An investigation into ownership concentration and financial performance of

listed South African industrial companies

Christopher Philip Cameron

Student Number: 10646681

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

09 November 2011

ABSTRACT

This paper examines the relationship between ownership concentration and corporate performance amongst listed South African industrial firms. The study's theory base is rooted in the principal-agent problem and seeks to investigate the theory's applicability to the South African context.

Descriptive statistical analysis is performed in line with existing studies (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Morck et al., 1988). The percentage sums of the five and ten largest shareholders as well as firm market capitalisation are treated as independent variables. The financial measures of Tobin's Q and return on capital employed (ROCE) form the dependent variables as a basis for measuring firm financial performance.

The results suggest that there is no statistically significant relationship between ownership concentration and firms' financial performance in the case of Tobin's Q or ROCE during the survey period. However, a statistically significant positive relationship between firms' market capitalisation and financial performance is found. The study tentatively suggests that the separation of ownership from control does not appear to have any negative behavioural implications for the theory of the firm in the South African context. Future research is encouraged to confirm these results.

Keywords: Ownership concentration; Financial performance; Market Capitalisation Tobin's Q; Return on Capital

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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"Shareholders are stupid and impertinent – stupid because they give their money to somebody else without any effective control over what this person is doing with it – impertinent because they ask for a dividend as a reward for their stupidity".

- Carl Furstenberg, German Banker

Chapter 1:   THE RESEARCH PROBLEM

1.1.   INTRODUCTION TO THE RESEARCH PROBLEM

The relationship between ownership concentration and corporate performance has been the subject of an important and long running debate in corporate finance and economic literature (Welch, 2003). It can trace its origins to Adam Smith's legendary warning in the *Wealth of Nations* about the "negligence and profusion" that will result when those who manage enterprises are "rather of other people's money than of their own" (Smith in Holderness, 2003).

In modern academic literature, the problem which Smith was referring to is commonly referred to as the principal-agent problem and formalised in the concept of 'Agency Theory'. As Fama and Jensen (1983) highlighted, agency problems arise because contracts are not costlessly written and enforced. Agency costs include the costs of structuring, monitoring, and bonding a set of contracts among agents with conflicting interests (most notably managers and owners of businesses).

Agency problems arise when the decision managers who initiate and implement decisions are not the major beneficiaries and therefore do not bear a major share of the wealth effects of these decisions. Without effective control procedures, such decision managers are more likely to take actions that deviate from the interests of the shareholder (Fama & Jensen, 1983).

The modern debate around the principal-agent problem was ignited by Adolph Berle and Gardiner Means' (1932) thesis, which suggested an inverse relationship between the diffuseness of shareholdings and firm performance. The authors posit that a more diffuse ownership breaks the link between ownership and control, and that the maximisation of profits is therefore not guaranteed. The fewer shares each shareholder owns the less control he or she will have over the activities of the professional manager. The latter may not necessarily act in the value-maximising interests of the

shareholder. Berle and Means (in Holderness, 2003) argue that managers (who have control rights) do not bear the consequences of their actions, whereas the shareholders (who have cash flow rights) do.

After being dormant for a number of decades, the debate was taken up by Monsen, Chiu and Cooley (1968) who studied the effect of the separation of ownership and control on the performance of large firms. The authors found that owner controlled firms were significantly more profitable than management controlled firms. They further found that the time horizon and the industry type were also significant whilst the size of the firm had no influence on performance. This finding appeared to mostly confirm Berle and Means' hypothesis.

Holl (1975) however, in a study of 183 listed British firms a few years later found no significant difference in the performance between management controlled and owner controlled firms when industry bias was accounted for. He followed this up two years later with a study of 343 large American listed firms and found that owner controlled firms were only significantly more profitable than management controlled firms with regard to management firms who lacked an efficient market for corporate control (Holl, 1977).

Ownership control and ownership concentration are inextricably linked. Despite a large body of literature and numerous studies, there is an apparent lack of consensus regarding the nature and validity of the posited relationship between ownership concentration and firm performance. Demsetz and Villalonga (2001) argue that the conflicting results of numerous studies may stem from differences with respect to the measurement of variables, sample period, estimating technique and whether or not the research explicitly accounts for the endogeneity of a firm's ownership structure.

In the South African context, the ownership and control of economic assets, particularly listed companies, is a contentious one. Since the fall of apartheid, the South African government's major policy-related influences on corporate ownership have been the liberalisation of tariffs and exchange controls, privatisation and Black Economic

Empowerment (BEE) (Chabane, Roberts, & Goldstein, June 2006). Since the ANC's 52nd National Conference held in Polokwane in 2007 sections of the governing tripartite alliance have begun to argue strongly for a review of the BEE ownership targets outlined in the industry charters as well as for empowerment deals to be more broad-based. Additionally, the issue of the privatisation of state companies has become an issue of contention within the alliance.

This proposed research revisits the work of key authors in this fields of Agency Theory, corporate governance, economics and finance, including Morck, Schleifer & Vishny (1988) and Demsetz & Villalonga (2001) by applying similar models to South African listed industrial companies. The research seeks to add to the extremely limited evidence regarding this relationship in the South African context, and seeks to determine whether the relationship between ownership structure and firm performance is consistent with that found in other comparable studies (Gerson & Barr, 1991; Louw, 1995).

Understanding this relationship in the South African context may assist in informing the discussion around privatisation of state-owned assets and Black Economic Empowerment (BEE) policy.

Chapter 2: THEORY BASE AND LITERATURE REVIEW

2.1. INTRODUCTION

To understand the relationship between ownership structure and firm performance, concepts and theory from the fields of economics, finance and law need to be understood and applied.

Several theoretical models have been devised to understand and explain the relationship but consensus remains elusive (Welch, 2003). In the Anglo-American corporate context, where the topic has been most actively debated and studied, the focus has been on how to resolve the problem of incentive misalignment and achieve effective monitoring, control and accountability that arise from the separation of corporate ownership and management control (Stiglitz & Edlin, 1995). As mentioned in the introduction, this problem is generally referred to as the principal-agent problem and will be discussed in this study in conjunction with the theories of property rights, finance, economics and corporate governance.

Over the past three decades, the modern fields of corporate finance and corporate governance has developed around the assumption of that firms are increasingly widely held and that as firms grow in size the power of the managerial 'agents' grows relative to that of the owners or 'principals'. This assumption is in alignment with the theory espoused by Berle and Means (1932), but has been questioned by the studies of Demsetz and Lehn (1985) and Morck, Shleifer and Vishny (1988) who found that even amongst the largest American firms there was a modest concentration of ownership. Holderness, Kroszner and Sheehan (1999b) even point out that the posited misalignment of interests between owners and managers may not be a severe as the theory suggests as management ownership in American firms during the 1990s was higher than it was during the 1930s when Berle and Means (1932) developed their theory.

Corporate ownership structures and the legal regimes which support them vary considerably across the world. As La Porta *et al* (1999), highlighted, numerous studies have shown that in both developed and developing countries ownership of listed firms tends to be concentrated. Kang and Shivdasani (1995) also showed that these owners tended to be actively engaged in corporate governance, in contrast to Berle and Means' (1932) vision of the unaccountable manager (D. L. Kang & Sørensen, 1999).

2.2. OWNERSHIP AND CONTROL IN SOUTH AFRICA

Prior to end of apartheid, the ownership structure of South African listed companies was informed to a large degree by the unique political and economic circumstances which the country found itself in as well as a regulatory regime which enabled the development of pyramid control structures whereby a few families controlled vast conglomerates whilst only owning a relatively small amount of equity (Gerson & Barr, 1991).

These tightly held ownership structures have changed significantly over the past 17 years. Numerous changes to the regulatory and policy environment have brought about a change to the ownership structure of South African listed firms. Amongst the most important regulatory and legislative changes have been the prohibition by the Johannesburg Stock Exchange (JSE) of new low and high voting securities (Section 4.18 of the Listing Requirements) as well as the advent of legislation which sought to promote equity ownership in listed companies by historically disadvantaged South Africans (Chabane *et al.*, 2006).

Nearly simultaneously, the large-scale privatisation programmes of the past three decades significantly reduced government control of the parastatals and moved enterprises such as Telkom, Denel and SASOL into the private sector (Louw, 1995). Many previously privately held firms floated minority stakes on the JSE for the first time, although the original owners generally retained control (Chabane *et al.*, 2006).

The issues of efficient ownership structures and corporate performance are particularly pertinent in South Africa, as a significantly greater percentage of GDP flows through

publicly listed companies compared to 17 years ago. In turn, major South African corporations are increasingly owned by citizens through their pension and provident funds. The ownership and performance of these firms has therefore become a significant public policy issue.

2.3. PROPERTY RIGHTS THEORY OF OWNERSHIP AND CONTROL

For purposes of this study, the discussion on property rights is centred on whether the distribution or concentration of ownership influences the performance of firms.

Property is concerned with assets in one form or another. These may be tangible, such as buildings, or intangible, such as patents and goodwill. Under South African private law (which has its origins in English common law), ownership connotes the right of use and disposal of property and the owner of property rights should be entitled to the residual benefit (Van der Merwe & du Plessis, 2004).

The property rights literature suggests that transfer of ownership, here understood as entitlement to the residual profit from operating an enterprise from public to private sector, changes the relationship between managers and owners and thus entails changes in both managerial behaviour and company performance. According to Demsetz (1964), however, when ownership of property is clearly defined and resides with specific economic agents, the latter benefit from using that property in the most productive manner or personally bear the cost in the form of reduced returns. Accordingly, mechanisms should be put in place to ensure that the value of assets is not eroded at the expense of the owner of the assets.

As indicated previously, Berle and Means (1932) were the first to raise explicitly the issue of the relationship between corporate ownership and performance. The authors postulated that a more diffuse ownership breaks the link between ownership and control, and the maximisation of profits can therefore not be guaranteed. According to their theory, the fewer shares each shareholder owns the less control he will have over the activities of the professional managers. The latter may then not necessarily pursue value-maximising strategies which will eventually lead to inferior firm performance.

They argue that managers (who have control rights) do not bear the consequences of their actions, whereas the shareholders (who have cash flow rights) do.

The implication of Berle and Mean's model is that firms with more concentrated ownership structures, but otherwise similar, are likely to be more profitable as there is a greater incentive on the part of owners to monitor the firm and take the necessary actions. This model was been tested extensively by, among others, Demsetz and Lehn (1985), Morck (1988) and Seifert (2005) who reach conflicting results.

To date, the greatest challengers to Berle and Means' thesis have been Demsetz and Lehn (1985) & (2001) who focussed on investor decisions to hold concentrated or dispersed shares. According to them, the decision of how to hold the shares is a rational one based on a profit maximising calculation. Ownership structure and performance are related only in so far as firms choosing a sub-optimal structure will not perform as well as those firms with the optimal structure. For these authors, the size of the firm and the stability of the market influence investors' decisions. The authors postulate that ownership concentration will increase with an increase in market instability and to decrease with an increase in firm size. Demnetz and Lehn (1985), in their analysis of US firms, conclude that highly diffused shareholdings do not necessarily perform worse than those with highly concentrated shareholdings.

2.4. OWNERSHIP, CONTROL AND THE PRINCIPAL AGENT PROBLEM

The separation of ownership and control of the firm gives rise to a principal–agent problem, which according to Stiglitz & Edlin (1995) and Shleifer and Vishny (1998) can result in the sub-optimal use of capital.

According to Kiser (1999) an agency relation is one where a 'principal' delegates authority to an 'agent' to perform some service for the principal. These relations may occur in a variety of social contexts involving the delegation of authority, including clients and service providers such as lawyers, citizens and politicians; political party members and party leaders; rulers and state officials; employers and employees; and stockholders and managers of corporations.

In an environment of highly dispersed ownership, the individual shareholder has little or no incentive to monitor management. As monitoring is a costly procedure, the marginal cost of monitoring often exceeds the marginal benefits of improved performance. Monitoring becomes a public good, as every shareholder benefits from the monitoring activities of others (Stiglitz & Edlin, 1995).

Corporate governance is concerned with solving the above agency problem, by designing mechanisms that assure providers of capital security of return on their investment (Shleifer & Vishny, 1997). The available measures can be divided into internal control mechanisms within the firm, and external control mechanisms outside the firm.

It is argued by authors such as La Porta *et al.* (1999) and La Porta *et al.* (2000) that deficiencies in national corporate governance structures are mitigated by higher concentrations of ownership. They argue that ownership concentration and institutional differences are a response to differing degrees of legal protection of minority shareholders across countries.

2.5. THE PRIVATE CONTROL BENEFITS OF OWNERSHIP AND CONTROL

There are potentially a large number of private control benefits (PCBs) enjoyed by large shareholders which can come at the expense of firm value and performance (Jensen & Meckling, 1976). These include pecuniary benefits such as straightforward asset expropriation, termed 'tunnelling' and 'financial tunnelling', in which the controlling shareholder engages in complex financial transactions that disadvantage or effectively expropriate minority shareholders (Kirchmaier & Grant, 2005).

PCBs also come in non-pecuniary forms. Jensen and Meckling (1976) describe these as:

> the utility generated by the physical appointments of the office, the attractiveness of office staff, the level of employee discipline, the kind and amount of charitable contributions, personal relations (e.g. friendship, respect, and so on) with employees, a larger than optimal computer to play with or purchase of production inputs from friends.

The existing law and economics literature is split concerning the effect of ownership on performance. Bebchuk and Roe (1999) argue that what, at face value, appear to be inefficient ownership structures (whether dispersed or concentrated) can in fact be efficient in the context of their institutional environment. Coffee (1999) extends this argument stating that the current ownership arrangements are more a "product of a path dependent history than the 'neutral' result of an inevitable evolution toward greater efficiency".

If Bebchuk and Roe are correct, then the predominant ownership structure should be the best performing one. If Coffee (1999) and Demnetz (1985) are correct, then the predominant ownership structure might not necessarily be the best performing one.

2.6. TYPE OF OWNER AND FIRM PERFORMANCE

Management literature emphasises that apart from ownership concentration, the type of owners of shareholdings are relevant in explaining variations in corporate performance (Kirchmaier & Grant, 2005).

The following provides a brief review of the research on various types of owners and their effect on firm performance. As with most of the research in this field, the results are still contested.

2.6.1. INSIDERS AND OUTSIDER OWNERSHIP

Literature shows how the allocation of shares among insiders and outsiders can influence the value of the firm (Jensen & Meckling, 1976). Demsetz and Villalonga (2001) compiled research relating to the effects of ownership structure on corporate performance, and found that discrepancies existed between the expectations of corporate performance by insiders who owned shares and the expectations of corporate performance by the stock market. This caused managers to change their corporate ownership according to anticipated company performance, implying that ownership structure and corporate performance were truly correlated (Ping & Hsien, 2009).

2.6.2. FAMILY OWNERSHIP

As organisations grow and mature, founders or founding families generally tend to exit the management of businesses and hand over control to professional managers. Over time, ownership can become 'fragmented' as shareholdings are diluted through share sales, inheritances as well as a myriad of other ways. This has implications for the power relationships between the shareholder and the managers of the business (D. L. Kang & Sørensen, 1999).

Andres (2008) examined the relationship between founding-family ownership and firm performance. He showed that family firms are not only more profitable than widely-held firms but also outperform companies with other types of blockholders. However, the performance of family businesses is only better in firms in which the founding family is still active either on the executive or the supervisory board. These findings suggest that family ownership is related to superior firm performance only under certain conditions. For example, family owners receive significant PCBs, and therefore, place a premium on retaining control of the firm and are hence more likely to be risk averse and capital constrained. They also face problems of nepotism, succession and family conflict. (Kirchmaier & Grant, 2005).

2.6.3. LARGE BLOCK AND INSTITUTIONAL OWNERS

Institutional investors have become important players in today's equity markets. Their increasing importance in corporate governance in the United States is observed from the growing volume of corporate equity they control. As of 2003, institutional investors were estimated to control 60% of all outstanding equity in the United States, compared to 45% in 1990, 33% in 1980 and 8% in 1950 (Taylor, 1990 in Tsai, 2007).

In terms of shareholding size, expertise in information collection and monitoring professional managers, institutional investors are very different from atomistic investors. Hence, a question arises as to whether and how institutional ownership influences firm performance.

According to Elyasiani and Jia (2010), three plausible scenarios can describe the role played by institutional investors: active monitoring, passive monitoring, and siding with managers to exploit smaller shareholders. In the first scenario, monitoring by institutional investors is likely to result in improved firm performance because, as large and sophisticated shareholders, institutional investors have the incentive and expertise to monitor the management, can do so low cost, and are able to exert enough influence to alter the governance structure and the firm's course of actions.

The passive role scenario is based on the argument that institutional owners may be short-term investors acting like 'traders', holding or selling the stocks according to their portfolio rebalancing needs, instead of intervening in corporate governance.

According to the third scenario, some institutional investors cooperate with the management in order to expropriate the dispersed small shareholders. For example, investment companies may support the managers at the expense of the shareholders in order to receive further business. These three scenarios are not mutually exclusive, though one may dominate the others as the main determinant of institutional investor behaviour (Elyasiani & Jia, 2010).

According to Elyasiani and Jia (2010), there is a positive relationship between firm performance and significant institutional ownership but that ownership stability is a key variable in the relationship.

2.6.4. CONTROLLING MINORITY SHAREHOLDERS

According to Bebchuk *et al.* (2000) in Cronqvist (2003), a controlling minority structure (CMS) has the potential to create large agency costs. The structure combines the agency problem of the firm being controlled by an insider who owns a fraction of the equity (Jensen & Meckling, 1976), with the agency problem of the firm being controlled by an insider who is insulated from the influence of other shareholders and the market of corporate control. Bebchuk *et al.* (2000) further show that a CMS structure can distort decisions regarding firm size, choice of projects, and transfers of control.

In a related paper, Bebchuk (1999) shows that when there are significant private benefits of control, a controlling owner fearing a control grab by outsiders will strive to maintain control, regardless of its efficiency for other shareholders.

When the size of control benefits makes it desirable to maintain a lock on control, a CMS structure enables the controlling party to maintain such a lock without incurring risk-bearing costs or liquidity costs. A controlling minority structure also means that a controlling owner is less likely to relinquish control even if it would be efficient, because a majority of the efficiency gains will go to other shareholders whereas the controller will fully internalise the loss of private benefits if control is relinquished. The implications of these arguments are that it is mainly controlling owners who derive large PCBs, and that CMSs can exist even if their control over firms is costly (Cronqvist & Nilsson, 2003).

