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UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
School of Accountancy
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Board Structure and Company Performance in South Africa

A research report in partial fulfillment (50%) of the requirements for the degree of Master of Commerce

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Declaration

I declare that this research report is my own original work and that all sources have been accurately reported and acknowledged. It is submitted for the degree of Masters of Commerce to the University of Witwatersrand, Johannesburg. This research has not been submitted for any degree or examination at this or any other university.

Naomi-Pearl Swartz Date

Dedication

This thesis is dedicated to my husband Gary and to my unborn baby, Logan.

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I would like to express my gratitude to my supervisor, Associate Professor Steven Firer, for his continual guidance, wisdom, and support. I would also like to express my sincere appreciation to my husband Gary for his continual input and support.

Abstract

Academic and commercial interest in the corporate governance practices of publicly listed companies has increased significantly in the past five to ten years. High-profile corporate failures such as Enron and Worldcom have heightened the interest in corporate governance practices. This research study's primary aim is to explore the contribution of board structure to company performance in South Africa. The majority of prior corporate governance literature has centered and focused on the relationship between board structure and company performance where performance is measured in terms of traditional measures. This research study follows the themes of Mitchell Williams (2000a), which diverges from this prior body of literature in two primary ways; first, the relationship between board structure and company performance is investigated where performance is defined by intellectual capital performance; and second, unlike the majority of prior literature that utilised data from the United States, data was collected and analysed from a sample of South African companies listed on the JSE Securities Exchange.

The population included all South African companies listed on the JSE Securities Exchange during 2003 with the final sample consisting of 117 companies after transformation of the data. Board composition was analysed in terms of 1) the percentage of women on the board of directors; 2) the percentage of colour members on the board of directors; 3) the percentage of non-executive directors on the board of directors; 4) the percentage of non-executive directors on the audit and remuneration committees; and 5) chairperson duality.

Results of the regression equations provide support for the proposition that there is a positive and significant relationship between the percentage of colour members on the board of directors, and intellectual capital performance for South African publicly listed companies. An insignificant relationship was observed between the percentage of women and the percentage of non-executive directors on the board of directors, the percentage of non-executive directors on the audit and remuneration committees and chairperson duality and company performance.

This research study therefore suggests that performance of South African companies listed on the JSE Securities Exchange is influenced by board composition when defined by the percentage of colour members on the board of directors.

Key words: Intellectual capital; performance; board structures; emerging economies; gender; colour.

Chapter 1- Introduction

1.1 Corporate governance and board structure

The relationship between corporate governance practices and company performance has been of significant interest to academic researchers and the general public for several decades. This interest has heightened in the last five to ten years following the incidence of high profile corporate failures. One of the important elements of corporate governance that has received attention is the structure of the board of directors. A board of directors is viewed as a team of individuals with fiduciary responsibilities of leading and directing a firm, with the primary objective of protecting the firm's shareholders' interests (Abdullah, 2004). The board of directors is thus responsible for the setting of corporate goals, which aim at realising long-term shareholder value. The importance of the board of directors arises as a result of the separation of ownership and management in modern companies; the owners of the company are not responsible for deciding on the direction and daily operations of the company. The daily operations of the firm are in the hands of a team of professional managers who, at best, own a negligible amount of equity (Abdullah, 2004). The separation between ownership and control has resulted in a potential conflict of interest (Berle and Means, 1932). Agency theory argues that when management interest is low, there is a greater likelihood that the management involves itself in value-decreasing activities (Jensen and Meckling, 1976).

The role of the board of directors is to monitor the performance of the company so that the interest of shareholders is protected (Kosnik, 1987). It is predicted that if the board performs its duties effectively, the value of the company is likely to increase, and the wealth of the shareholders will therefore be enhanced.

1.2 Limitations of previous research

Despite the importance of the results and empirical findings from previous investigations on the relationship between board structure and company performance, there are two primary limitations to the value of such findings. First,

the majority of empirical studies examining the relationship between board structure and company performance have relied on data obtained from first world markets such as the United States and United Kingdom (see, for example, Hermalin and Weisbach, 1991; Agrawal and Knoeber, 1996;Klein, 1996; Brickley, Coles and Jarrell, 1997). It is questionable whether these results can be extended and applied to other regions of the world, particularly emerging markets such as South Africa where capital flow is limited, markets are less sophisticated, production is more labour intensive due to the cheaper cost of labour, and limited educational and professional resources (Van Staden, 1998).

Second, with the exception of Mitchell Williams (2000a), previous studies have analysed the relationship between board structure and company performance by measuring performance using traditional measures such as return on assets and return on equity. A growing number of political leaders, academic researchers, and corporate executives are however recognizing the significance of a company's intellectual capital to its performance and future viability. Results and findings from previous studies examining the relationship between board structure and company performance using traditional performance measures, may be of question in the future given that intellectual capital is projected to become the "pivotal factor in corporate growth and development" (Luthy, 1998).

The increasing importance of a company's intellectual capital is illustrated by empirical works such as Luthy (1998) who states that intellectual capital is "becoming the preeminent resource for creating economic wealth". The role of intellectual capital in creating value has become crucial in achieving a competitive advantage in the market place (Usoff, 2002). This role is highlighted by Drucker (1993, p.54) who states that "knowledge has become the key economic resource and the dominant and perhaps even the only source of competitive advantage".

The creation, management, and maintenance of intellectual capital fall within a field that is broadly known as knowledge management; knowledge management has become the new mantra of modern organisations seeking to compete in an

increasingly turbulent and competitive world (Firer and Mitchell Williams, 2003). It is increasingly accepted that the only true competitive advantage for organisations over the long term is knowledge i.e. how organisations create or acquire knowledge, how organisations retain and store knowledge, how organisations disseminate and use knowledge, and how organisations protect and manage the knowledge that they have (Dzinkowski, 2000).

In today's knowledge-based economy, three of the most hidden dynamic factors of an organisation are its knowledge and know-how, which is created by and stored in its people (human capital), its relationships (social capital), and its organisational information technology systems and processes (organisational capital) (Edvinsson and Malone, 1997).

This study follows the themes of Mitchell Williams (2000a), first, the relationship between board structure and company performance is analyzed using data drawn from a sample of South African companies listed on the JSE Securities Exchange, and second, the *Value Added Intellectual Co-efficient* (*VAIC* ^{TM}), a measure of a company's intellectual capital potential, is used to measure company performance. The importance of this study is established within the South African context given the significance of emerging economies to the overall well-being and balance of the global economy; and the resulting importance of establishing an understanding of the development of intellectual capital in different socio-political and economic settings (Firer and Mitchell Williams, 2003).

1.3 A South African focus

A major feature of this research study is its focus on South Africa. A number of key reasons support this focus; South Africa is an emerging economy seeking to attract foreign capital and investment and it is not always easy to distinguish South Africa from the common perception of the entire Southern African region, as illustrated by the Rand's volatility and the events in Zimbabwe (PricewaterhouseCoopers, 2003). The adoption of strong corporate governance standards and practices would

contribute to the perception that South Africa is a suitable destination for foreign capital.

The King Report on Corporate Governance for South Africa (The King Report, 1994), incorporating a Code of Corporate Practices and Conduct was developed as an initiative of the Institute of Directors of Southern Africa to promote corporate governance practices in South Africa. The King Report 1994 was the first of its kind to be issued in South Africa and was internationally considered to be a comprehensive publication on corporate governance. Evolving global economies and legislative developments led to the King Committee on Corporate Governance releasing an updated version of the report, the King Report 2002 (King II). King II recognizes the importance of board structure, accountability and independence to effective corporate governance. King II contains guidelines and standards on good corporate governance practices, and in essence adopts the concept of stakeholder reporting. The existence of King II establishes the relevance of this study within the South African context. A more comprehensive review of the relevant provisions of King II is contained in Chapter 2.

South Africa has experienced aggressive transition across nearly all-social, economic and political aspects since the abolition of apartheid in 1994, and the election of the first democratic government. During the apartheid years, labour laws were restrictive in that they did not encourage equal employment opportunities and diversity at board level. Employment opportunities were very much defined by characteristics such as race and gender. This phenomenon has decreased since 1994 with the introduction of the Employment Equity Act and Affirmative Action practices, which legislate equal opportunities across all persons, irrespective of race or gender. South Africa is also considered to be a virtual microcosm of the world in terms of its colour diversity, level of economic development, standard of living and economic infrastructure; it is believed that such diversity better facilitates an examination of the effect of gender and race (Mitchell Williams, 2000a). A further reason for the interest in South Africa is that with the exception of Mitchell Williams (2000a), research in the African region is

currently underrepresented in the existent literature; recent editions of South African journals such as Meditari-Accounting Research and the SA Journal of Accounting Research have published limited research on corporate governance practices and issues pertaining to the African region. Investigation of corporate governance issues pertaining to Africa needs to be undertaken to establish whether findings from other global regions can be broadened to include Africa. South Africa is considered to be a dominant nation within the African region (Mitchell Williams, 2000c). The relevance of this research study is further enhanced as data was obtained from publicly listed South African companies nine years post the introduction of democracy and subsequent to the publication of King II thereby providing evidence as to the contribution of employment equity and diversity in determining company performance.

It is submitted that the results and empirical findings of this research study may be of interest to regulators, investors, corporate executives, special interest groups and academic researchers not only in South Africa, but in other regions of the world. For example, given their influence on the direction and nature of the South African business environment, policy makers could utilize the findings to determine whether amendments to present policies are required in order to promote and further the development of employment equity and corporate governance practices and policies. Findings may be of interest as this study expands on the prior limitations facing empirical results from previous board structure, corporate governance studies. Research of a company's intellectual capital performance is still within its infancy as much of the debate in this area has focused on the measurement of this concept (Guthrie and Petty, 2000). Evidence from this study assists in determining the value of the *VAIC*^{TM}, developed by the Austrian Center for Intellectual Capital, for future application in performance based accounting studies.

1.4 Scope and methodology

Company performance of South African publicly listed companies included in this study was measured for the 2003 fiscal year. The relationship between various

board characteristics and company performance for the aforementioned time was examined. A number of previous studies (see, for example, Kesner, 1998; Provan, 1980) submit that companies with greater gender and colour diversity in their employee pools appear to outperform more homogenous employee structures. Improved performance is alleged to result from a broader base of innovation and understanding of views and perceptions of fellow employees, customers and the relevant public at large (see, for example, Heidrick and Struggles, 1996; Kotz, 1998; Daily, Certo and Dalton, 1999). Companies with a broader employee base may therefore be better able to adapt and change to the dynamic conditions of the new "knowledge-based" economy whilst offering a more conducive work environment that leads to greater efficiency in processing activities (Kotz, 1998). Based on these submissions, this study adopts the proposal that boards with greater colour and gender diversity contribute towards improved company performance through the promotion of greater innovation, understanding of customer perceptions, and a willingness to change and adapt.

A second board characteristic examined in this research study was the ratio of executive to non-executive directors. Wang and Dewhist (1992) suggest that the higher the percentage of non-executive directors on the board, the higher the quality of monitoring and, therefore improved company performance. In a similar vein, the separation of the chairperson and chief-executive officer roles is believed to increase the quality of monitoring, and ultimately the performance of the company (Rechner and Dalton, 1991). Finally, previous studies, such as Vafeas and Theodorou (1998), argue that an increased percentage of non-executive directors on standing committees, such as audit, remuneration and nomination committees, contribute towards improved company performance.

Company performance was measured using the Pulic (1998) measure of intellectual capital performance. Multiple regression analysis was used to investigate the relationship between this measure of company performance and board composition. Contrary to initial expectations, empirical results of this research report suggest a positive, insignificant relationship between board

composition, with the exception of colour representation on the board of directors and company performance.

1.5 Limitations

The scope of this research study is to examine the relationship between board structure and company performance for South African companies listed on the JSE Securities Exchange for the 2003 fiscal year. A limitation of this research study is that women, persons of colour and non-executive directors in leadership positions was simply measured as the percentage of women, persons of colour or non-executive directors on the board of a given company; this measure does not take into account changes in the board composition of a given company and the date of appointment or length of service. Similarly, this research study does not take cognizance of the positions held by female or persons of colour on the board of directors, or the education or industry experience of board members. The composition of the board of directors for South African companies listed on the JSE Securities Exchange for the 2003 year-end was analysed and reviewed manually. Whilst every effort was taken to analyse and capture the board composition carefully, and steps were taken to verify the information, errors may still exist in the documented make-up and composition of the board.

1.6 Organisation of the report

Chapter two reviews the literature and research studies underlying the following key concepts highlighted in the research report:

1) corporate governance and stakeholder- agency theory;
2) gender and colour diversity on a board of directors;
3) executive versus non-executive directors on a board of directors;
4) chairperson duality;
5) composition of audit and remuneration committees.

Research problems and hypotheses are developed in chapter three. Chapter four examines the research framework; whilst methodology issues are examined and highlighted in chapter five. An analysis and interpretation of research results are

contained in chapter six. Summary conclusions, limitations and directions for future research are set out in chapter seven.

Chapter 2- Literature Review

2.1 Introduction

The relationship between company performance and corporate governance has been of interest to academics, researchers and the general public for the past several decades; with a heightened interest in the past five to ten years following the demise of large corporate organizations such as Enron. One of the most important elements of corporate governance that has received attention is the structure and composition of the board of directors. A board of directors is broadly viewed as a team of individuals with fiduciary responsibilities of leading and directing a company, with the primary objective of protecting the company's shareholders' interests (Abdullah, 2004). The importance of the board of directors arises as a result of the dispersion of ownership in today's modern companies, which rely heavily on external sources of capital (Abdullah, 2004). This research study has identified five characteristics of board structure that are considered to have significance to the overall effectiveness and success of a board of directors, and thus to the overall performance of a company. These five characteristics are broadly described as (a) gender and colour diversity on the board of directors; (b) chairperson of the board/chief executive officer duality; (c) ratio of executive and non-executive directors on the board of directors; and (d) percentage of non-executive directors on the audit and remuneration committees of a company.

The chapter begins with a discussion of the measures of corporate performance and identifies the dependent variable of the study. The chapter further reviews the literature underlying the theories of corporate governance and stakeholder-agency theory; including a review of the provisions of the King Report on Corporate Governance (King II) that relate to board composition. The chapter then examines the research that underlies the importance of gender and colour diversity on a board of directors and studies that investigate the relationship between gender and colour diversity and company performance as well as the literature on the proportion of executive and non-executive directors on a company's board of

directors and the resulting impact on an entity, including its level of performance. The chapter then discusses the research underlying the concept of chairperson duality and the perceived effects on company performance. Finally, the literature surrounding the significance of the composition of the audit and remuneration committees and the possible effects on company performance is reviewed.

2.2 Measure of dependent variables

A precise definition of corporate performance proves to be highly illusive despite frequent use by various special interest stakeholder groups, scholars and policy makers alike (Firer and Mitchell-Williams, 2003). The lack of consensus may arise because this concept is associated with a variety of facets of a firms overall wellbeing, ranging from financial profitability to output levels to market returns (Firer and Mitchell-Williams, 2003). Such measures are however of limited use as they rely on financial statement information which is based on historic cost accounting. In a paper discussing the limitations of accounting, Flegm (1989) concludes that one cannot reliably measure the value of a business or predict it's future success using annual financial statements. Two examples of major limitations of financial statements discussed by Flegm (1989) are historic cost accounting and non-recognition of internally generated goodwill. Furthermore, the paper argues that financial statements represent a summary of past events, and say very little about future prospects of the company. The question regarding the usefulness of annual financial statements in determining firm value is also evident in the increasing gap in the book to market ratio (Lev and Sougiannis, 1999).

A further step away from traditional measures has emerged in the form of resource-dependence theories and intellectual capital valuation models, which indicate that all facets of human resources need to be fully incorporated into valuation models (see, for example, Barney, 1991; Grant, 1991; Pulic, 1998; Sveiby, 2000, 2001). These theories argue that human resource assets enable a firm to increase its performance and wealth-creation potential. Diversification of a firm's human resource structure, with regard to its colour and gender mix, is often viewed as a necessary requirement to optimize this essential resource (Siciliano,

1996). Human resource diversity provides a variety of advantages. Iles and Auluck (1993), for example, suggested that a diversified workforce facilitates greater problem solving skills and synergy. Katzenbach and Associates (1995) argued that diversity promotes wider creativity and flexibility that enables a firm to adjust more rapidly to the changing and dynamic business environment. In particular, corporate governance researchers regularly suggest a diversified and well-balanced board of directors can significantly enhance a firm's performance (see, for example, Agrawal and Knoeber, 1996; Buck et al., 1998; Williams and O'Reilly, 1997).

Resource-dependence and corporate governance theorists recognize a board of directors as an essential mechanism that can enhance and create the coalitions with the stakeholders controlling resources required by a firm (Westphal and Milton, 2000). Each director brings a collection of unique and different experiences, attachments and points of view to a board (Wang and Dewhirst, 1992). If members' perceptions, views and backgrounds are relatively homogenous in nature there is a higher likelihood that decision-making strategies of this corporate governance mechanism will be single-minded, predictable and inflexible (Westphal and Zajac, 1998). Boards with a more diverse mix of members will better enable it to address the challenges of an uncertain and dynamic business environment (Daily, Certo and Dalton, 1999; Gilbert and Ivancevich, 2000). From the literature a variety of reasons can be suggested to support how greater colour and gender diversity can enhance a board's influence on a firm's performance. For example, dissimilarities in the colour and gender backgrounds of directors can contribute different sociological perceptions and understandings to the decision-making process (Coffey and Wang, 1998). As a result, a board is better able to instigate more comprehensive policies, strategies, activities and projects (Cox and Blake, 1991). Greater colour and gender diversity also enhances the board's flexibility in its decision-making process due to a wider set of perceptions and views (Gilbert and Ivancevich, 2000). This will enable a firm to better facilitate strategic change (Wiersema and Bantel, 1992). Consequently, a firm will be able to respond more rapidly to changes in the dynamic and uncertain business environment of the Information Age.

In the context of human resources, Cox and Blake (1991) suggested increased colour and gender diversity on a board of directors enhances a firm's ability to compete for skilled employees in the labour market. Consequently, firm intellectual capital performance will be promoted. A more diversified board will be better able to develop well-rounded recruiting policies and strategies, and working conditions attractive to a broader spectrum of potential employees and exploit its existing human resource capital (Powell, 1990; Shrader, Blackburn and Iles, 1997). Diversity is thought to intensify the sensitivity of a board to requirements of the workforce, thereby, enabling it to increase the capacity to instigate work practice initiatives addressing the needs of its employees and employee pressure groups such as unions (Shrader, Hoffman and Stearns, 1991). Also, diversification enables a board and firm to react more readily to changing workforce conditions, including those of a sensitive nature such sexual harassment (Daum, 1998; Gilbert and Ivancevich, 2000; Westphal and Zajac, 1998). Overall, a diversified board of directors enables a firm to create alliances and coalitions with a broader spectrum of human resources. Hence, a greater range of knowledge, skills and capabilities can be accumulated and exploited, thereby increasing a firm's intellectual capital potential.

Greater board diversity can also improve a firm's performance through its influence over other components of performance measurement, such as that related to consumers. With developments in information technology and increased globalization the consumer base of many firms have widened (Stewart, 1997). Firms best able to encapsulate this expanded consumer base will gain a considerable competitive advantage (Luthy, 1998). A diversified board of directors will enable a firm to generate broader initiatives, such as advertising and consumer policies, demonstrating greater imagination and sensitivity (Bilimoria and Piderit, 1994). These broader initiatives will hopefully appeal to the wider consumer audience enabling the firm to establish and sustain relationships with customers (Pfeffer and Salancik, 1978; Wang and Dewhirst, 1992; Young, Stedham and Beekun, 2000). Further, as customers' tastes change, firms having greater flexibility in their decision-making structure will be better able to make rapid adjustments to

maintain or improve it position (Laughlin, 1992; Moscovivi and Faucheaux, 1972; Nemeth, 1986).

Valuation models suggested for the measurement of intellectual capital performance of boards of directors by the papers of Agrawal and Knoeber (1996), Buck et al. (1998), and Williams and O'Reilly (1997) include the models of Barney (1991), Grant (1991), Pulic (1998), Sveiby (2000), (2001).

For the purposes of conducting the multiple regression analysis for this research study, the dependant variable has been defined as intellectual capital, in the form of the Value Added Intellectual Coefficient (VAIC^{TM}) (Pulic, 1998), choice of this measure is fully documented in Chapter 5.

2.3 Corporate governance and stakeholder-agency theory

This section of the chapter reviews the literature underpinning the theory of corporate governance and stakeholder-agency theory and discusses the provisions of the King Report on Corporate Governance (King II) that relate to board composition. The existence of King II establishes the relevance of this research study within the South African context.

The majority of studies examining the relationship between board characteristics and company performance have utilised economic based theoretical perspectives of corporate governance. Such theoretical perspectives have traditionally postulated two essential mechanisms of governance; namely markets and corporate hierarchies (Hollingsworth, Schmitter and Streeck, 1994, p.5). The Simple Finance Model of corporate control, as identified by Hawley and Williams (1996), is perhaps the leading example of the view that corporate governance is only reliant upon markets and corporate hierarchies; the model defines the essential issue of corporate governance "to construct rules and incentives (that is, implicit and explicit contract) to effectively align the behaviour of managers (agents) with the desires of principals (owners)" (Hawley and Williams, 1996, p.21). The construction of rules and incentives are generally designed to deal with the

actions of management with respect to the company's physical capital. Blair (1995, p.322) however stated, that the "goal of directors and management should be maximizing total wealth creation by the firm." The relevance of corporate control models that only identify two modes of governance is questionable when considering the increasing importance of a company's intellectual capital to its future survival and performance. This is because the management and monitoring of intellectual capital will involve interaction with alternative stakeholder groups, such as employees, unions, consumers, and consumer groups. As a result, it may be necessary to consider broader theoretical models of corporate control. Hollingsworth and Lindberg (1985 p221-222), for example, extended the two mode approach to governance in identifying "four distinctive forms of governance ….market, hierarchies, the clan or community and associations." Each of the four modes identified by Hollingsworth and Lindberg (1985) are "separate logic of collective action and social order" (Streeck and Schmitter, 1985, p.11). The stakeholder model of corporate control as identified by Hawley and Williams (1996), adopts the four mode approach stipulated by Hollingsworth and Lindberg (1985). This model implies that the company "is a system of stakeholders operating within the larger system of the host society that provides the necessary legal and market infrastructure for the firm's activities. The purpose of the firm is to create wealth or value for its stakeholders by converting their stakes into goods and service" (Clarkson, 1994, p.2). It is beyond the scope of this research study to evaluate the respective theoretical corporate control models. Rather, this research study adopts the perception that theories of corporate governance that emphasise two modes of control are not necessarily wrong, but fail to go into sufficient depth to capture the entire scope of corporate governance. Such theoretical perspectives do offer insights but do have limited application with respect to intellectual capital. Similarly, theories with a four mode point of view offer insights that are of relevance to the discussion of the relationship between corporate governance and company performance including intellectual capital performance. In an effort to recognise the respective shortcomings of the traditional mainstream view of corporate governance and those of new emerging perceptions, this study adopts stakeholder-agency theory as the underlying theoretical perspective.

Hill and Jones (1992) argue that agency theory, the dominant theoretical framework used to explain corporate governance and firm performance relationships, may be equally conceptualized as a 'nexus of contracts' between various stakeholders other than just management and shareholders. Apart from extending the narrow view of agency theory to encompass other stakeholders, there are three other major features of stakeholder-agency theory. First, stakeholder-agency theory adopts a broad definition of corporate governance activities. That is, "relatively successful *governance can take a variety of forms*, and hybrid forms are quite explicable and not unusual" (Buck, Filatochev and Wright, 1998, p.87). It is important for any successful company that there must be a form of effective control present that limits and controls managerial power. This control can be generated and implemented by various stakeholders that can constrain the actions of management through various combinations of governance measures, such as voicing of complaints, or withdrawal of financial facilities, products, or similar reactive signals (Buck et al., 1998). Another important feature of stakeholder-agency theory is that it provides for the notion of a *time-dimension (*Hill and Jones, 1992). In a constantly changing business environment that is subject to considerable uncertainty, such as that exhibited in South Africa particularly during the 1990's, this scenario leads to short-term market imperfections. In recognition of this fact, stakeholder- agency theory acknowledges that control over management in the short-term is imperfect but in the *long run* market processes work to select the most efficient organizational forms (Hill and Jones, 1992). Finally, stakeholder-agency theory redefines the position of senior management in a company; Stakeholder-agency theory assumes senior management to be the dominant stakeholders in a firm rather than being seen as the principal managerial agent of shareholders' interests (Hill and Jones, 1992).

Corporate governance can be described as the "concrete means by which stakeholders try to control dominant managers, rather than as a vague concept of the means by which corporate decisions are determined abstractedly" (Buck et al., 1998, pp. 86-87). Consistent with the Anglo-

American approach of corporate governance, corporate governance can also be defined as the process and structure used to direct and manage the business affairs of the company towards enhancing business prosperity and corporate accountability with the ultimate objective of realizing long-term shareholder value, whilst taking into account the interest of other stakeholders (The Cadbury Committee, 1992). The Cadbury Committee (1992, p.15) defines corporate governance as the "system by which companies are directed and controlled". The concern of corporate governance has been with both the accountability of the boards of directors and with the board effectiveness (Cadbury, 1997). In essence, stakeholder-agency theory suggests that corporate governance may be instigated and implemented by the various stakeholders of a company. Within a stakeholder-agency framework this research report examines the relationship between company performance and board composition defined by: (a) gender and colour diversity on the board of directors; (b) chairperson/chief executive officer duality; (c) ratio of executive and non-executive directors on the board of directors; and (d) percentage of non-executive directors on the audit and remuneration committees of a company.

