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DETERMINANTS OF SOUTH AFRICAN COMPANIES' CAPITAL STRUCTURE CHOICE

Howard Kantor

A Research Report submitted to the Faculty of Commerce, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirements for the Degree of Master of Commerce.

Johannesburg, October 1995.

DECLARATION

I declare that this research report is my own unaided work It is being submitted in partial fulfilment of the requirements for the degree of Master of Commerce in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

HK Peter

10 day of 10, 1995

ABSTRACT

This Research Report examines the determinants of South African industrial firms' capital structures. The report attempts to evaluate if a firm's preference for equity or debt capital can be attributed to specific variables which may reflect its industry profile or operating structure.

A literature review, discussing both perfect and imperfect capital market conditions, is included in order to determine if the premise of "variable influence" has academic support. The variables found to have an influence on (non South African company) capital structure by authors examined in the review, are

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1. INTRODUCTION

This Research Report examines the determinants of South African industrial firms' capital structures. The report attempts to evaluate if a firm's preference for equity or debt capital can be attributed to specific variables which may reflect its industry profile or operating structure.

The issue is examined in two main bodies. Firstly, literature on the debt-equity debate is reviewed, and variables which have been found to influence capital structure choice are highlighted. Secondly, trends in South African industrial companies' capital structures are calculated and tested against the variables which have been found to influence capital structure choice.

The literature review details the potential benefits and risks of increased usage of debt finance. The traditional view that there is an optimal debt to equity (gearing) ratio which minimises a firm's cost of capital and maximises its value, as well as the Modigliani and Miller assertion that capital structure is irrelevant in perfect capital markets, are examined. Finally, studies which found specific quantifiable variables which result in a firm having a higher (or lower) than average debt to equity capital structure are discussed.

The literature review concludes that debt to equity ratios are likely to vary in relation to a firm's debt capacity, the variability of its cash flows (operating risk), the uniqueness of its product and its ability to obtain funds from unprotected

creditors. This supports the view that seemingly independent variables may influence capital structure choice.

This report then selects a sample of South African industrial companies listed on the Johannesburg Stock Exchange (JSE). The research methodology employed is discussed which includes an assessment of the constituents of debt and equity, the sample selection criteria and statistical analysis methods. Relevant data are extracted from annual financial statements and analysed in order to determine whether any trends are apparent for South African industrial companies' capital structure. The predictive variables tested by this paper are regressed against debt to equity ratios in order to assess the relationship between these variables and levels of debt to equity.

The variables which are hypothesised to affect a firm's capital structure decision are tested in sections 3 and 4 of this report. These hypotheses are detailed below:

- Debt to equity ratios are higher for firms with lower levels of secured debt to total assets;

- Debt to equity ratios are higher for firms with higher levels of unsecured creditors to total assets;

- Debt to equity ratios are higher for firms with lower levels of operating profit variance;

- Debt to equity ratios are higher for firms with higher levels of tangible fixed assets to total assets;
- Debt-equity ratios are higher for firms with higher operating profit margins;
- Debt to equity ratios are higher for firms with higher levels of capital expenditure;
- Debt to equity ratios are higher for firms with higher levels of fixed assets; and
- Debt to equity ratios are higher for firms with higher levels of turnover.

The survey of South African listed companies concludes that there is a positive relationship between a company's debt to equity ratio and its turnover. The size of a firm is hence the best explanation of its debt to equity ratio.

2. A SURVEY OF THE RELEVANT LITERATURE

2.1 THE RELATIONSHIP BETWEEN FINANCING AND INVESTMENT DECISIONS

The existence of a relationship between financing and investment decisions is an important concept in terms of this dissertation. If such a relationship does exist then, as firms have differing investment needs and criteria, we would also logically expect to find a relationship between a firm's debt to equity ratio (its financing decision) and the type of investments it has made. The premise of variable influence on capital structures is thus based on an inherent relationship between the financing and investment decisions.

Modigliani and Miller have proved that there is no relationship between a firm's investment and financing decisions given the existence of perfect capital markets. (Modigliani and Miller, 1958, pp 261-297). In practice capital markets are not perfect. Notwithstanding this, Modigliani and Miller's view is important in order to understand the capital structure debate and is hence discussed in greater detail in this paper.

Correia *et al* define the primary responsibilities of financial management as twofold: locating optimal investment opportunities as well as locating the funds to finance these investments.

"Financial management (is the) catalyst between investment opportunities on the one hand and sources of finance on the other as reflected in the balance sheet which shows assets on the one hand and the financing of these assets on the other." (1989)

Reekie also argues that there is an interrelationship between the investment and financing decisions offering the logical premise that in order to evaluate projects management requires the use of the cost of capital as a discount rate in Net Present Value calculations or as a yardstick against which the Internal Rate of Return should be measured. (Reekie *et al*, 1987). This would suggest that the financial manager's financing and investment decisions are related. As investment decisions for different firms vary, this view would support the argument that (at least an element of) the financing decision, and hence capital structure, is explained in terms of the type of assets invested in and the manner in which the firm operates.

2.2 CONSIDERATIONS IN RAISING DEBT FINANCE

An obvious objective in obtaining finance is to obtain funds at the lowest cost. An investor or lender would assess his required return on these funds in terms of the associated risk of the underlying investments and the firm's existing capital structure. Finance can be raised in one or more of three broad ways which are detailed below:

- long term capital markets (equity, preference shares, debt instruments);
- short term finance on money markets (often used due to seasonal or cyclical reasons); or
- by retaining a portion of the company's profits

Management must decide on the level of debt to equity which it wishes to maintain, as well as the type of debt finance it wishes to use. This policy may depend on the risk profile which management decides to adopt and necessitates the consideration of two main risk categories: firstly, the risk inherent in the firm's operations and its investments (the variability of its cash flows) and secondly, the firm's financial risk as determined by its exposure to debt.

2.2.1 THE ADVANTAGES OF DEBT FINANCE

Reekie *et al* (1987, p.95) highlight four reasons why management may prefer debt to equity finance.

- Increasing borrowings can enhance shareholders' returns. If a firm's Return on Assets (Operating Profits as a percentage of total assets) is greater than its pre-tax cost of borrowing, it can achieve a higher Return on Equity (attributable earnings as a percentage of shareholders funds) by maintaining a higher debt to equity ratio than a competitor firm which has an equivalent Return On Assets. This is what is meant by financial gearing, a term which aptly describes the firm's ability to increase returns to (and the value of) shareholders by increasing borrowings;

- Raising funds through debt allows the shareholders to maintain control of the firm whilst still limiting their total investment;

- The smaller the equity proportion of the firm's total financing the greater the transference of default risk to lendors; and

- A tax deduction is available on interest payments but not on dividends. This means that after accounting for the tax subsidy debt is generally a cheaper form of finance than equity.

2.2.2 THE DISADVANTAGES OF DEBT FINANCE

- If a firm's Return On Assets is lower than its pre-tax interest rate on borrowings, exposure to debt reduces shareholders' returns;
- If interest payments cannot be met the firm is likely to be declared insolvent and its assets liquidated; and
- Financial Risk thus increases as a firm makes greater use of debt financing.