2.7. SOUTH AFRICAN RESEARCH ON OWNERSHIP AND PERFORMANCE

Since the studies of Gerson and Barr (1991) and Louw (1995) there has been very little research conducted on the relationship between ownership concentration and firm performance in South Africa. Since their studies, the South African economy and the regulatory environment under which publicly traded firms operate have changed significantly. It is therefore appropriate to revisit this topic in the South African context and investigate whether there have been any material developments.

2.8. SUMMARY OF KEY RESEARCH

Below is a summary of select key research on the relationship between ownership and performance as adapted from Welch (2003) and Demsetz and Villalonga (2001) and Mathiesen (2011).

Authors	Ownership Measure/s	Performance Measure/s	Methodology	Ownership Treated as Endogenous?	Results
Monsen *et al.* (1968)	1. Management control equal to or greater than 5% single block of voting control. 2. Owner control equal to or greater than10% shareholding and evidence of active control, or, equal to or greater than 20% shareholding	Return on equity observed between1952-63	Variance analysis and a balanced fixed model of three-way analysis of covariance with one concomitant variable.	No	Owner controlled firms are significantly more profitable than management controlled firms. Time and industry type are also significant. Size is not.
Holl (1975)	1. Owner Control (OC) if >50% of vote carrying shares are held by individual or if 20-50% of the votes are held by an individual, or if at least 20% of the votes are held by largest 20 vote holders subject to certain constraints. 2. Management Control assumed for all other firms.	Pre-tax profit / Net worth	Discriminant analysis and generalized Mahalanobis distance analysis. The sample is classified in order to control for industry.	No	No significant difference between OC and MC when industry bias is accounted for.
Holl (1977)	1. Managerial Control if management holds minimum of 10% single block of common stock. 2. Owner Control assumed if management hold 10% or less of equity.	Return on stocks calculated as average stock returns observed from 1962 to 1972 assuming that dividends are reinvested.	Standard t-tests are applied. The sample is classified in order to control for 'efficiency of market for corporate control', monopoly and size.	No	OC firms are only significantly more profitable than MC firms with regard to MC firms who lack an efficient market for corporate control.

Demsetz and Lehn (1985)	1. % of shares held by top 5 shareholders 2. % of shares held by top 20 shareholders 3. Herfindahl measure of ownership concentration 4. % of shares controlled by top 5 families and individuals 5. % of shares controlled by institutional investors	Post-Tax Accounting Profit / Book Value of Equity	Ordinary Least Squares Regression	Yes	No significant relationship
Holderness and Sheehan (1988)	95%> Majority held (MH) >50,1%, ownership by any single individual or entity (other corporation, or fund). Diffusely held (DH) <20% ownership by any shareholder	1. Tobin's Q by firm's market value to replacement cost of plants and inventories 2. Return on equity	Standard t-tests are applied. The sample is further classified in order to control for identity of MH control: MH by individuals and OC by entities.	No	No significant difference in performance between majority held and diffusely held firms.
Morck, Shleifer and Vishny (1988)	% of shares held by company directors	1. Tobin's Q 2. Accounting Profit Rate	Piecewise Linear Regression	No	Significant non-monotonic relationship
Holderness, Kroszner and Sheehan (1999a)	% of shares held by officers and company directors	Tobin's Q	Piecewise Linear Regression	Yes	Significant non-monotonic relationship
Demsetz and Villalonga (2001)	% of shares held by top management, the CEO and company directors	1. Tobin's Q 2. Accounting Profit Rate	1. Ordinary Least Squares Regression 2. 2-Stage Least Squares	No	No significant relationship
Elyasiani and Jia (2010)	% of shares held by institutional investors	1. Tobin's Q 2. Accounting Profit Rate	Linear regression with Heckman's two-step sample selection procedure	Yes	Positive relationship if significant stable shareholding is present

Chapter 3:   RESEARCH QUESTION

3.1. INTRODUCTION

This study was focussed on establishing whether there is a relationship between ownership concentration and the financial performance of listed South African industrial firms.

As indicated in the literature review above, the impact of ownership concentration on firm performance is theorised to be twofold. On the one hand, concentrated ownership should provide for better control of management, as size of ownership stake and the incentive to monitor are positively correlated. In turn, this should improve firm performance and equally benefit minority shareholders. On the other hand, a dominant shareholder or shareholder group can come with costs for minority shareholders as the controlling owners might try to expropriate from them.

3.2. CONSTRUCTS

The key constructs in this study are ownership concentration and firm performance. It should be noted up front that an assumption was made that in the South African context, ownership percentage and control are linked on a linear basis. This is due to the fact that listed shares with different voting rights are being phased out in South Africa in accordance with the listing rules of the JSE.

3.2.1. OWNERSHIP

Prior research by Demsetz & Lehn (1985) considered the ownership of the five and twenty largest shareholders as well as an estimation of the Herfindahl measure of ownership concentration for each firm within their sample.

For purposes of this study, the shareholding of the top five (A5) and top ten (A10) shareholders of each company within the sample was used in order to calculate ownership concentration. This was principally due to limitations on the available data

sources (McGregor BFA and PSG Online) which were only able to provide the individual ownership of the top ten shareholders of each company. The ownership figures were provided on an 'entity' basis and no identification of individual shareholders was possible if these shareholdings were housed in a legal construct such as a trust or other vehicles used by institutional or corporate investors.

In order to ensure consistency and comparability between companies, the ownership holding of the A5 and A10 shareholders were calculated as of the last day for the month in which the firm's Annual General Meeting (AGM) was held as it then when shareholders are most able to exercise their control over the firm and its management. This approach is supported by both Bearle & Means (1932) as well as Demnetz & Lehn (1985). The Herfindahl measure of ownership concentration was not applied is this research as it is based on estimates and is not supported by any other major piece of research in this field.

3.2.2. PERFORMANCE

Studies investigating organisational performance have traditionally made use of standard accounting definitions of profitability to determine firm 'performance'. The principal measures of profitability are return on sales (ROS), which is net income to total sales; return on assets (ROA), which is net income to total assets; and return on equity (RoE), which is net income to total equity (Feng, Sun, & Tong, 2004).

A supplementary approach followed by Demsetz & Lehn (1985) and Demsetz & Villalonga (2001) makes use of Tobin's Q to assess organisational performance. Tobin's Q differs from accounting measures of performance in two important respects. The first is in the time perspective - backward-looking for accounting profit rate and forward-looking for Tobin's Q. The argument expounded by Demsetz & Lehn (1985) is that in attempting to assess the effect of ownership structure on firm performance it is more appropriate to look at an estimate of what management will accomplish rather than merely look at what management has accomplished so far.

For purposes of this research a standardised Tobin's Q was applied to measure firm performance and was supplemented with the return on capital employed (ROCE) measure of performance. The standardised Tobin's Q ratios were sourced from McGregor BFA's data service.

The rationale for using Tobin's Q in this study is that it enabled a comparison between the outputs of this research and prior research. Additionally it is a tried and accepted performance measure in this field of research (Welch, 2003).

The inclusion of ROCE as a performance measure was justified by the fact that it is a more widely accepted measure of firm performance that the simple measures of ROS, ROE and ROA and is particularly suited to the analysis of industrial companies (McGregor BFA, 2009). Additionally, the ROCE ratio is considered to be the best measure of profitability in order to assess the holistic performance of the business. It is an indicator of how well management has used the investment made by owners and creditors into the business.

Whilst initially it had been proposed to use Economic Value Add (EVA) as the supplementary performance measure, this was abandoned after initial data analysis as there were concerns about the reliability and comparability of the EVA information being provided by McGregor BFA. This was likely due to reporting differences of the various firms included in the study.

3.2.3. SUMMARY OF CONSTRUCTS

The following constructs were therefore applied:

Table 1: Applied Constructs

Construct	Description
Ownership Concentration	
Top 5 (A5)	Percentage of shares held by top 5 (A5) shareholders at month-end of the month in which the firm's Annual General Meeting (AGM) is held.
Top 10 (A10)	Percentage of shares held by top 10 (A10) shareholders at month-end of the month in which the firm's Annual General Meeting (AGM) is held.
Firm Performance	
Return on Capital Employed (ROCE)	ROCE = ([Profit Attributable to Ordinary Shareholders] / ([Capital Employed] – ([Adjusted Market / Direct Value in Investment]) x100
Tobin's Q	$$Q-ratio = \frac{MV \; of \; equity + book \; debt}{assets \; (valued \; at \; replacement \; \cos t)}$$

3.3. HYPOTHESES

A hypothesis test was applied to determine whether there is a significant linear relationship between an independent variable X and a dependent variable Y. The test focussed on the slope of the regression line. In the research undertaken, the independent variable was ownership concentration (A5) and (A10) and the dependent variable firm performance (measured in terms of Tobin's Q and ROCE).

The hypotheses were as follow:

H_0: There is no linear relationship between ownership concentration and firm performance.

H_1: There is a linear relationship between ownership concentration and firm performance.

Chapter 4: RESEARCH METHOD

4.1. RESEARCH DESIGN

Descriptive statistical analysis was performed in line with existing studies (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Morck *et al.*, 1988). All of the data required for this analysis is publicly available secondary data and was sourced from McGregor BFA and PSG Online which are able to provide financial and shareholding data per company, including shareholding information as at the last day of the month of the relevant company's AGM for A5 and A10 shareholders as well as the relevant Tobin's Q and ROCE ratios and market capitalisation figures.

Relevant shareholding data for A5 and A10 was extracted from the McGregor database for each firm as at the final day of the month of the firms latest AGM. A5 and A10 were reported by McGregor directly. Minimal computation was required in order to transform the reported A5 and A10 shareholdings into percentage figures. The performance metrics of ROCE and Tobin's Q for each firm were available through McGregor BFA. All computations to derive the values had already been completed by McGregor BFA's data service using the formulae described in Section 3.1.3. above and were used without any further modification or adjustment to the values.

Data regarding each company's market capitalisation collected through PSG Online trading platform. This information was used as an input into a secondary analysis of the relationship between market capitalisation and firm performance. This analysis was included based on prior studies which have indicated that ownership concentration is often related to firm size. In general, firms with larger market capitalisations tend to have more diffused ownership concentration and the power of the agent therefore should theoretically rise relative to the owners of the business (Berle & Means, 1932).

Secondary data has several disadvantages including possible quality concerns as the data has not been specifically gathered for each study (Blumberg, Cooper, & Schindler,

2008). McGregor BFA and PSG Online provide high-quality and widely used information, independent of study type, extracted directly from the JSE's own information technology systems and calculated using published and accepted methods for derived metrics such as ROCE. There were therefore no concerns with the scope, authority or format of the data. However, in order to further verify the validity of the information extracted from McGregor BFA a further confirmation step was implemented by comparing the extracted data with other data sources, most notably PSG Online as well as the individual companies' financials.

Statistical analyses was performed on the data as per Section 4.4 and reported.

4.2. POPULATION OF RELEVANCE

The firms listed in the JSE's industrial sector in between 1 July 2010 and 31 August 2011 formed the population. All firms which formed part of the sector for the duration of this period would be included in the study. The period was selected as it is the latest period for which both the required ownership and financial information is available on McGregor BFA. The period is slightly longer than one year to make allowances for firms who's AGMs fell slightly outside of the twelve month period. In the few cases where a firm held two AGMs during the period in question, the latest AGM was considered.

As all firms within the population were included in the research; it took the format of a census and no sample was therefore required. According to Blumberg *et al.* (2008), a census is preferable to a sample when the population is small and when the elements are quite different from one another. In the research undertaken, the population was the industrial sector of the JSE which during the period in question included 172 firms.

For purposes of this research, the 'industrial sector' is defined broadly as constituting the following sectors of the JSE:

1. Consumer Goods;
2. Consumer Services;
3. Healthcare Services;

4. Industrials;

5. Technology Services; and

6. Telecommunications

Financials, Basic Materials (resources), Oil & Gas and Utilities were omitted from this research in accordance with the method applied in prior studies such as Demsetz & Lehn (1985). The principle reasons for this are that the nature of these businesses requires different performance metrics and they also tend to have different accounting conventions.

Any firms who did not hold an Annual General Meeting (AGM) during the period in question were excluded from the data set as shareholders had no opportunity to exercise their voting rights during this period. Principally, this decision affected suspended shares (of which there were six) and newly listed firms (of which there were four). Additionally, firms for which no reliable financial information or ratios could be gained from McGregor BFA were also excluded from the study. Firms whose primary listing falls outside of South Africa were also excluded as the financial performance of the local operations was not easily distinguishable from the global financials and the information extracted through McGregor BFA also did not distinguish between the shares traded on the JSE and the total issued shares of the firm.

4.3. UNIT OF ANALYSIS

According to Blumberg *et al.* (2008), the unit of analysis describes the level at which the research is performed and which objects are researched. For purposes of this research, the individual firm in the JSE's industrial sector between 1 July 2010 and 31 August 2011 formed the unit of analysis.

The industrial sector of the JSE was analysed in preference to the resources, oil and gas and financial sectors of the JSE due to the comparability of the financial information across firms as well as the fact that it will allow for a comparison with prior key research such as Demsetz & Lehn (1985).

4.4. DATA ANALYSIS

The fields in Table 2 below constitute the data that were extracted from McGregor BFA and PSG Online and utilised in this study.

Table 2: Data Attributes for Analysis

Attribute	Description
Firm Name	Official name of the listed entity
Market Capitalisation	Total value of issued stocks traded on the JSE as at last trading day of August 2011, as sourced PSG Online's trading platform.
A5	As defined in section 3.1.3 above
A10	
Q	
ROCE	

4.5. DESCRIPTIVE STATISTICS

Exploratory data analysis (Blumberg *et al.*, 2008) was performed to understand the structure of the data across the dimensions of ownership, performance and market capitalisation under investigation.

4.5.1. FIRM PERFORMANCE

Initial descriptive statistical analysis was undertaken to investigate the number of firms with performance (ROCE and Tobin's Q) in discrete categories via histograms. This provided an understanding of the distribution of performance across firms in the data set.

The means, modes, medians and standard deviations for Tobin's Q and ROCE were calculated for the industrial sector, providing a baseline for discussion on performance relative to peers.

4.5.2. OWNERSHIP CONCENTRATION

Initial descriptive statistical analysis investigated the number of firms with ownership concentration in discrete categories via histograms. This provided an understanding of the distribution of ownership concentration across firms in the data set for A5 and A10 (top 5 and top 10 shareholders, respectively).

The means, modes, medians and standard deviations for A5 and A10 were calculated for the industrial sector, providing a baseline for discussion on ownership concentration relative to peers.

4.5.3. MARKET CAPITALISATION

In addition to the above variables, initial descriptive statistical analysis investigated the market capitalisation of firms in discrete categories via histograms. This provided an understanding of the distribution of the market capitalisation across firms in the data set.

The means, modes, medians and standard deviations for A5 and A10 were calculated for the industrial sector, providing a baseline for discussion on market capitalisation, ownership concentration and financial performance.

4.5.4. SCATTERPLOTS

An initial analysis was performed to confirm Berle and Mean's (1932) posited relationship of an inverse relationship between company size and ownership concentration. Ownership concentration (A5 and A10) was plotted against market capitalisation.

The correlation between ownership concentration and firm performance was then investigated using additional scatterplots.

4.6. INVESTIGATING THE RELATIONSHIP BETWEEN PERFORMANCE AND OWNERSHIP CONCENTRATION

The strength and direction of the association between performance and ownership concentration's individual variables, was assessed with correlation analysis. A linear regression was used to assess the type of relationship between perfromance and ownership concentration using the method of ordinary least squares regression in accordance with (Blumberg *et al.*, 2008). Least squares regression has been used by several authors in their investigation of the relationship between ownership concentration and performance (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001). The resulting probability value (*p*-value) value from the regression was used to test the hypotheses H_0 and H_1 for concentration values of both A5 and A10 as per Table 3.

Table 3: Hypothesis Testing Approach

Performance Metric % Shareholding	Tobin's Q	Return on Capital
A5	Ordinary Least Squares Regression and Hypothesis Testing	Ordinary Least Squares Regression and Hypothesis Testing
A10	Ordinary Least Squares Regression and Hypothesis Testing	Ordinary Least Squares Regression and Hypothesis Testing

Market capitalisation was included as an additional independent variable due to the posited inverse correlation between market capitalisation and ownership concentration.

4.7. EXCLUSIONS

The research only considered the concentration of the A5 and A10 owners and not type of owners, for example institutional, director, managerial or family.

The analysis undertaken only focused on a single point in time, notably the dates of financial reporting for each firm. No time series or longitudinal analysis was undertaken. There may an argument that changes in ownership concentration lead to changes in performance but this is beyond the scope of the analysis undertaken.

Chapter 5: RESULTS

5.1. INTRODUCTION

The statistical techniques that were predominantly used in this study are correlation analysis and regression analysis. Means and frequencies are used to describe the sampling demographics.

The results are presented in the form of tables and figures and commentary is provided on inferences which are drawn from the data.

5.2. SAMPLE ANALYSIS

5.2.1. SAMPLE SIZE

The total population of this study was 172 firms. As was outlined in the method section, only complete data were included in the sample. Firms for which no full financial information was available, who did not hold an AGM during the defined period, whose primary listing was abroad or who had negative performance figures were excluded from the data set. The exclusion of thirteen firms with negative performance figures was undertaken as log transformations were used in the statistical analysis.

Amongst the most notable exclusions were firms such as SABMiller, Richemont and British American Tobacco which have significant market capitalisations but have their primary listings outside of South Africa. Other firms which were excluded following the first data analysis were John Daniel Holdings and Mazor Group limited as their ROCE values (following log transformations) became significant outliers and were distorting the results.

Following these exclusions, the total number of firms included in this study was 153 firms.

5.2.2. OUTLIERS AND LOG TRANSFORMATIONS

In order to provide more meaningful and useable information, the variables were transformed by taking the log. This was done to reduce the large variation and normalise the variables.

5.3. DESCRIPTIVE STATISTICS

The following section outlines the descriptive statistics. Only the untransformed descriptive statistics are discussed here. The transformed descriptive statistics may be found in the appendix.