2.3.1 King Report on Corporate Governance for South Africa, 2002

In 1994 the King Report on Corporate Governance (King I) was published by the King Committee on Corporate Governance, headed by former High Court judge, Mervyn King S.C. King I, incorporating a Code of Corporate Practices and Conduct, was the first of its kind in the country and was aimed at promoting the highest standards of corporate governance in South Africa (Institute of Directors of South Africa, 1994 and 2002).

Over and above the financial and regulatory aspects of corporate governance, King I advocated an integrated approach to good governance in the interests of a wide range of stakeholders. As a result of evolving global economic markets together with legislative developments the need arose to update King 1; to this end the King Committee on Corporate Governance developed the King Report on Corporate Governance for South Africa, 2002 (King II). King II acknowledges that there is a move away from the single bottom line (that is,

profit for shareholders) to a triple bottom line, which embraces the economic, environmental and social aspects of a company's activities.

King II highlights the importance of directors' responsibilities and board composition. It is recommended that South African companies have a unitary board structure that comprises executive and non-executive directors, preferably with a majority of non-executive directors, of whom a sufficient number should be independent of management in order to ensure the protection of minority shareholders' interests. Paragraph 2.2 of the Code (Institute of Directors of South Africa, 2002) specifies that South African companies should consider the demographics in relation to the composition of the board. An executive director is defined as a director involved in the day to day management and/or in the full time employ of the company, and/or any of its subsidiaries; in contrast, a non-executive director is a director not involved in the day to day management of the company and not a full time salaried employee of the company or any of its subsidiaries (Cliffe Dekker, 2002).

King II further discusses the functions of the board of directors which can be summarised as follows:

1) The board must retain full and effective control over the company and be responsible for monitoring management in respect of implementation of board plans and strategies;

2) The board has the duty of ensuring that the company complies with all the relevant laws, regulations and codes of business practice;

3) The board is ultimately responsible for the affairs of the company. The delegation of authority to any committee does not discharge the responsibility of the board in respect of the actions and decisions of a committee;

4) The board must give strategic direction to the company;

5) The board is responsible for the appointment of the chief executive officer and the succession process;

6) It is recommended that the board has an agreed procedure whereby directors are able to seek independent professional advice, should the

need arise. The professional services procured should be at the company's expense;

7) The board should develop a corporate code of conduct that addresses issues that relate, *inter alia*, to conflicts of interest, particularly relating to directors and management;

8) Insofar as it is practical, the board is responsible for assessing and rectifying issues in respect of the size, diversity and demographics of the company;

9) The board is responsible for identifying risk areas and performance indicators in respect of the company;

10) The board is also responsible for the monitoring and assessment of the non-financial aspects pertaining to the company;

11) The board should aim to conform to the governance constraints while simultaneously performing in an innovative and entrepreneurial way.

King II makes a clear distinction between the position of chief executive officer and chairperson of the board; the chairperson is responsible for the effective functioning of the board and the chief executive officer is responsible for the running of the company's business. The report specifies that the positions should be separated and in the instance that the roles are combined, there should be an independent non-executive director serving as the deputy chairperson. Alternatively, there should be a strong independent non-executive director element on the board. Where the decision is made to combine the roles, justification must be provided each year in the company's annual report.

King II provides for the appointment of a remuneration committee that consists predominantly of independent non-executive directors. The function of the committee should be to make recommendations to the board in respect of remuneration packages for executive directors. Membership of the remuneration committee must be disclosed in the annual report.

The report further provides for the establishment of additional board committees such as the nomination and audit committees which should be established to aid the board and its directors in giving detailed attention to specific areas of the directors' duties and responsibilities. It is recommended that all board committees be chaired by an independent non-executive director. The composition of the committees (especially the remuneration, audit and nomination committees) should be detailed in the annual report, together with information containing a description of the committees' responsibilities, the number of meetings held and any other information that may be of relevance to shareholders.

King II requires the board of directors to appoint an audit committee that has a majority of independent non-executive directors and specifies that the majority of the members of the audit committee should be financially literate. Membership of the audit committee should be disclosed in the annual financial statements.

King II applies to all companies with securities listed on the JSE Securities Exchange, banks, financial and insurance entities and certain public sector enterprises and agencies. It recommends that all companies, in addition to those falling within the prescribed categories, give due consideration to the application of King II. King II is effective in respect of the specified business enterprises whose financial years commence on or after 1 March 2002.

In summary, the provisions of King II establish the relevance of this research report within the South African context. The importance of board composition is established within the provisions of King II; King II provides for the separation of the roles of chairperson and chief executive officer, a majority of non-executive directors on the board of directors and the establishment of board committees with a predominant composition of non-executive directors. With respect to transformation issues, King II categorises the issues as employment equity, diversity management, black economic empowerment and social investment (Institute of Directors of South Africa, 1994 and 2002).

King II makes reference to the importance of human capital within an organization; it points out that any fair value of a company depends both on an assessment of what will drive value and on an evaluation of management's ability to unlock, protect and develop it (Marx, Van der Watt, Hamel and Bourne, 2003). Much of this value is inherent in the company's intangible assets; at the core of such intangible assets are the extent and quality of its human capital.

Within the South African context the Employment Equity Act recognises that as a result of apartheid and other discriminatory laws and practices, there are disparities in employment, occupation and income within the South African labour market; and that those disparities create disadvantages for certain groups of people; the designated groups as defined by the Act in Chapter One, paragraph one, include black people, women and people with disabilities (Minister of Labour, 1998). The Act states in Chapter one, paragraph two that it aims to promote equal opportunity and fair treatment in employment through the elimination of unfair discrimination and implementing of affirmative action measures to redress the disadvantages in employment experienced by designated groups, in order to ensure their equitable representation in all occupational capacities and levels within the workforce (Minister of Labour, 1998). Legislation and the King Report on Corporate Governance therefore provide for the relevance of this study within the South African context.

2.4 Gender and Colour diversity

Corporate governance experts have recently advocated that greater demographic diversity amongst members of corporate boards of directors will lead to improvements in a company's financial performance (see, for example, Heidrick and Struggles, 1996; Kotz, 1998; Daily, Certo and Dalton, 1999). In the past boards of directors were viewed as a "homogenous group of elites who have similar socioeconomic backgrounds, hold degrees from the same schools, have similar educational and professional training, and as a result, have very similar views about appropriate business practices"

(Westphal and Milton, 2000, p.366). However, given the current dynamic global business environment and the emergence of greater power being assigned to a wider set of stakeholder groups, it is argued that increased diversity on boards of directors would improve decision making (Useem, 1993; Coffey and Wang, 1998). During the 1990's corporate governance experts advocated that greater diversity amongst corporate boards of directors was necessary for a company to best meet and survive the challenges of the new business environment (see, for example, Daum, 1998; Daily and Dalton, 1994a). The South African business environment throughout the 1990's and early 2000's was one of great uncertainty and change (Mitchell Williams, 2000b). Increased diversity amongst the boards of directors of South African publicly listed companies may therefore have led to less insular decision making processes and greater openness to change, placing the firm in a better position to react and survive the ever altering environment (Gormley, 1996; Kotz, 1998).

Board diversity can broadly be defined as variations amongst the members of board of directors in terms of characteristics such as expertise and managerial backgrounds, personalities, learning styles, age, education and values (Mitchell Williams, 2000b). Two demographic characteristics that have been recognized in recent years, not only by academics but by corporations, as offering benefits to the corporation through increased diversity is the representation of woman and racial groups on the boards of directors (see, for example, Heidrick and Struggles, 1996; Kotz, 1998; Daily, Certo and Dalton, 1999). Gender and race diversification of board composition have regularly been emphasized by commentators on this issue (Wang and Dewhirst, 1992). Empirical analysis of the relationship between gender and race diversity of boards of directors and company performance, and in particular intellectual capital performance in South Africa, has not been readily undertaken during the 1990s. Studies considering such associations and relationships in emerging economies have been virtually non-existent.

2.4.1 Gender diversity

Empirical findings of prior literature on the relationship between the percentage of woman on the boards of directors and company performance have been somewhat contradictory. Early research, such as that by Babchuk Marsey and Gordon (1960) and Zald (1969), failed to find a significant relationship between the presence of women on the board of directors and company performance. Such studies concluded that the lack of any relationship was due to the low number of women that were actually on the boards of directors. Other research studies, Bilimoria and Piderit (1994), and Zahra and Stanton (1988), found similar results and attributed the lack of an association between women on the board of directors and company performance to the fact that women are disadvantaged by the type of assignments they are traditionally given whilst on the board of directors. Judge (2003) noted that whilst women were securing positions on company boards, the impact on company performance was negative. In her article she stated “so much for smashing the glass ceiling and using their unique skills to enhance the performance of Britain’s biggest companies- the triumphant march of women into the country’s boardrooms has instead wrecked havoc on companies’ performance and share prices” (Judge, 2003, p.21). Studies performed by Kesner (1988) and Provan (1980) had opposing results; empirical results found support for the proposition that having more women on the board of directors enhanced a company’s performance while Mitchell Williams (2000a) found that there is a positive significant relationship between the percentage of women on the board of directors and a company’s intellectual capital performance.

A variety of arguments have been suggested to explain how a company may benefit from the presence of women on its board of directors. It is suggested that woman can bring different sociological perceptions and understandings within the scope of a board of directors’ decision making processes. Graves and Powell (1988), for example, found that female directors were more concerned with the company’s responsibility to the community, and incorporating this as a criterion for business growth and development than male directors. One aspect of intellectual capital is a company’s reputation

with its external stakeholders, including the community. This research study submits that boards of directors with a higher percentage of women will make decisions on the future intellectual capital performance of the entity with a greater sensitivity toward community concerns than male only boards. The proposition is therefore made that there is a positive significant relationship between the percentage of women on the board of directors and intellectual capital performance.

Another potential benefit of having a greater percentage of women on boards of directors is the increased ability to attract and communicate with a wider scope of employees that will increase the competitive abilities of the firm; it is suggested that as the proportion of women on boards of directors increased this enabled the company to better compete within the labour market for talented employees (Graves and Powell, 1988). They further argue that by having woman on the board of directors, the company will be in a better position to attract women employees. By being more receptive to the contributions of women at the top, companies could gain a competitive advantage allowing them to deal more effectively with diversity in their product and labour markets (Fernandez, 1993). In addition, the presence of woman on a company's board of directors may assist in facilitating strategic change, increase financial performance, and provide greater idea generation and innovation (Wiersema and Bantel, 1992). Mattis (1993) and Schwartz (1980) argue that by virtue of their position at the top of the corporate hierarchy, female directors can serve other corporate women in unique ways: as role models, as mentors and champions for high-performing women in organizations, and as advocates of keeping the recruitment, retention and advancement of women high on their board's agendas. Given these important business functions served by women, it is important to address their presence and role in the governance of companies.

Despite the suggested benefits of having women on the boards of directors women in top leadership positions in the corporate world are rare (Bilimoria and Piderit, 1994). Various studies found that relatively few women serve on corporate boards (see, for example, Directors and Boards, 1992; Karr, 1991;

Von Glinow and Mercer, 1988). Adler (2000) and Davidson and Burke (2000) submitted that there is little doubt that women continue to be disadvantaged in the workplace and underrepresented in leadership positions. Evidence suggests that while women are typically confronted by an invisible barrier preventing their rise into leadership ranks, the "glass ceiling" (Kanter, 1977; Morrison, White and Van Velser, 1987), men are more likely to be conveyed into management positions by means of a "glass escalator" (Williams, 1992). Fierman (1990) identified a mere 19 women among the highest-paid officers and directors of the 1000 largest U.S industrial and service companies. The glass ceiling refers to the situation where women are prevented from reaching leadership ranks due to an unspecified invisible barrier, whilst the glass escalator refers to an invisible mechanism enabling men to attain leadership positions; thus implying that women face unspoken barriers in attaining leadership positions whilst men achieve positions of authority more easily and are in fact assisted in climbing the corporate ladder.

2.4.2 Colour diversity

South Africa has experienced significant transition in the business arena since the abolition of apartheid in 1994 and the election of the first democratic government. Affirmative action and black economic empowerment practices have resulted in increased pressure for greater colour diversity on the boards of directors of South African publicly listed companies.

Crano and Chen (1998) suggest that the inclusion of a different person of colour into the social mix of the board of directors has the potential to stimulate divergent thinking in the decision-making process. It is argued that the member of colour will be able to offer unique perceptions to issues that can alter the conventional views of the board of directors through the encouragement of others to question the assumptions that had previously implicitly guided the reasoning of the board (see, for example, Moscovici and Faucheaux, 1972; Nemeth, 1986; Laughlin, 1992). Recent research has supported the view that board members from different colour groups may assist in adjusting the thinking of an established board of directors (see, for example, Crano and Chen, 1998; Nemeth, 1986; Hitt and Barr, 1989). Apart

from promoting change in the original perceptions and views held by the board of directors, the introduction of a board member from a different colour group may also assist in generating more original approaches to intellective and decision-making tasks (McGrath, 1984; Bantel and Jackson, 1989; Williams and O'Reilly, 1997).

Resource-based theory of competitive advantage and strategy analysis offers another possible benefit to the introduction of members from different colour groups to the board of directors (Crano and Chen, 1998). The authors suggest that this theory proposes that a firm generates competitive advantage and better performance by its ability to capitalize on, and the application of its internal resources such as its employees, in uncertain and dynamic contexts. Given that the majority of the South African workforce are persons of colour, companies that can effectively deal with this internal resource will achieve a greater competitive advantage and improved performance. In this context, colour refers to black people as defined by the Employment Equity Act in chapter one, paragraph one- black is used as a generic term describing Africans, Indians and Coloureds (Minister of Labour, 1998).

The addition of a person of colour to a board of directors may however not provide a positive benefit to the company. Evidence suggests that the impact could be negative due to the new member of colour facing potential barriers in their ability to exert any influence; proponents of self-categorization theory, for example, argue that individuals construct social identities in classifying themselves and others into social categories based on a salient demographic feature such as colour (see, for example, Jackson, Stone and Alvarez, 1992; O'Reilly, Williams and Barsade, 1997). Through such categorization a demographic minority on a board of directors may be considered an out-group from the members of the majority (Westphal and Milton, 2000).

2.5 Executive and non-executive directors

The proportion of executive and non-executive directors on a company's board of directors has frequently been examined for its impact on an entity,

including its level of performance, (refer to 2.2.1 for the classification of directors into executive and non-executive). However to test the monitoring activities of non-executive directors, research studies have focused on crisis situations, such as a company's continuing poor performance (Weisbach, 1988) and the incident of greenmails where shares in the acquiror in a takeover attempt are purchased by the acquiree to prevent the takeover (Kosnik, 1987). Kosnik (1987) argued that non-executive directors' incentives to monitor and to discipline management on behalf of shareholders were high. Evidence also showed that non-executive directors are more likely to join, and executive directors leave, the boards of poorly performing companies (Hermalin and Weisbach, 1988). It is thus argued that poorly performing companies are expected to benefit from the existence of non-executive directors on the boards of directors; this argument may be extended to the proposition that companies in general are likely to perform better when the proportion of non-executive directors on the board exceeds the proportion of executive directors (Hermalin and Weisbach, 1988).

Several theories, including agency theory, resource dependence theory and stakeholder theory, support the proposition that non-executive directors have a significant impact on a firm's performance (see, for example, Pfeffer and Salancik, 1978; Wang and Dewhirst, 1992). These proponents of stakeholder theory argue that non-executive directors have different stakeholder orientations than that of executive directors; given the executive directors' dependence on a company for their principal employment, executive directors would focus on decisions that favour, protect or enhance management's position and overall retention.

To ensure board effectiveness, the Cadbury Committee (1992) recommends the inclusion of a sufficient number of non-executive directors who would bring independence to the board's judgment. Mace (1986) argues that non-executive directors were valued for their ability to advise, to solidify business and personal relationships, and to send a signal that the company is doing well rather than for their ability to monitor. Weisbach, (1988) argues that non-executive directors are stricter in discharging their responsibilities, as they are

not directly affiliated with the management. Having non-executive directors, who are argued to be impartial, is vital as they can act as "…providers of relevant complementary knowledge" to the management (Fama and Jensen, 1983, p.315). As a result, management performance is expected to improve and more importantly, result in improved company performance and thereby increase shareholder wealth.

Despite the perceived benefits of having a greater percentage of non-executive directors on the boards of directors of companies, evidence supporting the managerial hegemony theory is also documented; the concern has been on the issue of non-executive directors who may not be truly independent (Bhagat and Black, 1997). Managerial hegemony theory suggests that although shareholders legally own and control large corporations, they do not effectively control them; control having being effectively ceded to a new professional managerial class (Berle and Means, 1932). A variety of empirical works have leant support to this theory; Mace (1971) in his study of directors concluded that boards did not get involved in strategy except in crises, and that control rested with the president (chief executive) rather than the board. Herman (1981) came to similar conclusions but argued that power was always in the context of various constraints and the latent power of stakeholders such as external board members. In a more recent study Lorsch and MacIver (1989) conclude that although the functioning of boards has improved since Mace's study, their performance still leaves much room for improvement. Like Mace, they distinguish between boards in normal times and during crises, and conclude that during normal times power usually remains with the chief executive officer. McNulty and Pettigrew (1995) identify the limited time non-executive directors have to perform their duties and the norms of board behaviour that limit non-executive board members acting together as critics of management as factors limiting the power of boards. However, not all empirical studies have supported managerial hegemony theory. Interestingly in their own study of directors in the UK, McNulty and Pettigrew (1999) found that non-executive directors do play an important role in influencing organisational strategy; while they found

it rare for non-executive directors to initiate new strategic directions they were influential in both shaping and taking strategic decisions.

Perry (1995) argues that the inclusion of independent non-executive directors may negatively influence the board cohesiveness since they are involved in the decision-making process of the company and at the same time, act as monitors of management. In an empirical study, Fosberg (1989) found that there was no significant difference in various financial ratios (indicative of company performance) between companies whose boards were dominated by non-executive directors and companies whose boards were not dominated by non-executive directors. Perry's (1995) argument that having non-executive directors on the board of directors could negatively affect firm performance could be due to the fact that non-executive directors may not have access to and adequate knowledge of the company. This may be due to the nature of non-executive directors' appointments who are not full-time employees of the company, and the limited time commitment that could result in boards that are composed, in the majority, of weak non-executive directors (Koontz, 1967). Research evidence showing a negative association between the proportion of non-executive directors and company performance is documented in various studies (see, for example, Klein, 1998; Agrawal and Knoeber, 1996; Yermack, 1996).

2.6 Chairperson duality

Jensen (1983, p.862) argues that the board of directors is "at the apex of internal control system, and has the final responsibility for the functioning of the firm". Researchers have also agreed that chief executive officers are the single most influential individuals responsible for a firm's performance (see, for example, Dalton and Kesner, 1985; Hambrick and Mason, 1984; Hofer, 1980; Vance, 1983; Wang and Dewhirst, 1992).However when the board chairperson is also the chief executive officer, the board intensity to monitor and oversee the management is reduced as a result of lack of independence and a conflict of interest (Lorsch and MacIver, 1989). Rechner and Dalton (1991) submit that the weakest form of corporate governance is one where

the chief executive officer holds the chairpersonship of the board; when one person dominates a company, the role of independent non-executive directors becomes hypothetical. Rechner and Dalton (1991) argue that chairperson duality may negatively influence a company's performance because the organizations power, authority and stakeholder orientation is constricted. The separation of the roles of chairperson and chief executive officer is considered to enhance the power and authority of the board of directors. This infusion of power and authority enables the board of directors to effectively implement their decisions. Sonnenfeld (1981) argues that an executive acting both as chief executive officer and chairperson may lead to a role bias. A dual leadership structure "signals the absence of separation of the decision management and decision controls" (Fama and Jensen, 1983, p.314). The separation of the positions would place the board of directors in a better position to consider the interests of a more diverse set of stakeholders such as consumers, employees and external special interest groups (such as unions) (Wang and Dewhirst, 1992). Sanders and Carpenter (1998) consider another benefit of eliminating duality as the possible enhancement of the information-processing capacities of the board and the company's top management.

The Cadbury Committee (1982) addresses the separation of the chairperson and chief executive officer positions and recommends that the roles of board chairperson and the chief executive officer be separated. Within a South African context, The King Report on Corporate Governance (2002) recommends a similar board structure; the reason for the need for separation is that when both the monitoring roles and implementation roles are vested in a single person, the monitoring roles of the firm will be severely impaired. The impairment of board independence could affect company performance as the board may fail to pursue value-increasing activities.

Very little research regarding the determinants of the effect of the same individual in a company performing the role of chairperson and chief executive officer (chairperson duality) has been undertaken (see, for example, Daily and Dalton, 1994a; Finkelstein and Hambrick, 1996). Findings of such research

studies have been mixed. Rechner and Dalton (1991) and Pi and Timme (1993), for example, found that firms that had separated the two roles consistently outperformed entities with combined titles. Brickley et al., (1997) and Vafeas and Theodorou (1998), found contradictory results. Brickely et al., (1997) concluded that there was no support for the proposition that the separation of the two roles improved company performance. Proponents of the chairperson duality structure argue that combining these two roles provide a clear focus for objectives and operations (see, for example, Andersen and Anthony, 1986; Stoeberl and Sherony, 1985). Separation of the roles has both costs and benefits and it was shown that for larger firms, the costs are greater than the benefits (Brickley et al., 1997). It is argued that when one person is in charge of both tasks, decisions are reached faster, and that when the chairperson and chief executive officer is the same person, he or she is well aware of the decisions needed to improve company performance. In another study Baliga, Moyer and Rao (1996) investigated the announcement effect of changes in the leadership structure on company performance. Their findings suggest that: 1) the market was indifferent to changes in leadership structure; 2) there was no significant effect on the firm's operating performance; and 3) there was no significant influence on the firm's long-term performance.

This conflicting evidence therefore suggests that the value of separating the functions of board chairperson and chief executive officer is not yet empirically clear. This observation has implications for this study; the relationship between chairperson duality and company performance was found to be insignificant, indicating that the value of the separation is not present in the data examined.

2.7 Audit and remuneration committee composition

Although extensive literature on corporate boards has pointed to the importance of board members in corporate governance and control, the critical significance of board's standing committees has not been examined in sufficient detail (Kesner, 1988; Zahra and Pearce, 1989). Previous research has indicated that the delegation of governance responsibilities to committees

facilitates effective board and corporate functioning (see, for example, Anderson and Anthony, 1986; Bacon and Brown, 1975; Lorsch, 1989). Committees provide a means and structure for effective governance by allowing directors' specialized responsibility for and probing of important corporate concerns (Braiotta and Sommer, 1987). Kesner (1988) suggests that these subgroups of directors are critical structures for the conduct of a board's work since each is chartered with specific authorization, strategic, and oversight duties, contributing towards the board's total corporate governance task. This research study adds to the extant literature on corporate governance and board control by examining the relationship between the composition of corporate power and control (the standing committees of corporate boards) and company performance. The composition of standing committees was analysed in terms of the percentage of non-executive directors on the audit and remuneration committees of South African companies listed on the JSE Securities Exchange for the 2003 year.

Numerous corporate governance studies have presumed that an increased presence of non-executive directors on the board of directors will "eliminate the operating biases of business executives from social strategic planning decisions" (Marx, 1985, p.12). Whilst corporate stakeholder groups have looked favourably upon the addition of non-executive directors to the board of directors, authors within the sociological literature have argued that non-executive director influence can be nullified by executive directors (see, for example, Maass and Clark, 1984; Turner, 1987; O'Reilly, Williams and Barsade, 1997). It is suggested, for example, that the social psychological dynamics of executive directors may lead to a resistance toward non-executive directors (Westphal and Milton, 2000). Executive directors may categorize themselves as the in-group and non-executive directors as an out-group. Corporate governance literature suggests that the effects of in-group/ out-group categorization on the effectiveness of non-executive directors on a company's board can be eliminated by the presence of non-executive directors on various standing committees of a company. Klein (1996), for example, suggested that the ability of non-executive directors to provide a positive contribution to a company's performance in the decision making

process is their presence on committees focusing on control tasks. Such standing committees are the remuneration, nomination and audit committees.

Generally speaking, empirical research on the relationship between the composition of respective standing committees and a company's financial performance has been limited. Klein (1996) investigated the relationship between firm value and committee composition using data from the United States. She found a moderate impact of non-executive/executive director composition on standing committees and firm value. Using data from the United Kingdom, Forker (1992) found a weak association; the focus of the study was limited in that only the impact of the composition of a company's audit committee on company performance was investigated. Also using data from the United Kingdom Vafeas and Theodorou (1998) found that audit, nomination and remuneration committee composition did not have a significant impact on a company's value.