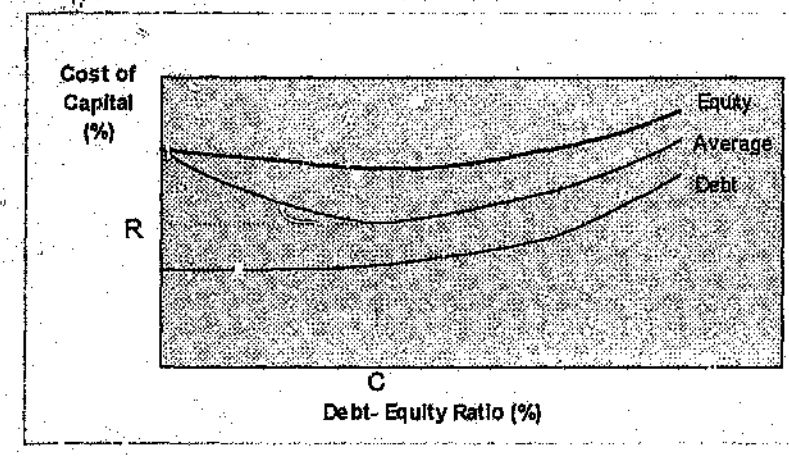
2.3 IS THERE AN OPTIMAL CAPITAL STRUCTURE?

Debt to equity ratios are more likely to differ between companies and across industries if it can be argued that there is an optimal capital structure and consequently that the issue of capital structure is not irrelevant. There are two distinct schools of thought: the Traditionalists who maintain that an optimal capital structure does exist and that of Miller and Modigliani who argue that in perfect capital markets a firm's capital structure is irrelevant.

2.3.1 TRADITIONAL THEORY

The traditional approach to the debt equity debate assumes that an optimal capital structure does exist and that the firm can increase its total value through the judicious use of leverage. (Van Horne). The graph below (Reekie *et al*, 1987, p.129) illustrates this view.

Graph One: Traditional Theory of Optimal Capital Structure



An all equity financed firm would reduce its cost of capital as it initially issues, and then increases, the debt component of its capital structure. As debt holders have prior call to equity holders on a company's assets, their lower risk on the company's insolvency, is translated into a lower rate of return. However, as debt levels continue to increase, the interest cover and hence the "cushion" against any downturn in the firm's fortunes lowers and the risk of default increases. Thus debt

holders require an increasing return (albeit lower than that required by equity holders) to compensate for increased financial risk.

This implies an optimal capital structure for the firm where R and C intersect on the above graph. This is where the benefits from increased levels of debt to equity are not offset by an increasing rate of return paid on borrowings and where the cost of capital is minimised.

2.3.2 MODIGLIANI AND MILLER : PERFECT CAPITAL MARKETS

Modigliani and Miller (MM) argue that the value of the firm and its average cost of capital are independent of its capital structure. They maintain that the firm cannot change its value by splitting its cash flows into different streams arguing that value is determined by a firm's real assets and not by the securities which it issues. Individual arbitrage ensures that a firm's value is derived from its Return on Assets, capitalised at a rate appropriate to firms in the same risk class.

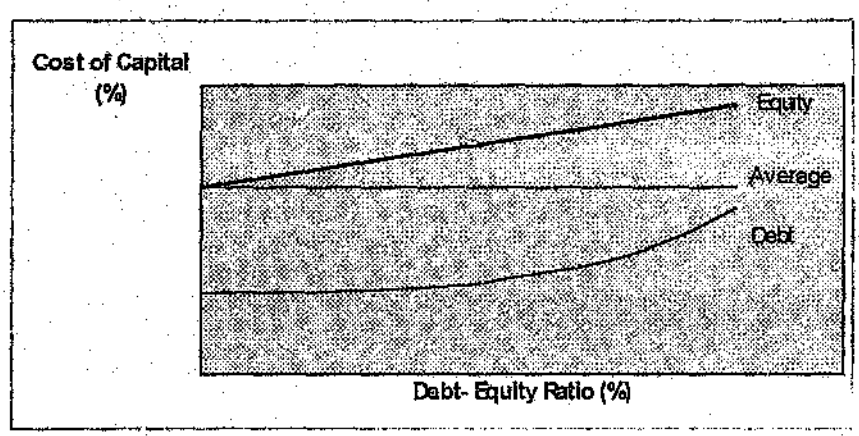
Modigliani and Miller believe that the required return on equity rises as the debt to equity ratio (and hence risk) increases and that this offsets any gains from cheaper debt finance. Thus the average cost of capital remains constant and both the value of the firm and its cost of capital is the same as if the firm had remained ungeared.

This premise assumes perfect capital markets including:

- Readily available information at no cost;

- No transaction costs;
- Rational investors;
- Absence of corporate taxes, as these are effectively a subsidy to borrowing rates;
- Each investor has the same expectation of earnings before interest for any firm;
- Business risk is deemed constant over time and independent of the debt to equity ratio; and
- Individuals are able to lend and borrow money at the same rate as quoted companies.

Graph Two : The Modigliani Miller View of the Cost of Capital



(graph: Reekie *et al*, 1986, p.134)

Modigliani and Miller argue that the total risk for all security holders of a firm is not altered by changes to its capital structure. Arbitrage by investors, who substitute personal leverage for corporate leverage, will preclude substitute

investments from selling at different prices in the same market. This ensures that the total value of the firm remains the same regardless of its financing mix. Hence, if equally risky companies differ in market value and the debt to equity ratio, then investors will sell shares in the higher valued firms and buy shares in the lower valued ones. As ungeared firms are one of the options available to investors, the cost of capital of all firms must equal the cost of equity in the all equity firm.

Brealy and Myers (1984, p377) note that if debt policies were completely irrelevant, debt ratios would vary randomly from firm to firm and industry to industry. They suggest that debt policy does matter in well functioning capital markets which respond to taxation and other factors such as the cost of bankruptcy and financial distress. This would indicate the interaction of a firm's investment and financing decisions

Debt financing has an advantage over equity finance in that interest paid to debtholders is a tax deductible expense to the company, whereas dividends paid to shareholders are not tax deductible. (Brealy and Myers, 1984, pp. 371-381). The table overleaf illustrates the tax advantage of debt finance by contrasting returns received by investors in two firms which have equivalent earnings before interest and tax. The one firm is financed entirely by debt (Firm D) and the other entirely by equity (Firm E).

Literature Review -Table One		
	Firm D (Rand)	Firm E (Rand)
Earning before Interest and Tax	1000	1000
Interest Expense (Assumed Borrowing Rate of 10% per annum)	100	0
Pre-tax earnings	900	1000
Taxation (Assumed corporate taxation rate of 35%)	315	350
Earnings	585	650
Total Income Received by Both Equity holders and Debtholders	685	650

The net difference in the income streams of the two firms is the higher tax bill of the ungeared firm. This is a result of the government having effectively paid the assumed corporate tax rate of 35% of Firm D's interest charge, representing a tax shield on debt. Hence the value of the firm is equivalent to the value of an all equity financed firm plus the present value of its future tax shields on debt.

In South Africa debt finance offers an additional enhancement to after tax income, as dividends distributed to shareholders attract a Secondary Tax on Companies (STC) of 25%. Interest on debt is free of STC.

The tax shield to debt finance supports the premise that there is an advantage to increased levels of debt finance. However, as all firms are not financed exclusively by debt there is clearly an offsetting disadvantage to corporate debt.