5.3.1. DISTRIBUTION BY INDUSTRY

The frequency of the firms classified by industry is provided in **Table 4** and **Figure 1** below:

Table 4: Count by Industry

Level	Count	Prob
Consumer Goods	21	0.13725
Consumer Services	36	0.23529
Health Care Services	8	0.05229
Industrials	65	0.42484
Technology Services	18	0.11765
Telecommunications Services	5	0.03268
Total	**153**	**1.00000**

Figure 1: Percentage Distribution
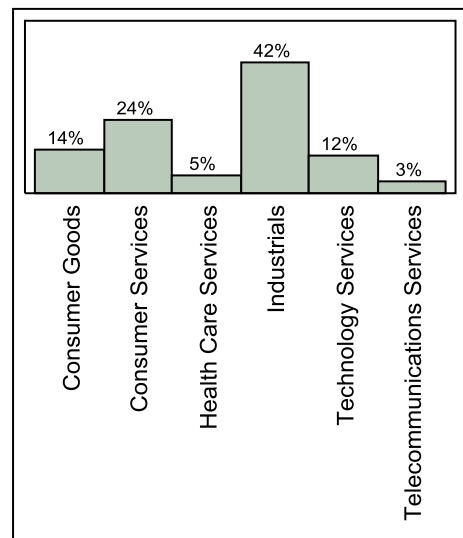
Only the Industrials and Consumer Services industries had sample sizes of over 30. In order to ensure that the industry-level results were credible, tests for normality were run. This is outlined later in this section.

5.3.2. A5 SHAREHOLDING

As defined in the methodology section in Chapter four, the A5 shareholding represents the sum percentage shareholder concentration of the five largest shareholders in a given firm. As mentioned previously, the data was transformed by taking the log. The results presented below are first the untransformed statistical outputs, followed by the transformed outputs.

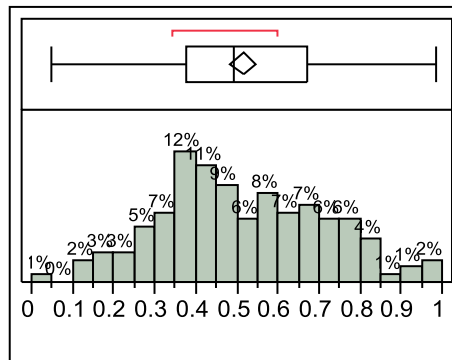Figure 2: A5 Shareholding Distribution (untransformed)
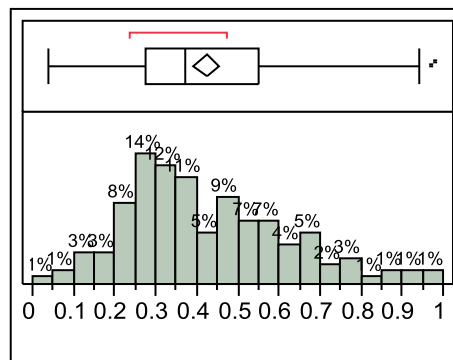
Quantiles

100.0%	Maximum	0.9797
99.5%		0.9797
97.5%		0.91078
90.0%		0.69388
75.0%	Quartile	0.5519
50.0%	Median	0.3732
25.0%	Quartile	0.27415
10.0%		0.20498
2.5%		0.10489
0.5%		0.0363
0.0%	Minimum	0.0363

Moments

Mean	0.423568
Std Dev	0.1979668
Std Err Mean	0.0160047
Upper 95% Mean	0.4551883
Lower 95% Mean	0.3919476
N	153

The mean A5 shareholding is over 42 percent which indicates a relatively high ownership concentration amongst listed South African industrial companies. The highest ownership concentration is in the sample is over 97 percent and the lowest 3.6 percent.

5.3.3. A10 SHAREHOLDING

The A10 shareholding represents the sum percentage shareholder concentration of the ten largest shareholders in a given firm. The data was transformed by taking the log. The results presented below are first the untransformed statistical outputs, followed by the transformed outputs.

Figure 3: A10 Shareholding Distribution (Untransformed)

Quantiles

100.0%	Maximum	0.9847
99.5%		0.9847
97.5%		0.94407
90.0%		0.78802
75.0%	Quartile	0.67325
50.0%	Median	0.4904
25.0%	Quartile	0.3754
10.0%		0.26478
2.5%		0.14089
0.5%		0.0491
0.0%	Minimum	0.0491

Moments

Mean	0.5157353
Std Dev	0.1977982
Std Err Mean	0.015991
Upper 95% Mean	0.5473287
Lower 95% Mean	0.4841419
N	153

The mean A10 shareholding is over 51 percent which indicates that in general, the ten largest shareholders of any given listed South African industrial company have effective control. The highest ownership concentration is in the sample is over 98 percent and the lowest 4.9 percent.

5.3.4. TOBIN'S Q

Tobin's Q was selected as a forward measure of firm performance. As defined in the methodology section, Tobin's Q is defined most simply defined as the market value of a company divided by the replacement value of its assets. The detailed formula is provided in Chapter four. As with the A5 and A10 Shareholder variables above, the statistical results below are first presented as untransformed outputs and then as transformed outputs.

Figure 4: Tobin's Q Distribution (Untransformed)
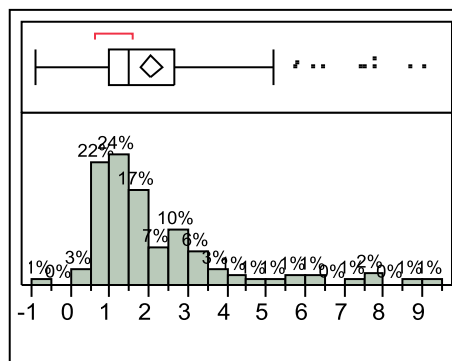
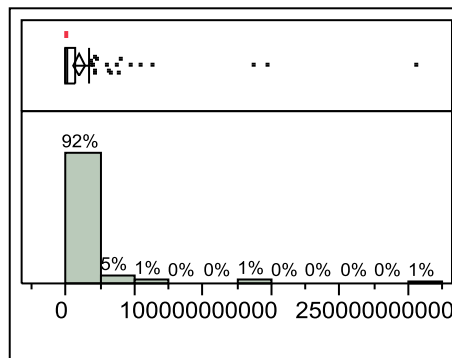| Quantiles				Moments	
100.0%	maximum	9.05		Mean	2.0671242
99.5%		9.05		Std Dev	1.7026472
97.5%		7.7815		Std Err Mean	0.1376509
90.0%		3.88		Upper 95% Mean	2.3390802
75.0%	quartile	2.665		Lower 95% Mean	1.7951682
50.0%	median	1.5		N	153
25.0%	quartile	0.97			
10.0%		0.716			
2.5%		0.4525			
0.5%		-0.9			
0.0%	minimum	-0.9			

The mean Tobin's Q ratio is over two which indicates that in general, the market value of listed South African industrial companies is twice the replacement value of their assets.

5.3.5. RETURN ON CAPITAL EMPLOYED

ROCE was selected as a backward-looking measure of firm performance. As indicated in Chapter four, it a more widely accepted measure of firm performance that the simple measures of ROS, ROE and ROA and is particularly suited to the analysis of industrial companies (McGregor BFA, 2009). ROCE can be viewed as an indicator of how well management has used the investment made by owners and creditors into the business.

As with the variables outlined above, the untransformed descriptive statistics are presented below. The transformed descriptive statistics may be found in the appendix B.

Figure 5: ROCE Distribution (Untransformed)
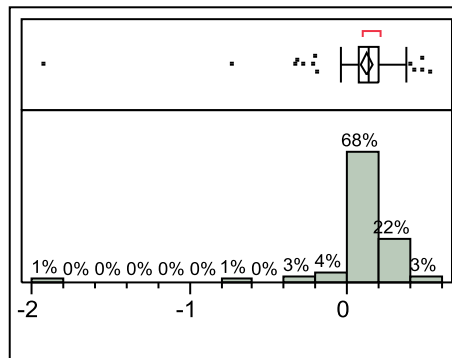
Quantiles			Moments	
100.0%	maximum	0.5187	Mean	0.1219569
99.5%		0.5187	Std Dev	0.2202032
97.5%		0.43071	Std Err Mean	0.0178024
90.0%		0.28062	Upper 95% Mean	0.1571289
75.0%	quartile	0.1991	Lower 95% Mean	0.0867848
50.0%	median	0.1405	N	153
25.0%	quartile	0.07635		
10.0%		0.02196		
2.5%		-0.3144		
0.5%		-1.92		
0.0%	minimum	-1.92		

The mean ROCE employed percentage is over 12 percent with the lowest figure being negative 192 percent and the highest 51.8 percent.

5.3.6. MARKET CAPITALISATION

Market capitalisation was included as an independent variable due to Bearle & Means' (1932) posited inverse relationship between market capitalisation and ownership concentration. As defined in the methodology section, market capitalisation was defined as the total value of issued stocks traded on the JSE as at last trading day of August 2011.

As with the variables outlined above, the statistical results below are first presented as untransformed outputs and then as transformed outputs.

Figure 6: Market Capitalisation Distribution (Untransformed)

Quantiles			Moments	
100.0%	maximum	2.6e+11	Mean	9.5448e+9
99.5%		2.6e+11	Std Dev	2.755e+10
97.5%		7.4e+10	Std Err Mean	2.2277e+9
90.0%		2.1e+10	Upper 95% Mean	1.395e+10
75.0%	quartile	7.14e+9	Lower 95% Mean	5.1436e+9
50.0%	median	1.29e+9	N	153
25.0%	quartile	3.14e+8		
10.0%		8.09e+7		
2.5%		7922513		
0.5%		2521070		
0.0%	minimum	2521070		

The distributions reveal that the listed South African industrials sector is heavily dominated by a few companies with very large market capitalizations. The remaining firms effectively constitute and 'long tail'.

5.4. INVESTIGATING THE RELATIONSHIP BETWEEN PERFORMANCE AND OWNERSHIP CONCENTRATION

In this section, the results of the regression analyses are presented. The results are first presented on the dataset for Tobin's Q and ROCE and then by industry. For each of the sub-sections, scatterplots are presented as well as correlation matrices.

Before regression was conducted, correlation analysis was used to explore individual relationships between variables.

Correlation matrices were calculated to test the strength of the relationships (if any), between the different variables. A correlation is a measure of the relation between two variables. As mentioned in the methodology section, in probability theory and statistics, correlation (often measured as a correlation coefficient) indicates the strength and direction of a linear relationship between two random variables.

The correlation coefficient (R) denotes the strength of the relationship between two variables. The r-value can range from negative one to one.

In order to independently explore the correlations of each independent variable without the influence of other variables, partial correlations were run and the results provided.

The statistical models for Tobin's Q and ROCE were each run with the complete data sets as well as on an industry basis.

5.4.1. INVESTIGATING THE RELATIONSHIP BETWEEN PERFORMANCE AND OWNERSHIP CONCENTRATION USING TOBIN'S Q FOR PERFORMANCE

Tobin's Q whole model results

Scatterplots

The scatterplots for the dependant variable (log Tobin's Q) with respect to the independent variables A5, A10 and market capitalisation are presented below.
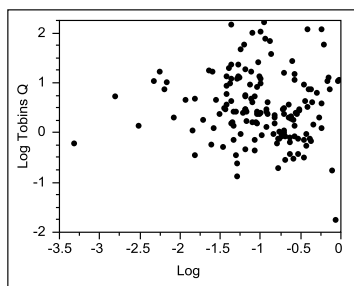
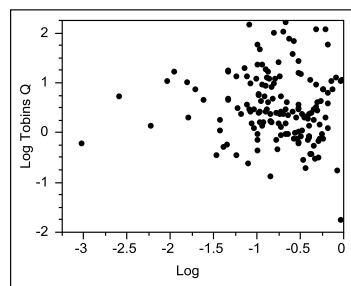Figure 7: Bivariate Fit of log Tobin's Q by log A5:
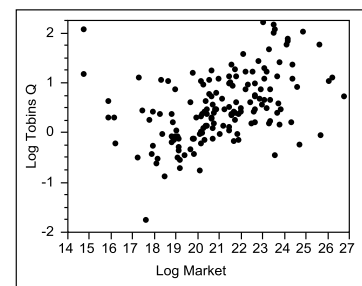
Figure 8: Bivariate Fit of log Tobin's Q by log A10

Figure 9: Bivariate Fit of log Tobin's Q by log Market Capitalisation

From the scatterplots above it is appears that the independent variables A5 and A10 show no relationship to the Tobin's Q measure of financial performance whilst market capitalisation (Figure 9) seems to show a positive linear relationship.

Tobin's Q correlation matrix (log)

The independent variables (log A5, log A10 and log market capitalisation) are presented in the correlation matrix below. The untransformed correlation matrices may be found in the appendix.

The correlation between log Tobin's Q and the independent variables indicates the strength of the association.

Correlations

	Log Tobins Q	Log Market CAP	Log A5	Log A10
Log Tobins Q	1.0000	0.4218	-0.0879	-0.0815
Log Market CAP	0.4218	1.0000	-0.1977	-0.1807
Log A5	-0.0879	-0.1977	1.0000	0.9837
Log A10	-0.0815	-0.1807	0.9837	1.0000

There are 1 missing values. The correlations are estimated by REML method.

Table 5: Log Tobin's Q Correlation Matrix

Log A5 Shareholding: There is an insignificant negative correlation between the log A5 shareholding and log Tobin's Q of 8.79 percent.

Log A10 Shareholding: There is an insignificant negative correlation between the log A10 shareholding and log Tobin's Q of 8.15 percent.

Log Market Capitalisation: There is a low to medium-strength positive correlation between the log Market Capitalisation and log Tobin's Q of 42.18 percent.

Tobin's Q partial correlation matrix (log)

In order to assess the correlation after the effect of the other independent variables is removed, partial correlations were run. The results are provided in the table below.

Partial Corr

	Log Tobins Q	Log Market CAP	Log A5	Log A10
Log Tobins Q	.	0.4135	0.0044	-0.0054
Log Market CAP	0.4135	.	-0.1048	0.0737
Log A5	0.0044	-0.1048	.	0.9833
Log A10	-0.0054	0.0737	0.9833	.

partialed with respect to all other variables

Table 6: Log Tobin's Q Partial Correlation Matrix

Log A5 Shareholding: There is an insignificant positive correlation between the log A5 shareholding and log Tobin's Q of 0.44 percent.

<u>Log A10 Shareholding:</u> There is a non-significant negative correlation between the log A10 shareholding and log Tobin's Q of 0.54 percent.

<u>Log Market Capitalisation:</u> There is a medium-strength positive correlation between the log market capitalisation and log Tobin's Q of 41 percent.

The partial correlation between log Tobin's Q and log market capitalisation is approximately 41percent (similar to the initial correlation of 42 percent) which indicates that the other variables log A5 and log A10 do not significantly influence the correlation between log Tobin's Q and log market capitalisation. Consequently, it appears that only market capitalisation holds an influence on Tobin's Q.

Full Regression for Tobin's Q

A full regression was undertaken to investigate the relationship between the dependent variable Tobin's Q and the independent variables: log A5, log A10 and log market capitalisation.

Summary of Fit

RSquare	0.300856
RSquare Adj	0.28532
Root Mean Square Error	0.567082
Mean of Response	0.518874
Observations (or Sum Wgts)	139

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	18.681764	6.22725	19.3644
Error	135	43.413584	0.32158	**Prob > F**
C. Total	138	62.095348		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.3825618	0.181953	7.60	<.0001*
Log Market CAP	0.4657574	0.062613	7.44	<.0001*
Log A5	-0.072713	0.526465	-0.14	0.8904

Term	Estimate	Std Error	t Ratio	Prob>|t|
Log A10	0.0013254	0.601504	0.00	0.9982

The null hypothesis is that none of the paramaters is useful in explaining the relationship. The null hypotheses can be rejected if the F-value is relatively large and the corresponding *p*-value is smaller than 0.05 (Albright, Winston, & Zappe, 2009).

Multiple regression was conducted to examine whether A5, A10 and market capitalisation impact on Tobin's Q. The overall model explained 28.5 percent of variance in performance, which was revealed to be statistically significant, $F_{(3,138)}$ = 19.36, *p* < .0001. An inspection of individual predictors revealed that market capitalisation (Beta = 0.4658, *p* < 0.0001) is a significant predictor of Tobin's Q (performance). Higher levels of Tobin's Q are associated with higher levels of market capitalisation.

If market capitalisation changes with one percent, then Tobin's Q will tend to increase by 0.466 percent.

Testing the Residuals for Normality

One of the assumptions of the regression requires that the distribution of the residuals (that is the error after the model is fitted) be normal. From the histogram below (mean=0 and sd=0.5), it can be seen that the distribution of the residuals are fairly normal.

Residual Log Tobins Q

Quantiles

100.0%	maximum	2.37003
99.5%		2.37003
97.5%		1.37098
90.0%		0.85773
75.0%	quartile	0.43192
50.0%	median	-0.0683
25.0%	quartile	-0.408
10.0%		-0.7091
2.5%		-1.1687
0.5%		-1.8282
0.0%	minimum	-1.8282

Normal(-7e-17,0.62323)

Moments

Mean	-6.91e-17
Std Dev	0.6223349
Std Err Mean	0.0506449
Upper 95% Mean	0.1000695
Lower 95% Mean	-0.10007
N	151

Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	-6.91e-17	-0.10007	0.1000695
Dispersion	σ	0.6223349	0.5591733	0.7017094

-2log(Likelihood) =

Goodness-of-Fit Test

Shapiro-Wilk W Test

W	Prob<W
0.982571	0.0530

Note: Ho = The data is from the Normal distribution. Small p-values reject Ho.

Table 7: Residuals Test for Log Tobin's Q

To test the variable 'Residual Log Tobin's Q' for normality, a Shapiro-Wilk test for normality was conducted. The p-value from the Shapiro-Wilk test is larger than 0.01 (p=0.053) indicating normality at a 99% level of confidence.

The residuals are normally distributed therefore this assumption of the regression is not violated.

5.4.2. Investigating the Relationship Between Performance and Ownership Concentration Using Tobin's Q for Performance by Industry

The results of the Tobin's Q regression model are further investigated on an industry basis below.

Consumer Goods Industry

Summary of Fit

|	
RSquare	0.336886
RSquare Adj	0.219866
Root Mean Square Error	0.521819
Mean of Response	0.436522
Observations (or Sum Wgts)	21
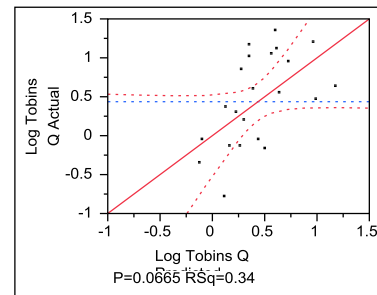
Figure 10: Consumer Goods - Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	2.3517144	0.783905	2.8789
Error	17	4.6290195	0.272295	**Prob > F**
C. Total	20	6.9807339		0.0665

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-0.199169	1.182357	-0.17	0.8682
Log Market CAP	0.0164174	0.058059	0.28	0.7808
Log A5	2.5631489	1.481605	1.73	0.1017
Log A10	-3.677619	1.821746	-2.02	0.0596

The model for the Consumer Goods Industry explained 21.99 percent of the variance in performance, which was revealed not to be statistically significant, $F_{(3,20)} = 2.87$, $p < .0665$. An inspection of individual predictors revealed that none of the variables is a

significant predictor of Tobin's Q (performance). Higher levels of Tobin's Q are not associated with any of the variables.