2.8 Summary and conclusions

In summary, empirical findings on the relationship between board structure and company performance have been somewhat contradictory. Studies examining the significance between gender and colour diversity and company performance generally concluded that the presence of women and persons of colour on a board of directors lead to improved company performance; where a lack of significance was identified, the results were explained by the low numbers of women and persons of colour on the boards of directors and the types of positions these individuals held. Similarly, the results of studies investigating the relationship between the existence of non-executive directors on the boards of companies and company performance have been contradictory. Stakeholder agency theory and managerial hegemony theory differ on the perceived benefits and resulting increase in company value arising from the inclusion of a greater proportion of non-executive directors on the board of directors. Stakeholder agency theory argues that non-executive directors would be more inclined to focus on decisions that do not necessarily favour, protect or enhance management's position; this as a result of their

primary employment not being with the company. Managerial hegemony theory argues that non-executive directors may not be truly independent and thus the perceived benefit of including a greater proportion of non-executive directors on a board may be lessened.

Empirical research on the relationship between the composition of the audit and remuneration committees and a company's financial performance has been limited. Results of these studies do however seem to indicate a weak to moderate relationship between the composition on standing committees and company value. Research evidence on the issue of separating the role of chairperson and chief executive officer seems to suggest that the issue is not critical in the corporate governance structure.

The primary and most significant implication of these findings for the current research study is that there may or may not be a significant relationship between board structure and company performance. Prior research does not appear to be conclusive on this issue. Chapter 3 converts the literature review into the hypotheses and research problems that underlie this research study.

Chapter 3- Research Problems and Rationale for Hypotheses

3.1 Introduction

This chapter introduces and sets out the research problems and hypotheses that underlie this research study. Explicit reasoning for the development of the hypotheses is posited.

Boards of directors have been recognised as playing a central role in corporate governance practices. The affect of boards of directors on a company's performance has been questioned both conceptually (see for example, Drucker, 1973; Jensen and Meckling, 1976; Mace, 1972; Molz, 1995) and empirically (see for example, Daily and Dalton, 1994a; Kesner, 1988; Kosnik, 1987, Pfeffer, 1972). Prior research has yielded contradictory results on the relationship between board composition and company performance. For the purposes of this research study, board composition was analysed in terms of gender and colour diversity, the proportion of executive and non-executive directors on the board of directors, chairperson duality and the proportion of non-executive directors on the audit and remuneration committees. Within a broad stakeholder-agency framework, this research examined the contribution between the above-mentioned board characteristics and company performance.

3.2 Rationale for hypotheses

3.2.1 Gender and colour diversity

A variety of suggestions have been proposed to explain how a company may benefit from the presence of women and persons of colour on the board of directors. The addition of women and persons of colour to a board of directors may diversify the sociological perceptions and understandings of a board of directors in the decision making process (Graves and Powell, 1988). Consequentially, this may enhance the direction and activities adopted by a company in the uncertain and dynamic South African business environment. The presence of women and persons of colour on the boards of directors of

South African publicly listed companies may also assist in facilitating strategic change, increase financial performance and provide greater idea innovation (Wiersema and Bantel, 1992).

In the 1990's the South African labour market was relatively inflexible with the nation's powerful Congress of South African Trades Union constantly threatening strike action (Mitchell Williams, 2000c). Given that the trade unions were primarily representatives of a workforce comprising primarily persons of colour, the South African Trade unions may have found a greater affinity in dealing with a company with a board of directors that had members of colour rather than one that was all-white (Mitchell Williams, 2000c).

Further, in line with resource based theory, South African companies with a greater presence of women and persons of colour on their board of directors may be better situated to attract better quality employees from the entire human resource pool than companies with all male, all white board compositions (Graves and Powell, 1988). A company with a more diversified board may be perceived to have a better, healthier work environment for women and employees of colour rather than a company with an all-white male board (Mitchell Williams, 2000c).

In light of the above discussion, this research study proposes the following research questions and hypotheses:

Research questions:

Question 1:

Is there a significant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies and intellectual capital performance?

Question 2:

Is there a significant positive relationship between the percentage of individuals of colour on the boards of directors of South African publicly listed companies and intellectual capital performance?

Hypotheses:

From question 1:

H_0: there is an insignificant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies and intellectual capital performance.

H_1: there is a significant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies and intellectual capital performance.

From question 2:

H_0: there is an insignificant positive relationship between the percentage of individuals of colour on the boards of directors of South African publicly listed companies and intellectual capital performance.

H_1; there is a significant positive relationship between the percentage of individuals of colour on the boards of directors of South African publicly listed companies and intellectual capital performance.

3.2.2 Non-executive directors

The proportion of executive and non-executive directors on a company's board of directors has frequently been investigated for any potential impact on an entity, including its level of performance. Several theories, including agency theory, resource dependence theory and stakeholder theory, support the proposition that non-executive directors have a significant impact on a company's performance (see, for example, Pfeffer and Salancik, 1978; Wang and Dewhist, 1992). It is suggested that executive directors will focus on projects that generate more immediate short-term returns as their remuneration is frequently dependent on the performance of the company, in contrast, non-executive directors are considered to have a broader focus as to the direction of the company other than financial returns (Pfeffer and Salanik, 1978). Non-executive directors may be viewed as representatives and protectors of a wider range of stakeholders; as a result, the decisions of non-

executive directors on projects affecting the company's performance will consider the wider interest of these stakeholders, interests that may not necessarily be financially based (Wang and Dewhist, 1992). Rosenstein and Wyatt (1990) found that the addition of a non-executive director to the board of directors resulted in the company earning a positive excess return. This suggests that shareholders and stakeholders of a company view the appointment of a non-executive director as having intrinsic value. In general executive directors have day-to-day familiarity with company performance and non-executive directors are valued for their objectivity and independent judgment (Bilimoria and Piderit, 1994). Though research findings on the relationship between the proportion of non-executive directors and company performance are mixed, evidence generally supports the positive effects of non-executive directors on company performance. This is primarily because non-executive directors are expected to be independent of management and were generally "…appointed for their business acumen, wide commercial experience or contacts in the government or industry" (Reay, 1994, p.74). This research study therefore asks the following research question and proposes the following hypothesis:

Research question 3:

Is there a significant positive relationship between the percentage of non-executive directors on the boards of directors of South African publicly listed companies and intellectual capital performance?

From question 3:

H_0: there is an insignificant positive relationship between the percentage of non-executive directors on the boards of directors of South African publicly listed companies and intellectual capital performance.

H_1: there is a significant positive relationship between the percentage of non-executive directors on the boards of directors of South African publicly listed companies and intellectual capital performance.

3.2.3 Chairperson duality

Since the literature does not seem to lead this research study in any particular direction, it is difficult to hypothesize an exact direction of the association between chairperson duality and company performance. However within the South African context, the King Report on Corporate Governance provides for the separation of the roles of chief executive officer and chairperson. To investigate the relationship between chairperson duality and company performance, the following research question and resulting hypothesis is posited:

Research question 4:

Is there a significant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies and intellectual capital performance?

From question 4:

$H_{0:}$ there is an insignificant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies and intellectual capital performance.

H_1: there is a significant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies and intellectual capital performance.

3.2.4 Audit and remuneration committee composition

Research concerning the composition and structure of corporate boards of directors has increased dramatically in recent years (see, for example, Kesner, Victor and Lamont, 1986; Kohls, 1985; Mattar and Ball, 1985). Yet despite this increased attention, this is still an area where little research has been performed. It has already been suggested that much board decision making takes place within the confines of the board's standing committees (Bacon and Brown, 1973); it is thus imperative that researchers extend their research to include the composition of standing committees. It is suggested that the use of board standing committees may lead to greater input and objectivity from members. Four types of standing committees are commonly

found in companies and are frequently cited as having the greatest influence on corporate activities; these being the audit, nominating, remuneration and executive committees (Vance, 1983; Waldo, 1985). In a survey of the Fortune 1000 companies (Heidrick and Struggles, Inc., 1986) 99.2% of the responding firms had audit committees and 99.6% had remuneration committees. Still other studies report similar levels across large firms (Vance, 1983; Waldo, 1985). The existence of these committees as well as their specific duties and functions indicates that they play a major role in the protection of shareholders' interests and have thus been chosen as the standing committees under consideration for the purposes of this research report. The Securities and Exchange Commission (SEC) as well as King II (Cliffe Dekker, 2002) consider these committees as important tools for monitoring corporate activities and requires companies to report the committees used and their memberships. In summary, the audit and remuneration committees stand out as the most important from the perspective of the company and regulatory authorities. Moreover members of these committees tend to hold the greatest power and influence over a company's corporate affairs (Kesner, 1988).

Various corporate governance studies have presumed that an increased presence of non-executive directors on the board of directors will "eliminate the operating biases of business executives from social strategic planning decisions" (Marx, 1985, p.12). Klein (1996) suggests that the ability of non-executive directors to provide a positive contribution to a company's performance in the decision making process is their presence on standing committees that focus on controlling tasks. Such standing committees are the remuneration and audit committees.

Generally speaking, empirical research on the relationship between the composition of respective standing committees and a company's financial performance has been limited and results have been somewhat contradictory. Klein (1996) investigated the relationship between firm value and committee composition using data from the United States. She found a moderate impact of non-executive/executive director composition on standing committees and firm value. Using data from the United Kingdom, Forker (1992) found a weak

association; the focus of the study was limited in that only the impact of the composition of a company's audit committee on company performance was investigated. Also using data from the United Kingdom Vafeas and Theodorou (1998) found that audit, nomination and remuneration committee composition did not have a significant impact on company value.

Despite the inconsistencies in the literature, for the purposes of this research report, the following research question and hypothesis is proposed:

Research question 5:
Is there a significant positive relationship between the percentage of non-executive directors on the audit and remuneration-standing committees of South African publicly listed companies and intellectual capital performance?

From question 5:
$H_{o:}$ there is an insignificant positive relationship between the percentage of non-executive directors on the audit and remuneration-standing committees of South African publicly listed companies and intellectual capital performance.
H_1: there is a significant positive relationship between the percentage of non-executive directors on the audit and remuneration-standing committees of South African publicly listed companies and intellectual capital performance.

3.3 Summary

This chapter developed and formulated five research problems and hypotheses that underlie this research study.

Despite the contradictory results identified in the literature, this research study proposed a significant positive relationship between the percentage of women, persons of colour and non executive directors on the board of directors of South African companies listed on the JSE Securities Exchange and company performance. Similarly, this research study proposed a significant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies

and the company's level of performance. Further, a significant positive relationship between the percentage of non-executive directors on the audit and remuneration-standing committees of South African publicly listed companies and the company's level of performance is proposed.

A summary of the research questions and hypotheses posited are presented in Table 1.

Refer to Appendix E Table 1

Once the research questions and rationale for the hypotheses have been postulated, the following questions need to be answered:

- What techniques will be used to gather data?
- What kind of sampling will be used?

These questions will be answered in Chapters 4 and 5, which outline the research framework, design and methodology used in this research study.

Chapter 4- Research Framework

4.1 Introduction

This chapter introduces the principles and concepts of the research framework that will be employed in this research study. This research study is classified as empirical. Empirical research is concerned with establishing the relationships between variables (Ryan, Scapens and Theobald, 2002). The variables considered in empirical research may be dichotomised as dependent or independent variables. The independent variable in an experiment is the variable that is manipulated by the researcher; it is in effect the variable that is being studied. The dependent variable measures the response to the manipulation of the independent variable. Thus in an experiment the researcher is interested in determining the impact of the changes in the independent variable upon the dependent variable. In the accounting and financial field, the direct manipulation of the independent variable is generally not possible. Empirical accounting and finance research cannot strictly be described as experimental and many of the experimental designs employed are of a quasi-experimental nature (Ryan, Scapens and Theobald, 2002). In the context of the above discussion, the research framework that the author considers the most appropriate for this research study is known as Correlation Design.

4.2 Correlation Design

Many of the theoretical models developed in accounting and finance predict that correlations should exist between variables (Ryan, Scapens and Theobald, 2002). At the simple correlation level there is no implication of causality; all that is implied is that the variables under study covary. The major problem associated with simple correlation is that spurious correlations can arise between variables as a result of both variables being correlated with a third variable. Where the underlying theoretical structure predicts a causal relationship between the variables, designs using regression techniques should be used (Cooper and Schindler, 2001).

Where the causal relationship is between the dependent variable and one independent variable, simple regression techniques are employed, but when the relationship between a dependent variable and more than one independent variable multiple regression techniques should be used (Ryan, Scapens and Theobald, 2002). Multiple regression is an extension of correlation analysis (Coakes, and Steed, 2001). The result of regression analysis is an equation that represents the best prediction of a dependent variable from several independent variables (Coakes, and Steed, 2001). There are three major regression models – namely, standard or simultaneous regression, hierarchical regression, and stepwise regression. In the standard or simultaneous model, all independent variables enter the regression equation at once because one wants to examine the whole set of predictors and the dependent variable. In hierarchical multiple regression, one determines the order of entry of the independent variables based on theoretical knowledge. In stepwise regression, the number of independent variables and the order of entry are determined by statistical criteria generated by the stepwise procedure. The choice of technique depends largely on the researcher's goals (Coakes, and Steed, 2001).

4.3 Choice of research design

This research study is based on the posture that relationships do exist between company performance, on the one hand, and board structure on the other hand. As such, the construction of statistical models in the form of linear regression serves as a vehicle to verify or otherwise refute the presence of relationships between interacting variables.

A significant number of empirical studies in accounting and finance research employ correlation and regression designs. Research into the determination of whether board structure is associated with or can explain company performance, whether questionnaires or annual reports have been used, has in the main employed correlation and regression analysis (examples can be viewed in: Bontis, 1998; Bontis et al, 2000; Firer and Saunders, 2002; Firer

and Mitchell Williams, 2003; Ho and Mitchell Williams, 2002; Hurwitz, Lines, Montgomery and Schmidt, 2002; Huselid, 1995; Mitchell Williams, 2000a; Mitchell Williams, 2001; Reed, 2000; Riahi-Belkaoui, 2003; Van Buren, 1999; Walker, 2001, Youndt et al, 1996). It can therefore be generally accepted that correlation and regression analysis is a proven research framework to test and interpret the relationship between intellectual capital and company performance.

The technical approach adopted in this research study will consist of three major steps. First, multiple linear regression models will be constructed that represent the anticipated relationships between company performance and board structure and related control variables. The standard or simultaneous model will be employed, as the objective is to examine the effect of all the predictors on the dependent variable.

Second, the multiple regression models will then be tested for validity and adequacy using statistical tools such as hypothesis testing, ANOVA analysis, and coefficient of determination (R^2).

Finally, based on the derived regression models, conclusions will be made as to whether there is a significant positive relationship between board structure and company performance.

4.4 Regression analysis

Linear regression can be used to examine sample data and draw conclusions about the functional relationships that exist among variables whereby such relationships are expressed in a form of mathematical functions that demonstrate how the variables are interrelated.

In multiple regression analysis, a response (dependent) variable (Y) is related to a set of control (independent) variables (X) using the following linear model:

$$Y = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + ... + a_k X_k + \varepsilon$$

Where Y is a linear function of k control variables $X_1 ... X_k$ and ε is an error term. The error term is normally distributed about a mean of zero. For the purposes of this research study the ε is assumed to be zero. Where a_0 is a constant, the value of *Y* and *X* will always be zero. Where a_1 is the slope of the regression surface or the response surface.

The a represents the regression coefficient associated with each *X.* The value of the regression coefficient states that *Y* varies with each unit change of the associated *X* variable when the effects of all other *X* variables are being held constant. The regression coefficients are stated either in raw core units (the actual values of *X*) or as standardised coefficients (*X* values restated in terms of their standard deviations).

When the regression coefficients are standardised they are called beta weights and their values indicate the relative importance of the associated *X* values, particularly when the predictors are unrelated. For example, in an equation where a beta (a_1) is 0.60 and another beta (a_2) is 0.20, a conclusion can be reached that X_1 has three times the influence on Y (the dependent variable) as does X_2.

A number of assumptions underpin the use of regression analysis:

- The number of sampling units needed depends on the type of regression model to be used. For standard regression, the minimum requirement is to have at least five times more units than independent variables (Coakes, and Steed, 2001);
- Extreme cases have considerable impact on the regression solution and should be deleted or modified to reduce their influence (Coakes, and Steed, 2001);
- Multicollinearity or collinearity refers to high correlations among the independent variables. Multicollinearity or collinearity will affect how the relationships between the predictors and the dependent variable will be

interpreted. Predictor variables that vary significantly with one another must be removed from the model (Coakes, and Steed, 2001); and

- Normality, is a prerequisite for the conducting of correlation and regression analysis. The scores for each variable in the analysis should be normally distributed. Mild deviations from linearity are not serious (Coakes, and Steed, 2001).

The first assumption relates the sample selection procedures while the other assumptions will be tested through regression analysis.

4.5 Hypotheses testing

Having detailed the hypotheses in Chapter three, it is important to determine the accuracy of the hypotheses as stated. The more established approach to hypothesis testing is known as the classical or sampling-theory approach (Cooper and Schindler, 2001). It is this approach that will be adopted for use in this research study. This approach represents an objective view of probability in which the decision making rests totally on an analysis of available sampling data. A hypothesis is established; it is rejected or fails to be rejected (accepted), based on the sample data collected (Cooper and Schindler, 2001).

The following steps will be adopted to test the hypotheses in this research study (Cooper and Schindler, 2001):

- Step 1: State the null hypothesis. The null hypothesis states that there are no relationships between variables. That board structure has no relationship with company performance;
- Step 2: Choose the statistical test. Where data has been transformed parametric tests will be carried out. Where data has not been transformed non-parametric tests will be carried out;
- Step 3: Select the desired level of significance. The most accepted significance level is 0.05 (Cooper and Schindler, 2001; Coakes and Steed, 2001). Statistical significance for the purposes of this research study will be assessed at the ρ=0.05 level;

- Step 4: Compute the calculated difference value. E-views will determine the calculated value *t*;
- Step 5: Obtain the critical test value. Once *t* has been calculated, E-views will determine the critical value. The critical value is the criterion that defines the region of rejection from the region of acceptance of the null hypothesis; and
- Step 6: Interpret the test. The method to be adopted for the purposes of this research study will be by presenting the extent to which the test statistic disagrees with the null hypothesis.

This method is in line with the use of E-views. E-views reports the results of statistical tests as a probability value (ρ values). The ρ value is the probability of observing a sample value as extreme as, or more extreme than, the actual value observed, given that the null hypothesis is true. The ρ value is compared to the level of significance determined above and on this basis the null hypothesis is either rejected or not rejected.

If the ρ< 0.05 (significance level), the null hypothesis is rejected. If ρ>0.05 (significance level), the null hypothesis is not rejected. E-views will compute the ρ value during the execution of the hypothesis test.

The alternative hypothesis holds that there is a relationship between variables. In other words, there is a relationship between board structure and company performance. The objective of this research study is to establish whether there is a relationship between board structure and company performance. As a result of the conceptual framework adopted in this study and in line with the hypotheses that have been developed, this relationship must be positive. Therefore, a one-tailed test or directional test will be used. This directional test will be a right one-tailed test. This means that *t* statistic calculated must be positive and significant (here t is > zero), if it is negative (here t < 0) the null hypothesis will not be rejected.

4.6 Description of the statistical tests and their implications

4.6.1 Data screening and transformation

Before statistical analysis can take place, it is important to ensure that the underlying assumptions of correlation and regression analysis are in place. A critical assumption of correlation and regression analysis is normality (Cohen and Cohen, 1975). The scores for each variable in the analysis should be normally distributed. For each variable in the analysis that is not normally distributed a natural logarithmic transformation must be carried out (Coakes and Steed, 2001).

The following different tests are considered appropriate for the exploration of normality (Coakes and Steed, 2001):

- Histograms. A histogram is a conventional solution for the display of interval-ratio data (Cooper and Schindler, 2001). Histograms are used when it is possible to group variable values into intervals. Histograms are constructed with bars where each value occupies an equal amount of area within an enclosed area. Histograms are useful for displaying all intervals in a distribution and examining the shape and distribution for skewness, kurtosis and the modal pattern (Cooper and Schindler, 2001); and
- Kolmogorov-Smirnov and Shapiro-Wilk statistic. This statistic tests for normality (Coakes and Steed, 2001). If the significance level is greater than 0.05, then normality is assumed (Coakes and Steed, 2001).

4.6.2 Descriptive statistics

The objective of descriptive statistics is first to explore the data and second to summarise and describe the observations (Coakes and Steed, 2001). The following descriptive statistics will be used for the purposes of this research study (Firer and Mitchell Williams, 2003):

- Mean; and
- Standard deviation.

The mean is the most often used measure of central tendency (Kranzler and Moursund, 1999). The mean of a set of numerical values is the average of the set of values (Jaisingh, 2000). The standard deviation is the most common measure of variability (Jaisingh, 2000). The standard deviation provides information about how the data vary about the mean (Jaisingh, 2000).

4.6.3 Regression analysis

As explained previously multiple regression analysis will be used. This model is based on one dependent variable and more than one independent variable. This analysis tool is used to determine the unique correlation that each independent variable will have with the dependent variable.

Regression analysis will be conducted through E-views. E-views provide two important regression analysis reports:

1. Model summary;
2. Coefficients.

The model summary consists of *R,* R^2*,* adjusted R^2 and standard error of the estimate. For the purposes of this research, study R^2 will be used as the tool to test the internal validity of the research study. Internal validity of an experiment is determined by how much control has been achieved in the study, that is, the greater the control achieved, the higher the internal validity (Ryan, Scapens and Theobald, 2002).

When a study is described as having a high internal validity, this is understood to mean that the changes in the dependent variable have been brought about, in the main by the independent variable changes nature (Ryan, Scapens and Theobald, 2002). The correlation of determination (R^2*)* is considered to be one of the preferred statistical tests for this purpose.

The coefficient of determination is determined by squaring the coefficient of correlation (Julyan and Nel, 2003). If R^2 is for example 80% this should be

interpreted to mean that 80% of the change in the dependent variable can be explained by the independent variables and that 20% of the change in the dependent variable is caused by factors other than the independent variables used.

Second is the t-test. This test measures the statistical significance of each of the regression coefficients, and must be read in conjunction with levels of significance. The t-test also indicates the direction of the relationship between variables; a positive t – test indicates a positive relationship while a negative t-test indicates a negative relationship.

4.7 Summary

The objective of this research study is to establish whether board structure is associated with, or can explain company performance. In statistical terminology: the aim is to explain or predict a dependent variable (company performance) from a set of independent variables (board composition characteristics and control factors). Multiple regression analysis has been selected for this purpose. Regression results provide information on the statistical significance of the independent variables, the strength of association between one or more of the predictors, and a predictive equation for future use. The information provided by regression analysis clearly achieves the aims and objectives of this research study. The following chapter will implement the research framework that has been discussed in this chapter.

Chapter 5- Research Design and Methodology

5.1 Introduction

This chapter discusses stakeholder-agency theory as the underlying theoretical basis for the research study. The chapter further outlines the research design and methodology that will be employed in this study. The research design and methodology constitutes the blueprint for the collection, measurement, and analysis of data. It consists of a plan and a structure for the investigation in order that answers for the research questions may be obtained.

The method used to enable the collection of data and the source from which data was collected is discussed in 5.3. 5.4 gives a detailed analysis of the sample selected, whilst 5.5 outlines the data screening and transformation procedures that were carried out on the raw data. Detailed analyses of the models and variables used in this study are provided in 5.6; each variable is defined and reviewed. The regression equations to be tested are formulated in section 5.7, whilst 5.8 discusses the various statistical techniques used to test the equations.

5.2 Stakeholder-agency theory

This research study has adopted stakeholder-agency theory as the underlying theoretical basis. There are four key features of stakeholder-agency theory. First, the narrow view of agency theory is extended to encompass other stakeholders; described as “those who have a legitimate claim on the company” (Hill and Jones, p.133). Second, Hill and Jones (1992) argue that stakeholder-agency theory provides for the notion of a time-dimension; in the South African business environment that is subject to uncertainty, short-term market imperfections are experienced. Stakeholder-agency theory thus acknowledges that control over management in the short-term is imperfect but that in the long-term market processes will identify the most inefficient

organizations (Hill and Jones, 1992). Third, stakeholder-agency theory also redefines the position of senior management within an organization; it assumes senior management to be the major stakeholders of the company. Fourth, the theory assumes that successful governance may take a variety of different forms. Corporate governance is therefore described as the "concrete means by which stakeholders try to control dominant managers, rather than as a vague concept of the means by which corporate decisions are determined abstractedly" (Buck, Filatitechev and Wright, 1998, pp. 86-87).

Within a broad stakeholder-agency framework, this research study examined the contribution between board structure and company performance.

5.3 Data source

Due to the difficulty in acquiring information from private companies, it was decided to limit this study to public companies that are listed on the JSE Securities Exchange. For the purposes of this study, the extent of company performance is measured using statutory annual reports. Data was collected from the 2003 fiscal year annual reports of companies listed on the JSE Securities Exchange.

The primary source of information for this study was the use of the secondary database from McGregor BFA (McGregor's, 2005). McGregor BFA supplies real-time and historical fundamental information on South African listed companies.

5.4 The Sample

Of the total 399 companies (listed in Appendix A) found on the McGregor BFA database (McGregor's, 2005), companies from the financial and resource sectors were excluded. This is consistent with prior literature; Vafeas and Theodorou (1998, p.391) argue that companies in the financial and utility industries should be excluded because "regulation masks efficiency differences across companies, potentially rendering governance mechanisms less important." A total of 123 companies (listed in Appendix B) displayed the

key variable staff costs, and disclosed the composition of the board of directors. Staff costs consist of the overall expenditures for employee's salaries and wages (Pulic, 1998). Altogether 6 companies were deleted because of data screening and transformation procedures (refer 5.5). A total of 117 (123 less 6) companies were included in the final data set (sample). A complete list of companies included in the final data set is listed in Appendix C.