As a firm increases the level of its borrowings it increases the possibility of financial distress and bankruptcy. Investors demand higher returns from leveraged firms in order to compensate for these risks. Hence, the value of the firm is equivalent to the value of an all equity financed firm plus the present value of its future tax shields on debt less the present value of the potential cost of financial distress and bankruptcy.

The graph overleaf illustrates that the optimal capital structure is a trade-off between the tax advantages of debt and the cost of distress. Whilst the present value of the tax shield increases as a firm borrows more, the cost of financial distress, which is initially insignificant, increases rapidly as debt becomes a more significant component of the firm's capital structure. This will offset the tax advantages of the corporate tax shield. The theoretical optimum is reached where increases in the present value of tax savings due to additional borrowings is just offset by increases in the present value of the cost of financial distress. (Brealy and Myers, 1984, pp390-391)

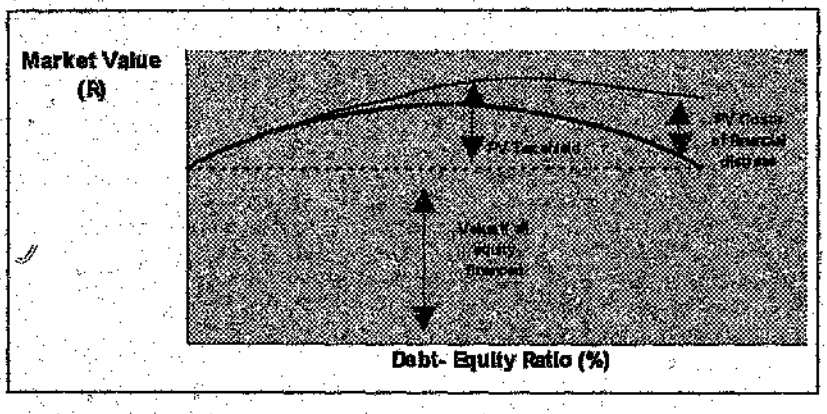
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Graph Three: Costs of Financial Distress



Brealy and Myers (1984, p.391)

2.4 CRITICISM OF THE DEBT TO EQUITY RATIO AS A MEANINGFUL MEASURE IN ISOLATION

Franks and Boyles (1979) discussed some limitations of the debt to equity ratio which highlight the dangers of viewing this ratio in isolation:

- Interest cover may be a better indicator of the firm's financial risk. It provides a better assessment of the firm's exposure to volatility in its earnings;
- Diversification of a firm complicates comparison with other companies;
- Different accounting values would result in differing disclosure of asset and debt values between companies;
- Differing financial year ends and resultant seasonal factors could affect the debt to equity ratio;
- Window dressing of annual financial statements may affect the debt to equity ratio; and
- Inflation's impact on asset valuations may not be accounted for if a firm does not revalue its assets.

This Research Report accepts the above limitations but notes that the debt to equity ratio is the most commonly used measure of capital structure in the literature, and is hence an essential ratio in order to determine the applicability of the predictive variables of capital structure found in other studies to South African companies. The debt to equity ratio remains the best objective measure of capital structure available to minority shareholders.

2.5 VARIABLES WHICH INFLUENCE CAPITAL STRUCTURE CHOICE

In this section this report discusses other studies in detail in order to highlight those variables found to have an influence on (non South African) capital structure choice. These predictive variables are then regressed against South African industrial companies' debt to equity ratios in order to assess their applicability to South Africa.

The predictive variables examined include the debt capacity of a firm's assets; the existence of unprotected (unsecured) creditors; the uniqueness of a firm's products or its operations; the variability of a firm's earnings; its growth plans and prospects and the firm's size.

A discussion of applicable data against which the relevant variables may be tested is highlighted as this forms the basis of the statistical research conducted in terms of this report.

2.5.1 ASSETS' DEBT CAPACITY

Chatterjee and Scott (1989, pp 283-309) tested the theory of optimal capital structure against (amongst other factors) bankruptcy related costs. Their study examined data from 12 industries and 237 corporations, and found that firms with high fixed-asset intensities (measured by the ratio of tangible fixed assets as a percentage of total assets) have higher levels of debt. This they attribute to the "floor" which these assets create for security holders in the event of the firm's bankruptcy.

This result, they believe, confirms inter-industry differences in debt ratios found in studies (to which they refer) by Schwartz and Aronson (1967) and Scott (1972), and explains the positive relationship between debt ratios and depreciation uncovered in a study by Bradley, Gregg and Han Kim (1984). The authors explain that the depreciation charge is an effective proxy for fixed assets.

Chatterjee *et al* (1989) conclude that an asset's realisable value explains why asset intensive firms (such as hotel chains) have higher debt ratios than firms with few physical assets such as advertising agencies, labelling this finding as "debt-capacity". They emphasise however that an optimal debt structure is less than the maximum debt capacity of a firm's assets.

Titman and Wessels (1988, p. 3) also refer to the potential "collateral value" of a firm's assets. They note that there may be inherent costs in issuing securities about which the firm's managers have better information than its outside shareholders. Hence, issuing debt secured by assets with known values may be both easier and less costly. Firms with assets which can be used as collateral may thus be expected to take advantage of such opportunity and issue more debt.

The Edgars Annual Report for the financial year ended 31 March 1993 innovatively (amongst South African corporate reports) contains express reference to the concept of debt capacity:

> "New investments have the capacity to sustain (either interest bearing or interest free) liabilities. The nature and security of each asset category was critically reviewed with bankers and the controlling shareholders. Management has concluded prudently that each asset investment can sustain liabilities in the following respective proportions:
>
> Fixed Assets 50%;
>
> Stock 75%;
>
> Debtors 66%; and
>
> Cash 100%."
>
> The report continues that "The unutilised capacity reflects the additional liabilities which the year end asset base could support." P. 43).

At 31 March 1993, the group's debt capacity calculated on the above basis was 163%, whilst the group's actual debt equity ratio was below this. This reinforces the fact that the maximum debt capacity of a firm's assets will not necessarily be its optimum debt ratio.

Test Data

Chaterjee and Scott (1989, p.283) suggest the ratio of tangible fixed assets as a percentage of total assets (fixed asset intensity) as an indicator of debt capacity. Their research indicates a positive relationship between fixed asset intensity and debt to equity ratios because of the floor these assets put under potential bankruptcy costs to security holders.

Titman *et al* (1988, p.3) offer two indicators of a firm's debt capacity. Firstly, the ratio of intangible assets to total assets, which they suggest has an inverse relationship to a firm's debt capacity. This reflects that tangible assets only are able to be used as collateral for borrowings.

The second ratio offered by Titman *et al* (1988, p.3) is the sum of stock and tangible fixed assets as a percentage of total assets. The ratio should be positively related to debt capacity as it takes cognisance of those assets which may be used as collateral.

This Research Report tests for a positive relationship between tangible fixed assets as a percentage of total assets and the debt to equity ratio. This ratio is effectively the inverse of Titman *et al*'s intangible assets to total asset ratio. The paper does however also test the second Titman suggestion for a positive relationship between the sum of stock and tangible fixed assets as a percentage of total assets and the debt to equity ratio.