It should be highlighted that the Consumer Goods Industry model contains only 21 data points which raises concerns about the validity of the sample.

Consumer Services Industry

Summary of Fit

|	
RSquare	0.355581
RSquare Adj	0.293217
Root Mean Square Error	0.707506
Mean of Response	0.963151
Observations (or Sum Wgts)	35
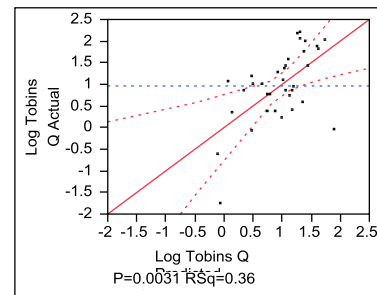
Figure 11: Consumer Services - Actual by

Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	8.562315	2.85411	5.7018
Error	31	15.517501	0.50056	**Prob > F**
C. Total	34	24.079816		0.0031*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-4.223405	1.290813	-3.27	0.0026*
Log Market CAP	0.2339929	0.060854	3.85	0.0006*
Log A5	-1.201674	1.30682	-0.92	0.3649
Log A10	1.5209729	1.631437	0.93	0.3584

The model for the Consumer Services Industry explained 29.32 percent of variance in performance, which was revealed to be statistically significant, F (3,34) = 5.70, $p <$ .0031. An inspection of individual predictors revealed that market capitalisation (Beta = 0.2339, $p < 0.0006$) is a significant predictor of Tobin's Q. Higher levels of Tobin's Q are associated with higher levels of market capitalisation.

If market capitalisation changes with one percent, then Tobin's Q will tend to increase by 0.2339 percent.

The Consumer Services Industry model contains 35 data points which is sufficient for purposes of this analysis.

Health Care Services Industry

Summary of Fit

RSquare	0.734064
RSquare Adj	0.534612
Root Mean Square Error	0.324186
Mean of Response	0.660661
Observations (or Sum Wgts)	8
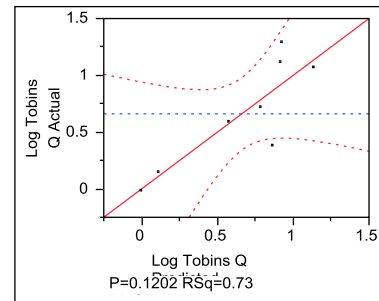
Figure 12: Health Care Services - Actual
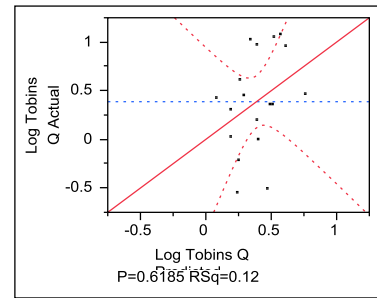
by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.1603952	0.386798	3.6804
Error	4	0.4203869	0.105097	**Prob > F**
C. Total	7	1.5807821		0.1202

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.202427	1.902924	-1.68	0.1677
Log Market CAP	0.1248502	0.084037	1.49	0.2116
Log A5	-3.269154	1.956306	-1.67	0.1700
Log A10	2.9037298	2.422545	1.20	0.2968

The model for the Health Care Services Industry explained 53.46 percent of variance in performance, which was revealed to be not statistically significant, $F_{(3,7)} = 3.68$, $p <$ .1202. An inspection of individual predictors revealed that none of the variables is a significant predictor of Tobin's Q. Higher levels of Tobin's Q are not associated with any of the variables.

It should be highlighted that the Health Care Services Industry model contains only eight data points which raises concerns about the validity of the sample.

Industrials Industry

Summary of Fit

|	
RSquare	0.077058
RSquare Adj	0.030911
Root Mean Square Error	0.522635
Mean of Response	0.24251
Observations (or Sum Wgts)	64
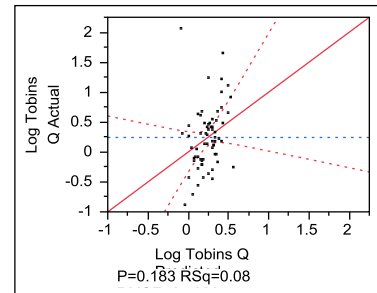
Figure 13: Industrials - Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.368326	0.456109	1.6698
Error	60	16.388817	0.273147	**Prob > F**
C. Total	63	17.757143		0.1830

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-1.11385	0.738829	-1.51	0.1369
Log Market CAP	0.0696802	0.038092	1.83	0.0723
Log A5	0.6463738	0.679954	0.95	0.3456
Log A10	-0.735988	0.762892	-0.96	0.3385

The model for the Industrials Industry explained a mere 3.09 percent of variance in performance, which was revealed not to be statistically significant, $F_{(3,63)} = 1.67$, $p <$ .183. An inspection of individual predictors revealed that none of the variables is a significant predictor of Tobin's Q. Higher levels of Tobin's Q are not associated with any of the variables.

The Industrials Industry model contains 64 data points which is sufficient for purposes of this analysis.

Technology Services Industry

Summary of Fit

RSquare	0.115894
RSquare Adj	-0.07356
Root Mean Square Error	0.528049
Mean of Response	0.387389
Observations (or Sum Wgts)	18

Figure 14: Technology Services - Actual

by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	0.5117224	0.170574	0.6117
Error	14	3.9037015	0.278836	**Prob > F**
C. Total	17	4.4154239		0.6185

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-0.228783	1.271512	-0.18	0.8598
Log Market CAP	0.0543729	0.066151	0.82	0.4249
Log A5	2.0831415	1.853694	1.12	0.2800
Log A10	-2.157636	1.987346	-1.09	0.2960

The model for the Technology Services Industry explained a very low -7.36 percent of variance in performance, which was revealed to be statistically insignificant, $F_{(3,17)}$ = 0.612, $p < 0.619$. An inspection of individual predictors revealed that none of the variables is a significant predictor of Tobin's Q. Higher levels of Tobin's Q are not associated with any of the variables.

The Industrials Industry model contains only eighteen data points which raises concerns about the validity of the model.

Telecommunications Services Industry

Summary of Fit

RSquare	0.539277
RSquare Adj	-0.84289
Root Mean Square Error	1.143572
Mean of Response	0.81103
Observations (or Sum Wgts)	5
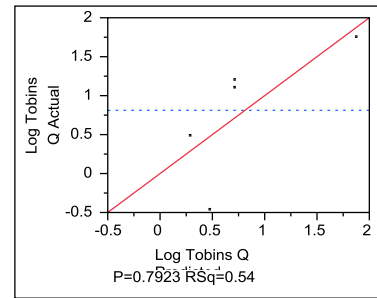
Figure 15: Telecommunication Services -

Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.5307290	0.51024	0.3902
Error	1	1.3077565	1.30776	**Prob > F**
C. Total	4	2.8384855		0.7923

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-4.685776	8.786902	-0.53	0.6881
Log Market CAP	0.2569204	0.355608	0.72	0.6017
Log A5	5.0303927	6.202801	0.81	0.5662
Log A10	-5.591005	7.24873	-0.77	0.5817

The model for the Telecommunications Services Industry explained a negative 84.29 percent of variance in performance, which was revealed not to be statistically significant, $F(3,4) = 0.39$, $p < 0.792$. An inspection of individual predictors revealed that none of the variables are a significant predictor of Tobin's Q.

The Telecommunications Services Industry model contains 5 data points which raises significant doubts as to the validity of the model.

5.4.3.   ROCE RESULTS

ROCE whole model results

Scatterplots

The scatterplots for the dependant variable (log ROCE) with respect to the independent variables A5, A10 and market capitalisation are presented below.
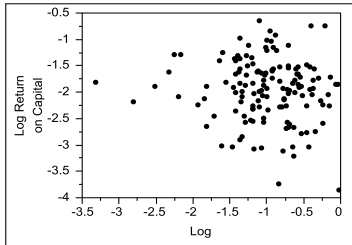
Figure 16: Bivariate Fit of log ROCE by log A5
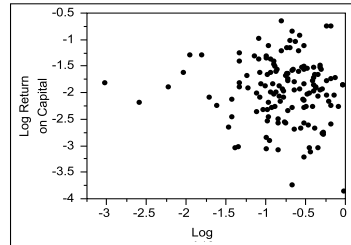
Figure 17: Bivariate Fit of log ROCE by log A10
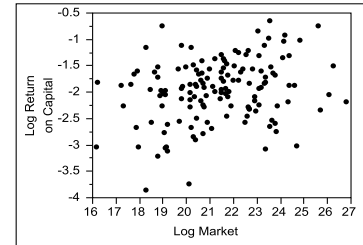
Figure 18: Bivariate Fit of log ROCE by log Market Capitalisation

From the scatterplots above it is appears that the independent variables A5 and A10 show no relationship to the ROCE measure of financial performance whilst market capitalisation (Figure 18) seems to show a positive linear relationship.

ROCE correlation matrix (log)

The independent variables (log A5, log A10 and log market capitalisation) are presented in the correlation matrix below. The untransformed correlation matrices may be found in the appendix.

The correlation between log ROCE and the independent variables indicates the strength of the correlation.

Multivariate

Correlations

	Log Return on Capital	Log Market CAP	Log A5	Log A10
Log Return on Capital	1.0000	0.3113	-0.1085	-0.0840
Log Market CAP	0.3113	1.0000	-0.1944	-0.1765
Log A5	-0.1085	-0.1944	1.0000	0.9837
Log A10	-0.0840	-0.1765	0.9837	1.0000

There are 13 missing values. The correlations are estimated by REML method.

Table 8: Log ROCE Correlation Matrix

Log A5 Shareholding: There is a weak negative correlation between the log A5 shareholding and log ROCE of 10.85 percent.

Log A10 Shareholding: There is a very weak negative correlation between the log A5 shareholding and log ROCE of 8.4 percent.

Log Market Capitalisation: There is a medium-strength positive correlation between the log market capitalisation and log ROCE of 31.13 percent.

ROCE partial correlation matrix (log)

Partial Corr

	Log Return on Capital	Log Market CAP	Log A5	Log A10
Log Return on Capital	.	0.2904	-0.1150	0.1075
Log Market CAP	0.2904	.	-0.0779	0.0480
Log A5	-0.1150	-0.0779	.	0.9835
Log A10	0.1075	0.0480	0.9835	.

partialed with respect to all other variables

Table 9: ROCE Partial Correlation Matrix

Log A5 Shareholding: There is a weak negative correlation between the log A5 shareholding and log ROCE of 11.5 percent.

Log A10 Shareholding: There is weak negative correlation between the log A10 shareholding and log Return on Capital Employed of 10.75 percent.

Log Market Capitalisation: There is a medium-strength positive correlation between the log Market Capitalisation and log ROCE of 29.04 percent.

The partial correlation between log ROCE and log market capitalisation is approximately 29.04 percent (similar to the initial correlation of 31.13 percent) which indicates that the other variables log A5 and log A10 do not significantly influence the correlation between log ROCE and log market capitalisation. The same holds true for log A5. Log A10 however appears to be strongly influenced by log market capitalisation.

Full Regression for ROCE

A full regression was undertaken to investigate the relationship between the dependent variable ROCE and the independent variables: log A5, log A10 and log market capitalisation.

Summary of Fit

|	
RSquare	0.091849
RSquare Adj	0.071668
Root Mean Square Error	0.575194
Mean of Response	-1.96439
Observations (or Sum Wgts)	139

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	4.517312	1.50577	4.5512
Error	135	44.664454	0.33085	**Prob > F**
C. Total	138	49.181767		0.0045*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.778347	0.518775	-7.28	<.0001*
Log Market CAP	0.0791756	0.024579	3.22	0.0016*
Log A5	-0.697754	0.530179	-1.32	0.1904
Log A10	0.7437987	0.606271	1.23	0.2220

Multiple regression was conducted to examine whether A5, A10 and market capitalisation impact on ROCE. The overall model explained a mere 7.17 percent of variance in performance, which was however revealed to be statistically significant, $F(3,138) = 4.55$, $p < .0045$. An inspection of individual predictors revealed that market capitalisation (Beta = 0.0791, $p < 0.0016$) is a significant predictor of ROCE. Higher levels of ROCE are associated with higher levels of market capitalisation.

If market capitalisation were to increase by one percent, then ROCE will tend to increase by 0.0791 percent.

Testing the Residuals for Normality

One of the assumptions of the regression requires that the distribution of the residuals (that is the error after the model is fitted) be normal. From the histogram below (mean=0 and sd=0.5), it can be seen that the distribution of the residuals is fairly normal.
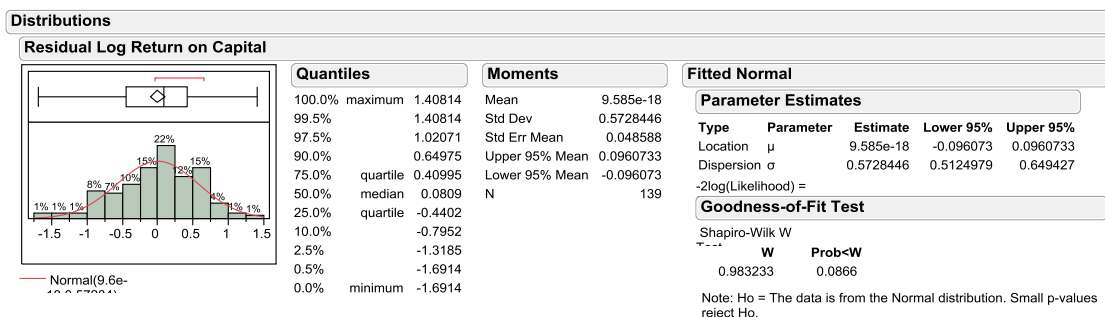
Table 10: Residuals Test for Log ROCE

To test the variable 'Residual Log ROCE' for normality, a Shapiro-Wilk test for normality was conducted. The p-value from the Shapiro-Wilk test is larger than 0.01 (p=0.086) indicating normality at a 99% level of confidence.

The residuals are normally distributed therefore this assumption of the regression is not violated.

5.4.4. Investigating the Relationship Between Performance and Ownership Concentration Using ROCE for Performance by Industry

The results of the ROCE regression model are further investigated on an industry basis below.

Consumer Goods Industry

Summary of Fit

RSquare	0.214064
RSquare Adj	0.045649
Root Mean Square Error	0.549989
Mean of Response	-2.03306
Observations (or Sum Wgts)	18
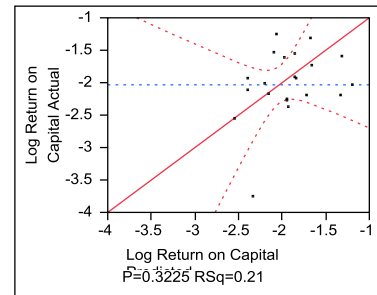
Figure 19: Consumer Goods - Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.1534331	0.384478	1.2711
Error	14	4.2348285	0.302488	**Prob > F**
C. Total	17	5.3882617		0.3225

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-5.687237	2.125201	-2.68	0.0181*
Log Market CAP	0.172843	0.098938	1.75	0.1025
Log A5	0.4877448	1.702433	0.29	0.7787
Log A10	-0.423034	2.116239	-0.20	0.8444

The model for the Consumer Goods Industry explained 4.56 percent of variance in performance, which was revealed to be statistically not significant, $F_{(3,17)} = 1.27$, $p <$

51

.323. An inspection of individual predictors revealed that none of them are a significant predictor of ROCE.

The Consumer Goods Industry model contains only eighteen data points which raises questions about the statistical validity of the sample.

Consumer Services Industry

Summary of Fit

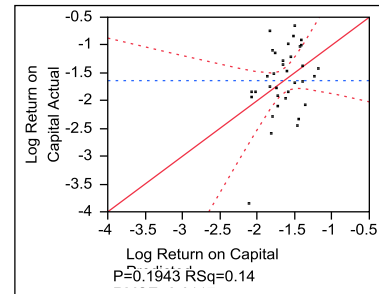|	
RSquare	0.138941
RSquare Adj	0.055612
Root Mean Square Error	0.611681
Mean of Response	-1.6405
Observations (or Sum Wgts)	35

Figure 20: Consumer Services - Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.871581	0.623860	1.6674
Error	31	11.598771	0.374154	Prob > F
C. Total	34	13.470352		0.1943

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-2.869292	1.139075	-2.52	0.0171*
Log Market CAP	0.0415122	0.054163	0.77	0.4492
Log A5	-1.806866	1.128395	-1.60	0.1195
Log A10	1.9808318	1.425956	1.39	0.1747

The model for the Consumer Services Industry explained 5.56 percent of variance in performance, which was revealed to be statistically not significant, F (3,34) = 1.27, $p <$ .194. An inspection of individual predictors revealed that none of them are a significant predictor of ROCE.

The Consumer Services Industry model contains 35 data points which is sufficient for statistical purposes.

Health Care Services Industry

Summary of Fit

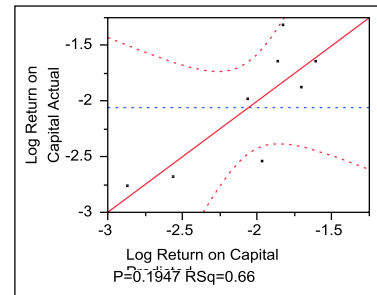|	
RSquare	0.65581
RSquare Adj	0.397667
Root Mean Square Error	0.420288
Mean of Response	-2.05811
Observations (or Sum Wgts)	8

Figure 21: Health Care Services - Actual

by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.3462739	0.448758	2.5405
Error	4	0.7065684	0.176642	**Prob > F**
C. Total	7	2.0528423		0.1947

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.930354	2.467027	-1.59	0.1863
Log Market CAP	0.0276471	0.108949	0.25	0.8122
Log A5	-4.320078	2.536234	-1.70	0.1637
Log A10	3.9888902	3.140685	1.27	0.2729

The model for the Health Care Services Industry explained 39.76 percent of variance in performance, which was revealed to be statistically not significant, $F_{(3,7)} = 2.541$, $p <$ .195. An inspection of individual predictors revealed that none of them are a significant predictor of ROCE.

The Health Care Services Industry model contains only eight data points which raises questions about the statistical validity of the sample.