5.5 Data Screening and Transformation

Data screening and transformation constitutes the first step in the analytic process of this research study. This step entails the exploration of the characteristics of the data. Data may have been incorrectly entered or distributions may deviate from normal. Errors in data entry are corrected, and variables that display non-normal distributions have been transformed. There are two major implications on this research study that arise as a result of the implementation of this step:

Implication one

In order to ensure that the data are suitable for estimation purposes (ready for use in the analysis), the following restrictions were placed on the sample:

- Companies with omitted key variables or misreported data values (such as undisclosed or zero staff costs) were excluded from the data set; and
- The requirement that all variables must be positive. The removal of variables that were negative is justified by the predictive purpose of the regression equation and in particular, the nature of the predictive variables. Using the women variable as an example, the regression model seeks to fit as straight line to the predictive ability of the number of women on the board of directors, and since the number of women on a board of directors can logically never be less than zero, the presence of a negative intellectual capital variable, or a loss, will therefore never be able to be catered for in the model, as this would require the number of women to be less than zero. This logical limitation therefore requires the analysis to be

performed using only positive observations for profitability and intellectual capital measures. Although this is considered to be a limitation of the model, it is not considered to affect the conclusions reached in this research study.

Implication two

Transformation results in the re-expression of data on a new scale using a single mathematical function for each data input (Cooper and Schindler, 2001). The results of transforming the data using natural logarithmic transformation, improves interpretation and compatibility of the data, enhances the symmetry, stabilizes the spread and improves the linear relationships between and among variables. This transformation makes it possible for regression analysis to be used. In the instance that data was not normally distributed, the natural log of the data was calculated. Section 5.7 identifies instances where data was not normally distributed.

5.6 Models

The models used in this research study are formalized by the following equations;

1). $VAIC^{TM}$= ∫ (PERGENDER, TA, ROA, ROE, TOR, E, R, S, LNDTA);

2). $VAIC^{TM}$= ∫ (PERCOLOUR, TA, ROA, ROE, TOR, E, R, S, LNDTA);

3). $VAIC^{TM}$ = ∫ (PERNONEXEC, TA, ROA, ROE, TOR, E, R, S, LNDTA);

4). $VAIC^{TM}$ = ∫ (PERCOM, TA, ROA, ROE, TOR, E, R, S, LNDTA);

5). $VAIC^{TM}$ = ∫ (CHAIR, TA, ROA, ROE, TOR, E, R, S, LNDTA);

Where:

$VAIC^{TM}$=Value Added Intellectual Coefficient;

PERGENDER= percentage of women on the board of directors;

PERCOLOUR= percentage of persons of colour on the board of directors;

PERNONEXEC= percentage of non-executive directors on the board of directors;

PERCOM= percentage of non-executive directors on the audit and remuneration committees;

CHAIR= dummy variable where a director holding the chairperson of the board and chief executive officer positions is scored a one (1); otherwise a zero (0);

TA= total assets;

ROA= return on assets ratio;

ROE= return on equity ratio;

TOR= turnover ratio;

E= electronic industry, dummy variable;

R= retail industry, dummy variable;

S= service industry, dummy variable;

DTA= natural log of debt to asset ratio.

5.6.1 Measure of the dependent variable

5.6.1.1 Intellectual Capital Performance

Empirical findings have illustrated the increasing importance of a company's intellectual capital to its overall value. For example, The Brookings Research Institute found that in 1962 62% of a company's value was represented by its physical capital; this percentage had declined to 38% in 1992. Luthy (1998) described the growing significance of intellectual capital by stating that intellectual capital was becoming the preeminent resource for creating wealth and that the relative importance of tangible assets had decreased through time due to the increasing importance of intangible, knowledge based assets.

Intellectual capital is a broad based term that is considered to be synonymous with a firm's intangible assets (Mitchell Williams, 2000b). There is however to date no precise agreement on the definition of intellectual capital. Stewart (1997, p.67) defines intellectual capital as "packaged useful knowledge". Brookings (1996, p.12) offers a more comprehensive definition stating that intellectual capital refers to the "combined intangible assets which enable a company to function". It was beyond the scope of this study to assess the respective merit of the various definitions of intellectual capital. For the

purposes of this research study intellectual capital was defined as the enhanced value of a firm attributable to assets, generally of an intangible nature, resulting from the company's organizational function, processes and information technology networks, the competency and efficiency of its employees and its relationship with its customers (Mitchell Williams, 2000c). Intellectual capital assets are developed from (a) the creation of new knowledge and innovation; (b) application of present knowledge to present issues and concerns that enhance employees and customers; (c) packaging, processing and transmission of knowledge; and (d) the acquisition of present knowledge created through research and learning (Mitchell Williams, 2000a).

For the purposes of this research study, the concept of intellectual capital was categorized into four major components; this is consistent with recent literature on intellectual capital such as Brookings (1996). These components are termed and described as follows:

(1) human resources- cover statements about the employees' qualifications, the management system's handling of the human development task and the employees' satisfaction;

(2) customers- cover statements about the composition of customers, the company's efforts to develop the customer relationship and customer satisfaction and loyalty;

(3) information technology and process- covers the scope and availability of IT systems and an activity-orientated expression of a number of business activities especially favoured by the company; and

(4) intellectual property- covers statements by a company on its investment into and development of creative ideas and items to which rights have been assigned. The term covers such items such as trademarks, patents, trade secrets and confidential information.

As yet there is no fully accepted measure of intellectual capital and the success of its application by a business. Generally speaking the methods to measure intellectual capital can be classified into two main groups. The first group adopts an approach where the value of intellectual capital is expressed in financial terms at an organization level with a specified benchmark of a

perceived value such as shareholders' equity. Common measures of intellectual capital at the organizational level are (1) calculated intangible value; (2) Tobin's q; and (3) Market to Book ratio (see Stewart, 1997). The primary premise of these measures is the relationship of intellectual capital to shareholder value. Table 2 illustrates examples of the organizational level/financial basis approach.

Refer to Appendix E Table 2

The second group of measures utilizes a component-by-component analysis of the intellectual capital held by a firm. For example intellectual capital may be considered to comprise three major components such as human, customer and infrastructure capital respectively. Under the component-by-component approach each component is valued separately using a measure appropriate for that component. Difficulties in aligning various component measures, have led to criticism of the component-by-component approach to measuring intellectual capital. Another limitation of the component-by-component approach is that such measures have usually been designed to fit the characteristics of one single company or industry. The generalisability of such measures is therefore in question. Table 3 illustrates examples of the component-by-component approach.

Refer to Appendix E Table 3

Mindful of the respective criticisms of the various measures of intellectual capital, two screening criteria were adopted in selecting the measure for intellectual capital performance in this research study. These criteria were 1) the basic underlying feature of the measure should be based on a key component of intellectual capital rather than a measure of physical capital; and 2) simplistic enough to enhance understanding and to allow relative ease in collecting data. The use of an uncomplicated intellectual capital measurement model can be supported for various reasons including behavioural, cognitive and cost/benefit reasons. With increased complexity there is an increased risk of ambiguity which has the potential to reduce the

understandability and applicability of the intellectual capital model. It is also suggested that the value of an intellectual capital measurement model comprising log checklists and complicated simulations between indicators may be undermined by the inability of stakeholders to comprehend all indicators at once (Mitchell Williams, 2000a). Finally from a pragmatic perspective, it can be argued that if the cost of designing, implementing, administering and updating the intellectual capital measurement model outweighs the benefits derived by company management and its stakeholders, there is a lack of incentive for its use.

Considering the two screening criteria outlined above, the Value Added Intellectual Coefficient ($VAIC^{TM}$) (Pulic, 1998) forms the underlying basis of measurement for intellectual capital performance in this research study. This measure is considered to be a "universal indicator showing abilities of a company in value creation and representing a measure for business efficiency in a knowledge based economy" (Pulic, 1998, p.9). $VAIC^{TM}$ is an analytical procedure that is designed to enable management, shareholders and other stakeholders to effectively monitor and evaluate the efficiency of *value added (VA)* by a company's total resources and each major resource component. Formally, $VAIC^{TM}$ is the sum of three separate indicators:

1) Capital employed efficiency *(CEE)*- an indicator of value added (*VA*) efficiency of capital employed; 2) Human capital efficiency *(HCE)*- an indicator of value added (*VA*) efficiency of human capital; and 3) Structured capital efficiency *(SCE*)- an indicator of value added (*VA*) efficiency of structured capital.

Equation 1 formalizes the relationship algebraically.

Equation 1

$VAIC^{TM}_i = CEE_i + HCE_i + SCE_i$

Where $VAIC^{TM}_i$ = VA intellectual coefficient for firm i;

$CEE_i = VA_i / CE_i$; VA capital employed coefficient for firm i;

$HCE_i = VA_i / HC_i$; human capital coefficient for firm i ; and

$SCE_i = SC_i / VA_i$; structured capital coefficient for firm i;

$VA_i = I_i + DP_i + D_i + T_i + M_i + R_i$; VA for firm I computed as the sum of interest expenses (I_i); depreciation expenses (DP_i); dividends (D_i) ; corporate taxes (T_i) ; equity of minority shareholders in the net income of subsidiaries (M_i) ; profits retained for the year (R_i);

CE_i = book value of the net assets for firm i;

HC_i = total investment in salaries and wages for firm i;

$SC_i = VA_i - HC_i$; structured capital for firm i

For the purposes of this research study, value added is defined in terms of Pulic (1998). Human Capital is measured through the total investment in salaries and wages for the financial year (staff costs) (Pulic, 1998). The book value of net assets of a company is measured by the physical capital employed by a company (Mitchell Williams, 2000a; Mitchell Williams, 2001; Pulic, 1998). For the purposes of this research study Structural Capital is Value Added minus Human Capital. Human Capital and Structural Capital are reverse proportional; the less Human Capital participates in value creation the more Structural Capital is involved (Pulic, 1999).

Table 4 presents a formal illustration of the calculation of each variable using the VAIC™ methodology.

Refer to Appendix E Table 4

The key reasons to support the use of the above measure are described as follows (Firer, and Mitchell Williams, 2003):

(1) the measure is unique in its flexibility for application to both macro and micro economic levels. The methodology can therefore be applied in developing an understanding of the intellectual capital performance of a single company, group of companies, specific business sectors or an entire capital market;

(2) the methodology provides a standardized and consistent basis of measurement, thereby enabling national and international comparison; and

(3) all data used in the equation are based on audited information;

calculations can therefore be considered to be objective and verifiable.

5.6.2 Measure of Independent variables

Gender diversity on the boards of directors was measured as the percentage of female directors on the board of directors of South African companies listed on the JSE Securities Exchange for the year ended 31 December 2003. This approach is consistent with previous research that has questioned the relationship between gender diversity on the board of directors and company performance (see, for example, Coffey and Wang, 1998; Mitchell Williams, 2000a; Kesner, 1988; Judge, 2003; Ryan and Haslam, 2004; Bilimoria, Piderit and Kristin, 1994). Colour diversity was measured as the percentage of colour directors on the board of directors for South African companies listed on the JSE Securities Exchange for the fiscal year ended 31 December 2003 (see, for example, Mitchell Williams, 2000a; Cochrane, Wood and Jones, 1985; Westphal and Milton, 2000). There were two primary reasons for the categorization of directors into two groups, white and persons of colour. This research study does recognize the existence of a number of different colour groups in South Africa; however, the review of the composition of the board of directors of South African publicly listed companies for the year ended 31 December 2003, indicated that the majority of persons of colour on the board of directors were of African heritage. So as not to exclude directors who were not categorized as white but not of African heritage from this research study, it was decided to utilize a broader definition of persons of colour for the purposes of this research report. Use of a broader definition of persons of colour for this research study is appropriate as it meets the definition applied in the Employment Equity Act where “black people” is used as a generic term describing Africans, Indians and Coloureds (Minister of Labour, 1998).

The influence of executive/non-executive directors on company performance was operationalised using the percentage of non-executive directors on the board of directors for South African companies listed on the JSE Securities Exchange for the year ended 31 December 2003 (see, for example, Kesner, 1998; Mitchell Williams, 2000c; Abdullah, 2004). A non-executive director was defined for the purposes of this research study, as an individual who is neither

a current or retired employee of the company, or one of its subsidiaries. This distinction is consistent with prior research such as Vance (1955, 1964). The percentage of all non-executive directors serving on the audit and remuneration committees of the respective companies was used to investigate the relationship between committee composition and company performance (see, for example, Mitchell Williams, 2000a; Kesner, 1988). Chairperson duality was captured by using a dummy variable, where a score of one was applied where the same person occupies the positions of chairperson and chief executive officer, and a zero was allocated where the same individual does not occupy both positions (see, for example, Abdullah, 2004; Mitchell Williams, 2000a).

5.6.3 Control factors

Statistical predictions can often be improved by using more than one independent variable (Van Staden, 1998). Therefore, by using control variables in addition to the explanatory variable, the predictive values of the regression models are increased.

The literature documents various accounting and market-based measures that may be utilised as a proxy measure designed to capture the respective properties of the control variables. Presently, there is no specific theoretical perspective or empirical evidence supporting any specific proxy measure over another. It is decided, therefore, that for the purposes of the present study to use proxy measures deemed to have been widely use in the prior literature (Firer and Mitchell Williams, 2003). Consequently, the proxy measures for each control variable are defined as follows:

5.6.3.1 Company Size

Total assets were used to control for company size. Larger company size is believed to lead to more empowerment opportunities and prestige to managers than in smaller companies (Tosi and Gomez-Mejia, 1989). With greater managerial empowerment and prestige there is an increased ability of

directors to influence the direction of the company towards the generation and maintenance of intellectual capital (Mitchell Williams, 2000a; Mitchell Williams, 2001).

5.6.3.2 Industry type

The extent of company participation in intellectual capital activities influences the intellectual capital performance of the company. Companies that are more reliant on technology and other intellectual capital components may provide management and directors with increased expertise and demands in managing intellectual capital.

When analysing the beta of shares on the Johannesburg Securities Exchange, Campbell (1979) found that individual share Betas' were more stable when measured against the respective sector indices than with the market as a whole, and consequently proposed that a different securities market line existed for each sector, with each sector therefore being a separate market, thereby supporting the use of industry identifiers when applying predictive models. This approach is further supported by Amir and Lev (1996) and Van Renburg and Robertson (2003) for similar reasons. For the purposes of this research study, industry classifications were taken from the JSE, and industries which were considered to be similar in structure were grouped together.

Dummy variables were used to indicate the industries within which companies operated. (E) was used to indicate companies within the electronics and resources industries, (S) was used for companies in the service industry and (R) to indicate companies in the retail sector.

See Table 5 for industry dummy variable analysis.

Refer to Appendix E Table 5

5.6.3.3 Risk

The risk profile of a company is measured by the debt to asset ratio (Firer and Mitchell Williams, 2003; Mitchell Williams, 2000a; Mitchell Williams, 2001). With increased debt, the attention of management may be directed towards its own requirements (company survival). This variable is anticipated to have a negative effect on company performance.

5.6.3.4 Productivity

Simply using total revenues as a measure of productivity is inadequate because productivity refers to whether that revenue was produced efficiently. However, using the turnover ratio which divides total revenues by total assets creates a simple measure of productivity (Firer and Mitchell Williams, 2003).

This ratio indicates how effectively a company's assets are being used, by comparing them with the volume of sales that they generate (Faul, Pistorius, Van Vuuren, Vorster, and Swanevelder, 2000). In other words, this ratio represents the efficiency with which physical and intellectual assets convert inputs into the goods and services that are subsequently sold.

5.6.3.5 Profitability

Return on assets and return on equity were used to control for company profitability. Return on equity was calculated as net income divided by ordinary shareholders' equity. Conceptually, the return on assets ratio consists of a numerator derived from the income statement and indicates a level of earnings of the firm, and a denominator derived from the balance sheet which reflects resources devoted to the generation of those earnings.

The primary objective of a business enterprise is to earn a reasonable yield on the assets invested in it. The earning capacity of the assets is called the return on assets (Faul, et al, 2000). Therefore, the variable measuring company profitability will be the company's return on assets (Firer and Mitchell Williams, 2003).

Return on assets will be calculated as the ratio between the company's profit and its total assets, comprised of both financial, physical assets, and intangible assets owned by the company.

A major strength of the return on assets ratio is that it is free from the effects of bias that can result from differences in capital structure between companies.

The return on equity ratio is considered to better measure the effects of a company's actions on shareholders' funds than the return on assets ratio (Cochran, Wood and Jones, 1985); it is therefore submitted that both control variables are to be included in the model.

Multicollinearity testing was performed on the ROA and ROE ratios, as both use a measure of income to determine a return on the resources used to produce this income. Three principal multicollinearity tests are suggested by Gujarati and Damodar (2003 : 361); first a correlation coefficient between the two variables, second, a variable inflation factor (VIF), and last Eigen Values. The results of the three tests are reflected in table 18. The correlation coefficient was calculated using Microsoft excel, and displayed a 7% correlation between the two variables; VIF values were calculated using SPSS software, with all values reflecting less than 10 and therefore no evidence of multicollinearity; and finally Eigen values were calculated using SPSS, where all values were well below the guideline of 100-1000, reflecting no mulicollinearity[1].

Refer to Appendix E Table 18

Although at face value the composition of ROA and ROE appear to be similar, and therefore potentially correlated, the two ratios are in fact materially

[1] In addition to the multicollinearity tests performed, all multiple regressions were run excluding either ROE or ROA to ensure that there was no multicollinearity effect. Results indicated a decrease in the R^2 and adjusted R^2 of between 0.04 and 0.05, with all other variables displaying negligible change and therefore no effect on the overall conclusions reached.

different. This is due to return on assets being a return on all assets, those funded by equity and debt instruments; whereas return on equity is return on funds provided by shareholders only. The two will therefore be materially different, as the numerator for ROE will be after interest charges, while the numerator for ROA is before, and the denominators will be materially different for the reasons noted above. The data used in the model are also cross-sectional, and therefore different companies, with different debt structures, different tax structures and different revenue and cost relationships will all have materially different ROA and ROE ratios, and therefore little collinearity between the two measures is likely to result, as reflected by the multicollinearity measures above. It should also be noted that the dependent variable is intellectual capital performance, and therefore the informational effect of ROE and ROA on this variable is unlikely to be the same.

5.7 Regression models

The contribution of board structure to company performance as measured by (VAIC^{TM}) is tested by using 5 different regression models as specified in 5.6. Models 1-5 are designed to empirically investigate the relationship between board structure and company performance.

The use of regression equations requires adherence to the following assumptions:

- Linearity: The regression equation assumes that a linear relationship exists between the dependent variable and the independent variables. The existence of linearity is observed using a scattergram. A linear disbursement is observed rather than a curvature.
- Normality: According to the central limit theorem, the residuals representing the unobserved explanatory variables are required to be normally distributed. If the residuals are normally distributed, then they have a linear function, and henceforth, the explanatory variables will be normally distributed.

In order to assess normality of all variables, a histogram was generated and visually examined for normal distribution. Where data was not normally distributed, the observations were logged using natural logarithms. Histograms were again generated and analysed using the transformed data, and in all cases the resulting data were found to be normally distributed. Data transformed included the total debt to total asset ratio.

To analyse consistency of scatter, and for identification of outliers, a scattergram was generated for each variable. Severe outliers were removed from the population. Table 17 illustrates histograms and scatter grams generated prior to transformation of the data.

Refer to Appendix E Table 17

5.8 Summary

The contribution of board structure to company performance in the South African economy was examined using five different models. Models 1-5 are designed to empirically investigate the relationship between a company's performance and board structure. Company performance is examined in terms of intellectual capital performance. The primary independent variables are percentage of women on the board of directors; percentage of persons of colour on the board of directors; percentage of non-executive directors on the board of directors; chairperson duality and the percentage of non-executive directors on the audit and remuneration committees of the company.

Chapter 5 sets out the research design and methodology that underlies this research study. The next step in the process is to prepare the data for analysis, conduct the hypothesis testing, and determine whether the hypotheses are to be accepted or rejected. These steps are discussed in detail in Chapter 6.

Chapter 6- Analysis and Interpretation of Research Results

6.1 Introduction

The objective of this chapter is to explore, display and examine the data collected. The chapter discusses the descriptive statistics for the primary variables, and describes the statistical results in respect of each model, of the multiple regression analysis and determines whether the hypotheses are accepted or rejected. Regression equations were tested at a 5% confidence level.

6.2 Descriptive statistics

Descriptive statistics of the key variables are presented in Tables 6, 7 and 8. Appendix D sets out the board characteristics of the companies included in the final data set.

Refer to Appendix E Table 6
Refer to Appendix E Table 7
Refer to Appendix E Table 8

6.2.1 Director characteristics

Focusing on the director characteristics of the sample it is observed that the average number of directors on the boards of directors of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year is 10.3 directors. These findings are consistent with research conducted on 1990's data in the United States and United Kingdom; results generally indicated that the majority of publicly listed companies in the United States and the United Kingdom had 10 or less directors on their boards (Conyon and Mallin, 1997; Main and Johnston, 1993; Finkelstein and Hambrick, 1996).

6.2.1.1 Women representation

With respect to the presence of women on the boards of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year, the

mean percentage of women representation is 6.4%. 46% of the companies included in the sample had female representation on the board of directors; this is significantly below that reported in developed nations such as the United States where nearly 75% of boards of directors have women representatives (see, for example, Dalton et al., 1998; Daum, 1998). These current findings are however consistent with the study conducted by Mitchell Williams (2000c) where results indicated that 47% of the sample had female representation on the board of directors. Consistent with findings from other nations, the number of woman on boards of directors having female representation was usually limited to one or two (see, for example, Daum, 1998; Directors and Boards, 1992; Karr, 1991; Von Glinow and Mercer, 1988; Kesner, 1988). Bilimoria and Piderit (1994) found that despite the suggested benefits of having women on the boards of directors, women in top leadership positions in the corporate world are rare. Adler (2000) and Davidson and Burke (2000) submitted that there is little doubt that women continue to be disadvantaged in the workplace and underrepresented in leadership positions. Morrison, White and Van Velser (1987) suggest that while women are typically confronted by an invisible barrier preventing their rise into leadership ranks, the "glass ceiling", men are more likely to be conveyed into management positions by means of a "glass escalator" (Williams, 1992). Fierman (1990) identified a mere 19 women among the highest-paid officers and directors of the 1000 largest U.S industrial and service companies.

The under representation of women in top management may be explained by two controversial arguments (Bilimoria and Piderit, 1994); the experienced-based bias argument and the sex-based bias argument. Proponents of the experienced-based bias view argue that the dearth of women leaders of corporations occurs because women have not yet acquired the necessary inputs for leadership; the substantive argument of this perspective is that men and women would have equal representation on corporate boards when they have equal qualifications (Bilimoria and Piderit, 1994). Graves and Powell (1988) suggest that male and female managers differ in their success and board representation simply due to the average male manager being older and therefore more experienced than the average female manager. Similarly

Friedman (1988) and Williams (1988) pointed out that it may still be too early for women to have attained proportional management on boards of directors, since young women who entered management in the mid-1970's are still younger than the average male executives. The experience-based-bias argument thus suggests that it is the experience of male and female directors and not their sex that influences their board representation. This argument supports the low numbers of women on the boards of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year.

In contrast to the proponents of the experience-based-bias argument, several writers have suggested that mechanisms hold women back regardless of their qualifications (Bilimoria and Piderit, 1994). It is suggested that women do not receive the same assistance and support as their male peers, are subject to greater scrutiny and expectations than men and are not as highly rewarded as men who have made comparable achievements (Hitt and Barr, 1989). Williams (1988) reported that headhunters indicate that organizations still prefer male candidates for senior executives over equally experienced women. Hitt and Barr (1989), drawing on a sample of managers and professionals, found that sex was an issue in selection decisions for midlevel and upper-level management positions; despite equal qualifications women had lower probabilities of being selected than men. In support of the view that women face barriers in the form of sex-based bias, Kanter (1977) presented evidence that regardless of their qualifications, when placed in groups in which they are significantly out-numbered by men, women become tokens and are faced with predictable treatment from others that forces them into roles that limit their probabilities of success. The sex-based-bias argument provides a compelling explanation for the proportionately low representation of females on the boards of directors of South African publicly listed companies for the 2003 year.

Despite the low level of female representation on the board of directors of South African companies listed on the JSE Securities Exchange for the 2003 year, an independent sample T-test indicated that the mean intellectual capital performance value for a company with women on the board was marginally

greater than that for companies with no women on the board of directors. A Levene's test for equality of variances as indicated in Table 15, indicated that the difference in the mean intellectual capital performance for companies with women on the board of directors and companies with no women on the board of directors was insignificant.

Refer to Appendix E Table 15

6.2.1.2 Colour representation

66% of the companies included in this research study had persons of colour on their boards of directors; this is consistent with the findings of Mitchell Williams (2000c) where 64% of the companies had persons of colour on the board of directors. The mean percentage of colour representation on the board of directors in the companies included in the sample is 13.7%.