2.5.2 UNPROTECTED CREDITOR EFFECT

Chatterjee and Scott (1989, pp 283-309) found that in addition to debt capacity, an unprotected creditor (or "wealth transfer") effect creates additional stimulus for debt issuance. By issuing secured debt, firms increase the value of their equity by expropriating wealth from their existing unsecured creditors. Wealth is thus transferred to protected and informed debtholders and ultimately to the shareholders, who are able to issue secured debt at a lower coupon.

This premise is based on the existence of creditors (including trade creditors and the receiver of revenue) who do not have access to the information or to adequate monitoring technology in order to react promptly to the issue of asset secured debt and the related reduction in the potential value of their claims. These creditors may not know a firm's debt policy at a specific time and related transaction costs may prevent their coming forward to press their (small) bankruptcy claims in the event of liquidation.

Firms which have higher percentages of assets which can be used as collateral may be expected to take greater advantage of this opportunity (Titman and Wessels, 1988). The relationship between this argument and the rationale supportive of the assets' debt capacity as an indicator of debt level, is hence evident.

Test Data

Chaterjee *et al* (1989, p.307) suggest that unprotected creditors to total assets provide a positive stimulus to the issue of debt, due to market imperfections such as transaction costs and asymmetrical information.

This Research Report tests this theory using two ratios. Firstly, the paper tests for a negative relationship between secured debt as a percentage of total assets and the debt to equity rano. Secondly, a positive relationship between unsecured creditors as a percentage of total assets and the debt to equity ratio is tested for.

2.5.3 UNIQUENESS

Titman and Wessels (1988, p.5) argue that debt levels are negatively related to the uniqueness or specialisation of a firm's operations. They suggest that customers, workers and suppliers of firms that provide unique or specialised products suffer relatively high costs in the event of liquidation. These potentially high liquidation costs are relevant to a firm's capital structure decision. This argument is based on the premise that a firm's workers and suppliers may have job specific skill and capital and that their customers may find it difficult to obtain service for their unique product(s) elsewhere.

Titman and Wessels' (1988) examination of the influences of capital structure choice found uniqueness to be the strongest explanation of differences in inter-company debt to equity ratios.

Test Data

Titman *et al* (1988, p.5) suggest a number of objective measurements of uniqueness. These include higher expenditure on research and development; higher levels of marketing as a percentages of turnover; and a lower rate at which employees voluntarily leave their jobs as their skills are specialised.

This report was unable to extract data for either of these three ratios from the published annual financial statements which were analysed, due to the limited disclosure requirements of the Companies Act and Generally Accepted Accounting Principles (GAAP). Only three companies examined disclosed the amount which was spent on research and development whilst none disclosed marketing expenditure. The disclosure of the number of employees is also not a mandatory requirement.

Hence, this report does not include the predictive variable of uniqueness in terms of its assessment of factors influencing South African capital structure choice.

2.5.4 OPERATING RISK

Flath and Knoeber (1980, p. 99) tested cross-industry variations in debt to equity ratios. Their study concludes that cross-industry variation in capital structure is best explained by differences in industry operating risks. This, they argue, is due to the reduced risk of generating sufficient cash flows to meet interest requirements in those industries which have lower operating risk. The risk of default is lower, the cost of borrowing reduced and higher debt levels are prudent.

Franks and Broyles (1979) agree with this assertion, suggesting that debt to equity ratios are higher for those firms which operate in industries which have lower business risk.

Test Data

Flath *et al* (1980) believe that the variability (and hence uncertainty) of turnover is the best indicator of such risk.

Titman *et al* (1988, p. 6) when postulating that debt to equity ratios may be a decreasing function of earnings volatility, argue that the standard deviation of the percentage change in operating income (which is the one earnings figure unaffected by interest earnings or charges) is a better measure of earnings volatility than turnover.

This paper agrees with the rationale of Titman *et al* and tests for a negative relationship between debt to equity ratios and earnings volatility, as measured by the standard deviation of the percentage change in operating income.

2.5.5 GROWTH

Titman and Wessels (1988, p. 4) suggest that there is a negative relationship between a firm's future growth plans and its long term debt levels. This may be due to the flexibility inherent in management's future investment decisions as well as higher uncertainty about the magnitude and timing of the firm's future cash flows. The effect could result in lenders insisting on higher financing rates.

Logic suggests that companies which have grown by cash funded acquisitions, may well have temporary higher debt to equity ratios until the anticipated cash flow benefits reduce borrowings to normal levels over time.

Indeed, Titman *et al* (1988) note evidence that the issuance of convertible debt may reduce the required borrowing cost and that convertible debt ratios may be positively related to growth opportunities.

Test Data

Titman *et al* (1988, p.4) suggest as an indicator of growth the ratio of capital expenditure to total assets, which gives the percentage increase in the firm's total assets.

This paper tests for a relationship between capital expenditure (excluding amounts spent on maintenance) as a percentage of total assets and the debt to equity ratio. As a result of the above discussion both a positive and negative relationship is tested for.

2.5.6 SIZE OF THE FIRM

Titman *et al* (1988, p. 6) note the logical expectation that relatively larger sized firms will have higher debt to equity ratios. This is due to two factors: Firstly, direct bankruptcy costs constitute a higher proportion of a lower value firm's total value. As a result, liquidation costs are relatively higher which increases the cost of issuing debt. Secondly, the diversified nature of relatively larger firms makes them less prone to bankruptcy and the risk of default on debt is thus lower.

Test Data

Titman *et al* (1988) suggest that the magnitude of a firm's turnover is a measure of its size. This paper tests for a positive relationship between levels of turnover and the debt to equity ratio.

2.5.7 PROFITABILITY

Titman *et al* (1988, p. 6) note that a firm is more likely to raise capital from retained earnings than issue debt. The past profitability of a firm and hence the amount of earnings available to be retained would be an indicator of its capital structure. The higher a firm's profitability the lower its debt to equity ratio is likely to be. The default risk of lower profitable operations is higher and hence borrowing costs are likely to be higher.

Test Data

Two ratios, operating income to sales and operating income to total assets are suggested by Titman *et al* (1988, p. 6) as measures of profitability.

This paper tests for positive relationships between the ratio of operating income to sales and the ratio of operating income to total assets to the debt to equity ratio.

2.5.8 TAXATION

The impact of taxation on the level of a firm's debt to equity ratio is a logical premise as tax is effectively a subsidy to the cost of debt. Taxes hence imply the existence of an optimal c , ital structure. (Flath *et al*, 1980, p. 113) The resulting enhancements to a firm's earnings and its returns to shareholders are illustrated in Table One of the Literature Review of this Research Report.

It is beyond the scope of this report to examine the impact of taxation on the debt to equity ratio. This would entail analysis of data over several years in order to properly reflect the influence of changes in the marginal rate of taxation on borrowing levels. This report examines the factors which influence the debt to equity ratio at a point in time. The advantage of debt is influenced by a firm's marginal and not its effective tax rate and as the firms' sampled are (with one exception) in a tax paying position the premise of tax influence on debt cannot be assessed in this paper.

3. RESEARCH DESIGN

3.1 POPULATION AND RESEARCH METHOD

This report examines data extracted from a sample of South African industrial companies listed on the Johannesburg Stock Exchange (JSE). The debt to equity ratio of each company is calculated and assessed with regard to the debt influence theories discussed in the literature review. Applicable data (as suggested by relevant authors) are extracted from the companies' annual financial statements and are analysed using regression analysis in order to assess which theory (or theories) best explain the determinants of capital structure choice in South Africa.

