBM SOUTH AFRICA GROUP LIMITED
1998/08/28	NWH	NORWICH HOLDINGS S.A. LIMITED
1998/08/28	ODV	OCEANA INVESTMENT CORPORATION P L C
1998/09/11	AUK	AUKLAND HEALTH LIMITED
1998/09/15	SNA	SNA CORPORATION LIMITED
1998/09/23	ICS	ICS HOLDINGS LIMITED
1998/09/23	IVG	INVEGO INVESTMENT LIMITED
1998/09/25	IGE	INGWE COAL CORPORATION LIMITED
1998/10/02	AMT	ARMATO CORPORATION LIMITED
1998/10/02	BON	BONNITA HOLDINGS LIMITED
1998/10/09	PSY	PLESSEY CORPORATION LIMITED
1998/10/16	GFC	GOLD FIELDS COAL LIMITED
1998/10/23	GLG	GALLAGHER ESTATE HOLDINGS LIMITED
1998/11/06	AAL	ALPHA LIMITED
1998/11/06	HCT	HOECHST SOUTH AFRICA LIMITED
1998/11/06	MEG	MILLENNIUM ENTERTAINMENT GROUP AFRICA LIMITED
1998/11/06	TME	TIMES MEDIA LIMITED
1998/11/16	CTC	CELTRON TECHNOLOGIES LIMITED
1998/11/20	SUN	SUNCRUSH LIMITED
1998/12/04	EXC	EXCEL MEDICAL HOLDINGS LIMITED
1998/12/04	PGM	P.G.M INVESTMENTS LIMITED
1998/12/15	EGN	ENGEN LIMITED
1998/12/18	NCW	NEW CENTRAL WITWATERSRAND AREAS LIMITED
1998/12/18	SMA	SAMANCOR LIMITED
1998/12/24	TUN	T & N HOLDINGS LIMITED
1999/01/08	ARM	AROMA LIQUOR HOLDINGS LIMITED

1999/01/08	CXN	CAXTON LIMITED
1999/01/08	DAG	DA GAMA TEXTILE COMPANY LIMITED
1999/01/15	ERL	ENVIRONMENTAL RESOURCES LIMITED
1999/01/15	PEI	PEP LIMITED
1999/01/25	TCO	TCO HOLDINGS LIMITED
1999/01/27	NRK	NORTHERN BAKERIES LIMITED
1999/01/29	HAG	HAGGIE LIMITED
1999/01/29	MGC	MEGACOR HOLDINGS LIMITED
1999/02/01	TCF	TECFIN INVESTMENTS LIMITED
1999/02/01	TML	TEXTILE MILLS (1947) HOLDINGS LIMITED-ZIMBABWE-
1999/03/25	LTH	LITHOTECH LIMITED
1999/04/23	EPW	SOUTH AFRICAN EMPOWERMENT FUND INV TRUST CO LTD
1999/04/30	TMX	TELEMETRIX PLC
1999/05/19	CNS	CONSHU HOLDINGS LIMITED
1999/06/03	CHL	CHILLERS GROUP LIMITED
1999/06/03	EQR	EQUIKOR HOLDINGS LIMITED
1999/06/03	NTR	NATAL OCEAN TRAWLING LIMITED
1999/06/03	PTA	PUTRA-STERLING LIMITED
1999/06/03	RFK	REF MARKETING AND MEDIA LIMITED
1999/06/03	SHO	SHOREDITS HOLDINGS LIMITED
1999/06/09	IDW	INDEPENDENT NEWSPAPERS HOLDINGS LIMITED
1999/06/23	FLX	FELTEX LIMITED
1999/06/24	FIT	FIRST INTERNATIONAL TRUST LIMITED
1999/06/24	ROM	ROMATEX LIMITED
1999/06/25	TCM	TECHNOLOGY COMMUNICATION HOLDINGS LIMITED
1999/07/01	AVN	ANGLOVAAL INSURANCE HOLDINGS LIMITED
1999/07/02	AIH	ANGLOVAAL INDUSTRIAL HOLDINGS LIMITED
1999/07/02	CRK	CORNICK GROUP LIMITED
1999/07/02	LBV	LIBERTY INVESTORS LIMITED
1999/07/05	SDG	SOUTH AFRICAN DRUGGISTS LIMITED
1999/07/07	FNC	FURNCO INVESTMENTS LIMITED
1999/07/09	BTS	BRITISH AMERICAN TOBACCO HOLDINGS (SA) LIMITED
1999/07/30	ARX	ABRAXAS INVESTMENT HOLDINGS LIMITED
1999/07/30	AST	ADVANCED SOFTWARE TECHNOLOGIES LIMITED
1999/07/30	PSL	PSG FINANCIAL SERVICES LIMITED
1999/08/06	SFG	SELECTIVE FINANCIAL GROUP LIMITED