This relatively low level of colour representation on the boards of South African publicly listed companies for 2003 may be explained by self-categorization theory and the experience based argument; proponents of the self-categorization theory argue that individuals construct social identities in classifying themselves and others into social categories based on a salient demographic feature such as colour (see, for example, Jackson, Stone and Alvarez, 1992; O'Reilly, Williams and Barsade, 1997); while proponents of the experienced based argument assert that persons of colour may be underrepresented due to a lack of experience caused by the effects of apartheid. Through such categorization a demographic minority on a board of directors may be considered an out-group from the members of the majority (Westphal and Milton, 2000). It is thus suggested that persons of colour may not accept positions on a board of directors where they are considered to be token members and where circumstances are unfavourable (see, for example, Westphal and Milton, 2000; O'Reilly, Williams and Barsade, 1997).

An independent sample T-test indicates that the mean intellectual capital performance value for a company with persons of colour on the board was marginally higher than that for companies with no persons of colour on the

board of directors. A Levene's test for equality of variances indicated that the difference in the mean intellectual capital performance for companies with persons of colour on the board of directors and companies with no persons of colour on the board of directors was insignificant. Refer to Table 16.

Refer to Appendix E Table 16

6.2.1.3 Executive versus non-executive director representation

The mean percentage of non-executive directors on the board of directors of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year is 59.2%. These results are consistent with findings from Vafas and Theodorou (1998) who reported that of 250 publicly listed firms surveyed, the percentage of non-executive and executive directors on the boards of directors was 61% and 39% respectively. Mitchell Williams (2000c) observed that the representation of non-executive and executive directors on the boards of South African publicly listed companies was evenly divided; it should be noted that this study was conducted prior to the implementation of King II that provides for a greater percentage of non-executive directors on a board of directors than executive directors (Cliffe Dekker, 2002).

Findings of this research study confirm that agency theory, resource dependence theory and stakeholder theory; support the proposition that non-executive directors have a significant impact on a company's performance (see, for example, Pfeffer and Salancik, 1978; Wang and Dewhist, 1992). Rosenstein and Wyatt (1990) found that the addition of a non-executive director to the board of directors resulted in the company earning a positive excess return. This suggests that shareholders and stakeholders of a company view the appointment of a non-executive director as having intrinsic value. These arguments explain the findings that there are a greater percentage of non-executive directors on the boards of South African companies listed on the JSE Securities Exchange for the 2003 year than there are executive directors.

6.2.1.4 Non-executive director representation on standing committees

The mean percentage of non-executive directors on the audit and remuneration committees of South African publicly listed companies for the 31 December 2003 year end is 84%. This composition is comparable to prior research in the United States and the United Kingdom (see, for example, Yermack, 1996; Conyon and Mallin, 1997).

Despite the increased attention on the composition of a board of directors, there is still very little research on the composition of board standing committees. Marx (1985) and Klein (1996) did suggest that the ability of non-executive directors to provide a positive contribution to a company's performance in the decision making process is their presence on standing committees that focus on controlling tasks; the authors conclude that a greater percentage of non-executive directors on the audit and remuneration committees of a company would be beneficial to company performance. Within the South African context, King II provides for a majority of non-executive directors on the standing committees of the board (Cliffe Dekker, 2002); in light of this argument, it is expected that the percentage of non-executive directors on the audit and remuneration committees for South African publicly listed companies for 2003 would be in excess of 50%.

6.2.1.5 Chairperson duality

Four companies of the 117 companies included in the final data set had not separated the role of the chairperson and chief executive officer. Where the positions were occupied by the same individuals, companies had provided comment that the situation was temporary and had resulted from circumstances such as resignation and changes in directorship. These findings are consistent with expectations; within the South African context (Cliffe Dekker, 2002), King II requires South African publicly listed companies to separate the two roles.

This research study's findings are substantially different to the Mitchell Williams (2000c) study, also performed on South African companies, where

42.8% of the companies included in the survey had a chief executive officer who also acted as the chairman of the board of directors. It should be emphasized that this study was conducted prior to the implementation of King II and thus the requirement for the separation of the two roles was not existent. The existence of only four instances of non separation is likely to affect the findings of the study, in that the majority of the companies had separated the role, and that any result regarding non separation on such a small sample are likely to be inconclusive. This will be borne in mind when interpreting the results.

6.3 Regression analyses

6.3.1 Women representation

Equation 1: VAICTM= ∫ (PERGENDER, TA, ROA, ROE, TOR, E, R, S, LNDTA)

Refer to Appendix E Table 9

Results- equation 1

The results for the regression testing the significance of women are presented in Table 9. Using equation 1, the regression yielded a positive robust relationship for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, and turnover ratio. The t-statistics in all cases were above the benchmark level of 2, and all yielded a significant relationship at a 5% confidence level. The model fit as measured by the R^2 and adjusted R^2 display a model fit for the data at around a 60% level. The model therefore has strong predictive ability and results therefore confirm that the model is stable and adequate as a base for the testing of the hypothesis. Control factors included in the model contribute towards the explanatory power of the model.

The coefficient for women, although displaying a positive relationship, is insignificant as measured by the t-statistic of 1.27 at a confidence level of 5%. The results therefore reject the hypothesis that there is a significant positive relationship between the percentage of women on the board on directors of

South African publicly listed companies and company performance; the null hypothesis is therefore accepted.

It should be noted that the actual numbers of women serving on the boards may be too small to ensure the accuracy of regression results and the drawing of any firm conclusions from the results.

Results are consistent with findings by Babchuk, Marsey and Gordon (1960) and Zald (1969), who failed to find a significant relationship between the presence of women on the board of directors and company performance; these studies concluded that the lack of any relationship was due to the low number of women that were actually on the boards of directors. Bilimoria and Piderit (1994), and Zahra and Stanton (1988), found similar results and attributed the lack of an association between women on the board of directors and company performance to the fact that women are disadvantaged by the type of assignments they are traditionally given whilst on the board of directors.

6.3.2 Colour representation

Equation 2: VAICTM= ∫ (PERCOLOUR, TA, ROA, ROE, TOR, E, R, S, LNDTA)

Refer to Appendix E Table 10

Results- equation 2

The results for the regressions testing the significance of colour diversity are presented in Table 10. Using equation 2, the regression yielded positive robust relationships for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio, and the industry dummy variables, E, R and S. The t-statistics in all cases were above the benchmark level of 2, and all yielded a significant relationship at a 5% confidence level. The model fit as measured by the R^2 and adjusted R^2 display a model fit for the data at around a 62% level. The results therefore confirm that the model is stable and adequate as a base for the testing of the hypothesis.

The coefficient for colour diversity, as measured by the t-statistic of 2.83 is significant, displaying a robust, positive relationship at a 5% confidence level. The results therefore support the hypothesis that there is a significant positive relationship between the percentage of colour representatives on the board of directors of South African publicly listed companies and company performance; the null hypothesis is therefore rejected.

The significant positive relationship between the percentage of persons of colour on the board of directors and company performance is supported by the literature that suggests that the inclusion of a person of colour into the social mix of the board of directors has the potential to stimulate divergent thinking in the decision-making process and thus improve company performance (see, for example, Crano and Chen, 1998; Nemeth, 1986; Hitt and Barr, 1989). Moscovici and Faucheaux (1972), Nemeth (1986) and Laughlin (1992) suggest that the addition of a person of colour to the board of directors will be able to offer unique perceptions to issues that can alter the conventional views of the board of directors through the encouragement of others to question the assumptions that had previously implicitly guided the reasoning of the board. Apart from promoting change in the original perceptions and views held by the board of directors, the introduction of a board member of colour may also assist in generating more original approaches to intellective and decision-making tasks and thus contribute towards an improved level of company performance (see, for example, McGrath, 1984; Bantel and Jackson, 1989; Williams and O'Reilly, 1997).

Resource-based theory of competitive advantage and strategy analysis further support the proposition that there is a significant relationship between the percentage of persons of colour on the board of directors and company performance (Crano and Chen, 1998). The authors propose that a firm generates competitive advantage and better performance by its ability to capitalize on and the application of its internal resources, such as its employees, in uncertain and dynamic contexts. Given that the majority of the South African workforce is comprised of persons of colour, companies that

can effectively deal with this internal resource will achieve a greater competitive advantage and improved performance.

6.3.3 Executive versus non-executive director representation

Equation 3: VAICTM =∫ (PERNONEXEC, TA, ROA, ROE, TOR, E, R, S, LNDTA)

Refer to Appendix E Table 11
Results- equation 3

Regression results testing the significance of the percentage of non-executive directors on the board of directors are presented in Table 11. Using equation 3, the regression yielded a positive robust relationship for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio and the dummy industry variables. The t-statistics in all cases were above the benchmark level of 2, and all yielded a significant relationship at a 5% confidence level; control factors therefore contributed to the overall explanatory power of the model. The model fit as measured by the R^2 and adjusted R^2 display a model fit for the data at around a 60% level. The model therefore has strong predictive ability and results therefore confirm that the model is stable and adequate as a base for the testing of the hypothesis.

The coefficient for the percentage of non-executive directors, although displaying a positive relationship, is insignificant as measured by the t-statistic of 0.93 *(p>0.05)*. The results therefore reject the hypothesis that there is a significant positive relationship between the percentage of non-executive directors on the board on directors of South African publicly listed companies and company performance; the null hypothesis is therefore accepted.

The low level of significance between the percentage of non-executive directors on the board of directors and company performance is consistent with evidence supporting the managerial hegemony theory (Bhagat and Black, 1997). In an empirical study, Fosberg (1989) found that there was no significant difference in various financial ratios (indicative of company performance) between companies whose boards were dominated by non-

executive directors and companies whose boards were not dominated by non-executive directors.

This lack of significance could be due to the fact that non-executive directors may not have access to and adequate knowledge of the company (Koontz, 1967). Research evidence showing an insignificant association between the proportion of non-executive directors and company performance was also documented in various other studies (see, for example, Klein, 1998; Agrawal and Knoeber, 1996; Yermack, 1996).

6.3.4 Non-executive director representation on standing committees

Equation 4: VAICTM =∫ (PERCOM, TA, ROA, ROE, TOR, E, R, S, LNDTA)

Refer to Appendix E Table 12
Results- equation 4

Regression results testing the significance of the percentage of non-executive directors on the audit and remuneration committees are presented in Table 12. Using equation 4, the regression yielded a positive robust relationship for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio and the dummy industry variables; control factors therefore contributed to the explanatory power of the model. The t-statistics in all cases were above the benchmark level of 2, and all yielded a significant relationship at a 5% confidence level. The model fit as measured by the R^2 and adjusted R^2 display a model fit for the data at around a 60% level. The model therefore has strong predictive ability and results therefore confirm that the model is stable and adequate as a base for the testing of the hypothesis.

Regression equation results for equation 4 indicate an insignificant relationship between the composition of the audit and remuneration committees and company performance; the coefficient for the percentage of non-executive directors on the remuneration and audit committees, although displaying a positive relationship, is insignificant as measured by the t-statistic of 0.18 ($p>0.05$). The results therefore reject the hypothesis that there is a significant, positive relationship between the percentage of non-executive

directors on the audit and remuneration committees and company performance; the null hypothesis is therefore accepted.

These results are consistent with previous empirical research on the relationship between the composition of respective standing committees and a company's financial performance; Klein (1996) found a moderate impact of non-executive/executive director composition on standing committees and firm value. Using data from the United Kingdom, Forker (1992) and Vafeas and Theodorou (1998) found a weak association between the composition of the audit committee and company performance.

6.3.5 Chairperson duality

Equation 5: VAICTM =∫ (CHAIR, TA, ROA, ROE, TOR, E, R, S, LNDTA)

Refer to Appendix E Table 13
Results- equation 5

Results of the regression testing the significance of chairperson duality are presented in Table 13. Using equation 5, the regression yielded a positive robust relationship for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio and the dummy industry variables. The t-statistics in all cases were above the benchmark level of 2, and all yielded a significant relationship at a 5% confidence level. The control factors included in the model contributed to the explanatory power of the model. The model fit as measured by the R^2 and adjusted R^2 display a model fit for the data at around a 60% level. The model therefore has strong predictive ability and results therefore confirm that the model is stable and adequate as a base for the testing of the hypothesis.

Regression results for equation 5 indicate a negative insignificant relationship between chairperson duality and company performance; the coefficient for chairperson duality is insignificant as measured by the t-statistic of -0.38 ($p>0.05$). The results therefore reject the hypothesis that there is a significant

positive relationship between chairperson duality and company performance; the null hypothesis is therefore accepted.

Regression results therefore suggest that chairperson duality is considered to be an insignificant determinant of company performance and therefore not viewed as critical in the corporate governance structure. Findings of research studies into the determinants of chairperson duality have been mixed; Rechner and Dalton (1991) and Pi and Timme (1993), for example, found that firms that had separated the two roles consistently outperformed entities with combined titles. Brickley et al. (1997) and Vafeas and Theodorou (1998), however, found contradictory results. Brickely et al. (1997) concluded that there was no support for the proposition that the separation of the two roles improved company performance.

6.4 Summary

As a result of the findings of this research study, it may be posited that there is a lack of association between company performance of South African organisations and the board structure of the company. However, evidence does exist (found in this research study) that there is a positive relationship between colour representation on the board of directors of companies listed on the JSE Securities Exchange and intellectual capital performance. This evidence suggests that South African companies are achieving transformation by appointing more persons of colour to the board of directors rather than by appointing women to directorship positions. Results of this research study seem to suggest that board composition is not an important determinant of company performance.

A summary of research findings are presented in Table 14.

Refer to Appendix E Table 14

In Chapter seven, the findings of the research are summarised, and final conclusions are drawn and clarified.

Chapter 7- Summary and conclusion

7.1 Introduction

This research study investigated the contribution of board structure to company performance in South Africa. Contribution was evidenced by determining whether board structure is an important determinant of company performance. Company performance was examined in one dimension; intellectual capital performance as measured by the Value Added Intellectual Coefficient (VAIC™), (Pulic, 1998). In this chapter, the findings of the research are summarised, and conclusions are drawn and explained.

7.2 Summary of results

In respect of Equation One, a t-statistic of 1.2740 *(p>0.05)* indicated a positive, yet insignificant relationship between the percentage of women on the board of directors of South African companies listed on the JSE Securities Exchange and company performance. These findings suggest that gender diversity on the board of directors is not an important determinant of intellectual capital performance. To decide whether colour diversity on the board of directors could explain and predict intellectual capital performance, Equation 2 hypothesised that there was a positive significant relationship between the percentage of persons of colour on the board of directors of South African companies listed on the JSE Securities Exchange and intellectual capital performance. The findings indicated a significant positive relationship between colour diversity and intellectual capital performance; this was evidenced by a t-value of 2.8352 *(p<0.05)*. These findings suggest that colour diversity on the board of directors is an important determinant of intellectual capital performance.

Equation 3 hypothesised that there was a positive significant relationship between the percentage of non-executive directors on the board of directors of South African publicly listed companies and intellectual capital performance. The findings did not support the hypothesis; the t-statistic of the independent variable was calculated as 0.9342 (p>0.05). The null hypothesis

was therefore accepted. Findings therefore suggest that the presence of a majority of non-executive directors on the board of directors is not related to intellectual capital performance. In respect of Equation 4, a t-value of 0.1759 ($p>0.05$) indicated a positive, yet insignificant relationship between company intellectual capital performance and the percentage of non-executive directors on the audit and remuneration committees. To decide whether chairperson duality could explain and predict intellectual capital performance, Equation 5 hypothesised that there was a positive relationship between chairperson duality and intellectual capital performance. The findings indicated an insignificant, negative relationship between chairperson duality and intellectual capital performance. This was evidenced by a t-statistic of -0.3868 ($p>0.05$). These findings suggest that neither chairperson duality nor the percentage of non-executive directors on the audit and remuneration committees is a determinant of intellectual capital performance.

The control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio and the dummy industry variables included in the equations yielded significant relationships at a 5% confidence level in all regression equations tested. The control factors therefore contributed to the explanatory power of the models; for all equations tested, the model fit as measured by the R^2 and adjusted R^2 displayed a model fit for the data at around a 60% level. The models therefore have strong predictive ability and results confirm that the models are stable and adequate as a base for the testing of the hypotheses.

As a whole, the findings indicated that the contribution of board structure to intellectual capital performance was informative, but mixed. The empirical findings suggest board structure is not a primary determinant of company performance in South African companies listed on the JSE Securities Exchange, however the greater the percentage of persons of colour on the board of directors the greater the probability that intellectual capital performance will improve. This conclusion is drawn as a result of the findings in Equation 2, where the contribution of colour diversity to intellectual capital performance is examined. The overall findings suggest that despite the importance of good corporate governance practices, company performance

when defined by intellectual capital performance is not largely dependent on board structure.

7.3 Contribution to the literature

With the exception of Mitchell Williams (2000c) much of the prior literature investigating the relationship between board structure and company performance may be limited in its application for two primary reasons; first, company performance was generally measured in terms of traditional performance measures such as return on assets and market measures. With the introduction of the information age intellectual capital has become an essential factor is determining a company's future viability and success. Prior literature may therefore not be as relevant in the new "knowledge-based" economy. Second, the majority of previous studies utilized data from developed nations such as the United States and United Kingdom; it is questionable whether the findings of such studies hold in alternative regions with varying social and environment factors such as in South Africa.

The literature review could not provide conclusive evidence that board structure has a causal association with company performance. Empirical findings have yielded somewhat contradictory results, supporting the results of this research study. This study therefore sought to provide additional evidence as to the efficacy of board structure by examining the explanatory and predictive power of board structure in order to determine whether board structure could explain and predict company performance when measured by the VAIC^{TM} within the South African context.

7.4 Limitations of research study and suggestions for future research

Findings of the present study are subject to some limitations that provide initiatives for future research. One possible reason for the mixed results may be that the separation of women or persons of colour into whether they hold executive or non-executive positions on the board was not analysed. The lack of association between women on the board of directors and a firm's

performance may be accredited to the type of assignments and tasks given to these members whilst on the board of directors. The focus of this study was whether the addition of women or persons of colour, per se to a board of directors contributed towards company performance and not whether the contribution was a function of the position held. A future study could explore the relationship between women and the specific positions they hold on the board and company performance.

Another possible reason for the mixed results may be that women or persons of colour or non-executive directors was operationalised simply as the percentage of women or persons of colour or non-executive directors on the board of a given company; this measure does not take into account changes in the number of women or persons of colour or non-executive directors on the board of a given company and the date of appointment or length of service. Future studies could examine the relationship between company performance and alternative board characteristics such as the overall board size, educational qualifications or occupational experience of directors and date of appointment or length of service of directors appointed to the board.

The focus of this research study was to analyse the association between board diversity and company performance during a single time period. Future studies could use the same basic hypotheses and regression construction, but might implement the study as a longitudinal study rather than a cross-sectional design. The longitudinal study would need to correct changes in data relative to time element, such as price inflation.

This research study examined the association between board structure and company performance within an isolated corporate governance setting; this study could be extended to consider nations with a different corporate governance structure to South Africa.

Despite the possible limitations of using single-period data, a relatively focused sample, operationalised board characteristics, and a single domestic location, it is believed that the results from the present study provide valuable

insights into the association between board structure and intellectual capital performance.

The focus of this research study was on one single measure of intellectual capital performance. A future study could explore a different standardised measure for intellectual capital performance.

7.5 Final conclusions

This research study identifies a link between the percentage of persons of colour on the board of directors of South African publicly listed companies and company performance. This connection is found in the empirical evidence that there is a positive relationship between colour diversity on the board of directors and company performance. These results are extremely positive within the South African context. The apartheid regime systematically and purposely restricted the black members of the South African society from meaningful participation in the economy. In the ten years following the abolition of apartheid, the South African economy has experienced consistent economic growth and macroeconomic stabilization. South Africa's constitution enshrined the right of all South Africans to equality and provided for specific measures to be taken to redress historical imbalances (Department of Trade and Industry, 2003). New legislation aimed at addressing the inequalities of Apartheid and transforming society in all areas. Some of the legislation introduced included the Employment Equity Act (1998), the Promotion and Prevention of Unfair Discrimination Act and the National Small Business Act of 1996. The Employment Equity Act outlaws all forms of unfair discrimination at work and requires companies to take affirmative action practices to bring about a representative spread of designated groups is all occupations and organizational levels (Department of Trade and Industry, 2003). This would include the appointment of black persons to leadership positions. The results of this research study indicate that South African business has progressed towards economic and social transformation and that transformation has been effective in contributing towards company performance. This is extremely

positive to identify a link between transformation practices and improved company performance.

Results of this study failed to identify a significant relationship between the other specified characteristics of board structure and company performance, suggesting that these board structure characteristics are not important determinants of company performance. It should however be noted that these results are not conclusive in isolation. Only by collecting data over a period of time can these results be tested accurately.

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APPENDIX A

All companies listed on McGregor BFA for fiscal year 2003

	Name
356	ABC CASH PLUS LTD
230	ABSA GROUP LTD
269	ACUCAP PROPERTIES LTD
207	ADCORP HOLDINGS LTD
101	ADONIS KNITWEAR HOLDINGS LTD
208	ADVANCED TECHNICAL SYSTEMS LTD
209	ADVTECH LTD
46	AECI LTD
126	AFGRI LTD
155	AFRICAN & OVERSEAS ENTERPRISES LTD
308	AFRICAN BANK INVESTMENTS LTD
25	AFRICAN GEM RESOURCES LTD
244	AFRICAN LIFE ASSURANCE COMPANY LTD
183	AFRICAN MEDIA ENTERTAINMENT LTD
44	AFRICAN OXYGEN LTD
28	AFRICAN RAINBOW MINERALS LTD
3	AFRIKANDER LEASE LTD (THE)
136	AFROX HEALTHCARE LTD
51	AG INDUSTRIES LTD
194	ALEX WHITE HOLDINGS LTD
237	ALEXANDER FORBES LTD
357	ALL JOY FOODS LTD
283	ALLAN GRAY PROPERTY TRUST
137	ALLIANCE PHARMACEUTICALS LTD
81	ALLIED ELECTRONICS CORPORATION LTD
80	ALLIED TECHNOLOGIES LTD
266	ALPINA INVESTMENTS LIMITED
364	ALUDIE LTD
106	AMALGAMATED APPLIANCE HOLDINGS LTD
118	AMALGAMATED BEVERAGE INDUSTRIES LTD
267	AMBIT PROPERTIES LIMITED
94	AMLAC LTD
108	ANBEECO INVESTMENTS HOLDINGS LTD
14	ANGLO AMERICAN PLATINUM CORPORATION LTD
27	ANGLO AMERICAN PLC
2	ANGLOGOLD ASHANTI LTD
268	ANNUITY PROPERTY FUND
276	APEXHI PROPERTIES A LTD
365	APS TECHNOLOGIES LTD
253	AQUILA GROWTH LTD
70	ARGENT INDUSTRIAL LTD
265	ARNOLD PROPERTY FUND
139	ASPEN PHARMACARE HOLDINGS LTD
29	ASSMANG LTD
30	ASSORE LTD
331	AST GROUP LTD
119	ASTRAL FOODS LTD
195	ASTRAPAK LTD
275	ATLAS PROPERTIES LTD

378 AVASA HOLDINGS LIMITED
64 AVENG LTD
130 AVI LTD
114 AWETHU BREWERIES LTD
71 BARLOWORLD LTD
310 BARNARD JACOBS MELLET HOLDINGS LTD
15 BARPLATS INVESTMENTS LTD
58 BASIL READ HOLDINGS LTD
144 BEARING MAN LTD
379 BEGET HOLDINGS LIMITED
358 BEIGE HOLDINGS LTD
87 BELL EQUIPMENT LTD
31 BHP BILLITON PLC
76 BICC CAFCA LTD
197 BIDVEST GROUP LTD (THE)
277 BONATLA PROPERTY HOLDINGS LTD
196 BOWLER METCALF LTD
309 BRAIT SA
143 BRANDCORP HOLDINGS LTD
97 BRIDGESTONE FIRESTONE MAXIPREST LTD
254 BRIMSTONE INVESTMENT CORPORATION LTD
385 BRYANT TECHNOLOGY LTD
52 BUILDMAX LTD
102 BURLINGTON INDUSTRIES LTD
332 BUSINESS CONNEXION GROUP LIMITED
333 BYTES TECHNOLOGY GROUP LTD
311 CADIZ HOLDINGS LTD
66 CANADIAN OVERSEAS PACKAGING INDUSTRIES LTD
255 CAPE EMPOWERMENT TRUST LTD
246 CAPITAL ALLIANCE HOLDINGS LTD
280 CAPITAL PROPERTY FUND
307 CAPITEC BANK HOLDINGS LTD
215 CARGO CARRIERS LTD
48 CASHBUILD LTD
189 CAXTON CTP PUBLISHERS AND PRINTERS
397 CCI HOLDINGS LTD
366 CENMAG HOLDINGS LTD
279 CENTRECITY PROPERTY FUND
53 CERAMIC INDUSTRIES LTD
278 CHARIOT LAND LTD
122 CHOICE HOLDINGS LTD
170 CITY LODGE HOTELS LTD
245 CLIENTELE LIFE ASSURANCE COMPANY LTD
213 COMAIR LTD
98 COMBINED MOTOR HOLDINGS LTD
212 COMMAND HOLDINGS LTD
334 COMPU-CLEARING OUTSOURCING LTD
120 CONAFEX HOLDINGS SOCIETE ANONYME
59 CONCOR LTD
145 CONNECTION GROUP HOLDINGS LTD
292 CONSOLIDATED PROPERTY & FINANCE LTD
82 CONTROL INSTRUMENTS GROUP LTD
304 CORONATION FUND MANAGERS LIMITED
312 CORPCAPITAL LTD