3.2 SAMPLE SELECTION

The sample is selected from the JSE Actuarial indices for industrial companies. This is done in order to select, on an objective basis, the higher market capitalised and hence more significant economic entities and also to ensure that a cross spectrum of industrial companies is analysed. However, this does mean that the sample is biased towards larger companies and different results may be obtained by a study which is not thus skewed.

A maximum of four companies per sector is selected in order of descending market capitalisation. Where less than four companies constitute a sector index, all are selected. Excluded from the sample are those companies which began operations during the past ten years and hence do not have a ten year earnings trend, as this is one of the attributes examined in terms of the regression exercise. Also excluded are those companies which source the majority of their earnings from non South African operations as these companies' debt to equity ratios may be affected by offshore tax structures and differing interest rate cycles which distorts direct comparison with those companies which source the majority of their earnings within South Africa. Finally, where accounting policies adopted for inflation distort comparison with historical cost accounts, such companies are excluded. Companies which are excluded are replaced in the sample, where applicable, by the next highest market capitalised company in the relevant sector index.

A total of 41 industrial firms is selected. Appendix One lists the companies included in the sample and contains details of those companies which are excluded as well as the reasons for such exclusion.

3.3 DEFINITIONS

The debt to equity ratio measures a company's total interest bearing liabilities as a percentage of its shareholders' funds. These terms are defined in greater detail in the ensuing discussion which explains the basis on which the debt to equity ratio is calculated in situations where confusion might arise.

3.3.1 LIABILITY

Accounting Concepts (AC) OOO, Framework for the Preparation and Presentation of Financial Statements, defines a liability as: "A present obligation of the enterprise arising from past events, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits." (1990, Para 49)

The Financial Accounting Standards Board (FASB) has a similar definition: "Liabilities are probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events." (FASB 6, 1985, Para 35)

3.3.2 EQUITY

Definitions of equity (shareholders' funds) are based on the "elements directly related to the measurement of financial position in the balance sheet (which are) assets, liabilities and equity" (AC000, 1990, Para 47), and include:

"The residual interest in the assets of the enterprise after deducting all its liabilities." (AC000, 1990, Para 49)

"The residual interest in the assets of an entity that remain after deducting its liabilities." (FASB 6, 1985)

3.3.3 INSTRUMENTS WHICH HAVE CHARACTERISTICS OF BOTH

FASB Concepts Statement No 6, Elements of Financial Statements, notes that although the line between liabilities and equity is clear in concept it sometimes is obscured in practice. (Para 55). Recent innovations in the financial markets have tended to obscure the essential characteristics of an instrument. As a result, applying the definition above does not always provide clear cut answers as some financial instruments combine characteristics of both equity and liabilities. (FASB, 1990, Para 2)

It is hence necessary to examine the relevant definitions in greater detail. Data extracted from the companies included in this report's sample found potential categorisation confusion to be restricted to the treatment of redeemable preference shares and convertible debentures and the treatment of these instruments is highlighted.

3.3.3.1 PREFERENCE SHARES

Floquet (1988) suggests that preference shares should be treated as part of shareholders' capital unless redeemable, in which case they are more analogous to interest bearing debt and should be treated as such for ratio analysis purposes.

The FASB recommendations (1990) agree with Floquet's view that non redeemable preference shares be regarded as an equity instrument and that preference shares redeemable at a fixed date or at some event beyond the control of either party, should be regarded as debt. The calculation section of this paper has adopted this approach.

However, FASB advises a more scientific approach to redeemable preference shares, where either party has control over redemption, noting two possible methods for determining classification These are the Governing Characteristics Method and the With and Without Method. (FASB, 1990, p. 72).

This Research Report uses the more objective Governing Characteristics method. This method states that the instrument must be treated as either a liability or as equity. If the shares are redeemable at the option of the company, such redemption may never take place. As a result of this the criterion of a present obligation (in order to be classified as a liability) is not met and the instrument is regarded as equity. However, if the holder has the option to redeem the instrument the relevant characteristics of a liability do exist: the event (instrument issuance) has occurred and a present obligation does exist.

The With and Without method recommends that part of the instrument should be regarded as an equity instrument and part as an option (FASB, 1990, pp 72-73). The option component should be regarded as debt if the holder has the right to enforce the option. This recognises that in such situations a present obligation exists due to a past event, namely the issuance of the instrument. However, the option should be regarded as an asset if the company has the right to convert the option.

3.3.3.2 CONVERTIBLE DEBENTURES

Unlike preference dividends, the non payment of interest on convertible debentures is likely to result in a company's liquidation. The argument can hence be made that debentures, until converted, be treated as debt in all situations. (FASB, 1990, p.58)

FASB further notes that whilst compulsorily convertible debentures could be treated as equity, debentures convertible at the option of either the holder or the company could be split into two components. The valuation of the instrument is the sum of the equity instrument and the underlying option, which is regarded as either debt (where conversion is at the holder's option) or equity (where conversion is at the company's option).

This report has treated compulsorily convertible debentures and debentures convertible at the company's option as equity. Where the holder has the option to convert the debenture into equity the instrument is regarded as debt.

3.3.4 DEFERRED TAXATION

The Accounting Practices Board recommends that "deferred tax should be classified either as an asset or as a liability depending upon the nature of the timing differences." The Board rejects any suggestions that deferred tax should be considered part of equity, or that the balance be disclosed between equity and liabilities "as part of a so-called fourth element" to the accounting equation. (AC 102, Technical Release, 1989).

Where it can be expected that the deferred tax liability will arise it makes sense to treat the balance as debt, but where it can be reasonably concluded that (a portion of) the liability is unlikely to arise it may make more sense to treat that amount as equity as there will always be new tax allowances to replace those which are reversing. The argument favours the inclusion of deferred tax as part of debt where the partial method has been used. In situations where the comprehensive method has been adopted, some merit lies in assigning part of the balance to equity.

This report treats deferred tax as a liability in accordance with AC 102 and (more importantly) in recognition that the inclusion of part of a comprehensive deferred tax balance in equity is impractical. The deferred tax balance is excluded in the calculation of the debt to equity ratio as it is an interest free liability.

3.3.5 CASH

The practice of deducting interest bearing assets from interest bearing liabilities to arrive at the numerator in the debt to equity ratio is well established. However, figures in the group balance sheet are an aggregation of the group's investments in its subsidiary companies, whilst its ability to access the cash resources held by certain subsidiaries may be a matter beyond simply controlling these entities given the probable existence of minority shareholders or the commitment of these funds to future capital projects. Hence, this report does not reduce debt by the amount of cash holdings.

3.3.6 BOOK VALUE OF DEBT

Debt is measured in terms of book value and not market value as the latter is generally unavailable. Titman *et al* (1988, p.7) note however that there is no reason to suspect any correlation between the capital structure determinants as tested in this report and cross-sectional differences between market and book values of debt. Hence, no obvious bias should result from this misspecification.

4. SUMMARY OF FINDINGS AND CONCLUSIONS

4.1 RESULTS

The relevant variables tested are regressed against debt to equity ratios. The coefficients of the relevant independent variable are examined in order to test the hypothesis that the debt to equity ratio is positively related to that variable.