Industrials Industry

Summary of Fit

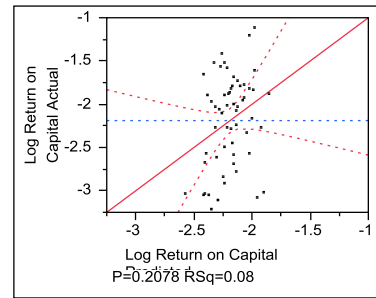|	
RSquare	0.08012
RSquare Adj	0.029015
Root Mean Square Error	0.523369
Mean of Response	-2.18898
Observations (or Sum Wgts)	58

Figure 22: Industrials - Actual by

Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.288306	0.429435	1.5678
Error	54	14.791426	0.273915	**Prob > F**
C. Total	57	16.079732		0.2078

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.999797	0.842998	-4.74	<.0001*
Log Market CAP	0.0905703	0.042236	2.14	0.0365*
Log A5	-0.050838	0.776688	-0.07	0.9481
Log A10	0.1618543	0.866977	0.19	0.8526

The model for the Industrials Industry explained 2.9 percent of variance in performance, which was revealed not to be statistically significant, $F(3,57) = 1.568$, $p <$ .208. An inspection of individual predictors revealed that only market capitalisation (Beta = 0.0905703, $p < 0.0365$) is a predictor of ROCE. Higher levels of ROCE are associated with higher levels of market capitalisation.

If market capitalisation changes with one percent, then ROCE will tend to increase by 0.0905 percent.

The Industrials Industry model contains 58 observations which is sufficient for statistical purposes.

Technology Services Industry

Summary of Fit

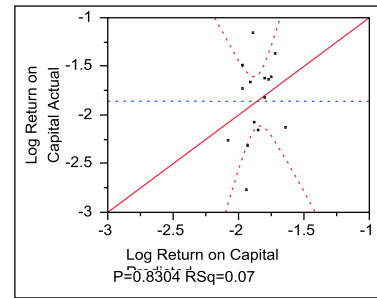|	
RSquare	0.073735
RSquare Adj	-0.17888
Root Mean Square Error	0.457789
Mean of Response	-1.8588
Observations (or Sum Wgts)	15

Figure 23: Technology Services - Actual

by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	0.1835118	0.061171	0.2919
Error	11	2.3052778	0.209571	**Prob > F**
C. Total	14	2.4887896		0.8304

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-2.302212	1.46717	-1.57	0.1449
Log Market CAP	0.0082592	0.075629	0.11	0.9150
Log A5	-1.182484	1.690135	-0.70	0.4987
Log A10	1.1797614	1.827796	0.65	0.5319

The model for the Technology Services Industry explained a negative 17.88 percent of variance in performance, which was revealed to be statistically not significant, $F(3,57)$ = 0.2919, p < .8304. An inspection of individual predictors none of them is a significant predictor of ROCE.

The Technology Services Industry model contains only fifteen observations which raises concerns about the statistical validity of the sample.

Telecommunications Services Industry

Summary of Fit

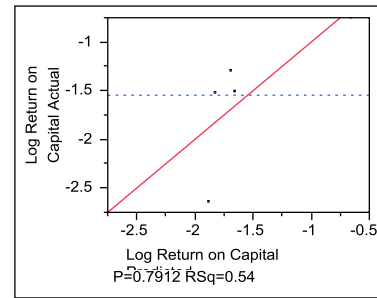|	
RSquare	0.540927
RSquare Adj	-0.83629
Root Mean Square Error	0.935547
Mean of Response	-1.54592
Observations (or Sum Wgts)	5

Figure 24: Telecommunications Services -

Actual by Predicted Plot

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	1.0313074	0.343769	0.3928
Error	1	0.8752478	0.875248	**Prob > F**
C. Total	4	1.9065552		0.7912

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.424224	7.188493	-0.48	0.7170
Log Market CAP	0.110618	0.29092	0.38	0.7687
Log A5	4.1500439	5.074461	0.82	0.5636
Log A10	-4.389148	5.930127	-0.74	0.5944

The model for the Telecommunication Services Industry explained a negative 83.63 percent of variance in performance, which was revealed to be statistically not significant, F (3,4) = 0.3928, $p < 0.7912$. An inspection of individual predictors none of them is a significant predictor of ROCE.

The Telecommunications Services Industry model contains only five observations which raises concerns about the statistical validity of the sample.

Chapter 6: INTERPRETATION OF RESULTS

6.1. INTRODUCTION

Overall, the results of this study indicate that there is no statistically significant relationship between ownership concentration and the financial performance of listed South African industrial firms. This outcome appears to contradict the hypothesis underpinning Agency Theory which posits an inverse relationship between the diffuseness of shareholding and firm performance. As previously highlighted, the authors Berle and Means (1932) posited that a more diffuse ownership breaks the link between ownership and control, and that the maximisation of profits is therefore not guaranteed. The fewer shares each shareholder owns the less control he or she will have over the activities of the professional manager.

This study did however reveal one important relationship – that between market capitalisation and firm performance. From the statistical evidence it appears that there is a statistically significant positive relationship between the listed value of a firm and its financial performance as measured by the financial metrics of Tobin's Q and ROCE.

Before the results are analysed further, it should be reiterated that this analysis was conducted on a sample set of 153 South African firms and that the period considered was one of significant economic volatility. This period of volatility may have led to a skewing of the results by impacting more heavily on shares with lower market capitalisations and more limited access to funding sources.

With this background, this chapter aims to gain a deeper understanding of the results by drawing on previous research and attempting to explain the observations as well as any deviations from the established literature. The interpretation of the results is performed by first considering the dynamics of the South African industrial sector as revealed through the statistical analysis. This is followed by an analysis of the relationship between shareholder concentration and firm performance. The final section

provides analysis on the identified relationship between market capitalisation and firms' financial performance.

6.2. THE SOUTH AFRICAN INDUSTRIAL SECTOR

Important findings about listed South African industrial firms were revealed through the initial descriptive statistics. These are outlined below.

6.2.1. SHAREHOLDER CONCENTRATION

Previous research undertaken by Gerson and Barr (1991) on the determinants for ownership and control in South Africa highlighted that finding that of the 288 JSE listed industrial firms which they initially examined, 259 were found to be under the absolute control of a single dominant shareholder or shareholder 'group'. They identified only four firms which had markedly diffuse control structures with the largest shareholder group controlling less than 25 percent of the voting rights. It should be remembered that at the time of the Gerson and Barr (1991) study it was common practice for South African firms to issue 'A' and 'B' class shares with differing voting rights. The shareholders (principally families) who exercised control were able to do so with relatively small shareholdings.

The practice of issuing 'A' and 'B' class shares has been phased out by the JSE which has brought the concepts of 'ownership' and 'control' into greater alignment. For purposes of this study, the concepts of 'ownership' and 'control' were assumed to be linearly related.

This descriptive statistics in this study revealed that the degree of ownership concentration in South African industrial firms is exceptionally high when compared to listed companies in developed markets. For example, the mean for A5 shareholding in South Africa is 42.71 percent and 51.57 percent at A10. By comparison, this level of shareholder concentration was not even reached on an A20 level (37.66 percent) in Demsetz and Lehn's (1985) study of 511 listed American firms.

This high level of ownership concentration may suggest that as 'A' and 'B' class voting shares have fallen into disuse, controlling shareholders have increased their equity stakes in firms in order to retain control over them. This would be in alignment with the arguments put forward by Jensen and Meckling (1976) as well as other authors such as Kirchmaier and Grant (2005), that owners of businesses (or those who control such businesses) derive significant private control benefits (PCBs) from this control. Consequently, they would attempt to retain such control, even if this requires them to increase their equity holding in the firm to do so. In this case, however, this would have to be verified through further investigations into the ownership structures of individual firms by piercing the veil of trusts and other legal structures behind which the true identity of shareholders is often hidden. What however is evident is that listed South African industrial firms are tightly held and that, in general, the ten largest shareholders in such firms have sufficient votes to affect control over the firm and its management.

6.2.2. MARKET CAPITALISATION DISTRIBUTIONS

The descriptive statistics revealed that the total market capitalisation of the listed South African industrials sector is highly skewed towards a few multinationals (most notably British American Tobacco, SABMiller, MTN, Richemont, Naspers and Vodacom). Of these firms, three are have their primary listing outside of South Africa, one is effectively controlled by an offshore multinational (Vodacom) and the remaining two (MTN and Naspers) have significant international operations and have even considered separately listing their international businesses form their domestic businesses in order to gain easier access to international capital markets. These larger firms (Vodacom aside) generally also have the most diffuse ownership structures (see Appendix A for breakdown of the firms' ownership structures on an A5 and A10 level) which is in alignment with the Berle and Means' (1932) assumption that as firms grow in size their ownership structures are likely to become more diffuse.

This finding also appears to imply two key things about listed South African industrials. Firstly, as they grow in size their shareholding becomes more diffuse and secondly, as

they begin to outgrow the domestic market they have to move abroad in order to sustain and fund their growth. Neither of these implications is particularly surprising, but it is reassuring that the data appears to support theory in this regard.

As mentioned previously, firms whose principal listing was not is South Africa were excluded from the sample. This had the effect of reducing the average market capitalisation of firms in the sample to just under R1.5 billion.

6.2.3. ROCE PERFORMANCE

The accounting measure of ROCE was used for purposes of this study in order to identity whether there is a relationship between ownership concentration and the historic financial performance of the firm. Previous studies have used a variety of accounting measures in order to measure financial performance. The leading studies in this field such as Demsetz and Lehn (1985), Mork, Shleifer and Vishny (1988), Demsetz and Villalonga (2001) and Elyasiani and Jia (2010) tended to use a form of accounting profit rate. The mean profit rates in these studies are however not readily comparable with this study due to accounting differences between South Africa and the United States. Additionally, the differing time periods, economic conditions and structures of the respective economies differ and make such comparisons effectively meaningless.

From the descriptive statistics it can be gleaned that the mean for ROCE of the sample set is approximately 12.2 percent. Whilst this figure in itself may appear modest, it should be remembered that this return was achieved in the midst of the recent global financial crisis.

6.2.4. TOBIN'S Q PERFORMANCE

As mentioned in chapter two, the leading studies which have investigated the relationship between ownership concentration and firm performance such as Mork, Shleifer and Vishny (1988), Holderness, Kroszner and Sheehan (2001), Demsetz and

Villalonga (2001) and Elyasiani and Jia (2010) have used the forward-looking performance measure of Tobin's Q. As Demsetz and Villalonga (2001) pointed out, in attempting to assess the effect of ownership structure on firm performance, it more sensible to look at an estimate of what management has accomplished or at an estimate of what management will accomplish.

Based on the descriptive statistics, it appears that the mean Tobin's Q ratio for South African listed industrial firms is 2.07 which indicates that in general, the market value of these firms is more than twice the replacement value of the assets. The implication of this is that the equity markets believe that these firms will effectively utilise these assets in order to generate profits.

6.3. SHAREHOLDER CONCENTRATION AND PERFORMANCE

In order to identify whether there is a relationship between shareholder concentration and ownership two statistical models were built. One model was built around the dependent variable ROCE and the other on Tobin's Q. Correlation matricides were developed in order to test strength of the relationships between the dependent and independent variables. Partial correlations were run in order to assess the correlation after the effect of the other independent variables was removed.

Full regression models were run in order to investigate the relationship between the dependent (for example ROCE) and the dependent variables (e.g. A5 ownership concentration). Regression analysis requires that the distribution of the residuals (that is the error after the model is fitted) be normal. In order to test for this, Shapiro-Wilk tests for normality were conducted.

The interpretation of the results is discussed below, first by considering the Tobin's Q and then the ROCE models.

6.3.1. SHAREHOLDER CONCENTRATION AND TOBIN'S Q

An initial analysis of the scatterplots for the Tobin's Q model indicated that the independent variables A5 and A10 hold no relationship to the Tobin's Q measure of financial performance whilst the independent variable market capitalisation (Figure 9) appears to indicate a positive linear relationship.

The correlation matrix appears to confirm this initial analysis as there is an insignificant negative correlation between the log A5 shareholding and log Tobin's Q of 8.79 percent, an insignificant negative correlation between the log A10 shareholding and log Tobin's Q of 8.15 percent but a medium-strength positive correlation between the log market capitalisation and log Tobin's Q of 42.18 percent.

As mentioned previously, the partial correlations were run in order to explore the correlations of each independent variable without the influence of other variables (Albright *et al.*, 2009). The partial correlations indicate that the variables log A5 and log A10 do not significantly influence the correlation between log Tobin's Q and log market capitalisation. Consequently, it appears that only market capitalisation holds an influence on Tobin's Q.

The full regression model for Tobin's Q indicated that the model explained 28.5 percent of variance in performance, which was revealed to be statistically significant, $F_{(3,138)}$ = 19.36, $p < .0001$. An inspection of the individual predictors however revealed that market capitalisation (Beta = 0.4658, $p < 0.0001$) is the only significant predictor of Tobin's Q. The implication of this is that higher levels of Tobin's Q are positively associated with higher levels of market capitalisation but that the variables A5 and A10 hold no statistically significant predictive power.

The finding that ownership concentration does not influence firms financial performance as measured by the measure of Tobin's Q is supported by the findings of Demsetz and Lehn (1985) and Demsetz and Villalonga (2010) but contradict those of Morck, Schleifer and Vishny (1988), Holderness, Kroszner and Sheehan (1999) and

Elyasiani and Jia (2010) and Welch (Welch, 2003). It should, however, be noted that the principal focus of those studies was to consider the relationship between the ownership concentration of managers and other company officials and firm financial performance.

6.3.2. SHAREHOLDER CONCENTRATION AND TOBIN'S Q BY INDUSTRY

The results of the Tobin's Q regression model were further investigated on an industry basis. Regressions were run for six industries to understand the relationship between the independent variables and Tobin's Q. The table below provides a summary of the results.

Industry	Sample Size adequate?	Model Significant?	Independent Variable a Predictor?		
			A5	A10	Market Capitalisation
Consumer Goods	21	Yes	No	No	No
Consumer Services	35	Yes	No	No	Yes
Health Care Services	8	No	No	No	No
Industrials	64	No	No	No	No
Technology Services	18	No	No	No	No
Telecommunications Services	5	No	No	No	No

Table 11: Shareholder Concentration and Tobin's Q by Industry

From the table it can be seen that of the six industries only two of them had sample sizes which were statistically robust. The sample sizes for Health Care Services, Technology Services and Telecommunications Services were so small as to raise serious doubts about the statistical validity of the samples.

Of the six industries examined, only Consumer Goods and Consumer Services produced results which were statistically significant, i.e. the model indicated a statistically significant relationship between the dependent and independent variables. Most interestingly however, when the statistically significant results were further investigated, it appeared that only market capitalisation was a true predictor for Tobin's Q. Ownership concentration on either an A5 or A10 level was found not to be a predictor for Tobin's Q.

This result indicates that on an industry-level basis, ownership concentration does not appear to influence the financial performance of the firm as measured by Tobin's Q. Only one industry indicated that market capitalisation is a statistically significant predictor of financial performance of as measured by Tobin's Q.

6.3.3. SHAREHOLDER CONCENTRATION AND ROCE

An initial analysis of the scatterplots for the ROCE model indicated that the independent variables A5 and A10 hold no relationship to the ROCE measure of financial performance whilst the independent variable market capitalisation (Figure 18) appears to indicate a positive linear relationship.

The correlation matrix appears to confirm this initial analysis as there is a weak negative correlation between the log A5 shareholding and log ROCE of 10.85 percent, a weak negative correlation between the log A10 shareholding and log ROCE of 8.4 percent but a medium-strength positive correlation between the log market capitalisation and log ROCE of 31.12 percent.

The partial correlations indicate that the variables log A5 and log A10 do not significantly influence the correlation between log Tobin's Q and log market capitalisation. Consequently, it appears that only market capitalisation holds an influence on Tobin's Q. Interestingly however, log A10 however appears to be influenced by log market capitalisation.

The full regression model for ROCE indicated that the model explained a mere 7.17 percent of variance in performance, which was however revealed to be statistically significant, $F_{(3,138)} = 4.55$, $p < .0045$. An inspection of individual predictors revealed that Market Capitalisation (Beta = 0.0791, $p < 0.0016$) is a significant predictor of ROCE (performance). The implication of this is that higher levels of ROCE are positively associated with higher levels of market capitalisation but that the variables A5 and A10 hold no statistically significant predictive power. This finding is in alignment with the results of the Tobin's Q model although the Tobin's Q model appears to be more robust.

6.3.4. SHAREHOLDER CONCENTRATION AND ROCE BY INDUSTRY

The results of the ROCE regression model were further investigated on an industry basis. Regressions were run for six industries to understand the relationship between the independent variables and ROCE. The table below provides a summary of the results.

Industry	Sample Size adequate?	Model Significant?	Independent Variable a Predictor?		
			A5	A10	Market Capitalisation
Consumer Goods	18	No	No	No	No
Consumer Services	35	No	No	No	No
Health Care Services	8	No	No	No	No
Industrials	58	No	No	No	Yes
Technology Services	15	No	No	No	No
Telecommunications Services	5	No	No	No	No

Table 12: Shareholder Concentration and ROCE by Industry

From the table it can be seen that of the six industries only two of them had sample sizes which were statistically robust. The sample sizes for Health Care Services, Technology Services and Telecommunications Services were so small as to raise serious doubts about the statistical validity of the samples.

None of the industries examined produced results which were statistically significant, put otherwise, the ROCE model was not a statistically significant predictor of ROCE performance. Interestingly though, it appeared that market capitalisation was a predictor for ROCE for the Industrials industry. The model itself is not a statistically significant predictor of the dependent variable and thus this result can be ignored.

Ownership concentration on either an A5 or A10 level was found not to be a predictor for ROCE for any of the industries investigated.

This result indicates that on an industry-level basis, ownership concentration does not appear to influence the financial performance of the firm as measured by ROCE. Even market capitalisation appears to be a poor predictor and only found weak support in the Industrials industry.

Chapter 7:   SUMMARY OF FINDINGS

7.1. CONCLUSION

This study revealed two unexpected facts about South African listed industrial companies. The first is that the degree of ownership concentration is exceptionally high when compared to listed companies in developed markets. For example, the mean for A5 shareholding in South Africa is 42.71 percent and 51.57 at A10. By comparison, this level of shareholder concentration was not even reached on an A20 level (37.66 percent) in Demsetz and Lehn's (1985) study of 511 listed American firms.

The second key finding is that that amongst listed South African industrial shares there is no empirical support for the hypothesis that there is a relationship between ownership concentration and the financial performance of the firm. The regression analyses for both Tobin's Q and ROCE indicate that it is rather other variables which hold greater predictive power of firm's financial performance.