256 CORWIL INVESTMENTS LTD
380 CREDITVISION HOLDINGS LTD
121 CROOKES BROTHERS LTD
335 CS COMPUTER SERVICES HOLDINGS LTD
173 CULLINAN HOLDINGS LTD
270 CUPAR PROPERTIES LTD NM
386 CYBERHOST LTD
336 DATACENTRIX HOLDINGS LTD
359 DATAPRO GROUP LIMITED
337 DATATEC LTD
313 DECILLION LTD
77 DELTA ELECTRICAL INDUSTRIES LTD
23 DIAMOND CORE RESOURCES LIMITED
83 DIGICORE HOLDINGS LTD
338 DIMENSION DATA HOLDINGS PLC
242 DISCOVERY HOLDINGS LTD
116 DISTELL GROUP LTD
54 DISTRIBUTION & WAREHOUSING NETWORK LTD
199 DNA SUPPLY CHAIN INVESTMENTS LTD
171 DON GROUP LTD
55 DORBYL LTD
4 DURBAN ROODEPOORT DEEP LTD
367 DYNAMIC CABLES RSA LTD
157 DYNAMO RETAIL LTD
368 EC-HOLDINGS LTD
156 EDGARS CONSOLIDATED STORES LTD
60 ELB GROUP LTD
339 ELEXIR TECHNOLOGY HOLDINGS LTD
146 ELLERINE HOLDINGS LTD
271 EMIRA PROPERTY FUND
340 ENTERPRISE OUTSOURCING HOLDINGS LTD
321 ENTERPRISE RISK MANAGEMENT LTD
211 ENVIROSERV HOLDINGS LTD
341 ERP.COM HOLDINGS LTD
257 EUREKA INDUSTRIAL LTD
198 EXCELLERATE HOLDINGS LTD
42 EXXOTEQ LIMITED
281 FAIRVEST PROPERTY HOLDINGS LTD
5 FALCON INVESTMENT HOLDINGS SOCIETE ANONYME
179 FAMOUS BRANDS LTD
343 FARITEC HOLDINGS LTD
159 FASHION AFRICA LTD
231 FIRSTRAND LTD
138 FORIM HOLDINGS LTD
158 FOSCHINI LTD
355 FRONTRANGE LTD
322 GENCOR LTD
387 GILBOA PROPERTIES LTD
238 GLENRAND MIB LTD
344 GLOBAL TECHNOLOGY LTD
200 GLOBAL VILLAGE HOLDINGS LTD
112 GLODINA HOLDINGS LTD
6 GOLD FIELDS LTD
167 GOLD REEF CASINO RESORTS LTD

24 GOOD HOPE DIAMONDS (KIMBERLEY) LTD
220 GRINDROD LTD
84 GRINTEK LTD
61 GROUP FIVE LTD
282 GROWTHPOINT PROPERTIES LTD
7 HARMONY GOLD MINING COMPANY LTD
190 HERITAGE COLLECTION HOLDINGS LTD
68 HIGHVELD STEEL & VANADIUM CORPORATION LTD
258 HOSKEN CONSOLIDATED INVESTMENTS LTD
113 HOUSE OF BUSBY LTD (THE)
91 HOWDEN AFRICA HOLDINGS LTD
90 HUDACO INDUSTRIES LTD
284 HYPROP INVESTMENTS LTD
342 IDION TECHNOLOGY HOLDINGS LTD
285 IFOUR PROPERTIES LTD
49 ILIAD AFRICA LTD
131 ILLOVO SUGAR LTD
16 IMPALA PLATINUM HOLDINGS LTD
72 IMPERIAL HOLDINGS LTD
320 IMR INVESTMENTS LTD
314 INCENTIVE HOLDINGS LTD
369 INDEPENDENT FINANCIAL SERVICES LTD
370 INDEQUITY GROUP LTD
381 INDUSTRIAL CREDIT COMPANY AFRICA HOLDINGS LIMITED
371 INFOWAVE HOLDINGS LTD
147 INMINS LTD
360 INSURANCE OUTSOURCING MANAGERS HOLDINGS LTD
372 INTEGREAR LTD
388 INTERCONNECTIVE SOLUTIONS LTD
123 INTERTRADING LTD
316 INVESTEC LTD
315 INVESTEC PLC
92 INVICTA HOLDINGS LTD
69 ISPAT ISCOR LTD
50 ITALTILE LTD
85 JASCO ELECTRONICS HOLDINGS LTD
21 JCI LTD
148 JD GROUP LTD
373 JIGSAW HOLDINGS LTD
382 JOHN DANIEL HOLDINGS LIMITED
193 JOHNNIC COMMUNICATIONS LTD
191 JOHNNIC HOLDINGS LTD
184 KAGISO MEDIA LTD
88 KAIROS INDUSTRIAL HOLDINGS LTD
73 KAP INTERNATIONAL HOLDINGS LIMITED
32 KELGRAN LTD
180 KING CONSOLIDATED HOLDINGS LTD
33 KUMBA RESOURCES LTD
117 KWV BELEGGINGS BPK
161 LA GROUP LTD
383 LABAT AFRICA LTD
174 LEISURENET LTD
149 LEWIS GROUP LIMITED
248 LIBERTY GROUP LTD

247 LIBERTY HOLDINGS LTD
286 LIBERTY INTERNATIONAL PLC
306 LONDON FINANCE & INVESTMENT GROUP PLC
17 LONMIN PLC
389 LONRHO AFRICA PLC
305 M CUBED HOLDINGS LTD
272 MARSHALLS LTD
287 MARTPROP PROPERTY FUND
56 MASONITE (AFRICA) LTD
141 MASSMART HOLDINGS LTD
162 MATHOMO GROUP LTD
22 MATODZI RESOURCES LIMITED
134 MEDI-CLINIC CORPORATION LTD
232 MERCANTILE LISBON BANK HOLDINGS LTD
18 MESSINA LTD
95 METAIR INVESTMENTS LTD
34 METOREX LTD
140 METOZ HOLDINGS LIMITED
243 METROPOLITAN HOLDINGS LTD
351 MGX HOLDINGS LTD
273 MICC PROPERTY INCOME FUND LIMITED
323 MICROMEGA HOLDINGS LTD
361 MILKWORX LIMITED
214 MILLIONAIR CHARTER LTD
221 MOBILE INDUSTRIES LTD
192 MONEY WEB HOLDINGS LTD
74 MONTEAGLE SOCIETE ANONYME
168 MORIBO LEISURE LTD
390 MOULDED MEDICAL SUPPLIES LTD
166 MR PRICE GROUP LTD
228 MTN GROUP LTD
62 MURRAY AND ROBERTS HOLDINGS LTD
328 MUSTEK LTD
239 MUTUAL & FEDERAL INSURANCE COMPANY LTD
19 MVELAPHANDA RESOURCES LTD
124 NAMIBIAN SEA PRODUCTS LTD
201 NAMPAK LTD
187 NASPERS LTD N
233 NEDCOR LTD
135 NETWORK HEALTHCARE HOLDINGS LTD
185 NEW AFRICA INVESTMENTS LTD
163 NEW CLICKS HOLDINGS LTD
152 NICTUS LTD
20 NORTHAM PLATINUM LTD
89 NORTHERN ENGINEERING INDUSTRIES (AFRICA) LTD
107 NU-WORLD HOLDINGS LTD
125 OCEANA GROUP LTD
289 OCTODEC INVESTMENTS LTD
249 OLD MUTUAL PLC
352 OMEGA ALPHA INTERNATIONAL IT HOLDINGS LTD
45 OMNIA HOLDINGS LTD
362 ONELOGIX GROUP LTD
384 PACIFIC HOLDINGS LTD
35 PALABORA MINING CO LTD

103 PALS HOLDINGS LTD
291 PANGBOURNE PROPERTIES LTD
345 PARACON HOLDINGS LTD
290 PARAMOUNT PROPERTY FUND LTD
78 PASDEC RESOURCES SA LTD
175 PEERMONT GLOBAL LIMITED
317 PEREGRINE HOLDINGS LTD
36 PETRA MINING LTD
169 PHUMELELA GAMING AND LEISURE LTD
224 PICK N PAY HOLDINGS LTD
223 PICK N PAY STORES LTD
329 PINNACLE TECHNOLOGY HOLDINGS LTD
259 PREMIER GROUP LTD (THE)
293 PREMIUM PROPERTIES LTD
57 PRETORIA PORTLAND CEMENT COMPANY LTD
295 PRIMA PROPERTY TRUST
188 PRIMEDIA LTD
210 PRIMESERV GROUP LTD
353 PRISM HOLDINGS LTD
324 PROPER GROUP LTD
318 PSG GROUP LTD
216 PUTCO LTD
294 PUTCO PROPERTIES LTD
202 QUYN HOLDINGS LTD
127 RAINBOW CHICKEN LTD
8 RANDGOLD & EXPLORATION COMPANY LTD
391 RARE EARTH EXTRACTION COMPANY LTD
260 REAL AFRICA HOLDINGS LTD
203 REBSERVE HOLDINGS LTD
296 REDEFINE INCOME FUND LTD
150 RELYANT RETAIL LTD
261 REMGRO LTD
250 RENTSURE HOLDINGS LTD
274 RESILIENT PROPERTY INCOME FUND LTD
164 RETAIL APPAREL GROUP LTD
79 REUNERT LTD
165 REX TRUEFORM CLOTHING COMPANY LTD
109 RICHEMONT SECURITIES AG
297 RICHWAY RETAIL PROPERTIES LTD
234 RMB HOLDINGS LTD
374 S & J LAND HOLDINGS LTD
240 SA EAGLE INSURANCE COMPANY LTD
392 SA MINERAL RESOURCES CORP LTD
302 SA RETAIL PROPERTIES LTD
236 SAAMBOU HOLDINGS LTD
298 SABLE HOLDINGS LTD
115 SABMILLER PLC
263 SABVEST LTD
251 SAGE GROUP LTD
176 SAIL GROUP LTD
38 SALLIES LTD
300 SAMRAND DEVELOPMENT HOLDINGS LTD
252 SANLAM LTD
241 SANTAM LTD

67 SAPPI LTD
186 SASANI LTD
319 SASFIN HOLDINGS LTD
43 SASOL LTD
39 SCHARRIG MINING LTD
104 SEARDEL INVESTMENT CORPORATION LTD
75 SEKUNJALO INVESTMENTS LTD
86 SETPOINT TECHNOLOGY HOLDINGS LTD
229 SHAWCELL TELECOMMUNICATIONS LTD
226 SHOPRITE HOLDINGS LTD
299 SHOPS FOR AFRICA LTD
330 SILTEK LTD
9 SIMMER AND JACK MINES LTD
37 SOUTH AFRICAN CHROME AND ALLOYS LTD
393 SOUTHERN ELECTRICITY COMPANY LTD
128 SOVEREIGN FOOD INVESTMENTS LTD
47 SPANJAARD LTD
301 SPEARHEAD PROPERTY HOLDINGS LTD
375 SPECTRUM SHIPPING LTD
346 SPESCOM LTD
181 SPUR CORPORATION LTD
347 SQUARE ONE SOLUTIONS GROUP LTD
235 STANDARD BANK GROUP LTD
105 STEINHOFF INTERNATIONAL HOLDINGS LTD
376 STELLA VISTA TECHNOLOGIES LTD
10 STILFONTEIN GOLD MINING COMPANY LTD
172 STOCKS HOTELS & RESORTS LTD
394 STRATCORP LTD
11 SUB NIGEL GOLD MINING COMPANY LTD
177 SUN INTERNATIONAL LTD
217 SUPER GROUP LTD
303 SYCOM PROPERTY FUND
377 SYNERGY HOLDINGS LTD
227 TELKOM SA LIMITED
182 TEREXKO LTD
205 TERRAFIN HOLDINGS LTD
40 THABEX EXPLORATION LTD
225 THE SPAR GROUP LIMITED
132 TIGER BRANDS LTD
96 TIGER WHEELS LTD
325 TIGON LTD
326 TISEC LTD
133 TONGAAT-HULETT GROUP LTD
348 TOP INFO TECHNOLOGY HOLDINGS LTD
178 TOURISM INVESTMENT CORPORATION LTD
142 TRADEHOLD LTD
26 TRANS HEX GROUP LTD
204 TRANSPACO LTD
264 TREMATON CAPITAL INVESTMENTS LTD
222 TRENCOR LTD
160 TRUWORTHS INTERNATIONAL LTD
354 UCS GROUP LTD
206 UNITED SERVICE TECHNOLOGIES LTD
218 UNITRANS LTD

110 UNIVERSAL GROWTH HOLDINGS LTD
100 VAALAUTO LTD
99 VAALTRUCAR LTD
219 VALUE GROUP LTD
262 VENFIN LTD
111 VENTER LEISURE & COMMERCIAL TRAILERS LTD
349 VESTA TECHNOLOGY HOLDINGS LTD
395 VIKING INVESTMENTS & ASSET MANAGEMENT LTD
12 VILLAGE MAIN REEF GOLD MINING COMPANY LTD
288 VUKILE PROPERTY FUND LTD
129 W B HOLDINGS LTD
1 WANKIE COLLIERY COMPANY LTD
93 WESCO INVESTMENTS LTD
13 WESTERN AREAS LTD
396 WHETSTONE INDUSTRIAL HOLDINGS LTD
63 WILSON BAYLY HOLMES-OVCON LTD
151 WINHOLD LTD
154 WOOLTRU LTD
153 WOOLWORTHS HOLDINGS LTD
363 XANTIUM TECHNOLOGY HOLDINGS LIMITED
350 Y3K GROUP LTD
65 YORK TIMBER ORGANISATION LTD
41 ZAMBIA COPPER INVESTMENTS LTD
399 ZAPTRONIX LTD
327 ZELTIS HOLDINGS LTD
398 ZENITH CONCESSIONS LTD

APPENDIX B

Companies disclosing staff costs and board composition

1 ADVTECH LTD
2 AECI LTD
3 AFGRI LTD
4 AFRICAN OXYGEN LTD
5 AFROX HEALTHCARE LTD
6 AG INDUSTRIES LTD
7 ALLIED ELECTRONICS CORPORATION LTD
8 ALLIED TECHNOLOGIES LTD
9 AMALGAMATED APPLIANCE HOLDINGS LTD
10 ANGLO AMERICAN PLATINUM CORPORATION LTD
11 ANGLOGOLD ASHANTI LTD
12 ARGENT INDUSTRIAL LTD
13 ASPEN PHARMACARE HOLDINGS LTD
14 ASTRAL FOODS LTD
15 ASTRAPAK LTD
16 AVENG LTD
17 AVI LTD
18 BARLOWORLD LTD
19 BASIL READ HOLDINGS LTD
20 BEARING MAN LTD
21 BELL EQUIPMENT LTD
22 BHP BILLITON PLC
23 BIDVEST GROUP LTD (THE)
24 BRANDCORP HOLDINGS LTD
25 CARGO CARRIERS LTD
26 CASHBUILD LTD
27 CERAMIC INDUSTRIES LTD
28 CITY LODGE HOTELS LTD
29 COMBINED MOTOR HOLDINGS LTD
30 CONCOR LTD
31 CROOKES BROTHERS LTD
32 CULLINAN HOLDINGS LTD
33 DATACENTRIX HOLDINGS LTD
34 DELTA ELECTRICAL INDUSTRIES LTD
35 DIGICORE HOLDINGS LTD
36 DISTELL GROUP LTD
37 DISTRIBUTION & WAREHOUSING NETWORK LTD
38 DON GROUP LTD
39 DORBYL LTD
40 DRD GOLD LTD
41 EDGARS CONSOLIDATED STORES LTD
42 ELLERINE HOLDINGS LTD
43 ENVIROSERV HOLDINGS LTD
44 EXCELLERATE HOLDINGS LTD
45 FAMOUS BRANDS LTD
46 FARITEC HOLDINGS LTD
47 FOSCHINI LTD
48 GOLD FIELDS LTD
49 GRINDROD LTD
50 GRINTEK LTD

51 GROUP FIVE LTD
52 HIGHVELD STEEL & VANADIUM CORPORATION LTD
53 HOUSE OF BUSBY LTD (THE)
54 HOWDEN AFRICA HOLDINGS LTD
55 HUDACO INDUSTRIES LTD
56 ILIAD AFRICA LTD
57 ILLOVO SUGAR LTD
58 IMPALA PLATINUM HOLDINGS LTD
59 IMPERIAL HOLDINGS LTD
60 INMINS LTD
61 INVICTA HOLDINGS LTD
62 ISPAT ISCOR LTD
63 ITALTILE LTD
64 JASCO ELECTRONICS HOLDINGS LTD
65 JD GROUP LTD
66 JOHNNIC COMMUNICATIONS LTD
67 JOHNNIC HOLDINGS LTD
68 KUMBA RESOURCES LTD
69 LA GROUP LTD
70 MASONITE (AFRICA) LTD
71 MASSMART HOLDINGS LTD
72 MATHOMO GROUP LTD
73 MEDI-CLINIC CORPORATION LTD
74 METAIR INVESTMENTS LTD
75 MGX HOLDINGS LTD
76 MR PRICE GROUP LTD
77 MTN GROUP LTD
78 MURRAY AND ROBERTS HOLDINGS LTD
79 MUSTEK LTD
80 NAMPAK LTD
81 NASPERS LTD N
82 NETWORK HEALTHCARE HOLDINGS LTD
83 NEW CLICKS HOLDINGS LTD
84 NICTUS LTD
85 NU-WORLD HOLDINGS LTD
86 OCEANA GROUP LTD
87 OMNIA HOLDINGS LTD
88 PARACON HOLDINGS LTD
89 PHUMELELA GAMING AND LEISURE LTD
90 PICK N PAY STORES LTD
91 PINNACLE TECHNOLOGY HOLDINGS LTD
92 PRETORIA PORTLAND CEMENT COMPANY LTD
93 PRISM HOLDINGS LTD
94 PUTCO LTD
95 RAINBOW CHICKEN LTD
96 RELYANT RETAIL LTD
97 REUNERT LTD
98 REX TRUEFORM CLOTHING COMPANY LTD
99 SABMILLER PLC
100 SAPPI LTD
101 SEARDEL INVESTMENT CORPORATION LTD
102 SETPOINT TECHNOLOGY HOLDINGS LTD
103 SHOPRITE HOLDINGS LTD
104 SOVEREIGN FOOD INVESTMENTS LTD

105 SPUR CORPORATION LTD
106 STEINHOFF INTERNATIONAL HOLDINGS LTD
107 SUN INTERNATIONAL LTD
108 SUPER GROUP LTD
109 TELKOM SA LIMITED
110 TIGER BRANDS LTD
111 TIGER WHEELS LTD
112 TRANS HEX GROUP LTD
113 TRANSPACO LTD
114 TRUWORTHS INTERNATIONAL LTD
115 UCS GROUP LTD
116 UNITRANS LTD
117 VALUE GROUP LTD
118 W B HOLDINGS LTD
119 WANKIE COLLIERY COMPANY LTD
120 WESTERN AREAS LTD
121 WILSON BAYLY HOLMES-OVCON LTD
122 WOOLWORTHS HOLDINGS LTD
123 YORK TIMBER ORGANISATION LTD

APPENDIX C

Companies included in final data set

1 ADVTECH LTD
2 AECI LTD
3 AFGRI LTD
4 AFRICAN OXYGEN LTD
5 AFROX HEALTHCARE LTD
6 AG INDUSTRIES LTD
7 ALLIED ELECTRONICS CORPORATION LTD
8 ALLIED TECHNOLOGIES LTD
9 AMALGAMATED APPLIANCE HOLDINGS LTD
10 ANGLO AMERICAN PLATINUM CORPORATION LTD
11 ANGLOGOLD ASHANTI LTD
12 ARGENT INDUSTRIAL LTD
13 ASPEN PHARMACARE HOLDINGS LTD
14 ASTRAL FOODS LTD
15 ASTRAPAK LTD
16 AVENG LTD
17 AVI LTD
18 BARLOWORLD LTD
19 BASIL READ HOLDINGS LTD
20 BEARING MAN LTD
21 BELL EQUIPMENT LTD
22 BHP BILLITON PLC
23 BIDVEST GROUP LTD (THE)
24 BRANDCORP HOLDINGS LTD
25 CARGO CARRIERS LTD
26 CASHBUILD LTD
27 CERAMIC INDUSTRIES LTD
28 CITY LODGE HOTELS LTD
29 COMBINED MOTOR HOLDINGS LTD
30 CONCOR LTD
31 CROOKES BROTHERS LTD
32 CULLINAN HOLDINGS LTD
33 DATACENTRIX HOLDINGS LTD
34 DELTA ELECTRICAL INDUSTRIES LTD
35 DIGICORE HOLDINGS LTD
36 DISTELL GROUP LTD
37 DISTRIBUTION & WAREHOUSING NETWORK LTD
38 DON GROUP LTD
39 DORBYL LTD
40 EDGARS CONSOLIDATED STORES LTD
41 ELLERINE HOLDINGS LTD
42 ENVIROSERV HOLDINGS LTD
43 EXCELLERATE HOLDINGS LTD
44 FAMOUS BRANDS LTD
45 FARITEC HOLDINGS LTD
46 FOSCHINI LTD
47 GOLD FIELDS LTD
48 GRINDROD LTD
49 GRINTEK LTD

50 GROUP FIVE LTD
51 HIGHVELD STEEL & VANADIUM CORPORATION LTD
52 HOUSE OF BUSBY LTD (THE)
53 HOWDEN AFRICA HOLDINGS LTD
54 HUDACO INDUSTRIES LTD
55 ILIAD AFRICA LTD
56 ILLOVO SUGAR LTD
57 IMPALA PLATINUM HOLDINGS LTD
58 IMPERIAL HOLDINGS LTD
59 INMINS LTD
60 INVICTA HOLDINGS LTD
61 ISPAT ISCOR LTD
62 ITALTILE LTD
63 JASCO ELECTRONICS HOLDINGS LTD
64 JD GROUP LTD
65 JOHNNIC COMMUNICATIONS LTD
66 JOHNNIC HOLDINGS LTD
67 KUMBA RESOURCES LTD
68 LA GROUP LTD
69 MASONITE (AFRICA) LTD
70 MASSMART HOLDINGS LTD
71 MATHOMO GROUP LTD
72 MEDI-CLINIC CORPORATION LTD
73 METAIR INVESTMENTS LTD
74 MGX HOLDINGS LTD
75 MR PRICE GROUP LTD
76 MTN GROUP LTD
77 MURRAY AND ROBERTS HOLDINGS LTD
78 MUSTEK LTD
79 NAMPAK LTD
80 NASPERS LTD N
81 NETWORK HEALTHCARE HOLDINGS LTD
82 NEW CLICKS HOLDINGS LTD
83 NICTUS LTD
84 NU-WORLD HOLDINGS LTD
85 OCEANA GROUP LTD
86 OMNIA HOLDINGS LTD
87 PARACON HOLDINGS LTD
88 PHUMELELA GAMING AND LEISURE LTD
89 PICK N PAY STORES LTD
90 PINNACLE TECHNOLOGY HOLDINGS LTD
91 PRETORIA PORTLAND CEMENT COMPANY LTD
92 PRISM HOLDINGS LTD
93 PUTCO LTD
94 REUNERT LTD
95 REX TRUEFORM CLOTHING COMPANY LTD
96 SABMILLER PLC
97 SAPPI LTD
98 SEARDEL INVESTMENT CORPORATION LTD
99 SETPOINT TECHNOLOGY HOLDINGS LTD
100 SOVEREIGN FOOD INVESTMENTS LTD
101 SPUR CORPORATION LTD
102 STEINHOFF INTERNATIONAL HOLDINGS LTD
103 SUN INTERNATIONAL LTD

104 SUPER GROUP LTD
105 TIGER BRANDS LTD
106 TIGER WHEELS LTD
107 TRANS HEX GROUP LTD
108 TRANSPACO LTD
109 TRUWORTHS INTERNATIONAL LTD
110 UCS GROUP LTD
111 UNITRANS LTD
112 VALUE GROUP LTD
113 W B HOLDINGS LTD
114 WANKIE COLLIERY COMPANY LTD
115 WESTERN AREAS LTD
116 WILSON BAYLY HOLMES-OVCON LTD
117 WOOLWORTHS HOLDINGS LTD