The hypothesis is tested against the null hypothesis that there is no significant relationship between the debt to equity ratio and that variable.

The alternative hypothesis signifies direction and therefore a one tailed test is used.

All tests are carried out at a 0,01 level of statistical significance.

Details of the tests and statistical results are contained below and definitions of the relevant ratios are contained in Appendix Three of this report.

4.1.1 SECURED DEBT TO TOTAL ASSETS

To test the hypothesis that the debt to equity ratio will be greater for firms with low levels of secured debt to total assets, the ratio of secured debt to total assets is regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table One

Results of Regression of the Ratio of Secured debt as a Percentage of Total Assets Against the Debt to Equity Ratio

Variable : Secured Debt to Total Assets

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1344.848	255.85828	5.2562224	0
Secured Debt	2.2237716	0.5449694	4.0805439	0.0002

R-Squared	0.299202
Adjusted R-Squared	0.281233
Standard Error of regression	1272.425
Log Likelihood	-350.2471
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	63143531
F-Statistic	16.65084
Prob (F-statistic)	0.000215

A positive coefficient for the secured debt to total asset variable was estimated and hence the null hypotheses, that there is no relationship between levels of secured debt and the debt to equity ratio was accepted.

4.1.2 UNSECURED CREDITORS TO TOTAL ASSETS

To test the hypothesis that the debt to equity ratio will be greater for firms with high levels of unsecured creditors to total assets, the ratio of unsecured creditors to total assets was regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Two

Results of Regression of the Ratio of Unsecured Creditors as a Percentage of Total Assets Against the Debt to Equity Ratio

Variable : Unsecured Creditors to Total Assets

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	2799.3485	535.4809	5.227728	0
Unsecured Creditors	-0.2709893	0.164524	-1.6471113	0.1076

R-Squared	0.065039
Adjusted R-Squared	0.041066
Standard Error of regression	1469.713
Log Likelihood	-356.157
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	84242144
F-Statistic	2.712976
Prob (F-statistic)	0.107571

A positive coefficient for the unsecured creditors to total asset variable was estimated and hence the null hypotheses, that there is no relationship between levels of unsecured creditors and the debt to equity ratio was accepted.

4.1.3 OPERATING PROFIT VARIANCE

To test the hypothesis that gearing will be greater for firms with lower levels of operating profit variance, operating profit variance was regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Three

Results of Regression of Operating Profit Variance Against the Debt to Equity Ratio

Variable : Operating Profit Variance

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1420.0256	237.20471	5.9864983	0
Operating Variance	0.0010253	0.0002372	4.3217447	0.0001

R-Squared	0.323876
Adjusted R-Squared	0.306488
Standard Error of regression	1249.87
Log Likelihood	-349.5139
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	60924830
F-Statistic	18.67748
Prob (F-statistic)	0.000103

A positive coefficient fr perating profit variance was estimated and hence the null hypotheses, that there is no relationship between levels of operating profit variance and the debt to equity ratio was accepted.

4.1.4 TANGIBLE FIXED ASSETS TO TOTAL ASSETS

To test the hypothesis that the debt to equity ratio will be greater for firms with higher levels of tangible fixed assets to total assets, the ratio of tangible fixed assets to total assets was regressed against the ratio of debt to equity. The results of the regression are tabulated below.

Regression Results - Table Four

Results of Regression of the Ratio of Tangible Fixed Assets as a Percentage of Total Assets Against the Debt to Equity Ratio

Variable: Tangible Fixed Assets

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1193.1953	471.52438	5.594819	0.0155
Tang. Fixed Assets	0.2339012	0.1195243	1.9569348	0.0575

R-Squared	0.089415
Adjusted R-Squared	0.066066
Standard Error of regression	1450.427
Log Likelihood	-355.6154
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	82045851
F-Statistic	3.829594
Prob (F-statistic)	0.057541

A positive but insignificant relationship at the 0,01 level was estimated for the tangible fixed asset variable and hence the null hypotheses that there is no relationship between levels of tangible fixed assets and the debt to equity ratio was accepted.

4.1.5 OPERATING PROFIT MARGIN

To test the hypothesis that the debt to equity ratio will be greater for firms with higher operating margins, the ratio of operating profits to revenues was regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Five

Results of Regression of the Operating Margin Against the Debt to Equity Ratio

Variable : OPERATING MARGIN

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1934.548	469.41307	4.121206	0.0002
Operating Margin	0.0643013	0.3833279	0.1677449	0.8677

R-Squared	0.000721
Adjusted R-Squared	-0.024902
Standard Error of regression	1519.424
Log Likelihood	-357.5208
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	90037359
F-Statistic	0.028138
Prob (F-statistic)	0.867651

A positive but insignificant relationship at the 0,01 level was estimated for the operating margin variable, and hence the null hypotheses that there is no relationship between levels of operating profit margin and the debt to equity ratio was accepted.

4.1.6 CAPITAL EXPENDITURE

To test the hypothesis that gearing will be greater for firms with higher (or lower) levels of capital expenditure, the ratio of capital expenditure to total assets was regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Six

Results of Regression of the Ratio of Capital Expenditure to Total Assets Against the Debt to Equity Ratio

Variable : Capital Expenditure

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1964.5626	338.34927	5.8063157	0
Capital Expenditure	0.0501397	0.3188538	0.1572497	0.8759

R-Squared	0.000634
Adjusted R-Squared	-0.024991
Standard Error of regression	1519.491
Log Likelihood	-357.5226
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	90045228
F-Statistic	0.024727
Prob (F-statistic)	0.875859

A positive but insignificant relationship at the 0,01 level was estimated for the capital expenditure variable and hence the null hypotheses that there is no relationship between levels of capital expenditure and the debt to equity ratio was accepted.

4.1.7 FIXED ASSETS

To test the hypothesis that the debt to equity ratio will be greater for firms with higher levels of fixed assets, the level of fixed assets was regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Seven

Results of Regression of Fixed Assets Against the Debt to Equity Ratio

Variable : Fixed Assets

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1008.1537	763.60392	1.3202573	0.1944
Fixed Assets	0.1792192	0.1311324	1.3667036	0.1795

R-Squared	0.045705
Adjusted R-Squared	0.021236
Standard Error of regression	1484.831
Log Likelihood	-356.3766
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	85984167
F-Statistic	1.867879
Prob (F-statistic)	0.179546

A positive but insignificant relationship at the 0,01 level was estimated for the fixed asset variable and hence the null hypothesis that there is no relationship between levels of fixed assets and the debt to equity ratio was accepted.

4.1.8 TURNOVER

To test the hypothesis that the debt to equity ratio will be greater for firms with higher levels of turnover, turnover is regressed against the debt to equity ratio. The results of the regression are tabulated below.