1999/08/20	CSF	C.G.SMITH FOODS LIMITED
1999/09/03	NPT	NEWPORT PROPERTY FUND
1999/09/10	ETS	EMERALD TOPBRAND SPORTS LIMITED
1999/09/10	MHL	MAS HOLDINGS LIMITED
1999/09/10	MXT	MAXTEL LIMITED
1999/09/10	MSH	MSI HOLDINGS LIMITED
1999/09/23	BRS	BOTSWANA RST LIMITED

1999/10/15	IGI	IGI INSURANCE COMPANY LIMITED
1999/10/15	MSN	MASHOLD CONSOLIDATED INVESTMENT HOLDINGS LIMITED
1999/10/22	CLT	CULLINAN HOTEL AND LEISURE GROUP LIMITED
1999/10/22	LGB	LANGEBERG HOLDINGS LIMITED
1999/11/04	PIN	POLIFIN LIMITED
1999/11/05	QLA	QALA GROUP LIMITED
1999/11/26	BTR	BATEMAN INDUSTRIAL CORPORATION LIMITED
1999/11/26	GRC	GRINAKER CONSTRUCTION LIMITED
1999/11/26	PEN	PENROSE HOLDINGS LIMITED
1999/11/26	SPH	SPUR HOLDINGS LIMITED
1999/11/26	SPU	SPUR STEAK RANCHES LIMITED
1999/11/29	GPT	GLOBAL CAPITAL PRIVATE EQUITY LIMITED
1999/12/03	PGS	PLATE GLASS AND SHATTERPRUFE INDUSTRIES LIMITED
1999/12/17	ADC	ADCOCK-INGRAM LIMITED
2000/01/14	IRV	IRVIN AND JOHNSON LIMITED
2000/01/21	HDG	COROHEDGE CAPITAL LIMITED
2000/01/28	RTC	RETAIL CORPORATION
2000/01/28	TJ	TELJOY HOLDINGS LIMITED
2000/02/18	CGS	C.G.SMITH LIMITED
2000/03/03	MTK	METKOR GROUP LIMITED
2000/03/24	FCS	THE FEDICS GROUP LIMITED
2000/04/07	IVS	ISLAND VIEW STORAGE LIMITED
2000/04/15	BOU	BOUMAT LIMITED
2000/04/18	SSH	STOCKS AND STOCKS HOLDINGS LIMITED
2000/04/20	BNC	BENGUELA CONCESSIONS LIMITED
2000/04/26	STS	STOCKS & STOCKS LIMITED
2000/05/05	ALR	FRASER ALEXANDER LIMITED
2000/05/24	PSB	PSG NOBLE CAPITAL LIMITED
2000/05/26	GAR	GUARDIAN NATIONAL INSURANCE COMPANY LIMITED
2000/06/02	ADS	ADVSOURCE HOLDINGS LIMITED
2000/06/02	TLC	THE LEARNING CORPORATION LIMITED
2000/07/07	RFN	RANDFONTEIN ESTATES LIMITED
2000/07/14	MAC	MERCURY ALPHA CAPITAL LIMITED
2000/07/21	PRB	PERSKOR BELEGGINGS BEPERK
2000/07/25	TWE	TWEEFONTEIN UNITED COLLIERIES LIMITED
2000/08/04	PTR	AFRICAN PARTNERSHIP LIMITED
2000/08/04	ICH	INDUSTRIAL AND COMMERCIAL HOLDINGS GROUP LIMITED
2000/08/15	SFR	SAFMARINE AND RENNIES HOLDINGS LIMITED
2000/08/18	COT	COATES BROTHERS (SOUTH AFRICA) LIMITED
2000/08/25	APG	AUTOPAGE HOLDINGS LIMITED
2000/08/28	FRS	FRANSAF LIMITED
2000/09/01	RDS	RADIOSPOOR TECHNOLOGY HOLDINGS LIMITED
2000/09/22	RMB	REMBRANDT CONTROLLING INVESTMENTS LIMITED

2000/09/22	RMT	REMBRANDT GROUP LIMITED
2000/09/22	TEG	TEGNIесе BELEGGINGS KORPORASIE BEPERK
2000/09/22	TIB	TEGNIесе EN INDUSTRIELE BELEGGINGS BEPERK
2000/09/29	WAC	WACO INTERNATIONAL LIMITED
2000/10/02	NEH	NEI AFRICA HOLDINGS LIMITED
2000/10/09	SIB	SIB HOLDINGS LIMITED
2000/10/13	BYX	BYNX LIMITED
2000/10/27	CRS	CARSON HOLDINGS LIMITED
2000/10/27	LTA	L.T.A. LIMITED
2000/10/27	STC	STORECO LIMITED
2000/11/03	LSF	FIRST LIFESTYLE HOLDINGS LIMITED