However, the analysis did reveal a statistically significant relationship between the market capitalisation of a firm and its financial performance. This finding is at odds with the theoretical underpinnings of Agency Theory which postulates an inverse relationship between ownership concentration and the financial performance of firms. As Berle and Means' (1932) hypothesised, larger firms are likely to have more diffused ownership which in turn breaks the link between ownership and control. The authors further argued that managers (agents) cannot be relied on to follow value-maximising strategies and that financial performance can therefore not be guaranteed.

This study found that there appears to be a size bias in the equity market for South African industrial firms. Firms which have larger market capitalisations tend to perform better than those with small market capitalisations. This holds true for both measures of financial performance investigated in this study. The identified relationship was particularly strong between increased market capitalisation and Tobin's Q.

This relationship was found not only on an aggregate basis but also on a sub-industry level with increased market capitalisations generally being associated with superior financial performance. This finding, however, is only statistically defendable in the Consumer Services and Industrials sub-industries as the population samples of the other samples were so small so as to raise questions around the statistical integrity of the results.

7.2. IMPLICATIONS FOR MANAGEMENT THEORY

Whilst the results of this study appear to contradict Berle and Means' (1932) hypothesis they do appear to be in alignment with Demsetz and Lehn (1985) & (2001) who focussed their research on investor decisions to hold concentrated or dispersed shares. Findings from their research indicate that the size of the firm and the stability of the market hold statistically important relationships with firms financial performance, particularly when measured against Tobin's Q.

The implication of the finding that firms with larger market capitalisations tend to financially outperform smaller firms raises important questions about Agency Theory's hypothesised principal / agent tension in the South African context. Could it be that more diffuse ownership structures actually enable professional managers to achieve superior financial returns by avoiding some of the private control benefits (PCBs) enjoyed by large shareholders as highlighted by Jensen and Meckling (1976). As highlighted by Krichmaier and Grant (2005) these PCBs can be significant and disadvantage both the firm and its shareholders.

Whilst not investigated statistically as part of this study, a feature of listed South African industrial firms is that there are extensive controlling minority structures (CMS) are prevalent, particularly amongst smaller and mid-sized firms. As highlighted by Bebchuk *et al.* (2000) in Cronqvist (2003), a CMS has the potential to create large agency costs. The structure combines the agency problem of the firm being controlled by an insider who owns a fraction of the equity (Jensen & Meckling, 1976), with the agency problem of the firm being controlled by an insider who is insulated from the influence of other

shareholders and the market of corporate control. Bebchuk *et al.* (2000) further show that a CMS structure can distort decisions regarding firm size, choice of projects, and transfers of control. This may explain the relative financial under-performance of the smaller firms in this study.

An alternative explanation may reside in the field of corporate governance. As South African listed firms have become increasingly subject to tight governance rules the scope for managerial abuse has waned. Concurrently, there has been a global trend toward the professionalising of management which may provide some explanation as to the superior ROCE figures of larger firms.

These findings of this study have wider implications for managerial theories of the firm in the South African context as they seem to suggest that the separation of ownership from control does not have any behavioural implications for the theory of the firm. While future research may point conclusively in this direction the results presented above do not allow us to come to this conclusion yet.

7.3. LIMITATIONS OF THE STUDY

The analysed data covers the timeframe of one year (2010/11) which witnessed a period of significant economic volatility which impacted firms revenues and profitability as well a market valuations. Unfortunately due to data constraints, multi-year regressions were not possible. Caution, therefore, should be exercised when considering these results as the economic climate may have impacted firms in differing ways. For example, smaller firms may have been more severely impacted due to their smaller balance sheets and more limited access to finance.

The financial performance measure of Tobin's Q is tangentially linked to market capitalisation and therefore caution should be exercised in the analysis of the Tobin's Q results.

As mentioned previously, whilst the total sample size was adequate for statistical purposes, the industry-level analysis should be treated with caution as four of the six

sectors had sample sizes which were so small as to raise concerns about the statistical inferences which could be drawn from them.

The shareholding data provided by McGregor BFA's data service provides the shareholder information on an entity basis. Where multiple shareholders are represented through a single entity, for example the Government Employee Pension Fund (GEPF), other collective investment vehicles or trusts it is not possible to identify the underlying shareholders and their effective interest in the firm. As mentioned previously, for purposes of this study, the 'entity' was assumed to be a single shareholder as the assumption is that the fund or trust administrator would act as a shareholder in relation to the firm and its management team. This data limitation may however have lead to an over-estimation of the effective ownership concentration in the analysed data set.

7.4. SUGGESTED FUTURE RESEARCH

Further investigation is recommended to investigate whether the type of ownership structures are related to firms financial performance. In particular, the relationship between managerial ownership and control and firm performance should be further investigated in the South African context. No recent studies have been performed in this field and the results of this study infer (though not prove) a possible relationship between managerial control and enhanced financial performance.

The suggested implication of this study, that professional managers in larger firms generate superior long-term wealth for shareholders, also needs to be tested. A significant finding in this regard would fundamentally undermine Agency Theory and may even have implications for the fields of corporate governance theory.

Whilst this study appears to indicate that larger firms tend to reward shareholders more than smaller firms this would need to be subject to further study based on total investment performance. For example, the effect of dividends was not taken into account in this study. Additionally, the timeframe of one year (2010/11) as well as the

fact that the sample period in question was during a period of market turbulence introduces further limitations on the reliability and applicability of this study.

In order to eliminate the possible effect of the recent global financial crisis from the reported results, it is suggested that a multi-year study be performed in order to confirm the finding that there is a statistically significant relationship between firm size and financial performance.

As the two models developed for the study (Tobin's Q and ROCE) have demonstrated only modest predictive power (principally through the variable of market capitalisation), further explanatory variables other than ownership concentration should be introduced into the analysis. Examples of such variables are insiders versus outsiders, the type of owners (for example collective investment schemes, trusts etc.) and the life stage of the business itself.

As the sample size, whilst sufficient for statistical purposes, was quite small compared to other studies it may be worthwhile to consider including firms listed on the JSE's AltX board as these tend to be smaller companies with far more varied financial performances and ownership concentrations. Including these firms in a study may generate stronger signals either in support of the hypothesis that ownership concentration and financial performance are related or against it.

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Appendix A: LIST OF ANALYSED FIRMS

I: CONSUMER GOODS INDUSTRY

| No. | Company Name | JSE Ticker | AGM | Independent Variables | | Dependent Variables | | Include / Exclude from sample? | Notes / Rationale for exclusion |
			Date of AGM	Market Capitalisation	A5 Shareholding	A10 Shareholding	Tobin's Q (Standardised)	Return on Capital		
10	Afgri Limited	AFR	15/10/2010	R 2 159 145 585	24.30%	32.95%	3.04	13.23%	Include	
28	Amalgamated Appliance Holdings Limited	AMA	05/11/2010	R 403 160 409	46.36%	56.33%	0.88	14.28%	Include	
42	Astral Foods Limited	ARL	10/02/2011	R 4 990 427 984	32.47%	39.27%	2.59	19.61%	Include	
46	AVI Limited	AVI	19/10/2010	R 11 016 589 638	37.32%	45.36%	2.88	14.29%	Include	
48	Awethu Breweries Limited	AWT	08/02/2011	R 2 536 707	56.35%	61.72%	3.2	-73.16%	Include	
67	British American Tobacco Plc	BTI	28/04/2011	R 693 264 068 523	2.49%	3.21%	2.35	20.08%	Exclude	Primary listing abroad
75	Capevin Investments Limited	CVI	22/10/2010	R 3 276 000 000	63.97%	66.69%	0.85	10.25%	Include	
92	Clover Industries Limited	CLR	None	R 1 997 097 317					Exclude	Clover listed on the 14/12/2010
98	Compagnie Financiere Richemont SA	CFR	08/09/2010	R 210 470 400 000	85.77%	86.90%	2.78	12.91%	Exclude	Primary listing abroad
106	Country Bird Holdings Limited	CBH	22/11/2010	R 929 518 840	76.92%	81.45%	1.35	11.39%	Include	

107	Crookes Brothers Limited	CKS	22/07/2011	R 544 940 000	43.50%	51.59%	0.95	2.34%	Include	
120	Distell Group Limited	DST	20/10/2010	R 13 963 319 909	88.02%	89.12%	2.35	17.68%	Include	
122	Dorbyl Limited	DLV	20/10/2010	R 95 396 157	65.25%	78.46%	0.95	-32.42%	Include	
176	Illovo Sugar Limited	ILV	19/07/2011	R 10 985 125 052	14.64%	19.99%	1.89	10.49%	Include	
183	Intertrading Limited	ITR	None	R 500 000					Exclude	Currently suspended - Cash shell
225	Metair Investments Limited	MTA	04/05/2011	R 2 423 731 494	49.82%	62.09%	1.45	21.42%	Include	
256	Nu-world Holdings Limited	NWL	09/02/2011	R 407 636 370	47.17%	58.59%	0.87	11.93%	Include	
259	Oceana Group Limited	OCE	11/02/2011	R 4 440 429 348	20.31%	26.47%	3.32	28.47%	Include	
280	Pioneer Food Group Limited	PFG	18/02/2011	R 11 983 522 514	23.77%	29.49%	1.6	14.77%	Include	
295	Rainbow Chicken Limited	RBW	30/07/2010	R 5 559 037 141	70.36%	73.75%	1.83	20.89%	Include	Change in financial year end
320	SABMiller Plc	SAB	21/07/2011	R 434 722 505 975	6.08%	7.49%	2.06	11.13%	Exclude	Primary listing abroad
332	Seardel Investment Corporation Limited	SER	25/10/2010	R 535 001 776	90.53%	93.90%	0.46	-1.92	Include	
344	Sovereign Food Investments Limited	SOV	13/07/2011	R 357 280 803	30.68%	47.03%	0.7	7.67%	Include	
350	Steinhoff International Holdings Limited	SHF	07/12/2010	R 37 973 868 196	25.99%	38.09%	1.23	11.11%	Include	
365	Tiger Brands Limited	TBS	15/02/2011	R 39 675 311 844	28.17%	37.13%	3.88	26.75%	Include	
366	Tongaat Hulett Limited	TON	29/07/2011	R 9 451 276 290	24.29%	32.92%	1.73	9.32%	Include	

II: Consumer Services Industry

No.	Company Name	JSE Ticker	Date of AGM	Market Capitalisation	A5 Shareholding	A10 Shareholding	Tobin's Q (Standardised)	Return on Capital	Include / Exclude from sample?	Notes / Rationale for exclusion
			AGM	**Independent Variables**			**Dependent Variables**			
1	1TIME Holdings Limited	1TM	10/06/2011	R 86 800 000	36.74%	47.84%	1.42	31.61%	Include	
9	ADVTech Limited	ADH	17/05/2011	R 2 356 928 504	25.79%	39.12%	3.88	25.06%	Include	
12	African and Overseas Enterprises Limited	AON	17/11/2010	R 162 199 056	88.41%	92.41%			Exclude	No reliable data available
17	African Media Entertainment Limited	AME	20/10/2010	R 396 902 168	49.78%	60.10%	3.3	32.86%	Include	
47	Avusa Limited	AVU	20/09/2010	R 2 799 719 832	37.16%	45.92%	1.46	12.22%	Include	
82	Cashbuild Limited	CSB	06/12/2010	R 2 541 651 930	24.26%	40.93%	2.53	24.12%	Include	
83	Caxton CTP Publishers and Printers	CAT	06/12/2010	R 6 991 737 620	33.58%	39.69%	1.23	10.06%	Include	
89	City Lodge Hotels Limited	CLH	11/11/2010	R 2 742 721 224	30.59%	40.93%	3.55	22.99%	Include	
90	Clicks Group Limited	CLS	18/01/2011	R 10 433 638 918	38.70%	51.35%	9.05	42.39%	Include	
95	Comair Limited	COM	28/10/2010	R 1 027 270 589	57.42%	69.56%	1.46	14.64%	Include	
96	Combined Motor Holdings Limited	CMH	25/05/2011	R 1 190 184 303	74.50%	83.67%	2.17	17.37%	Include	
108	Cullinan Holdings Limited	CUL	25/02/2011	R 574 684 163	96.88%	97.42%	2.75	15.57%	Include	
137	Famous Brands Limited	FBR	29/06/2011	R 4 009 980 253	42.15%	55.75%	4.75	29.56%	Include	

162	Holdsport Limited	HSP	None	R 1 380 807 040					Exclude	Holdsport listed on the 18/07/2011
173	IFA Hotels and Resorts Limited	IFH	25/10/2010	R 89 466 379	97.97%	98.47%	2.87	2.10%	Include	
192	Italtile Limited	ITE	26/11/2010	R 4 484 664 447	69.44%	79.21%	2.33	16.78%	Include	
195	JD Group Limited	JDG	17/02/2011	R 6 564 250 000	27.14%	38.40%	1.5	8.47%	Include	
199	Kagiso Media Limited	KGM	25/11/2010	R 2 194 186 406	11.57%	16.48%	2.69	27.32%	Include	
208	Lewis Group Limited	LEW	13/08/2010	R 7 074 881 742	30.60%	40.40%	2.06	15.82%	Include	
219	Massmart Holdings Limited	MSM	24/11/2010	R 31 495 964 489	39.24%	53.31%	6.47	35.14%	Include	
239	Mr Price Group Limited	MPC	27/08/2011	R 16 942 227 880	33.33%	44.83%	7.4	51.87%	Include	
247	Naspers Limited	NPN	26/08/2011	R 146 962 706 871	37.60%	49.05%	0.94	9.53%	Include	
253	Nictus Beperk	NCS	24/08/2011	R 104 214 825	49.28%	52.97%	-0.9	14.18%	Include	
275	Phumelela Gaming and Leisure Limited	PHM	08/12/2010	R 848 120 735	24.41%	37.74%	2.13	18.79%	Include	
276	Pick n Pay Holdings Limited	PWK	13/06/2011	R 8 040 548 501	54.89%	59.73%	4.16	20.65%	Include	
277	Pick n Pay Stores Limited	PIK	13/06/2011	R 17 774 700 877	66.59%	72.86%	7.79	21.82%	Include	
310	Rex Trueform Clothing Company Limited	RTO	17/11/2010	R 46 492 880	94.18%	97.28%	0.17	15.60%	Include	
337	Shoprite Holdings Limited	SHP	25/10/2010	R 62 907 747 495	36.83%	49.87%	7.53	36.06%	Include	
346	Spur Corporation Limited	SUR	10/12/2010	R 1 288 753 396	25.66%	42.51%	2.94	20.74%	Include	
353	Sun International Limited	SUI	25/11/2010	R 9 193 122 008	11.28%	18.05%	2.37	12.29%	Include	
356	Taste Holdings Limited	TAS	04/08/2011	R 197 663 485	50.50%	67.56%	0.92	13.87%	Include	

362	The Don Group Limited	DON	03/03/2011	R 73 621 326	27.79%	33.33%	0.53	-4.21%	Include	
363	The Foschini Group Limited	TFG	01/09/2010	R 21 245 614 610	35.86%	47.44%	4.08	18.37%	Include	
364	The Spar Group Limited	SPP	14/02/2011	R 16 495 392 384	25.65%	33.65%	8.69	36.96%	Include	
375	Truworths International Limited	TRU	04/11/2010	R 32 581 723 574	41.97%	56.88%	6.19	39.81%	Include	
376	Tsogo Sun Holdings Limited	TSH	15/06/2011	R 21 132 828 158	78.97%	83.45%	1.77	7.44%	Include	
382	Verimark Holdings Limited	VMK	08/07/2010	R 175 979 385	67.70%	79.73%	2.35	47.27%	Include	
398	Woolworths Holdings Limited	WHL	18/11/2010	R 30 073 619 988	30.11%	37.35%	5.8	25.88%	Include	

			AGM	Independent Variables			Dependent Variables			
No.	Company Name	JSE Ticker	Date of AGM	Market Capitalisation	A5 Shareholding	A10 Shareholding	Tobin's Q (Standardised)	Return on Capital	Include / Exclude from sample?	Notes / Rationale for exclusion
7	Adcock Ingram Holdings Limited	AIP	27/01/2011	R 10 628 640 626	24.88%	32.02%	3.63	26.85%	Include	
21	Afrocentric Investment Corporation Limited	ACT	15/12/2010	R 612 978 881	49.61%	57.31%	0.98	6.83%	Include	
40	Aspen Pharmacare Holdings Limited	APN	25/11/2010	R 39 310 938 804	27.73%	36.77%	2.9	15.33%	Include	
88	Cipla Medpro SA Limited	CMP	25/05/2011	R 2 973 873 935	33.49%	41.98%	1.81	13.70%	Include	
210	Life Healthcare Group Holdings Limited	LHC	27/01/2011	R 19 729 030 568	36.82%	48.31%	3.06	19.31%	Include	
211	Litha Healthcare Group Limited	LHG	11/08/2011	R 955 414 403	34.55%	49.04%	2.04	19.19%	Include	
221	Medi-Clinic Corporation Limited	MDC	28/07/2011	R 22 100 443 753	71.05%	76.33%	1.16	6.31%	Include	
250	Netcare Limited	NTC	21/01/2011	R 19 035 804 860	29.93%	37.62%	1.46	7.85%	Include	
7	Adcock Ingram Holdings Limited	AIP	27/01/2011	R 10 628 640 626	24.88%	32.02%	3.63	26.85%	Include	

IV: INDUSTRIALS INDUSTRY

No.	Company Name	JSE Ticker	AGM	Independent Variables			Dependent Variables		Include / Exclude from sample?	Notes / Rationale for exclusion
			Date of AGM	Market Capitalisation	A5 Shareholding	A10 Shareholding	Tobin's Q (Standardised)	Return on Capital		
8	Adcorp Holdings Limited	ADR	24/06/2011	R 1 524 218 340	16.30%	26.59%	1.96	15.10%	Include	
20	Afrimat Limited	AFT	03/08/2011	R 573 049 648	45.76%	59.87%	0.8	10.22%	Include	
22	AG Industries Limited	AGI	None	R 43 181 470					Exclude	Currently suspended - In liquidation
26	Allied Electronics Corporation Limited	ATN	15/07/2011	R 2 615 310 992	69.31%	75.22%	0.83	14.52%	Include	
29	Amalgamated Electronic Corporation Limited	AER	19/11/2010	R 147 392 287	56.78%	67.42%	0.91	21.69%	Include	
37	ARB Holdings Limited	ARH	17/10/2010	R 752 000 000	8.14%	10.92%	1.12	14.93%	Include	
39	Argent Industrial Limited	ART	24/08/2010	R 666 750 081	26.44%	37.01%	0.85	5.77%	Include	
43	Astrapak Limited	APK	28/09/2010	R 1 054 023 750	44.15%	51.36%	1.19	10.17%	Include	
44	Austro Group Limited	ASO	02/03/2011	R 223 130 415	46.37%	64.58%	0.49	4.42%	Include	
45	Aveng Limited	AEG	21/10/2010	R 13 680 372 990	25.82%	34.94%	1.19	15.91%	Include	
50	Barloworld Limited	BAW	26/01/2011	R 14 112 833 755	31.28%	43.43%	1.25	4.57%	Include	
51	Basil Read Holdings Limited	BSR	26/05/2011	R 1 652 877 357	26.64%	39.28%	1.14	13.55%	Include	
55	Bell Equipment Limited	BEL	19/07/2011	R 1 410 126 300	47.90%	52.79%	0.95	6.78%	Include	