Regression Results - Table Eight

Results of Regression of Turnover Against the Debt to Equity Ratio

Variable : Turnover

Variable	Coefficient	Standard Error	T Statistic	2 Tail Significance
Constant	1449.8068	259.13381	5.594819	0
Turnover	1.80E-05	5.11E-06	3.5334198	0.0011

R-Squared	0.242499
Adjusted R-Squared	0.223076
Standard Error of regression	1322.901
Log Likelihood	-351.8421
Mean of dependent variable	2002.488
Standard Deviation of dependent variable	1500.852
Sum of squared residual	68252631
F-Statistic	12.48506
Prob (F-statistic)	0.001073

A positive and significant relationship at the 0,01 level was estimated for the turnover variable and hence the alternative hypothesis that there is a relationship between the level of turnover and the debt to equity ratio was accepted.

4.2 CONCLUSION

A number of variables were identified in the literature to support the premise that debt to equity ratios are likely to vary between companies in imperfect financial markets. Variables identified in the literature indicate that higher debt to equity ratios are likely for those firms which have:

- Assets with a higher debt-capacity;
- Lower variability of cash flows (operating risk);
- Products which are less unique;
- Higher funding of assets by unprotected creditors;
- Higher levels of capital expenditure (growth prospects);
- A greater size. This can be measured in terms of a company's turnover; or
- Greater levels of profitability.

Hence, the literature review concludes that an element of the debt to equity ratio is attributable to the firm's operations.

When testing companies listed on the Johannesburg Stock Exchange to determine the applicability of the variables identified in the (non South African) literature only one variable was found to influence the debt to equity ratio. The other variables were found to have an insignificant influence. The survey of South African listed companies' debt to equity ratios concludes that a firm's size, measured in terms of its turnover, is the best explanation for its debt to equity ratio. This corresponds to the theory of Titman *et al* (1988).

5 APPENDICES

APPENDIX ONE COMPANIES INCLUDED IN SAMPLE AND REASONS FOR EXCLUSION OF COMPANIES FROM SAMPLE OR FOR LIMITATIONS OF SAMPLE SIZE		
Sector /Index Constituents in Population	**Accepted:✓ Excluded:×**	**Reasons For Exclusion/ Limitation of Sample Size**
Beverages Hotel and Leisure		
1 Kersaf	✓	-
2 South African Breweries (SAB)	✓	-
3 M-Net	×	No ten year profit history
4 N/A	×	Sector index has only three constituents
Building, Construction and Allied		
1 Grinaker	✓	-
2 LTA	✓	-
3 Pretoria Portland Cement (PPC)	✓	-
4 Anglo Alpha	×	Inflation accounting distorts comparability
5 N/A	×	Sector index has only four constituents
Chemicals, Oil and Plastics		
1 Engen	×	No ten year profit history
2 Sasol	✓	-
3 N/A	×	Sector index has only two constituents
Clothing, Footwear and Textiles		
1 Amshoe	✓	-
2 Conshu	✓	-
3 Da Gama	✓	-
4 Romatex	✓	-

	Sector /Index Constituents in Population	Accepted: ✓ Excluded: ×	Reasons For Exclusion/ Limitation of Sample Size
	Electronics and Electrical		
1	Altech	✓	-
2	Fintech	✓	-
3	Information Service Group (ISG)	×	No ten year profit history
4	Powertech	✓	-
5	Reunert	✓	-
6	Telemetrix	×	Bulk of earnings are Non South African
	Engineering		
1	Afrox	✓	-
2	Dorbyl	✓	-
3	Hudaco	✓	-
4	Standard Engineering	✓	-
	Food		
1	Delfoods	×	Bulk of earnings are Non South African
2	Hunt Leuchars & Hepburn (HLH)	✓	-
3	Premier Group	✓	-
4	Tiger Oats	✓	-
5	Tongaat Hullet	✓	-
	Furniture, Households and Allied		
1	Afcol	✓	-
2	Elerine	✓	-
3	JD Group	×	No ten year profit history
4	N/A	×	Sector index has only three constituents
	Motors		
1	Gentyre	✓	-
2	Toyota	✓	-
3	N/A	×	Sector index has only two constituents
	Paper and Packaging		
1	Consol	✓	-
2	Nampak	✓	-
3	Sappi	✓	-
4	N/A	×	Sector index has only three constituents

	Sector /Index Constituents in Population	Accepted: ✓ Excluded: ×	Reasons For Exclusion/ Limitation of Sample Size
	Pharmaceutical and Medical		
1	Adcock Ingram	✓	-
2	SA Drug	✓	-
3	Premier Pharmaceutical	✓	-
4	N/A	×	Sector index has only three constituents
	Printing and Publishing		
1	Argus	✓	-
2	Times Media (TML)	✓	-
3	N/A	×	Sector index has only two constituents
	Steel and Allied		
1	Highveld	✓	-
2	Iscor	✓	-
3	N/A	×	Sector index has only two constituents
	Stores		
1	Edgars	✓	-
2	Foschini	✓	-
3	Pepkor	✓	-
4	Pick 'n Pay (PIK)	✓	-
	Transportation		
1	Trencor	✓	-
2	Unitran	✓	-
3	N/A	×	Sector index has only two constituents

Notes:

- Sample selected per sector indices at 31 July 1993 and share prices at that date
- Four index companies per sector were selected
- Where this was not possible details have been included above.

APPENDIX TWO								
DATA SUMMARY								
NUMBER	1	2	3	4	5	6	7	8
COMPANY	SAB	Kersaf	Grinaker	LTA	PPC	Sasol	Romatex	Da Gama
GEARING RATIO	63.8%	24.8%	16.9%	34.9%	10.6%	27.7%	3.9%	2.2%
RATIO: 1	45%	72%	12%	37%	53%	72%	42%	33%
2	7%	1%	2%	4%	3%	2%	2%	2%
3	28%	20%	59%	54%	14%	14%	28%	15%
4	21779.2	2026.9	2278.1	1614.0	884.6	8247.4	707.5	254.1
5	15%	12%	8%	8%	18%	14%	11%	9%
6	11%	21%	3%	3%	22%	24%	8%	10%
7	499.5	83.3	32.4	9.3	12.9	174.0	6.3	13.5
8	6.%	74%	46%	48%	61%	81%	60%	68%
9	3.8%	13.0%	4.3%	11.0%	0.5%	13.2%	2.4%	0.0%
NUMBER	9	10	11	12	13	14	15	16
COMPANY	Conshu	Amshoe	Altech	Powertech	Reunert	Fintech	Afrox	Dorbyl
GEARING RATIO	24.8%	43.2%	0.1%	7.5%	9.5%	1.2%	36.1%	26.7%
RATIO: 1	22%	16%	14%	28%	24%	5%	67%	42%
2	0%	6%	0%	1%	0%	0%	7%	1%
3	31%	18%	26%	36%	51%	48%	18%	29%
4	630.8	247.2	1023.0	1092.9	2277.6	602.2	1113.2	2977.1
5	14%	11%	15%	17%	17%	10%	17%	9%
6	8%	7%	13%	10%	9%	5%	20%	5%
7	15.7	8.3	7.2	27.6	57.0	16.7	37.4	19.2
8	53%	46%	31%	58%	54%	36%	74%	70%
9	1.4%	6.5%	19.9%	23.9%	8.3%	1.5%	0.0%	4.2%
NUMBER	17	18	19	20	21	22	23	24
COMPANY	Hudaco	Standard	Premier	Tiger	HLH	Tongaat	Afcol	Ellerine
GEARING RATIO	23.2%	11.5%	14.2%	38.7%	13.7%	20.7%	1.0%	22.9%
RATIO: 1	18%	33%	31%	34%	22%	56%	21%	14%
2	1%	3%	0%	6%	1%	7%	1%	0%
3	40%	34%	41%	31%	10%	20%	29%	17%
4	562.6	794.9	10151.1	10039.4	758.4	3872.8	788.6	757.7
5	20%	15%	12%	13%	8%	9%	8%	20%
6	11%	10%	4%	7%	15%	7%	5%	15%
7	12.6	39.2	59.4	105.9	42.3	26.9	5.1	18.5
8	67%	66%	82%	60%	27%	72%	39%	23%
9	36.6%	1.1%	4.9%	4.7%	3.3%	1.9%	0.0%	0.9%