2000/11/03	PEG	PEPGRO LIMITED
2000/11/10	MDM	MACADAMS BAKERY SUPPLIES HOLDINGS LIMITED
2000/11/10	PRT	PRIMA TOY & LEISURE GROUP LIMITED
2000/11/17	GRA	GRAY SECURITY SERVICES LIMITED
2000/11/24	SPR	MORESPORT HOLDINGS LIMITED
2000/12/01	BWR	BOLTON FOOTWEAR LIMITED
2000/12/01	GHO	GROUP FIVE HOLDINGS LIMITED
2000/12/01	GDS	S M GOLDSTEIN LIMITED
2000/12/01	SHV	SEA HARVEST CORPORATION LIMITED
2000/12/01	SFW	STELLENBOSCH FARMERS WINERY GROUP LIMITED
2000/12/06	CGU	CGU HOLDINGS LIMITED
2000/12/08	BOC	BOE CORPORATION LIMITED
2000/12/08	FAM	FRAME GROUP LIMITED
2000/12/15	CAS	CADBURY SCHWEPPEs (SOUTH AFRICA) LIMITED
2000/12/18	ITT	INVESTEC INVESTMENT TRUST LIMITED
2000/12/22	FUS	FUSION CAPITAL LIMITED
2000/12/22	GSC	GENBEL SECURITIES LIMITED
2000/12/22	GLH	GLOHOLD LIMITED
2001/01/05	FSC	FASIC LIMITED
2001/02/09	DLC	DEL MONTE ROYAL CORPORATION LIMITED
2001/02/09	DLH	DEL MONTE ROYAL HOLDINGS LIMITED
2001/02/20	AUM	ACUMEN HOLDINGS LIMITED
2001/02/23	FRX	FRALEX LIMITED
2001/02/23	SMT	SMACSOFT GROUP LIMITED
2001/03/02	AGR	A M MOOLLA GROUP LIMITED
2001/03/02	APX	APEX PROPERTY FUND
2001/03/02	DLS	DALYS LIMITED
2001/03/02	ETN	ETTINGTON INVESTMENTS LIMITED
2001/03/02	TEM	TEMPORA INVESTMENTS LIMITED
2001/03/05	NWT	NEW WITS LIMITED
2001/04/06	STR	STRAND GROUP HOLDINGS LIMITED
2001/04/11	PNT	PENTACOM HOLDINGS LIMITED

2001/04/12	DLF	DEL MONTE ROYAL FOODS LIMITED
2001/05/18	ECR	EDUCOR LIMITED
2001/05/25	GOC	GENERAL OPTICAL COMPANY LIMITED
2001/06/08	SET	SEARTEC LIMITED
2001/06/15	LNC	LENCO HOLDINGS LIMITED
2001/06/15	MDG	MDM GROWTH INVESTMENT LIMITED
2001/06/22	MMW	MMW TECHNOLOGY HOLDINGS LIMITED
2001/06/28	ESC	ELVEY SECURITY TECHNOLOGIES LTD
2001/06/29	BVC	BEVERAGE AND CONSUMER INDUSTRY HOLDINGS LIMITED
2001/06/29	IEH	INTEGRATED TECHNOLOGY HOLDINGS LIMITED
2001/06/29	ITI	ITI TECHNOLOGY HOLDINGS LIMITED
2001/06/29	LBS	LIBLIFE STRATEGIC INVESTMENTS LIMITED
2001/06/29	MMD	MACMED HEALTH CARE LIMITED
2001/06/29	PLG	PLASGROUP LIMITED
2001/06/29	PUR	PROSPUR PACKAGING AND PLASTICS LIMITED
2001/06/29	STT	STANTRONIC GROUP HOLDINGS LIMITED
2001/06/29	VLC	VALUECOM HOLDINGS LIMITED
2001/07/06	CDR	CREDCOR LIMITED
2001/07/06	MEB	M-WEB HOLDINGS LIMITED
2001/07/13	SRY	SENTRY GROUP LIMITED
2001/07/13	TOY	TOYOTA (SOUTH AFRICA) LIMITED
2001/08/10	PNY	PENNYSTOCKS INVESTMENTS LTD
2001/08/20	ARE	ARIES INVESTMENT HOLDINGS LIMITED
2001/08/24	BNS	BRANSBY INVESTMENT COMPANY LIMITED
2001/08/24	INF	INFINITI TECHNOLOGIES LIMITED
2001/08/24	KLT	KLIPTON LIMITED
2001/08/24	LOT	LOGOPT LIMITED
2001/08/24	PCF	PACIFIC ASIA INVESTMENTS INTERNATIONAL LIMITED
2001/08/24	TDL	TRIDELTA MAGNET TECHNOLOGY HOLDINGS LIMITED
2001/08/31	AXI	APEXHI PROPERTIES LIMITED.