APPENDIX D

Board composition of companies included in final data set

Full name	Board size	Women	Colour	Non-exec	Chairman Duality	Non-exec on comm
ADVTECH LTD	9	0.11	0	0.56	0	1
AECI LTD	8	0.13	0.13	0.75	0	1
AFGRI LTD	15	0	0	0.73	0	1
AFRICAN OXYGEN LTD	12	0	0.08	0.92	0	1
AFROX HEALTHCARE LTD	12	0	0.08	0.83	0	1
AG INDUSTRIES LTD	10	0.1	0	0.3	0	1
ALLIED ELECTRONICS CORPORATION LTD	15	0.07	0.13	0.53	0	0.5
ALLIED TECHNOLOGIES LTD	11	0	0	0.73	0	1
AMALGAMATED APPLIANCE HOLDINGS LTD	12	0	0	0.75	0	0.83
ANGLO AMERICAN PLATINUM CORPORATION LTD	22	0.05	0.18	0.5	0	1
ANGLOGOLD ASHANTI LTD	14	0.07	0.07	0.71	0	1
ARGENT INDUSTRIAL LTD	9	0.13	0	0.13	0	0
ASPEN PHARMACARE HOLDINGS LTD	12	0.08	0.17	0.75	0	1
ASTRAL FOODS LTD	9	0.11	0.11	0.67	0	0.71
ASTRAPAK LTD	7	0	0	0.29	0	0
AVENG LTD	16	0.06	0.19	0.63	0	1
AVI LTD	13	0	0.08	0.69	0	0.57
BARLOWORLD LTD	17	0.06	0.06	0.47	0	1
BASIL READ HOLDINGS LTD	8	0.13	0.13	0.75	0	1
BEARING MAN LTD	8	0	0	0.5	0	0.71
BELL EQUIPMENT LTD	15	0	0.07	0.47	0	1
BHP BILLITON PLC	11	0	0	0.82	0	1
BIDVEST GROUP LTD (THE)	31	0.06	0.06	0.35	0	1
BRANDCORP HOLDINGS LTD	7	0	0	0.43	0	0.67
CARGO CARRIERS LTD	5	0	0	0.6	0	0.71
CASHBUILD LTD	4	0	0	0.5	0	1
CERAMIC INDUSTRIES LTD	8	0	0.13	0.75	0	1
CITY LODGE HOTELS LTD	14	0	0.07	0.43	0	0.67
COMBINED MOTOR HOLDINGS LTD	8	0	0	0.38	0	1
CONCOR LTD	5	0.2	0	0.6	0	0.71
CROOKES BROTHERS LTD	6	0	0.17	0.83	0	1
CULLINAN HOLDINGS LTD	6	0.17	0	0.67	0	0.67
DATACENTRIX HOLDINGS LTD	12	0.33	0.42	0.42	0	0.56
DELTA ELECTRICAL INDUSTRIES LTD	11	0	0	0.55	0	0.86
DIGICORE HOLDINGS LTD	12	0	0.42	0.5	0	0.8
DISTELL GROUP LTD	11	0	0.09	0.82	0	1
DISTRIBUTION & WAREHOUSING NETWORK LTD	5	0	0	0.6	0	0.67
DON GROUP LTD	6	0.17	0.5	0.83	1	1
DORBYL LTD	8	0	0.13	0.5	0	0.57
DRD GOLD LTD	6	0	0.17	4	1	1
EDGARS CONSOLIDATED STORES LTD	12	0.17	0.17	0.5	0	0.6
ELLERINE HOLDINGS LTD	10	0.1	0.2	0.4	0	0.67
ENVIROSERV HOLDINGS LTD	12	0.25	0.25	0.42	0	0.83
EXCELLERATE HOLDINGS LTD	11	0	0	0.36	0	0.67

FAMOUS BRANDS LTD	6	0	0	0.5	0	0.71
FARITEC HOLDINGS LTD	7	0	0.29	0.43	0	1
FOSCHINI LTD	10	0.1	0.2	0.8	0	1
GOLD FIELDS LTD	12	0	0.08	0.83	0	1
GRINDROD LTD	14	0	0	0.5	0	1
GRINTEK LTD	10	0	0.3	0.6	0	0.71
GROUP FIVE LTD	9	0.11	0.22	0.56	0	0.6
HIGHVELD STEEL & VANADIUM CORPORATION LTD	6	0	0.25	0.69	0	0.63
HOUSE OF BUSBY LTD (THE)	8	0	0	0.38	0	1
HOWDEN AFRICA HOLDINGS LTD	6	0.17	0.33	0.67	0	1
HUDACO INDUSTRIES LTD	14	0.07	0.07	0.71	0	0.57
ILIAD AFRICA LTD	6	0	0	0.67	0	0.57
ILLOVO SUGAR LTD	17	0	0.24	0.47	0	0.86
IMPALA PLATINUM HOLDINGS LTD	11	0.18	0.09	0.67	0	1
IMPERIAL HOLDINGS LTD	15	0.07	0.13	0.53	0	0.88
INMINS LTD	7	0	0	0.57	0	0.67
INVICTA HOLDINGS LTD	5	0	0	0.6	0	0.8
ISPAT ISCOR LTD	14	0.07	0.57	0.57	0	1
ITALTILE LTD	14	0.07	0.57	0.57	0	1
JASCO ELECTRONICS HOLDINGS LTD	10	0.1	0.3	0.6	0	0.6
JD GROUP LTD	9	0.11	0.11	0.56	0	1
JOHNNIC COMMUNICATIONS LTD	11	0.09	0.73	0.64	0	1
JOHNNIC HOLDINGS LTD	11	0.18	0.64	0.73	0	1
KUMBA RESOURCES LTD	15	0.07	0.27	0.67	0	0.86
LA GROUP LTD	8	0.25	0.5	0.5	0	1
MASONITE (AFRICA) LTD	10	0	0	0.6	0	1
MASSMART HOLDINGS LTD	12	0.08	0.25	0.75	0	1
MATHOMO GROUP LTD	7	0.14	0.43	0.86	0	0.67
MEDI-CLINIC CORPORATION LTD	13	0	0.23	0.62	0	0.58
METAIR INVESTMENTS LTD	6	0.17	0	0.67	0	1
MGX HOLDINGS LTD	6	0.17	0.17	0.5	0	1
MR PRICE GROUP LTD	8	0	0	0.5	0	1
MTN GROUP LTD	11	0.18	0.55	0.55	0	1
MURRAY AND ROBERTS HOLDINGS LTD	14	0.07	0.21	0.79	0	1
MUSTEK LTD	7	0	0.14	0.43	0	0.75
NAMPAK LTD	16	0	0.13	0.56	0	1
NASPERS LTD N	13	0.08	0.08	0.85	0	1
NETWORK HEALTHCARE HOLDINGS LTD	14	0.07	0	0.43	0	0.5
NEW CLICKS HOLDINGS LTD	7	0	0.29	0.57	0	1
NICTUS LTD	5	0	0	0.4	0	0.67
NU-WORLD HOLDINGS LTD	5	0	0	0.4	0	1
OCEANA GROUP LTD	10	0	0.3	0.6	0	0.67
OMNIA HOLDINGS LTD	10	0	0	0.8	0	0.75
PARACON HOLDINGS LTD	10	0.2	0.2	0.7	0	1
PHUMELELA GAMING AND LEISURE LTD	10	0	0.4	0.8	0	0.73
PICK N PAY STORES LTD	12	0.17	0.08	0.58	0	1
PINNACLE TECHNOLOGY HOLDINGS LTD	5	0	0.2	0.6	0	0.67
PRETORIA PORTLAND CEMENT COMPANY LTD	11	0	0	0.55	0	1
PRISM HOLDINGS LTD	11	0	0	0.55	0	1
PUTCO LTD	7	0.14	0.14	0.71	0	0.67
RAINBOW CHICKEN LTD	11	0	0.18	0.73	0	1

RELYANT RETAIL LTD	6	0	0.17	0.67	0	0.83
REUNERT LTD	11	0	0.09	0.64	0	0.75
REX TRUEFORM CLOTHING COMPANY LTD	13	0.23	0	0.38	0	0.67
SABMILLER PLC	13	0.08	0.08	0.85	0	1
SAPPI LTD	14	0	0.07	0.64	0	1
SEARDEL INVESTMENT CORPORATION LTD	7	0.14	0.29	0.57	0	0.75
SETPOINT TECHNOLOGY HOLDINGS LTD	10	0.1	0.1	0.5	0	0.8
SHOPRITE HOLDINGS LTD	12	0	0.17	0.5	0	0.6
SOVEREIGN FOOD INVESTMENTS LTD	7	0	0	0.57	0	0.5
SPUR CORPORATION LTD	8	0	0	0.5	0	0.75
STEINHOFF INTERNATIONAL HOLDINGS LTD	14	0	0.07	0.57	0	1
SUN INTERNATIONAL LTD	10	0	0	0.8	0	1
SUPER GROUP LTD	12	0	0.08	0.67	0	1
TELKOM SA LIMITED	11	0.09	0.45	0.73	0	1
TIGER BRANDS LTD	16	0	0.13	0.63	0	1
TIGER WHEELS LTD	7	0	0	0.43	0	1
TRANS HEX GROUP LTD	11	0.09	0.09	0.64	0	0.86
TRANSPACO LTD	10	0	0	0.5	0	1
TRUWORTHS INTERNATIONAL LTD	8	0.13	0.13	0.63	0	1
UCS GROUP LTD	11	0.09	0	0.45	0	0.83
UNITRANS LTD	11	0	0.09	0.64	0	0.8
VALUE GROUP LTD	8	0	0.13	0.25	0	0.67
W B HOLDINGS LTD	6	0	0	0.5	0	0.44
WANKIE COLLIERY COMPANY LTD	9	0	1	0.89	0	0.9
WESTERN AREAS LTD	12	0.83	0.17	0.67	0	1
WILSON BAYLY HOLMES-OVCON LTD	6	0	0	0.67	1	1
WOOLWORTHS HOLDINGS LTD	10	0.2	0.1	0.5	0	1

APPENDIX E

TABLES

Table 1- Summary of Research questions and Hypotheses

Research Question	*Hypothesis*
Research question 1: Is there a significant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies and intellectual capital performance?	*From question 1:* There is a significant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies intellectual capital performance.
Research question 2: Is there a significant positive relationship between the percentage of individuals of colour on the boards of directors of South African publicly listed companies and intellectual capital performance?	*From question 2:* There is a significant positive relationship between the percentage individuals of colour on the boards of directors of South African publicly listed companies and intellectual capital performance.
Research question 3: Is there a significant positive relationship between the percentage of non-executive directors on the boards of directors of South African publicly listed companies and intellectual capital performance?	*From question 3:* There is a significant positive relationship between the percentage of non-executive directors on the boards of directors of South African publicly listed companies and intellectual capital performance.
Research question 4: Is there a significant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies and intellectual capital performance?	*From question 4*: There is a significant positive relationship between the separation of the roles of chief executive officer and chairperson on South African publicly listed companies and intellectual capital performance.
Research question 5: Is there a significant positive relationship between the percentage of non-executive directors on the audit and remuneration standing committees of South African publicly listed companies and intellectual capital performance?	*From question 5:* There is a significant positive relationship between the percentage of non-executive directors on the audit and remuneration standing committees of South African publicly listed companies and intellectual capital performance.

Table 2- Examples of the Organisational Level/Financial Basis approach

	MAJOR PROPONENT	DESCRIPTION	SUITABILITY WITHIN THE RESEARCH CONTEXT
Tobins q	Stewart (1997) Bontis (1999)	The q is the ratio of the stock market value of the firm divided by the replacement cost of its assets. Changes in q provide a proxy for measuring effective performance or not of a firm's intellectual capital	Stock market value is not an appropriate measure within the context of this research
Investor Assigned Market Value (IAMV™)	Stanfield (1998)	Takes a company's true value to be its stock market value and divides it by its intangible assets + (Realised intellectual capital + intellectual capital Erosion + Sustainable Competitive Advantage)	Stock market value is not an appropriate measure within the context of this research
Market to Book Value	Stewart (1997) Luthy (1998)	The value of intellectual capital is considered to be the difference between the firm's stock market value and the company's book value	Stock market value is not an appropriate measure within the context of this research
Economic Value Added (EVA™)	Stewart (1997)	Calculated by adjusting the firm's disclosed profit with charges related to intangibles. Changes in EVA provide an indication of whether the firm's intellectual capital is productive or not.	Measurement model too complex. Complicated adjustment procedures are required. Not suitable within the research context
Human Resource	Johannsson (1996)	Calculates the hidden impact of HR related costs	Measurement model does not capture most

Costing and Accounting (HRCA)		which reduce a firm's profits. Adjustments are made to the profit and loss. Intellectual capital is measures by calculation of the contribution of human assets held by the company divided by capitalised salary expenditures	of the components of intellectual capital. Human capital only one aspect of intellectual capital. Not suitable within the research context
Calculated Intangible Value	Stewart (1997) Luthy (1998)	Calculates the excess return on hard assets the uses this figure as a basis for determining the proportion of return attributable to intangible assets	Measurement model too complex, not suitable within the research context
Knowledge Capital Earnings	Lev (1999)	Knowledge capital earnings are calculated as the portion of normalised earnings over and above expected earnings attributable to book assets	Measurement model too complex, not suitable within the research context
Value Added Intellectual Coefficient (VAIC™)	Pulic (1999) According to Sveiby (2000) this measurement technique does of quite fit any of the categories	Measures how efficiently intellectual capital and capital employed create value based on the relationship of three major components: (1) Capital employed, (2) Human capital, (3) Structural capital	Measurement model too complex, suitable within the research context

Table 3-Examples of the Component-by-Component approach

	MAJOR PROPONENT	DESCRIPTION	SUITABILITY WITHIN THE RESEARCH CONTEXT
Technology Broker	Brooking (1996)	Value of intellectual capital of a firm is assessed based on diagnostic analysis of a firm's response to twenty questions covering four major components of intellectual capital	Measurement model is subjective. Questions must be evaluated for relevance. Not suitable within the research context
Citation-Weighted Patents	Bontis (1998)	A technology factor is calculated on the patents developed by a firm. Intellectual capital and its performance are measured based on the impact of research and development efforts on a series of indices, such as number of patents and cost of patents to sales turnover, that describe the firm's patents	Patents form part of structural capital. Measurement model does not capture most of the components of intellectual capital. Not suitable within the research context
Inclusive Valuation Methodology (IVM)	McPherson (1998)	Uses hierarchies of weighted indicators that are combined, and focuses on relative rather than absolute values. Combined Value Added = Monetary Value Added combined with Intangible Value Added	Measurement model appears to be too complex. Not suitable within the research context
The Value Explorer™	Andriessen and Tiessen (2000)	Accounting methodology proposed by KPMG for calculating and allocating value to five types of intangible assets: (1) Assets and endowments, (2) Skills and tacit knowledge, (3) Collective values and	Taking the context of the research into consideration, not suitable within the research context

		norms, (4) Technology and explicit knowledge, (5) Primary and management processes	
Intellectual Asset Valuation	Sullivan (2000)	Methodology for assessing the value of Intellectual Property	Intellectual property forms part of structural capital. Measurement model does not capture most of the components of intellectual capital. Not suitable within the research context
Total Value Creation TVC™	Anderson and Mclean (2000)	A project initiated by the Canadian Institute of Chartered Accountants. TVC uses discounted projected cash flows to re examine how events affect planned activities	Taking the context of the research into consideration, not suitable within the research context

Accounting for the Future (AFTF)	Nash H (1998)	A system of projected discounted cash flows. The difference between AFTF value at the end and beginning of the period is the value added during the period.	Taking the context of the research into consideration, not suitable within the research context
Human Capital Intelligence	Bontis and Fitz-Enz (2002)	Sets of human capital indicators are collected and benchmarked against a database	Taking the context of the research into consideration, not suitable within the research context
Skandia Navigator™	Edvinsson and Malone (1997)	Intellectual capital is measured through the analysis of up to 164 metrics (91 intellectually based and 73 traditional metrics) that cover five components: (1) Financial, (2) Customer, (3) Process, (4) Renewal and	Taking the context of the research into consideration, not suitable within the research context

		Development, (5) Human	
Value Chain Scoreboard ™	Lev B. (2002)	A matrix of non-financial indicators arranged in three categories according to the cycle of development. Discovery/Learning, Implementation, and Commercialisation	Taking the context of the research into consideration, not suitable within the research context
IC – Index™	Roos, Roos, Dragonetti,and Edvinsson (1997)	Consolidates all individual indicators representing intellectual properties and components into a single index. Changes in the index are then related to changes in the firm's market valuation	Measurement model too complex, taking the context of the research into consideration, not suitable within the research context
Intangible Asset Monitor	Sveiby (1997)	Management selects indicators, based on strategic objectives of the firm, to measure four aspects of creating value from intangible assets. (1) Growth, (2) Renewal, (3) Utilisation/Efficiency and (4) Risk reduction/Stability	Taking the context of the research into consideration, not suitable within the research context
Balanced Scorecard	Kaplan and Norton (1992)	A company's performance is measured by indicators covering four major focus perspectives: (1) Financial, (2) Customer, (3) Internal process, and (4) Learning perspective	Taking the context of the research into consideration, not suitable within the research context

Table 4- Formal illustration of the calculation of each variable using the VAIC™ methodology

(MITCHELL WILLIAMS, 2000A; MITCHELL WILLIAMS, 2001):

INTEREST EXPENSE (I)	R214,700,000
Depreciation Expense (DP)	R228,200,000
Dividends (D)	R284,900,000
Corporate Taxation (T)	R555,300,000
Equity of Minority Shareholders in Net Income of Subsidiaries (M)	R286,200,000
Profits Retained for the Year (R)	R471,500,000
Book Value of Net Assets (CA)	R3,978,100,000
Staff Costs (Salaries and Wages) (HC)	R1,749,700,000
VA = I + DP + D + T + M + R	R2,040,800,000
VACA = VA/CA	R2,040,800,000 / R3,978,100,000 = 0.513
VAHC = VA/HC	R2,040,800,000 / R1,748,700,000 = 1.167
SC = VA-HC	R2,040,800,000 – R1,748,700,000 = R292,100,000
SCVA = SC/VA	R292,100,000 / R2,040,800,000 = 0.143
VAIC™ = VACA + VAHC + SCVA	1.823

Table 5- Industry Dummy Variable Analysis

	Retail	Electronics / Resources	Service
AECI LTD	1	0	0
AFRICAN OXYGEN LTD	1	0	0
AFROX HEALTHCARE LTD	1	0	0
ALLIED ELECTRONICS CORPORATION LTD	0	1	0
ANGLO AMERICAN PLATINUM CORPORATION LTD	0	1	0
ANGLOGOLD ASHANTI LTD	0	1	0
ASPEN PHARMACARE HOLDINGS LTD	1	0	0
ASTRAL FOODS LTD	1	0	0
AVENG LTD	1	0	0
AVI LTD	1	0	0
BARLOWORLD LTD	1	0	0
BASIL READ HOLDINGS LTD	1	0	0
BELL EQUIPMENT LTD	0	1	0
BIDVEST GROUP LTD (THE)	0	0	1
CERAMIC INDUSTRIES LTD	1	0	0
CITY LODGE HOTELS LTD	0	0	1
CROOKES BROTHERS LTD	1	0	0
DATACENTRIX HOLDINGS LTD	0	0	1
DIGICORE HOLDINGS LTD	0	1	0
DISTELL GROUP LTD	1	0	0
DON GROUP LTD	0	0	1
DORBYL LTD	1	0	0
DRD GOLD LTD	0	1	0
EDGARS CONSOLIDATED STORES LTD	1	0	0
ELLERINE HOLDINGS LTD	1	0	0
ENVIROSERV HOLDINGS LTD	0	0	1
FARITEC HOLDINGS LTD	0	0	1
FOSCHINI LTD	1	0	0
GOLD FIELDS LTD	0	1	0
GRINTEK LTD	0	1	0
GROUP FIVE LTD	1	0	0
HIGHVELD STEEL & VANADIUM CORPORATION LTD	0	1	0
HOWDEN AFRICA HOLDINGS LTD	0	1	0
HUDACO INDUSTRIES LTD	0	1	0
ILLOVO SUGAR LTD	1	0	0
IMPALA PLATINUM HOLDINGS LTD	0	1	0
IMPERIAL HOLDINGS LTD	1	0	0
ISPAT ISCOR LTD	0	1	0
ITALTILE LTD	1	0	0
JASCO ELECTRONICS HOLDINGS LTD	0	1	0
JD GROUP LTD	1	0	0
JOHNNIC COMMUNICATIONS LTD	0	0	1
JOHNNIC HOLDINGS LTD	0	0	1
KUMBA RESOURCES LTD	0	1	0
LA GROUP LTD	1	0	0
MASSMART HOLDINGS LTD	1	0	0
MATHOMO GROUP LTD	1	0	0

MEDI-CLINIC CORPORATION LTD	1	0	0
MGX HOLDINGS LTD	0	0	1
MTN GROUP LTD	0	0	1
MURRAY AND ROBERTS HOLDINGS LTD	1	0	0
MUSTEK LTD	0	1	0
NAMPAK LTD	0	0	1
NASPERS LTD N	0	0	1
NEW CLICKS HOLDINGS LTD	1	0	0
OCEANA GROUP LTD	1	0	0
PARACON HOLDINGS LTD	0	0	1
PICK N PAY STORES LTD	1	0	0
PINNACLE TECHNOLOGY HOLDINGS LTD	0	1	0
PUTCO LTD	0	0	1
RELYANT RETAIL LTD	1	0	0
REUNERT LTD	0	1	0
SABMILLER PLC	1	0	0
SAPPI LTD	1	0	0
SEARDEL INVESTMENT CORPORATION LTD	1	0	0
SETPOINT TECHNOLOGY HOLDINGS LTD	0	1	0
SHOPRITE HOLDINGS LTD	1	0	0
STEINHOFF INTERNATIONAL HOLDINGS LTD	1	0	0
SUPER GROUP LTD	0	0	1
TELKOM SA LIMITED	0	0	1
TIGER BRANDS LTD	1	0	0
TRANS HEX GROUP LTD	1	0	0
TRUWORTHS INTERNATIONAL LTD	0	0	1
UNITRANS LTD	0	0	1
VALUE GROUP LTD	0	0	1
WANKIE COLLIERY COMPANY LTD	1	0	0
WESTERN AREAS LTD	0	1	0
WOOLWORTHS HOLDINGS LTD	1	0	0
YORK TIMBER ORGANISATION LTD	1	0	0

Table 6- Descriptive statistics

Variable	Sample size	Mean	Std Deviation	Minimum	Maximum
VAIC™	117	3.512	1.031	2.034	8.431
Board size	117	10.30	3.85	4	31
Percentage of women	117	0.0645	0.1031	0	0.83
Percentage of persons of colour	117	0.13786	0.149	0	1
Percentage of non-executive	117	0.592	0.1488	0.13	0.92
Percentage of non-executive on audit and remuneration committees	117	0.8405	0.2049	0	1
ROE	117	21.08453	13.19657	0.59	92.55
ROA	117	17.8553	7.95782	0.81	40.63
Turnover ratio	117	7.763761	8.979403	0.18	79.1
Total assets	117	4572512	7467834	33592	40287930
Debt to asset ratio	117	1.533077	1.894538	0.06	15.2

Table 7- Descriptive statistics

Variable	Percentage representation on the board of directors	Percentage non non-representation on the board of director
Percentage of women	46%	54%
Percentage of persons of colour	66%	34%

Table 8- Descriptive statistics

Variable	Mean VAIC™ with women/colour representation	Mean VAIC™ with women/colour non-representation
Percentage of women	4.18	3.59
Percentage of persons of colour	4.13	3.26

Table 9- Regression results women representation

Dependent variable: VAIC™

Independent variable: Percentage of women on board of directors

N	117
R-squared	0.602433
Adjusted R-squared	0.572983

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	3.146468	1.050768	2.994445	0.0034
ROE	2.387367	0.629033	3.795299	0.0002
TA	4.63E-08	8.84E-09	5.230155	0.0000
DTA	0.312730	0.088093	3.549990	0.0006
TOR	2.576156	1.009892	2.550922	0.0121
ELECTRONICS	1.978702	0.261976	7.552994	0.0000
RETAIL	1.851630	0.172183	10.75387	0.0000
SERVICE	2.242873	0.207033	10.83341	0.0000
WOMEN	0.950822	0.746294	1.274059	0.2054

Table 10- Regression results colour representation

Dependent variable: VAIC™

Independent variable: Percentage of persons of colour on board of directors

N	117
R-squared	0.624412
Adjusted R-squared	0.596591

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	3.070886	1.010215	3.039833	0.0030
ROE	2.122975	0.617366	3.438762	0.0008
TA	3.58E-08	9.16E-09	3.909879	0.0002
DTA	0.377099	0.085570	4.406922	0.0000
TOR	3.595024	0.819090	4.389048	0.0000
ELECTRONICS	1.876717	0.257582	7.285888	0.0000
RETAIL	1.817594	0.166209	10.93562	0.0000
SERVICE	2.178673	0.200019	10.89234	0.0000
COLOUR	1.061920	0.374547	2.835208	0.0055

Table 11- Regression results non-executive director representation

Dependent variable: VAIC™

Independent variable: Percentage of non-executive directors on board of directors

N	117
R-squared	0.599693
Adjusted R-squared	0.570040

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	2.956199	1.041984	2.837087	0.0054
ROE	2.276813	0.638700	3.564762	0.0005
TA	4.31E-08	9.09E-09	4.737729	0.0000
DTA	0.340060	0.087189	3.900265	0.0002
TOR	3.300554	0.838689	3.935374	0.0001
ELECTRONICS	1.798719	0.354636	5.072016	0.0000
RETAIL	1.670601	0.294713	5.668566	0.0000
SERVICE	2.099628	0.301894	6.954841	0.0000
EXEC_NONEXEC	0.417588	0.446966	0.934272	0.3522

Table 12- Regression results non-executive representation on standing committees

Dependent variable: VAIC™

Independent variable: Percentage of non-executive directors on audit and remuneration committees

N	117
R-squared	0.596573
Adjusted R-squared	0.566690

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	2.918320	1.053599	2.769858	0.0066
ROE	2.387069	0.641754	3.719602	0.0003
TA	4.47E-08	9.22E-09	4.843797	0.0000
DTA	0.333284	0.087231	3.820700	0.0002
TOR	3.291672	0.842800	3.905638	0.0002
ELECTRONICS	1.981234	0.355313	5.576025	0.0000
RETAIL	1.849585	0.314034	5.889762	0.0000
SERVICE	2.263975	0.331181	6.836067	0.0000
NE_ON_COMM	0.057883	0.329059	0.175904	0.8607