APPENDIX TWO (ctd)
DATA SUMMARY

NUMBER	25	26	27	28	29	30	31	32
COMPANY	Gentyre	Toyota	Consol	Nampak	[illegible]ppi	Adcock	SA Drug	Argus
GEARING RATIO	25.3%	44.4%	12.0%	16.0%	43.3%	0.0%	5.1%	11.9%
RATIO: 1	32%	43%	40%	46%	73%	33%	27%	23%
2	0%	14%	6%	0%	13%	0%	3%	2%
3	14%	20%	29%	3[illegible]	11%	36%	42%	31%
4	521.4	3452.6	2165.7	4543.7	4677.0	971.5	1835.7	1653.0
5	8%	8%	19%	20%	5%	27%	11%	14%
6	7%	4%	13%	11%	9%	16%	7%	9%
7	8.2	60.8	81.6	50.1	170.2	36.3	15.4	23.8
8	48%	67%	65%	71%	81%	52%	55%	39%
9	10.8%	11.6%	20.2%	3.9%	12.4%	5.1%	4.1%	10.7%

NUMBER	33	34	35	3[illegible]	37	38	39	40
COMPANY	TML	Highveld	Iscor	Edg[illegible]	[illegible]chini	Pepkor	PIK	Trencor
GEARING RATIO	24.2%	11.4%	35.7%	36.4	34.9%	12.7%	1.2%	5.5%
RATIO: 1	9%	49%	62%	15%	10%	26%	34%	12%
2	0%	0%	0%	4%	2%	4%	0%	4%
3	24%	18%	14%	40%	32%	54%	66%	13%
4	348.3	1488.8	8825.1	3175.9	1161.4	7763.9	6423.5	740.6
5	22%	1%	5%	26%	25%	10%	12%	16%
6	15%	1%	6%	13%	19%	3%	2%	26%
7	23.9	159.4	89.7	98.2	51.7	55.1	11.9	46.7
8	10%	63%	83%	43%	33%	69%	68%	18%
9	13.8%	3.6%	2.4%	2.6%	6.7%	6.8%	3.5%	11.2%

NUMBER	41
COMPANY	Unitran
GEARING RATIO	22.3%
RATIO: 1	69%
2	12%
3	18%
4	357.2
5	14%
6	16%
7	14.1
8	72%
9	13.4%

APPENDIX THREE	
DEFINITIONS OF ABOVE RATIOS	
Ratio:	**Definition**
1	Tangible Fixed Assets / Total Assets.
2	Secured Debt/ Total Assets
3	Unsecured Creditors / Total Assets
4	Turnover
5	Operating Profit / Total Assets
6	Operating Profit Margin
7	Operating Profit Variability
8	(Fixed Assets + Stock) / Total Assets
9	Capital Expenditure / Total Assets

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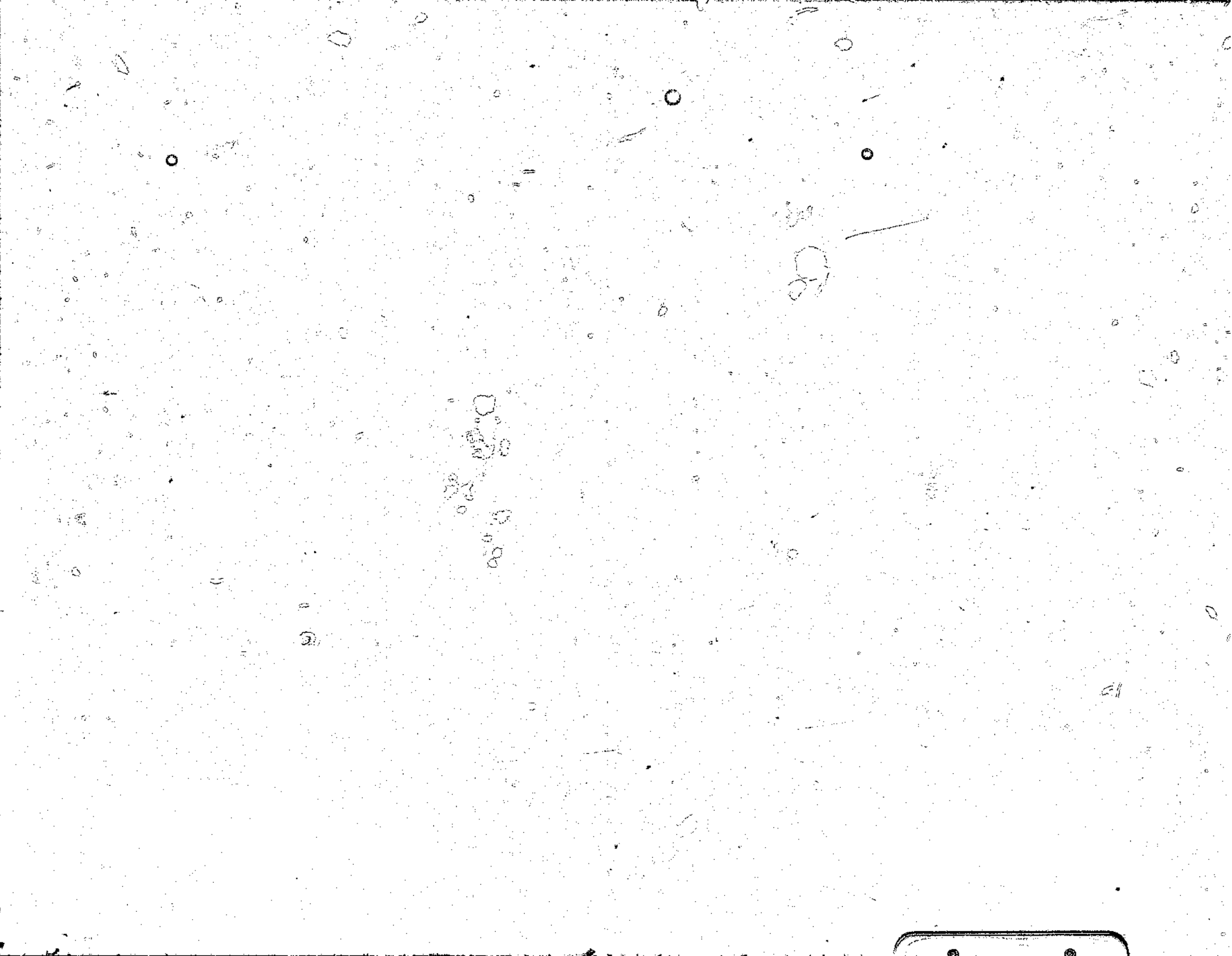
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