2001/08/31	SDA	SECUREDATA SOLUTIONS LIMITED
2001/09/07	CON	CONTLAN HOLDINGS LIMITED
2001/09/20	TLT	TELTRON LIMITED
2001/09/25	MGF	MAGNUM GLOBAL FUNDS SA LIMITED
2001/09/28	RNS	RENAISSANCE RETAIL GROUP LIMITED
2001/10/01	CLY	CLYDE INDUSTRIAL CORPORATION LIMITED
2001/10/01	SNR	SONDOR INDUSTRIES LIMITED
2001/10/03	THK	THUTHUKANI GROUP LIMITED
2001/10/05	CPS	COMPASS PROPERTY HOLDINGS LIMITED
2001/10/08	OMA	OMEGA HOLDINGS LIMITED
2001/10/09	CCH	COMPUTER CONFIGURATIONS HOLDINGS LIMITED
2001/10/15	GDL	GUNDLE LIMITED
2001/10/15	POR	PORTLAND HOLDINGS LIMITED

2001/10/22	CPB	CORPCAPITAL BANK CONTROLLING COMPANY LIMITED
2001/10/22	CPC	CORPCAPITAL LIMITED
2001/10/26	MTR	METROPOLIS TRANSACTIVE HOLDINGS LIMITED
2001/11/12	CPM	CORPCOM LIMITED
2001/11/12	IFS	I-FUSION HOLDINGS LIMITED
2001/11/28	HRL	HARWILL INVESTMENTS LIMITED
2001/11/28	KAR	KAROS HOTELS LIMITED
2001/11/28	NMB	NIMBUS HOLDINGS LIMITED
2001/11/28	OHA	O'HAGAN'S INVESTMENT HOLDINGS LIMITED
2001/11/28	QMT	Q MART HOLDINGS LIMITED
2001/11/28	RDP	ROADCORP LIMITED
2001/12/03	WTC	WORLD EDUCATIONAL TECHNOLOGIES LIMITED
2001/12/13	FIN	FINTECH LIMITED
2001/12/18	CET	CHET INDUSTRIES LIMITED
2001/12/18	EQX	EQUINOX HOLDINGS LIMITED
2001/12/21	WSC	WESTERN CAPE PROPERTY COMPANY LIMITED
2001/12/24	AXA	AXIAM HOLDINGS LIMITED
2001/12/27	SOT	SOTTA SECURITISATION INTERNATIONAL LIMITED
2002/01/14	PMA	PRIMEDIA LIMITED
2002/01/14	PMA	PRIMEDIA LIMITED
2002/01/28	CST	CAPESTAR GROWTH INVESTMENTS LIMITED
2002/02/04	BTO	BATEMAN PROJECT HOLDINGS LIMITED
2002/02/04	MNX	MONEX LIMITED
2002/03/15	DNL	DUNLOP AFRICA LIMITED
2002/03/18	MSI	MSAULI ASBES BEPERK
2002/03/22	VLX	VOLTEX HOLDINGS LIMITED
2002/03/26	PAG	PARAGON BUSINESS COMMUNICATIONS LIMITED
2002/04/09	CBD	C B D PROPERTY FUND
2002/04/09	PNR	PIONEER PROPERTY FUND
2002/04/16	MLN	MARLIN CORPORATION LIMITED
2002/04/16	MNH	MARLIN HOLDINGS LIMITED
2002/04/30	FDS	FEDSURE HOLDINGS LIMITED
2002/05/02	SRB	SOUTH AFRICAN RESERVE BANK
2002/05/03	BLT	BOLTON INDUSTRIAL HOLDINGS LIMITED
2002/05/03	KTL	KUNENE TECHNOLOGY LIMITED
2002/05/03	MIR	MICOR LIMITED
2002/05/03	THW	THW INVESTMENTS LIMITED
2002/05/03	UNS	UNISPIN HOLDINGS LIMITED
2002/05/06	NCX	NATIONAL CHICK LIMITED
2002/05/15	ABC	ABACUS TECHNOLOGY HOLDINGS LIMITED
2002/06/03	CTL	COASTAL GROUP LIMITED
2002/06/03	FEQ	FE SQUARED HOLDINGS LIMITED
2002/06/03	FGM	MASTERFRIDGE LIMITED

2002/06/03	SEM	SEMPRES INTERNATIONAL TECHN HLDGS LD
2002/06/04	FRC	FURNEX CAPITAL LIMITED