56	Best Cut Limited	BCH							Exclude	Delisted - 27/05/2011
63	Bowler Metcalf Limited	BCF	11/11/2010	R 742 795 754	39.77%	51.65%	1.59	20.37%	Include	
69	Buildmax Limited	BDM	24/11/2010	R 413 365 913	58.73%	69.49%	0.64	15.06%	Include	
72	Cafca Limited	CAC	21/05/2011	R 30 600 000			0.6	15.30%	Exclude	No prior AGM in SENS anouncements
80	Capricorn Investment Holdings Limited	CPN	None	R 960 000					Exclude	Currently suspended
81	Cargo Carriers Limited	CRG	05/08/2011	R 210 000 000	23.15%	24.99%	0.74	4.73%	Include	
85	Ceramic Industries Limited	CRM	26/11/2010	R 2 130 746 940	66.33%	73.49%	1.66	14.05%	Include	
97	Command Holdings Limited	CMA	None	R 1 322 500					Exclude	Currently suspended
101	Consolidated Infrastructure Group	CIL	15/04/2011	R 995 768 361	58.87%	76.55%	0.87	6.13%	Include	2009 data used for financial measures
102	Control Instruments Group Limited	CNL	15/06/2011	R 58 563 437	53.05%	68.07%	0.64	6.83%	Include	
116	Digicore Holdings Limited	DGC	24/11/2010	R 743 007 816	35.51%	43.42%	1.44	8.23%	Include	
121	Distribution and Warehousing Network Limited	DAW	14/01/2011	R 1 198 812 091	48.84%	59.74%	1.58	7.50%	Include	
126	ELB Group Limited	ELR	23/11/2010	R 677 200 000	26.64%	34.51%	1.5	12.21%	Include	
127	Ellies Holdings Limited	ELI	17/11/2010	R 576 660 813	54.38%	64.07%	1.36	13.19%	Include	
130	Eqstra Holdings Limited	EQS	17/11/2010	R 3 167 859 417	28.85%	37.13%	0.96	-4.54%	Include	
132	Esorfranki Limited	ESR	24/06/2011	R 632 296 688	20.78%	35.62%	1.07	-2.26%	Include	
134	Excellerate Holdings Limited	EXL	14/01/2011	R 201 870 319	68.86%	79.03%	0.88	12.68%	Include	
157	Grindrod Limited	GND	25/05/2011	R 7 139 775 893	30.57%	37.97%	2.09	9.68%	Include	
158	Group Five Limited	GRF	13/10/2010	R 3 191 223 330	22.18%	30.67%	1.43	0.00%	Include	

166	Howden Africa Holdings Limited	HWN	02/06/2011	R 953 072 081	19.56%	26.49%	3.43	24.33%	Include	
167	Hudaco Industries Limited	HDC	24/03/2011	R 2 611 037 445	31.05%	41.01%	1.49	13.02%	Include	
175	Iliad Africa Limited	ILA	19/05/2011	R 718 732 529	25.78%	38.81%	1.87	5.43%	Include	
178	Imperial Holdings Limited	IPL	03/11/2010	R 23 070 076 590	30.63%	41.21%	1.59	10.28%	Include	
188	Invicta Holdings Limited	IVT	29/07/2011	R 3 560 635 976	35.46%	48.51%	1.51	16.85%	Include	
193	Jasco Electronics Holdings Limited	JSC	26/10/2010	R 146 399 336	53.36%	59.83%	0.81	3.99%	Include	
200	Kairos Industrial Holdings Limited	KIR	24/06/2011	R 2 521 070	78.76%	81.93%	7.78	-31.27%	Include	
201	KAP International Holdings Limited	KAP	26/11/2010	R 1 018 736 777	78.71%	83.87%	1.07	10.57%	Include	
202	Kaydav Group Limited	KDV	28/04/2011	R 62 436 707	65.22%	70.81%	0.76	4.79%	Include	
204	Kelly Group Limited	KEL	22/02/2011	R 355 000 000	40.68%	52.31%	1.82	20.76%	Include	
216	Marshall Monteagle Plc	MMP	14/02/2011	R 211 559 321	30.11%	33.91%			Exclude	No reliable data available
218	Masonite (Africa) Limited	MAS	11/05/2011	R 272 501 606	27.14%	29.33%	0.63	-0.01%	Include	
220	Mazor Group Limited	MZR	30/06/2011	R 154 306 972	53.11%	67.75%	0.89	0.04%	Include	
228	Metrofile Holdings Limited	MFL	30/11/2010	R 979 404 590	52.51%	59.47%	1.73	16.01%	Include	
229	Micromega Holdings Limited	MMG	15/07/2011	R 203 040 672	34.61%	37.46%	0.69	4.68%	Include	
231	Mix Telematics Limited	MIX	07/09/2010	R 926 370 000	54.32%	66.56%	1.31	16.72%	Include	
233	Mobile Industries Limited	MOB	30/06/2011	R 10 680 397	52.95%	63.92%	1.35	4.77%	Include	
237	Morvest Bus Group Limited	MOR	30/08/2011	R 169 789 653	34.27%	46.39%	0.86	13.82%	Include	
238	Mpact Limited	MPT	None	R 2 162 132 554					Exclude	Mpact listed on the 11/07/2011

241	Murray and Roberts Holdings Limited	MUR	27/10/2010	R 8 861 532 927	32.90%	44.25%	1.94	11.44%	Include	
245	Mvelaserve Limited	MVS	None	R 1 557 178 403					Exclude	Mvelaserve listed on the 29/11/2010
246	Nampak Limited	NPK	01/02/2011	R 14 364 612 325	21.40%	26.43%	1.9	16.17%	Include	
249	Net 1 UEPS Technologies Limited	NT1	29/11/2010	R 2 919 979 750	28.14%	28.98%	3.03	18.39%	Include	A5 and A10 figures shourced from PSG & McGregor data
285	Pretoria Portland Cement Company Limited	PPC	31/01/2011	R 13 687 078 186	29.11%	38.22%	5.2	32.42%	Include	
286	Primeserv Group Limited	PMV	02/07/2010	R 52 825 097	55.88%	70.91%	1.28	18.89%	Include	Change in financial year end - 2009 data
287	Protech Khuthele Holdings Limited	PKH	22/09/2010	R 181 250 000	49.71%	62.45%	1.03	13.02%	Include	
299	Raubex Group Limited	RBX	08/10/2010	R 2 398 967 298	44.02%	53.25%	1.39	16.61%	Include	
306	Remgro Limited	REM	18/08/2010	R 54 846 126 180	20.08%	26.01%	0.77	4.85%	Include	
309	Reunert Limited	RLO	08/02/2011	R 11 716 928 424	32.83%	41.96%	3.39	19.97%	Include	
327	Sanyati Holdings Limited	SAN	25/07/2011	R 108 192 655	27.69%	43.24%	0.41	7.56%	Include	
331	Sea Kay Holdings Limited	SKY	11/02/2011	R 39 109 138	60.35%	73.74%	1.54	-19.33%	Include	
342	South Ocean Holdings Limited	SOH	22/06/2011	R 218 930 312	50.57%	63.02%	0.57	7.26%	Include	
349	Stefanutti Stocks Holdings Limited	SSK	27/08/2010	R 2 125 312 430	39.82%	48.65%	1.1	17.60%	Include	
354	Super Group Limited	SPG	29/11/2010	R 2 782 132 436	18.08%	24.24%	1.27	8.57%	Include	
361	The Bidvest Group Limited	BVT	15/11/2010	R 48 054 770 370	35.51%	43.97%	2.47	15.26%	Include	

371	Transpaco Limited	TPC	03/12/2010	R 472 779 119	44.13%	58.21%	1.34	21.60%	Include	
373	Trencor Limited	TRE	30/06/2011	R 6 006 712 374	35.33%	47.54%	1.19	7.60%	Include	
379	Universal Industries Corporation Limited	UNI	02/06/2011	R 1 131 060 241	60.46%	71.03%	1.59	12.55%	Include	
381	Value Group Limited	VLE	08/09/2010	R 724 989 959	56.89%	67.23%	1.14	15.46%	Include	
395	Wilson Bayly Holmes-Ovcon Limited	WBO	27/10/2010	R 6 844 200 000	36.97%	44.96%	2.68	29.82%	Include	
396	Winhold Limited	WNH	31/02/2011	R 175 439 032	48.00%	61.60%	0.91	10.28%	Include	

V: TECHNOLOGY SERVICES INDUSTRY

No.	Company Name	JSE Ticker	AGM Date of AGM	Independent Variables Market Capitalisation	A5 Shareholding	A10 Shareholding	Dependent Variables Tobin's Q (Standardised)	Return on Capital	Include / Exclude from sample?	Notes / Rationale for exclusion
6	Adaptit Holdings Limited	ADI	22/10/2010	R 62 255 687	39.97%	56.15%	1.52	19.85%	Include	
11	Africa Cellular Towers Limited	ATR	17-Aug-11						Exclude	
25	Alliance Mining Corporation Limited	ALM	None						Exclude	Currently suspended - In liquidation
70	Business Connexion Group Limited	BCX	13/01/2011	R 2 122 055 732	16.00%	24.10%	1.03	11.79%	Include	
99	Compu-Clearing Outsourcing Limited	CCL	08/12/2010	R 125 299 335	9.80%	13.06%	2.79	19.62%	Include	
103	Convergenet Holdings Limited	CVN	21/01/2011	R 192 174 348	63.79%	75.73%	0.6	6.25%	Include	
109	Datacentrix Holdings Limited	DCT	10/06/2011	R 866 221 182	56.28%	68.06%	2.84	18.85%	Include	
110	Datatec Limited	DTC	11/08/2010	R 7 136 267 494	30.68%	35.75%	1.58	9.79%	Include	
129	EOH Holdings Limited	EOH	23/02/2011	R 2 157 700 492	25.46%	34.42%	2.65	19.50%	Include	
138	Faritec Holdings Limited	FRT	None	R 18 915 446					Exclude	Currently suspended - In liquidation
149	Gijima Group Limited	GIJ	20/11/2010	R 600 381 575	40.49%	49.84%	1.43	31.24%	Include	A5 and A10 figures sourced from PSG & McGregor data
179	Indequity Group Limited	IDQ	01/02/2011	R 32 925 000	86.09%	92.25%	2.95	10.41%	Include	
196	John Daniel Holdings Limited	JDH	28/01/2011	R 12 612 189	77.70%	82.34%	-8.73	2410.62%	Include	ROCE & TQ figures may be outliers for technical

										reasons
207	Labat Africa Limited	LAB	11/11/2010	R 76 890 248	55.49%	71.87%	0.58	-21.12%	Include	Used 2009 financial figures as latest available
242	Mustek Limited	MST	02/12/2010	R 586 077 333	47.11%	60.00%	1	11.60%	Include	
271	Paracon Holdings Limited	PCN	08/03/2011	R 646 975 912	64.06%	73.62%	2.59	22.41%	Include	
272	PBT Group Limited	PBT	18/01/2011	R 408 648 886	84.91%	90.20%			Exclude	No reliable data available
279	Pinnacle Technology Holdings Limited	PNC	29/10/2010	R 1 686 328 675	23.86%	33.68%	1.57	25.16%	Include	
333	Securedata Holdings Limited	SDH	26/01/2011	R 147 792 163	57.93%	67.46%	1.42	17.72%	Include	
343	Southern Electricity Company Limited	SLO	12/11/2010	R 10 989 635	3.63%	4.91%	0.8	16.03%	Include	
347	Square One Solutions Group Limited	SQE	None	R 443 944					Exclude	Currently suspended - In liquidation
351	Stella Vista Technologies Limited	SLL	28/01/2011	R 7 943 658	12.61%	16.63%	1.35	-28.02%	Include	
368	Total Client Services Limited	TCS	29/10/2010	R 7 802 694	64.26%	77.50%	1.84	-19.94%	Include	
378	UCS Group Limited	UCS	28/01/2011	R 156 370 339	34.82%	43.51%	1.22	12.47%	Include	

VI: TELECOMMUNICATIONS SERVICES INDUSTRY

No.	Company Name	JSE Ticker	AGM Date of AGM	Independent Variables Market Capitalisation	A5 Shareholding	A10 Shareholding	Dependent Variables Tobin's Q (Standardised)	Return on Capital	Include / Exclude from sample?	Notes / Rationale for exclusion
27	Allied Technologies Limited	ALT	20/07/2011	R 6 258 649 377	10.61%	14.27%	3.32	27.45%	Include	
61	Blue Label Telecoms Limited	BLU	12/10/2010	R 3 709 186 727	49.44%	59.94%	1.61	22.00%	Include	
240	MTN Group Limited	MTN	22/06/2011	R 255 947 397 178	28.63%	41.35%	2.99	21.94%	Include	
359	Telkom SA Limited	TKG	30/08/2011	R 17 290 025 414	16.42%	23.12%	0.63	7.07%	Include	
385	Vodacom Group Limited	VOD	04/08/2011	R 137 442 310 980	81.41%	83.57%	5.73	46.93%	Include	A5 and A10 figures sourced from PSG Online & McGregor data

All data was sourced from McGregor BFA's data service as well as PSG Online.

Appendix B: DESCRIPTIVE STATISTICS

I: A5 SHAREHOLDING (LOG TRANSFORMED VALUES)

Figure 25: Log A5 Shareholding Distributions
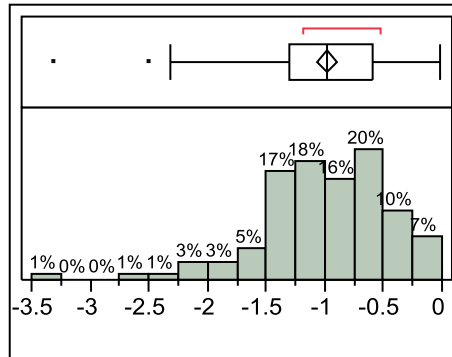
Quantiles

100.0%	Maximum	-0.0205
99.5%		-0.0205
97.5%		-0.0936
90.0%		-0.3655
75.0%	Quartile	-0.5944
50.0%	Median	-0.9856
25.0%	Quartile	-1.2941
10.0%		-1.5849
2.5%		-2.2553
0.5%		-3.3159
0.0%	Minimum	-3.3159

Moments

Mean	-0.980577
Std Dev	0.5283011
Std Err Mean	0.0427106
Upper 95% Mean	-0.896194
Lower 95% Mean	-1.06496
N	153

II: A10 SHAREHOLDING (LOG TRANSFORMED VALUES)

Figure 26: Log A10 Shareholding Distribution
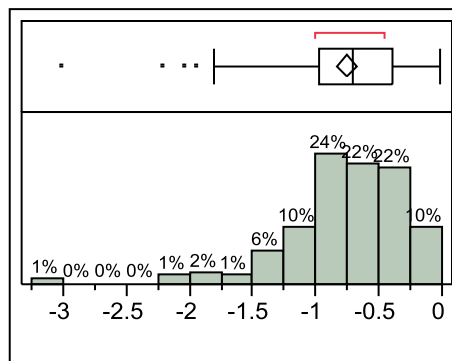
Quantiles

100.0%	maximum	-0.0154
99.5%		-0.0154
97.5%		-0.0576
90.0%		-0.2382
75.0%	quartile	-0.3956
50.0%	median	-0.7125
25.0%	quartile	-0.9798
10.0%		-1.3289
2.5%		-1.9603
0.5%		-3.0139
0.0%	minimum	-3.0139

Moments

Mean	-0.751521
Std Dev	0.4616637
Std Err Mean	0.0373233
Upper 95% Mean	-0.677782
Lower 95% Mean	-0.825261
N	153

III: TOBIN'S Q (LOG TRANSFORMED VALUES)

Figure 27: Log Tobin's Q Distribution
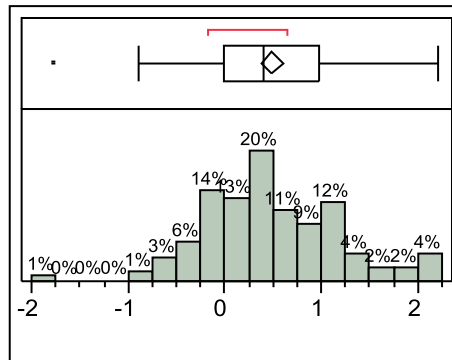
Quantiles

100.0%	maximum	2.20276
99.5%		2.20276
97.5%		2.05178
90.0%		1.35584
75.0%	quartile	0.983
50.0%	median	0.40879
25.0%	quartile	-0.0152
10.0%		-0.2931
2.5%		-0.7244
0.5%		-1.772
0.0%	minimum	-1.772

Moments

Mean	0.4907555
Std Dev	0.6846165
Std Err Mean	0.0555297
Upper 95% Mean	0.6004711
Lower 95% Mean	0.3810399
N	152

IV: ROCE (Log Transformed Values)

Figure 28: Log ROCE Distribution
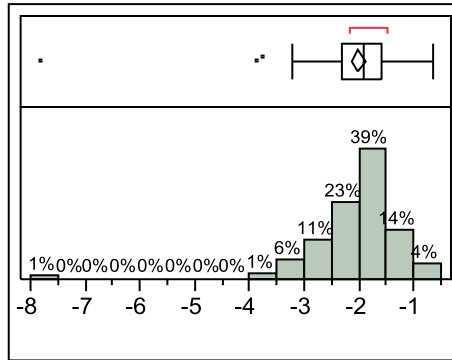
Quantiles

100.0%	maximum	-0.6564
99.5%		-0.6564
97.5%		-0.8099
90.0%		-1.2225
75.0%	quartile	-1.5742
50.0%	median	-1.9072
25.0%	quartile	-2.2939
10.0%		-2.79
2.5%		-3.4749
0.5%		-7.824
0.0%	minimum	-7.824