Table 13- Regression results chairperson duality

Dependent Variable: VAIC™

Independent variable: chairperson duality

N	117
R-squared:	0.597016
Adjusted R-squared	0.567165

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	2.878357	1.057671	2.721411	0.0076
ROE	2.386472	0.634745	3.759732	0.0003
TA	4.48E-08	8.89E-09	5.039372	0.0000
DTA	0.330788	0.087433	3.783337	0.0003
TOR	3.324132	0.844122	3.937974	0.0001
ELECTRONICS	2.032937	0.262488	7.744877	0.0000
RETAIL	1.906432	0.171871	11.09223	0.0000
SERVICE	2.323198	0.204324	11.37017	0.0000
CHAIRPERSON	-0.156836	0.405423	-0.386845	0.6996

Table 14- Summary of research findings

Equation	Independent variable	R^2 for model	t-value independent variable	Null Hypothesis H_0
$VAIC^{TM} = f$ (PERGENDER, TA, ROA, ROE, TOR, E, R, S, DTA)	Percentage of women on board of directors	0.602	1.2740	Accepted
$VAIC^{TM} = f$ (PERCOLOUR, TA, ROA, ROE, TOR, E, R, S, DTA)	Percentage of persons of colour on board of directors	0.624	2.8352	Rejected
$VAIC^{TM} = f$ (PERNONEXEC, TA, ROA, ROE, TOR, E, R, S, DTA)	Percentage of non-executive directors on board of directors	0.599	0.9342	Accepted
$VAIC^{TM} = f$ (PERCOM, TA, ROA, ROE, TOR, E, R, S, DTA)	Percentage of non-executive directors on audit and remuneration committees	0.596	0.1759	Accepted
$VAIC^{TM} = f$ (CHAIR, TA, ROA, ROE, TOR, E, R, S, DTA)	Chairperson duality	0.597	-0.3868	Accepted

Table 15- Independent samples test, women

Levene's Test for Equality of Variances- women

	F	Sig
VAIC™ equal variances assumed	2.035	0.157

t-test for Equality of Means- women

	t	df	Sig. (2-tailed)	Mean difference
VAIC™ equal variances assumed	0.998	91	0.321	0.30643
VAIC™ equal variances not assumed	0.975	75.923	0.332	0.30643

t-test for Equality of Means- women

		95% confidence interval of the difference	
	Std error difference	Lower	Upper
VAIC™ equal variances assumed	0.30703	-0.30345	0.91632
VAIC™ equal variances not assumed	0.31414	-0.31923	0.93210

Table 16- Independent samples test, colour representation

Levene's Test for Equality of Variances- colour

	F	Sig
VAIC™ equal variances assumed	1.533	0.219

t-test for Equality of Means- colour

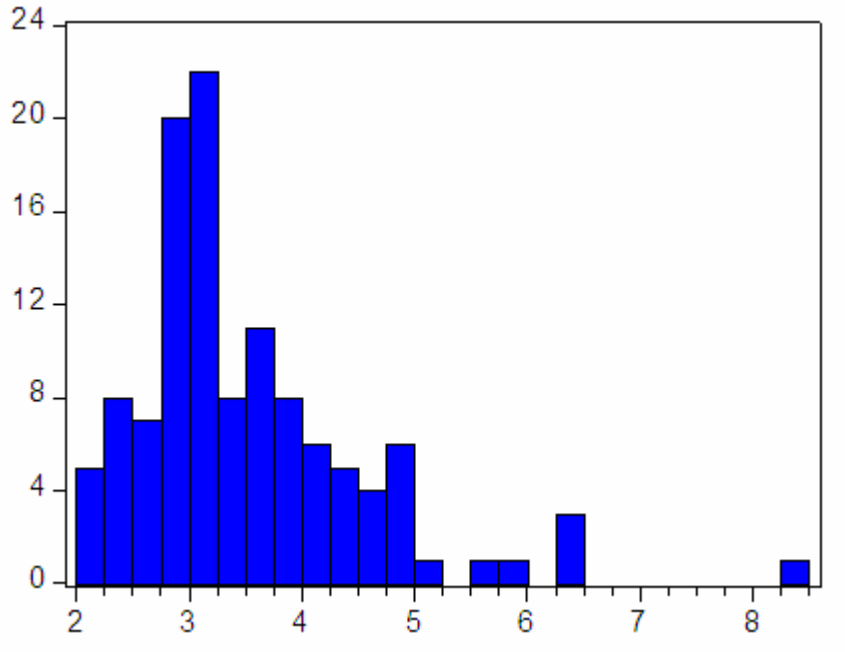
	t	df	Sig. (2-tailed)	Mean difference
VAIC™ equal variances assumed	0.267	90	0.790	0.9018
VAIC™ equal variances not assumed	0.301	69.404	0.764	0.9018

t-test for Equality of Means- colour

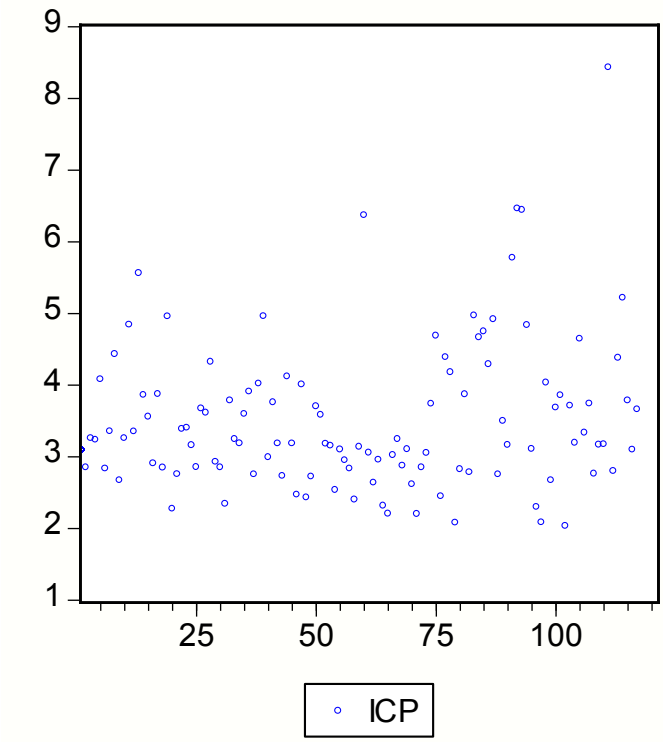
		95% confidence interval of the difference	
	Std error difference	Lower	Upper
VAIC™ equal variances assumed	0.33800	-0.58131	0.76166
VAIC™ equal variances not assumed	0.29958	-0.50742	0.68777

Table 17- Histograms and scatter grams

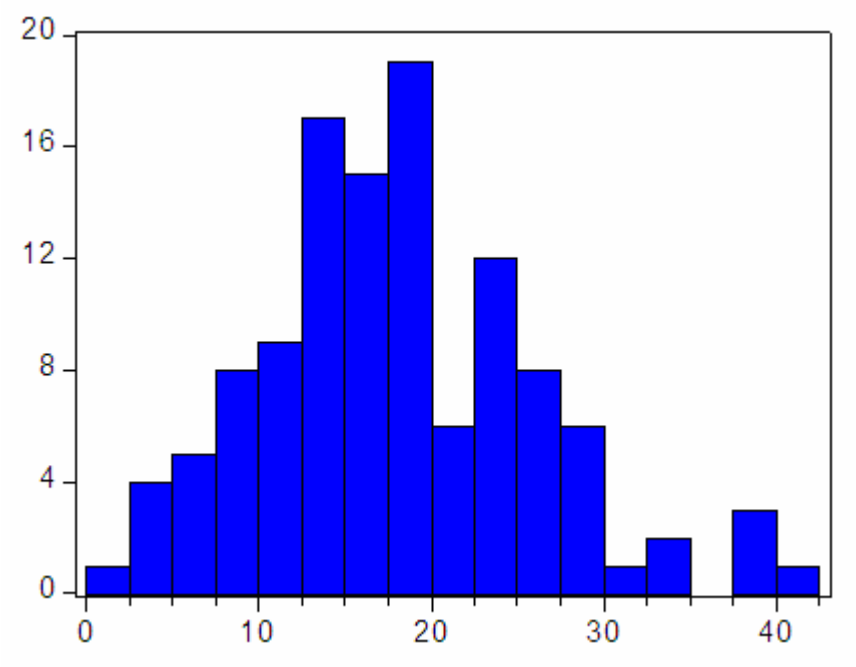
VAIC™



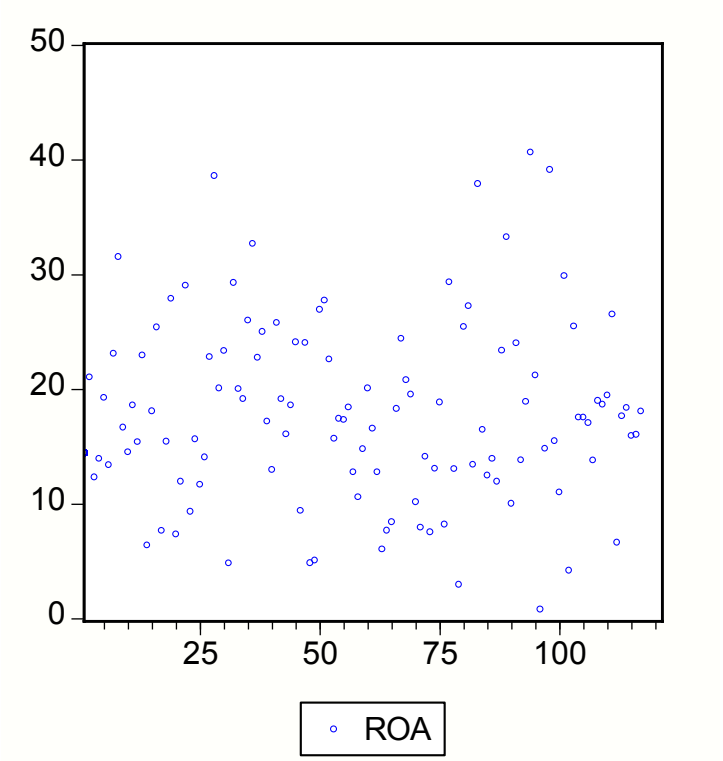
VAIC™



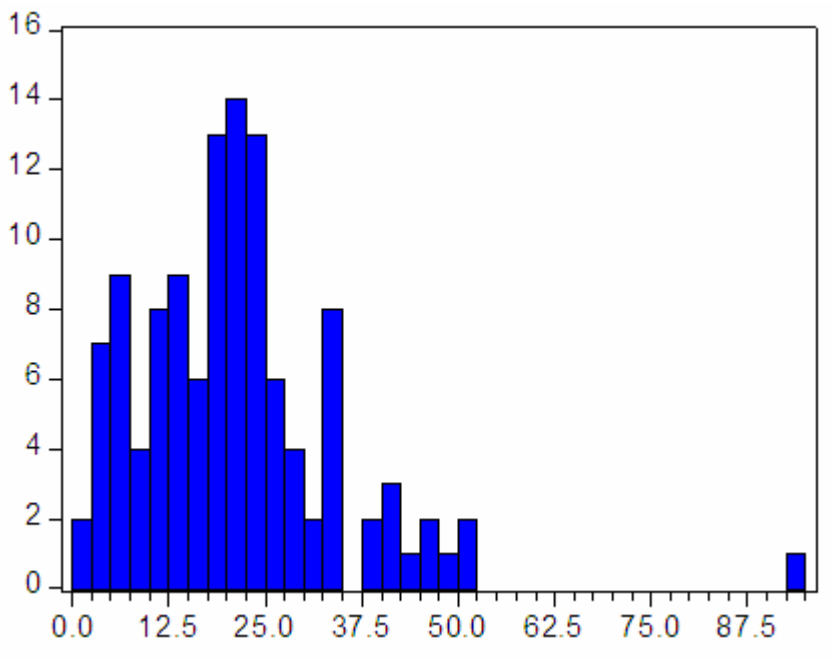
ROA



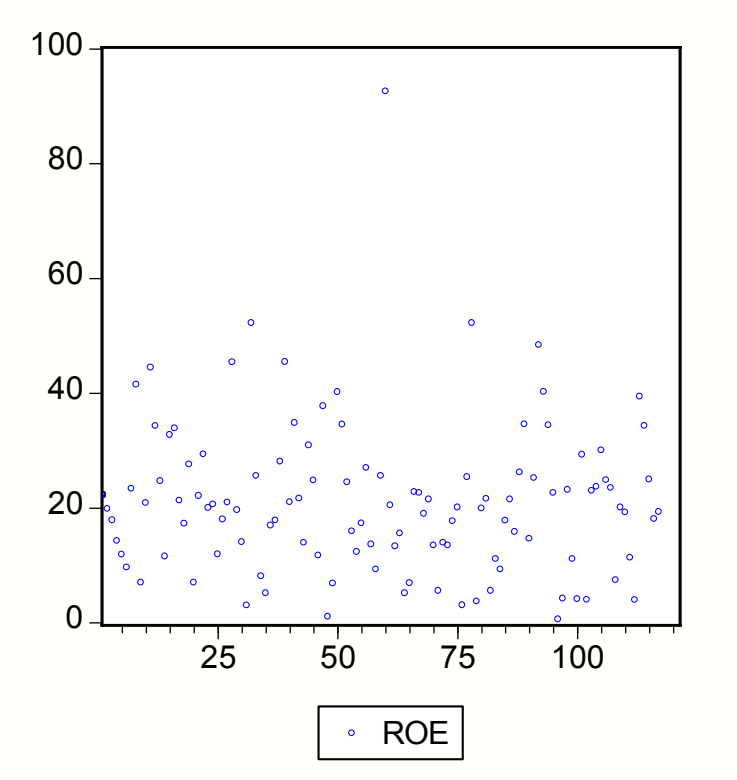
ROA



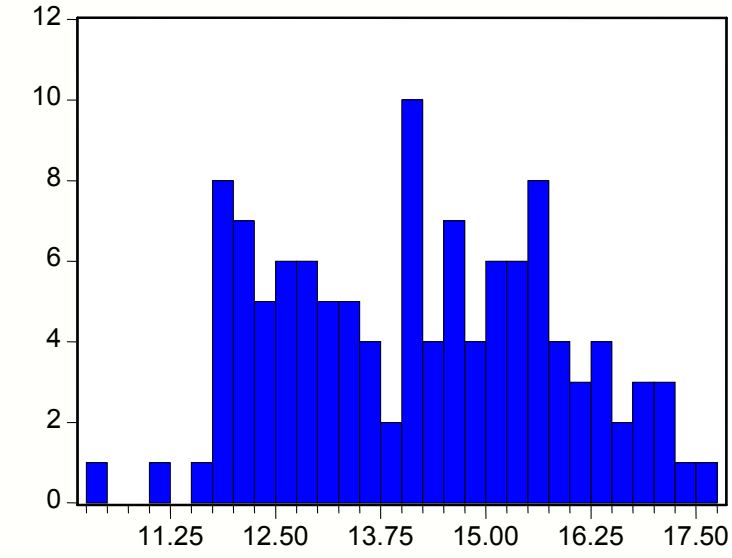
ROE



ROE

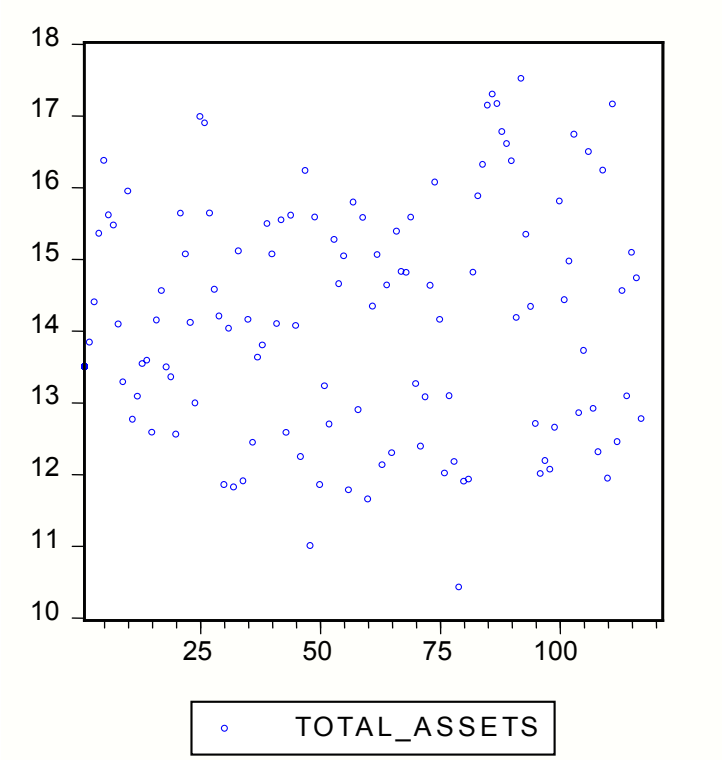


Total Assets

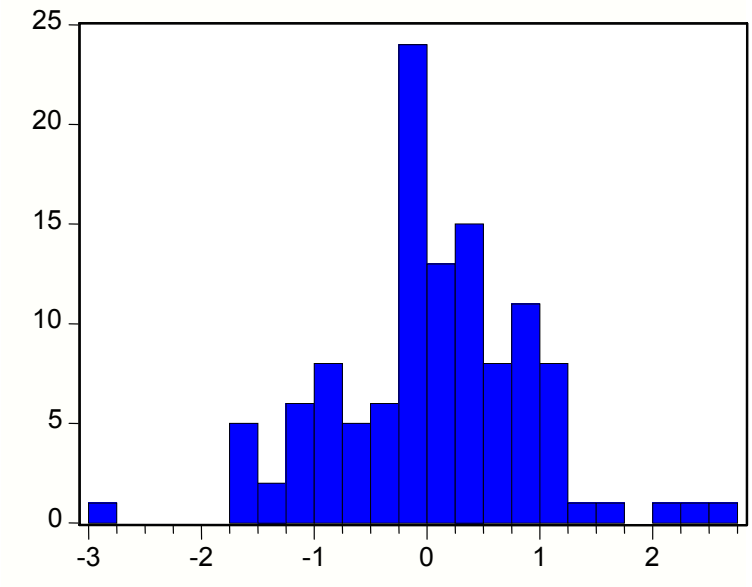


Series: TOTAL_ASSETS

Total Assets

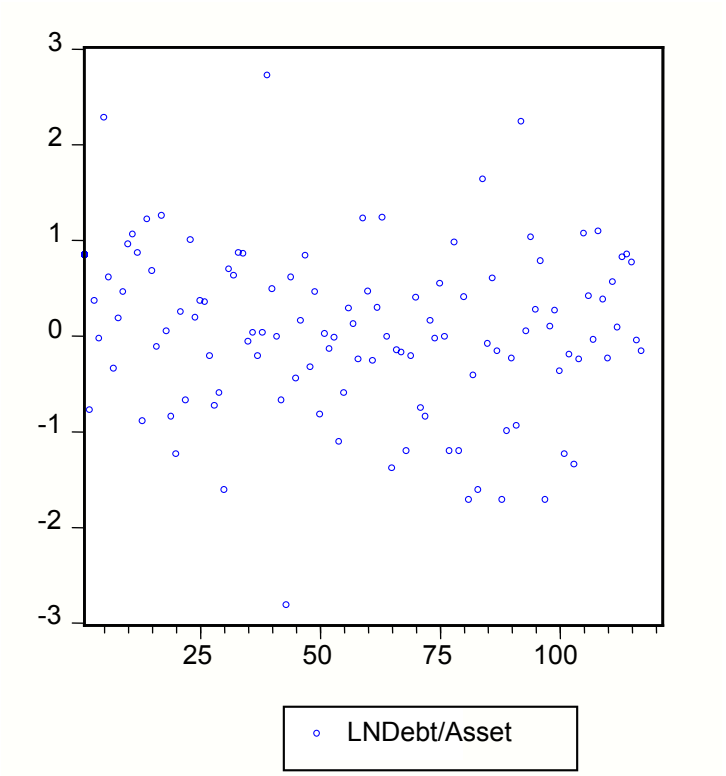


LN Debt to Asset Ratio

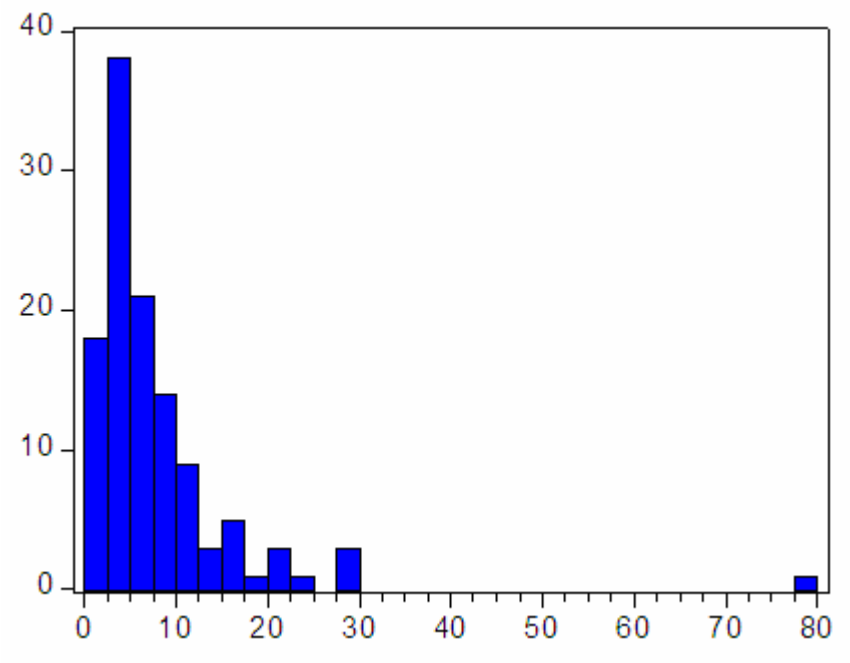


Series: LN Debt/Asset

LN Debt to Asset Ratio



Turnover Ratio



Turnover Ratio

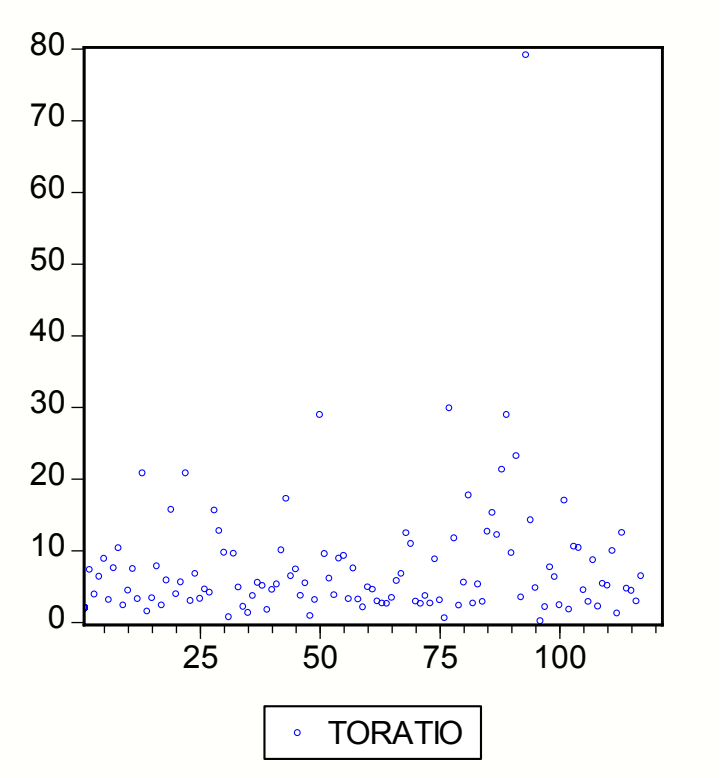

80
70
60
50
40
30
20
10
0
25
50
75
100
TORATIO

Table 18- Multicollinearity Diagnostics

Correlation coefficient

Array 1	ROE
Array 2	ROA
Calculated coefficient	-0.0687

Variable Inflation Factor Collinearity Diagnostics

Model		Unstandardized Coefficients B	Sig.	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	1.852	.000					
	ROA	3.146	.003	.425	.277	.182	.560	1.787
	ROE	2.387	.000	.559	.343	.230	.568	1.761
	Total Assets	4.625E-08	.000	.383	.450	.317	.897	1.115
	DE	.313	.001	.260	.323	.215	.657	1.522
	TO_RATIO	2.576E-02	.012	.405	.238	.155	.476	2.102
	Electronics	.127	.550	-.038	.058	.036	.818	1.222
	SERVICE	.391	.013	.097	.237	.154	.872	1.146
	WOMEN	.951	.205	.270	.122	.077	.661	1.513

a Dependent Variable: ICP

Eigen Value Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)
1	1	4.434	1.000	.01
	2	1.153	1.961	.00
	3	1.048	2.057	.00
	4	.821	2.324	.00
	5	.706	2.507	.00
	6	.456	3.117	.01
	7	.210	4.595	.11
	8	.108	6.398	.44
	9	6.372E-02	8.342	.44

a Dependent Variable: ICP