2002/06/14	RCT	RECTRON HOLDINGS LIMITED
2002/06/19	UNF	UNIFER HOLDINGS LIMITED
2002/06/19	UHS	UNI HOLD LIMITED
2002/06/28	POW	POWER TECHNOLOGIES LIMITED
2002/07/01	CIH	CENTRAL INFORMATION HOLDINGS LTD
2002/07/01	DLM	DIAL-A-MOVIE LIMITED
2002/07/01	ESS	ESSENTIAL BEVERAGE HOLDINGS LTD
2002/07/01	JMH	JEM TECHNOLOGY HOLDINGS LIMITED
2002/07/01	NSI	NATIONAL SPORTING INDEX LTD
2002/07/01	NXT	NEXTTVEST HOLDINGS LIMITED
2002/07/01	NRB	NRB HOLDINGS LIMITED.
2002/07/01	OXB	OXBRIDGE ONLINE LIMITED
2002/07/01	QCK	QUICK HOLDINGS LIMITED
2002/07/01	SMH	SMG HOLDINGS LIMITED
2002/07/01	TOC	TOCO HOLDINGS LIMITED
2002/07/01	TRM	TOLARAM 2000 LIMITED
2002/07/05	IPG	IMPERILOG LIMITED
2002/07/08	ATQ	AUTOQUIP GROUP LTD
2002/07/11	BOE	BOE LIMITED
2002/07/16	NTH	NATURAL HEALTH HOLDINGS LTD
2002/07/26	INH	INVESTEC HOLDINGS LIMITED
2002/08/06	BLL	BILLBOARD HOLDINGS LIMITED
2002/08/12	HXT	HIX TECHNOLOGIES LIMITED
2002/08/14	CTH	COMMUNITY TECHNOLOGIES LIMITED
2002/08/14	TLF	TILE AFRIKA HOLDINGS LIMITED
2002/08/27	MLB	MALBAK LIMITED
2002/08/27	MOL	MOLOPE GROUP LIMITED
2002/09/03	GECG	GENBEL SOUTH AFRICA LIMITED
2002/09/05	SRV	SERVEST HOLDINGS LIMITED
2002/09/09	FOR	FORTUNE BEVERAGES LIMITED
2002/09/10	VLY	VELOCITY HOLDINGS LIMITED
2002/09/13	SPI	SPICER HOLDINGS LIMITED
2002/09/17	RAI	REAL AFRICA INVESTMENTS LIMITED
2002/09/18	IOT	IOTA FINANCIAL SERVICES LIMITED
2002/10/08	YBG	YABENG INVESTMENT HOLDING COMP LD
2002/10/11	MDS	MIDAS LIMITED
2002/10/22	NIB	NEDCOR INVESTMENT BANK HOLDINGS LD
2002/11/01	MBT	MB TECHNOLOGIES LIMITED
2002/11/05	HLH	HUNT LEUCHARS AND HEPBURN HLDGS LD
2002/11/12	CES	CHESTER INVESTMENT HOLDINGS LIMITED
2002/11/12	DAE	DAEWOO ELECTRONICS SA LIMITED

2002/11/19	MAS	MASONITE (AFRICA) LIMITED
2002/11/28	HOR	HICOR LIMITED
2002/12/18	SLU	INVESTMENT SOLUTIONS HOLDINGS LD
2002/12/24	CXT	CAXTON PUBLISHERS AND PRINTERS LD
2002/12/24	MHH	MIH HOLDINGS LIMITED
2003/01/02	RRM	RRM INVESTMENT HOLDINGS LIMITED
2003/01/13	CRX	CRUX TECHNOLOGIES LIMITED
2003/01/21	IFA	IFANET LIMITED
2003/02/04	FOZ	FORZA GROUP LIMITED
2003/02/11	ARC	ARCAY GROUP LIMITED
2003/02/11	FBF	FBC FIDELITY BANK HOLDINGS LIMITED
2003/02/25	HCH	HOMECHOICE HOLDINGS LIMITED
2003/02/25	NIN	NINIAN AND LESTER HOLDINGS LIMITED
2003/03/18	LSR	THE LASER GROUP LIMITED
2003/04/01	PGH	PSG INVESTMENT BANK HOLDINGS LD
2003/04/01	WPH	WOMEN INVESTMENT PORTFOLIO HLDGS LD
2003/04/03	VTR	VESTACOR LIMITED
2003/04/15	ALE	APPLETON LIMITED
2003/04/15	NDS	NANDO'S GROUP HOLDINGS LIMITED