Moments

Mean	-2.00624
Std Dev	0.7740026
Std Err Mean	0.0654152
Upper 95% Mean	-1.876903
Lower 95% Mean	-2.135578
N	140

V: Market Capitalisation (Log Transformed Values)

Figure 29: Log Market Capitalisation Distribution
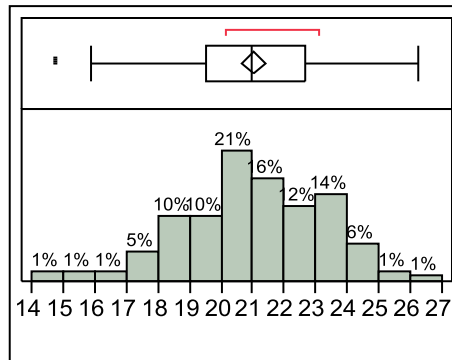
Quantiles

100.0%	maximum	26.2682
99.5%		26.2682
97.5%		24.9822
90.0%		23.7773
75.0%	quartile	22.6887
50.0%	median	20.9769
25.0%	quartile	19.5554
10.0%		18.2064
2.5%		15.8852
0.5%		14.7402
0.0%	minimum	14.7402

Moments

Mean	21.034522
Std Dev	2.2303952
Std Err Mean	0.1803168
Upper 95% Mean	21.390773
Lower 95% Mean	20.678271
N	153

Appendix C: TOBIN'S Q STATISTICAL OUTPUTS

I: TOBIN'S Q WHOLE MODEL RESULTS (UNTRANSFORMED)

Tobin's Q correlation matrix (Untransformed)

Multivariate

Correlations

	Tobin's Q_(Standardised)	Market Capitalisation	A5 Shareholding	A10 Shareholding
Tobin's Q_(Standardised)	1.0000	0.2431	-0.0371	-0.0433
Market Capitalisation	0.2431	1.0000	-0.0629	-0.0615
A5 Shareholding	-0.0371	-0.0629	1.0000	0.9794
A10 Shareholding	-0.0433	-0.0615	0.9794	1.0000

Figure 30: Tobin's Q Correlation Matrix

Tobin's Q partial correlation matrix

Partial Corr

	Tobin's Q_(Standardised)	Market Capitalisation	A5 Shareholding	A10 Shareholding
Tobin's Q_(Standardised)	.	0.2415	0.0302	-0.0355
Market Capitalisation	0.2415	.	-0.0198	0.0087
A5 Shareholding	0.0302	-0.0198	.	0.9794
A10 Shareholding	-0.0355	0.0087	0.9794	.

partialed with respect to all other variables

Figure 31: Tobin's Q Partial Correlation Matrix

II: TOBIN'S Q FOR PERFORMANCE BY INDUSTRY

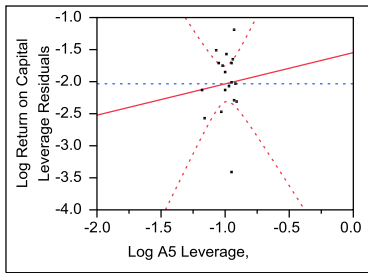### Consumer Goods Industry Scatterplots
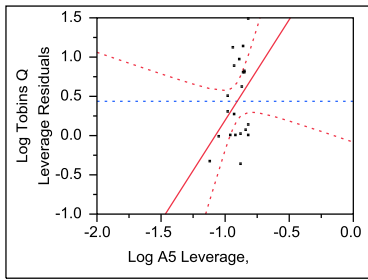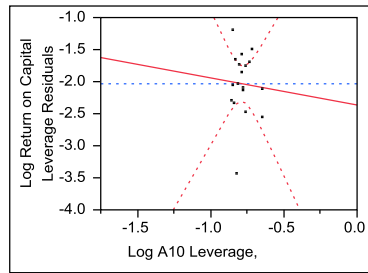

Figure 32: Log A5 Leverage Point
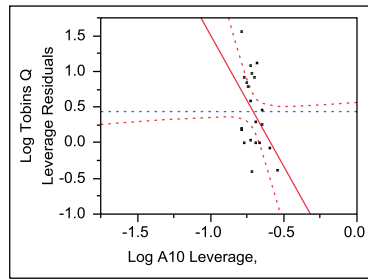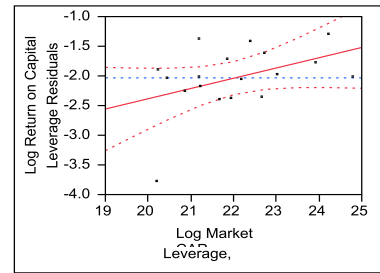
Figure 33: Log A10 Leverage Point
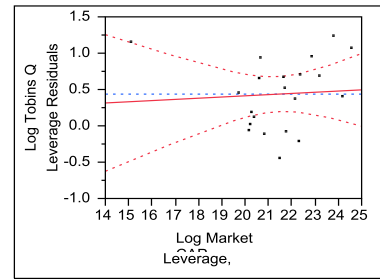
Figure 34: Log Market Capitalisation Leverage Point

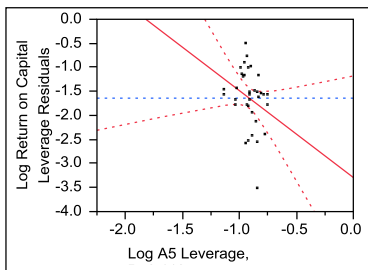### Consumer Services Industry Scatterplots
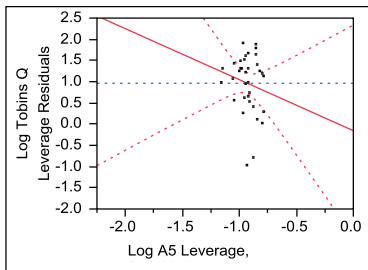
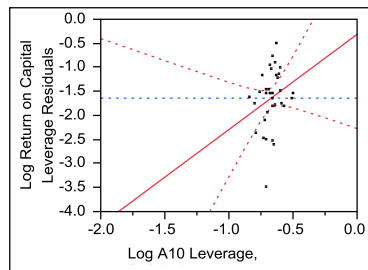Figure 35: Log A5 Leverage Point
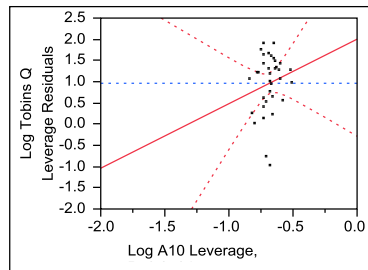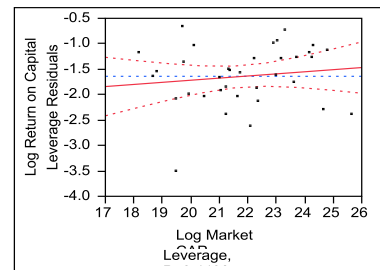
Figure 36: Log A10 Leverage Point
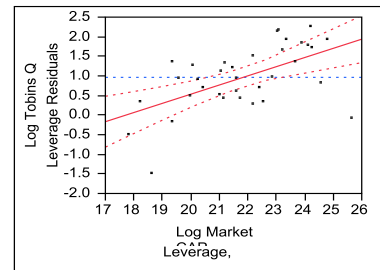
Figure 37: Log Market Capitalisation Leverage Point
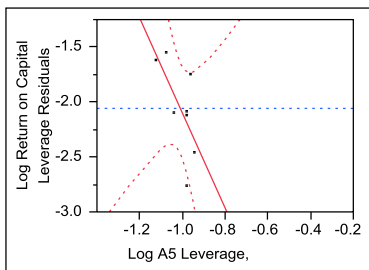
Health Care Services Industry Scatterplots
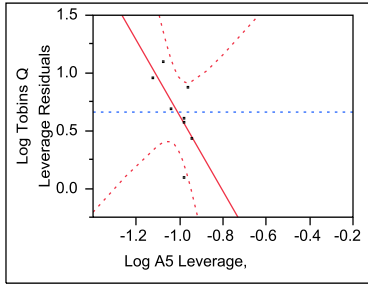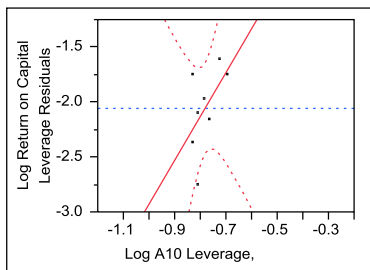

Figure 38: Log A5
Leverage Point
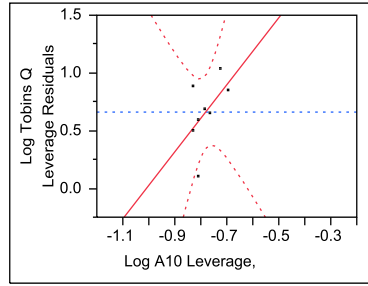
Figure 39: Log A10
Leverage Point
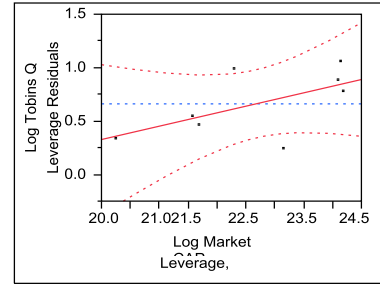
Figure 40: Market
Capitalisation Leverage
Point

Industrials Industry Scatterplots
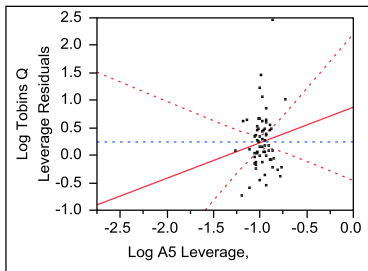
Figure 41: Log A5
Leverage Point
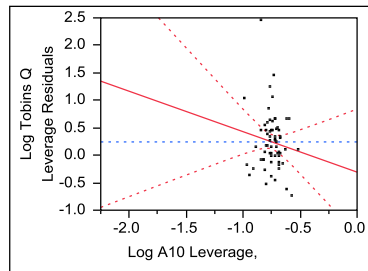
Figure 42: Log A10
Leverage Point
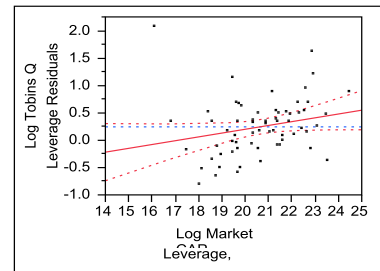
Figure 43: Log Market
Capitalisation Leverage
Point

Technology Services Industry
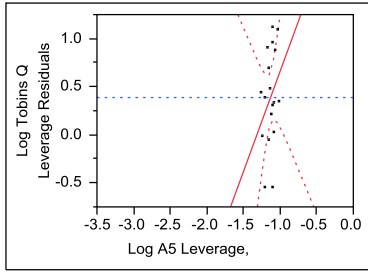
Figure 44: Log A5

Leverage Point
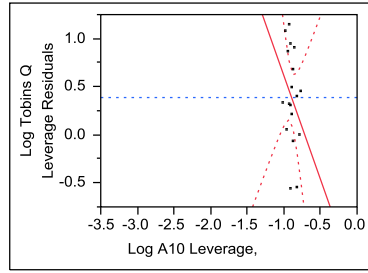
Figure 45: Log A10

Leverage Point
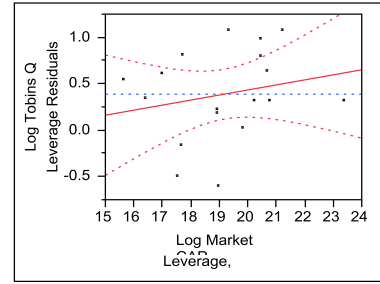
Figure 46: Log Market

Capitalisation Leverage

Point

Telecommunications Services Industry Scatterplots
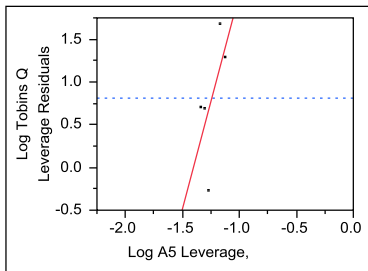
Figure 47: Log A5

Leverage Point
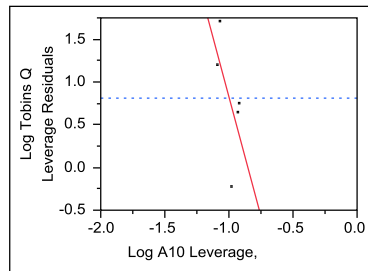
Figure 48: Log A10

Leverage Point
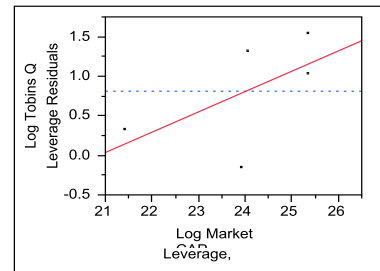
Figure 49: Log Market

Capitalisation Leverage

Point

Appendix D: ROCE STATISTICAL OUTPUTS

I: ROCE WHOLE MODEL RESULTS (UNTRANSFORMED)

ROCE correlation matrix

Multivariate

Correlations

	Return on Capital	Market Capitalisation	A5 Shareholding	A10 Shareholding
Return on Capital	1.0000	0.1441	-0.2259	-0.1971
Market Capitalisation	0.1441	1.0000	-0.0617	-0.0599
A5 Shareholding	-0.2259	-0.0617	1.0000	0.9796
A10 Shareholding	-0.1971	-0.0599	0.9796	1.0000

Figure 50: Return on Capital Employed Correlation Matrix

ROCE partial correlation matrix

Partial Corr

	Return on Capital	Market Capitalisation	A5 Shareholding	A10 Shareholding
Return on Capital	.	0.1345	-0.1663	0.1246
Market Capitalisation	0.1345	.	0.0073	-0.0137
A5 Shareholding	-0.1663	0.0073	.	0.9791
A10 Shareholding	0.1246	-0.0137	0.9791	.

partialed with respect to all other variables

Figure 51: ROCE Partial Correlation Matrix

II: ROCE FOR PERFORMANCE BY INDUSTRY

Consumer Goods Industry Scatterplots

Figure 52: Log A5 Leverage Point

Figure 53: Log A10 Leverage Point

Figure 54: Log Market Capitalisation Leverage Point

Consumer Services Industry Scatterplots

Figure 55: Log A5 Leverage Point
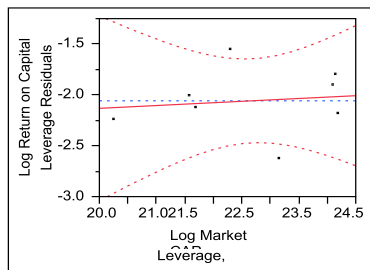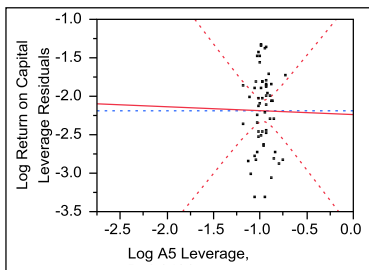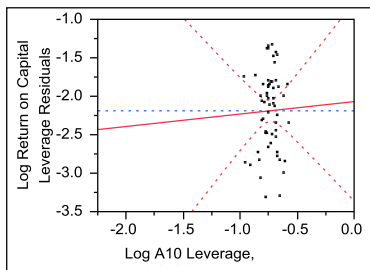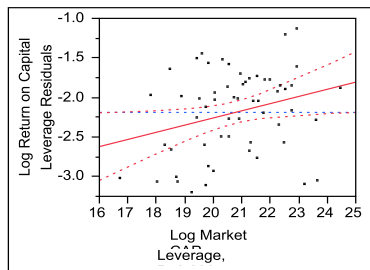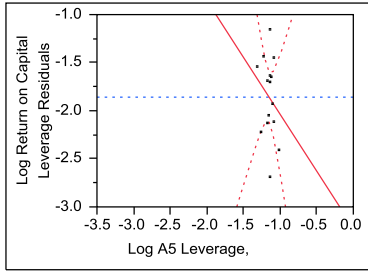
Figure 56: Log A10 Leverage Point

Figure 57: Log Market Capitalisation Leverage Point

Health Care Services Industry Scatterplots

Figure 58: Log A5
Leverage Point

Figure 59: Log A10
Leverage Point

Figure 60: Log Market
Capitalisation Leverage
Point

Industrials Industry Scatterplots

Figure 61: Log A5
Leverage Point

Figure 62: Log A10
Leverage Point

Figure 63: Log Market
Capitalisation Leverage
Point

101

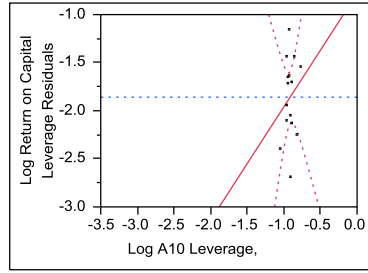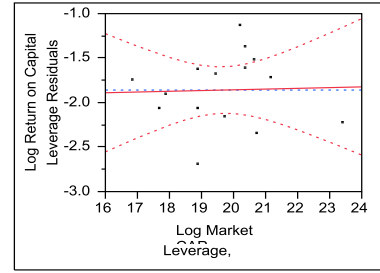## Technology Services Industry Scatterplots

Figure 64: Log A5

Leverage Point

Figure 65: Log A10

Leverage Point

Figure 66: Log Market

Capitalisation Leverage

Point

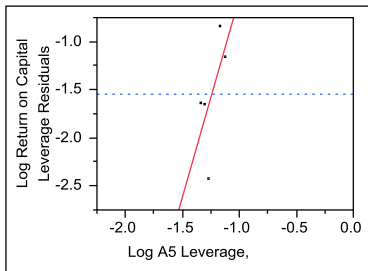## Telecommunications Services Industry Scatterplots
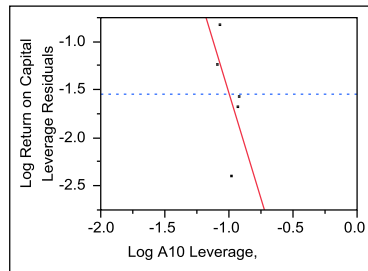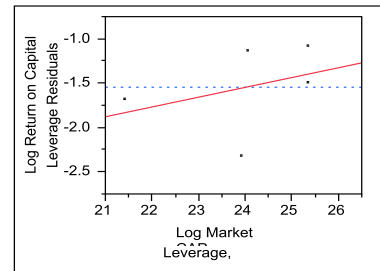

Figure 67: Log A5

Leverage Point

Figure 68: Log A10

Leverage Point

Figure 69: Log Market

Capitalisation Leverage

Point