2003/04/23	PON	PROFURN LIMITED
2003/05/08	OZZ	OZZ LIMITED
2003/05/13	RGL	REGAL TREASURY BANK HOLDINGS LD
2003/05/20	MZG	METJE AND ZIEGLER LIMITED
2003/05/27	HVN	SWEETS FROM HEAVEN HOLDINGS LIMITED
2003/06/02	ACR	ACCORD TECHNOLOGIES LIMITED
2003/06/02	ABR	AFRIBRAND HOLDINGS LIMITED
2003/06/02	PDM	PARADIGM CAPITAL HOLDINGS LIMITED
2003/06/02	PTH	PLANIT TECHNOLOGY HOLDINGS LIMITED
2003/06/02	UAM	UNION ALLIANCE MEDIA LIMITED
2003/06/17	NFH	NAMIBIAN FISHING INDUSTRIES LIMITED
2003/06/18	MEL	METTLE LIMITED
2003/07/01	TBE	THEBE FINANCIAL SERVICES LIMITED
2003/07/08	AHV	AFRICAN HARVEST LIMITED
2003/07/22	IPR	IPROP HOLDINGS LIMITED
2003/08/13	CRH	CORONATION HOLDINGS LIMITED
2003/08/15	GLE	GOLD EDGE HOLDINGS LIMITED
2003/08/19	OSI	OSI HOLDINGS LIMITED
2003/10/27	AMB	AMB HOLDINGS LIMITED
2003/10/28	CNF	CONGELLA FEDERATION LIMITED
2003/10/28	WET	WETHERLYS INVESTMENT HOLDINGS LD
2003/11/04	CFC	COMMERCIAL FINANCE COMPANY LIMITED
2003/11/25	SFT	SOFTLINE LIMITED
2003/12/17	CHE	CHEMICAL SERVICES LIMITED

2003/12/23	FRE	FREE STATE DEV & INVESTMENT CORP LD
2004/02/03	ALY	ALACRITY FINANCIAL SERVICES LIMITED
2004/03/02	MEC	MAXTEC LIMITED
2004/03/03	PEP	PEPKOR LIMITED
2004/03/30	AVS	AVIS SOUTHERN AFRICA LIMITED
2004/04/13	MCC	MC CARTHY LIMITED
2004/04/15	MNS	ELEC MEDIA NET & SUPERSPORT INT HLD
2004/05/25	LYS	LYONS FINANCIAL SOLUTIONS HLDGS LD
2004/06/01	CPX	COMPAREX HOLDINGS LIMITED
2004/06/15	CYD	CYCAD FINANCIAL HOLDINGS LIMITED
2004/07/01	APL	NET 1 APPLIED TECHNOLOGY HLDGS LD
2004/07/13	CCN	CCN HOLDINGS LIMITED
2004/08/02	ENR	ENERGY AFRICA LIMITED
2004/08/18	SIS	SUN INTERNATIONAL (SOUTH AFRICA) LD
2004/08/24	ITV	INTERVID LIMITED
2004/09/01	LIBU	LIBERTY GROUP LIMITED
2004/09/24	ACY	ACUITY GROUP HOLDINGS LTD
2004/10/05	ADL	ADMIRAL LEISURE WORLD LIMITED
2004/10/19	CMT	CEMENTATION COMPANY (AFRICA) LD
2004/10/19	IST	IST GROUP LIMITED
2004/11/30	ALN	ALLIANCE PHARMACEUTICALS LIMITED
2004/11/30	FOM	FORIM HOLDINGS LIMITED
2004/11/30	GDA	GLODINA HOLDINGS LIMITED
2004/12/14	ABI	AMALGAMATED BEVERAGE INDUSTRIES LD
2004/12/21	CAKVC	CANADIAN OVERSEAS PACKAGING IND LD
2004/12/29	VLT	VAALAUTO LIMITED
2004/12/29	VCR	VAALTRUCAR LIMITED
2005/01/03	USV	UNITED SERVICE TECHNOLOGIES LIMITED
2005/01/04	SIR	SAIL GROUP LIMITED
2005/01/31	GLT	GLOBAL TECHNOLOGY LIMITED
2005/03/07	BUR	BURLINGTON INDUSTRIES LIMITED
2005/03/23	AHH	AFROX HEALTHCARE LIMITED
2005/04/12	PTC	PUTCO LIMITED
2005/04/19	MOZ	METOOZ HOLDINGS LIMITED
2005/04/26	CPT	CAPITAL ALLIANCE HOLDINGS LIMITED
2005/05/03	ADT	ADVANCED TECHNICAL SYSTEMS LIMITED
2005/05/03	CAL	CHARIOT LAND LIMITED
2005/05/03	COI	CHOICE HOLDINGS LIMITED
2005/05/03	DNM	DYNAMO RETAIL LIMITED
2005/05/03	FSH	FASHION AFRICA LIMITED
2005/05/03	LST	LEISURENET LIMITED
2005/05/03	STK	SILTEK LIMITED
2005/05/03	PML	THE PREMIER GROUP LIMITED

2005/05/03	UNG	UNIVERSAL GROWTH HOLDINGS LIMITED
2005/05/17	GNK	GRINTEK LIMITED
2005/06/20	RLY	RELYANT RETAIL LIMITED
2005/07/04	CPA	CORPCAPITAL LIMITED
2005/08/27	TSC	TISEC LIMITED
2005/09/02	BRM	BEARING MAN LIMITED
2005/09/13	SGG	SAGE GROUP LIMITED
2005/09/27	BDS	BRIDGESTONE FIRESTONE MAXIPREST LD
2005/10/04	SSA	SASANI LIMITED
2005/12/16	PRO	PROPER GROUP LIMITED
2005/12/20	CCT	CONNECTION GROUP HOLDINGS LIMITED
2006/01/10	FRO	FRONTRANGE LIMITED
2006/02/17	AFI	AFRICAN LIFE ASSURANCE COMPANY LD
2006/02/25	MRB	MORIBO LEISURE LIMITED
2006/02/27	PRM	PRIMA PROPERTY TRUST
2006/03/13	OAI	OMEGA ALPHA INT INFO TECH HLDGS
2006/04/04	CEN	CENTRECITY PROPERTY FUND
2006/04/06	AQL	AQUILA GROWTH LIMITED
2006/04/18	VNF	VENFIN LIMITED
2006/04/21	ELX.	ELEXIR TECHNOLOGY HOLDINGS LIMITED
2006/05/20	HCL	HERITAGE COLLECTION HOLDINGS
2006/06/01	LAR	L A GROUP LIMITED
2006/06/20	ALX	ALEX WHITE HOLDINGS LIMITED
2006/07/04	CNC	CONCOR LIMITED
2006/07/04	PIM	PRISM HOLDINGS LIMITED
2006/08/29	BCX	BUSINESS CONNEXION GROUP LIMITED
2006/11/21	IDI	IDION TECHNOLOGY HOLDINGS LIMITED
2007/01/22	PSC	PASDEC RESOURCES SA LIMITED
2007/01/29	NMS	NAMIBIAN SEA PRODUCTS LIMITED
2007/03/30	WARA	WESTERN AREAS LIMITED
2007/04/11	CSL	CONSOL LIMITED
2007/04/16	ALC	AMLAC LIMITED
2007/04/16	ICT	INCENTIVE HOLDINGS LIMITED
2007/04/16	MLL	MILLIONAIR CHARTER LIMITED
2007/04/16	RAG	RETAIL APPAREL GROUP LIMITED
2007/04/16	SWL	SHAWCELL TELECOMMUNICATIONS LIMITED
2007/04/16	SCH	STOCKS HOTELS & RESORTS LIMITED
2007/04/16	TRX	TEREXKO LIMITED
2007/04/16	TRF	TERRAFIN HOLDINGS LIMITED
2007/04/16	TGN	TIGON LIMITED
2007/04/16	TOT	TOP INFO TECHNOLOGY HOLDINGS LD
2007/04/25	PTG	PEERMONT GLOBAL LIMITED
2007/05/25	ECO	EDGARS CONSOLIDATED STORES LIMITED

2007/05/29	BPL	BARPLATS INVESTMENTS LIMITED
2007/05/29	UTR	UNITRANS LIMITED
2007/06/06	RNT	RENTSURE HOLDINGS LIMITED
2007/06/12	EXO	EXXOTEQ LIMITED
2007/07/27	AFB	ALEXANDER FORBES LIMITED
2007/09/04	BRC	BRANDCORP HOLDINGS LIMITED
2007/10/01	PMA	PRIMEDIA LIMITED
2007/10/01	PMA	PRIMEDIA LIMITED
2008/01/22	ELH	ELLERINE HOLDINGS LIMITED
2008/03/04	TAL	TIGER AUTOMOTIVE LIMITED
2008/04/30	BSB	THE HOUSE OF BUSBY LIMITED
2008/05/13	SMR	SAMRAND DEVELOPMENT HOLDINGS LD
2008/05/26	CLE	CLIENTELE LIFE ASSURANCE COMPANY LD
2008/07/28	KLK	KELGRAN LIMITED
2008/09/09	TRT	TOURISM INVESTMENT CORPORATION LD
2008/09/25	JNC	JOHNNIC HOLDINGS LIMITED
2008/11/04	ENV	ENVIROSERV HOLDINGS LIMITED
2008/12/01	LIBU	LIBERTY GROUP LIMITED
2009/02/16	PFN	CONSOLIDATED PROPERTY AND FIN LD
2009/02/16	NEI	NORTHERN ENGINEERING IND AFRICA LD
2009/02/23	CVS	CORVUS CAPITAL (SA) HOLDINGS LTD
2009/02/24	KWS	Kwikspace Modular Buildings Limited
2009/02/24	VTL	VENTER LEISURE AND COMM TRAILERS LD
2009/03/16	PAL	PALS HOLDING LIMITED
2013/07/02	AMA	AMALGAMATED APPLIANCE HOLDINGS LD
2013/07/16	CMP	CIPLA MEDPRO SOUTH AFRICA LIMITED
2013/07/16	MOB	MOBILE INDUSTRIES LIMITED
2013/08/20	ALT	ALLIED TECHNOLOGIES LIMITED
2013/08/27	AGI	AG INDUSTRIES LIMITED
2013/09/10	IFH	IFA HOTELS AND RESORTS LIMITED
2013/11/12	MVS	MVELASERVE LIMITED
2013/12/10	KGM	KAGISO MEDIA LIMITED
2014/03/18	SDH	SECUREDATA HOLDINGS LIMITED
2014/04/01	AFR	AFGRI LIMITED
2014/05/20	CNL	CONTROL INSTRUMENTS GROUP LIMITED
2014/07/01	DLV	DORBYL LIMITED
2014/07/29	CRW	CORWIL INVESTMENTS LIMITED
2014/07/29	DON	THE DON GROUP LIMITED
2014/11/18	KEL	KELLY GROUP LIMITED
2014/12/17	CBH	COUNTRY BIRD HOLDINGS LIMITED
2015/02/10	LHG	LITHA HEALTHCARE GROUP LIMITED
2015/04/29	ACP	ACUCAP PROPERTIES LIMITED
2015/05/12	GIJ	GIJIMA GROUP LIMITED

2015/06/09	TMG	TIMES MEDIA GROUP LIMITED
2015/07/07	JDG	JD GROUP LIMITED
2015/08/12	MOR	MORVEST GROUP LIMITED
2015/08/17	ASCEN	ASCENSION PROPERTIES LIMITED
2015/08/25	BCX	BUSINESS CONNEXION GROUP LIMITED
2015/09/22	CCL	COMPU-CLEARING OUTSOURCING LIMITED
2015/09/22	ZSA	ZURICH INSURANCE COMPANY S A LTD
2015/10/06	DGC	DIGICORE HOLDINGS LIMITED
2015/10/13	IRA	INFRASORS HOLDINGS LIMITED
2015/11/03	CDZ	CADIZ HOLDINGS LIMITED
2015/11/30	CPF	CAPITAL PROPERTY FUND LIMITED
2016/02/15	MDCE	MEDICLINIC INTERNATIONAL LIMITED
2016/04/13	AQP	AQUARIUS PLATINUM LIMITED
2016/06/20	FRT	FARITEC HOLDINGS LIMITED
2016/06/20	SAN	SANYATI HOLDINGS LIMITED
2016/06/20	SKY	SEA KAY HOLDINGS LIMITED
2016/06/20	SQE	SQUARE ONE SOLUTIONS GROUP LIMITED
2016/06/28	ILV	ILLOVO SUGAR LIMITED
2016/08/30	PWK	PICK N PAY HOLDINGS LIMITED
2016/09/26	DRN	DELRAND RESOURCES LIMITED
2016/10/11	HPA	HOSPITALITY PROPERTY FUND LIMITED
2016/10/14	ANBE	ANHEUSER-BUSCH INBEV SA/NV
2016/10/14	SOSAB	SABMILLER PLC
2016/11/01	AER	AMALGAMATED ELECTRONIC CORP LIMITED