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LONGITUDINAL STUDY OF THE RELATIONSHIP BETWEEN BOARD ATTRIBUTES
AND FIRM PERFORMANCE IN SOUTH AFRICA

BY

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DECLARATION

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ABSTRACT

Corporate governance is not a new concept, although researchers have only shown interest in the topic in the past few decades. The recent financial crisis reignited debate on appropriate mechanisms for making management more accountable to shareholders. Management and boards of directors have been accused of not doing much to protect the interests of shareholders and other relevant stakeholders. This study examines the relationship between board attributes and corporate performance for publicly listed companies in South Africa. In contrast to prior studies, in this research performance is defined as the efficiency of the value added by a firm's total resources, and its two major components, physical capital (PC) and intellectual capital (IC).

The literature identifies four board attributes that may influence firm performance, namely, board composition, CEO duality, director's ownership and board size.

After univariate and bivariate analysis of the data was undertaken, a multiple regression analysis on a sample of 99 publicly listed companies in South Africa between 2001 and 2009 was performed on three samples (a sample from the pre-King Report II era, one from the post King Report II period, and a pooled sample). The results reveal no consistent significant relationship between the four chosen board attributes and firm performance. However, individual board attributes are found to be significantly associated with performance.

The proportion of non-executive directors on the board exerts a positive impact on the value added by a firm's total resources, and by its intellectual capital, but a negative impact by its physical capital. Directors' ownership and board size have no impact on the value added by a firm's total resources or by a firm's physical and intellectual capital. Separating the roles of CEO and chairman exerts a negative impact on total value added by a firm's physical capital only.

In the light of these findings, a comprehensive measure of performance is recommended, while expanding the theoretical framework used to examine corporate governance and performance, to accommodate contrasting conceptual frameworks.

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CHAPTER ONE

GENERAL INTRODUCTION

The ultimate measure of a man is not where he stands in moments of comfort but where he stands at times of challenge and controversy.

Martin Luther King

1.1 Introduction

Corporate governance has been a topic of research undertaken on the business profession since Adam Smith's (1775) seminal publication *the Wealth of Nations*, and given impetus by the work of Berle & Means (1932) on the separation of corporate ownership and control and, more recently, by Jensen & Meckling's (1976) analytical work on the agency theory. In this research area corporate governance is considered to reduce conflicts of interest, and enhance the monitoring mechanism of managers, which should increase the value of the firm (Denis & McConnell, 2003). Spectacular business failures and financial crises during the 1980s reignited debate on appropriate mechanisms for making corporate management more effective and business managers more accountable to shareholders and other relevant stakeholders (Demirage, Sudarsanam, & Wright 2000). This has resulted in an increasing number of countries across the world publishing corporate governance guidelines and codes of best practice (Demirag et al., 2000; Gregory, 2004). Boards of directors were at the epicentre of this effort to make directors more accountable to their shareholders (Ho & Williams, 2003; Vafeas & Theodorou, 1998). An ineffective board may lead to poor corporate governance, therefore various corporate governance reforms have focused on changes to board composition, leadership structures and directors' ownership,¹ to improve corporate governance and enhance corporate performance (Ho & Williams, 2003). The relationship between board attributes and firm performance has been examined, both theoretically and empirically in past research (for example Abidin et al., 2009; Brown & Caylor, 2006; Mangena & Chamisa, 2008; Ho & Williams, 2003; Klapper & Love 2004; Leech & Leahy, 1991; Molz, 1995; Renders, Gaeremynck, & Sercu, 2010; Vafeas & Theodorou, 1998 & Zahra & Pearce, 1989).

¹ For the purpose of this study, board composition refers to the make-up of the board, such as the number of directors and the mix of executive and non-executive directors; Leadership structure refers to whether a single individual or two separate people undertake the roles of the CEO and chairman of the board; and directors' ownership refers to the percentage of issued shares owned by all directors directly and indirectly.

Previous studies have analysed this relationship by comparing the firm's performance using accounting or market-based measures that focus on returns from an entity's physical capital. However, seminal studies claim that the concept of value added is a proper measure of a firm's performance (see, for example: Evraer & Belkaoui, 1998; Ho & Williams, 2003; Meek & Gray, 1998; and Pulic, 1998). Recent studies support this view (Adidin et al., 2009 and Clarke et al., 2011). Corporate governance guidelines published in the past two decades often emphasised the concept of value added as the primary objective of a board of directors (Ho & Williams, 2003).

A growing number of leading academics, business professionals and public sector entities are acknowledging that existing accounting measures do not reflect a firm's total value (physical and intellectual capital). These traditional accounting systems have been in existence for a long time and have formed the basis for assessing performance on financial criteria (Bruns, 1998; Gregory, 1993; Lynch & Cross, 1991). However, with a change in the economic environment and the increasing incorporation of knowledge into products and services, companies face the challenge of measuring their performance in new ways (Neely, 1999; Pulic, 2004). Pulic (2000) asserts that a larger number of companies are sensing the gap between the modern approach of value creation and the traditional way of monitoring operations. Furthermore, interlocking driving forces which are changing the rules of doing business and measuring performance, such as globalisation, and information or knowledge intensity (where efficient production relies on information and know-how), has increased the need for new indicators to explain and measure the total value of firms, including their intellectual capital.

Intellectual capital is argued to be the most important source of sustainable competitive advantage (Pulic & Bornemann, 1999). There are three main components of intellectual capital; these are human capital, structural capital and customer capital (Edvinsson & Malone, 1997). According to Edvinsson & Malone (1997), human capital represents the combined knowledge, skills, and ability of employees to carry out their required tasks. Roos, Roos, Dragonetti, & Edvinsson (1997) argue that employees generate intellectual capital through their competence, attitude and intellect. On the other hand, structural capital is the hardware, software, trademarks, patents, and all other assets which support employees to achieve productivity. It arises from processes and organisational value, reflecting the internal and external focus of the company, and its renewal and development value for the future (Roos et al., 1997). According to Skandia's model, the sum of human and structural capital comprises intellectual capital (Bontis, 2001). However, Edvinsson &

Malone (1997) emphasize that there is considerable interaction between physical and intellectual capital in the creation of value. The realisation of the importance of intellectual capital for a firm's performance has resulted in many attempts to report on intellectual capital (Dixon, Nanni, & Vollmann, 1990; Kaplan & Norton, 1992, 1996, 2000; Kennerley & Neely, 2002; Neely, 2003; Neely, Mike, & Platts, 1996, Neely & Bourne, 2000; Pulic, 1998, 2000). Among the later contributions to the ongoing debate are the methods developed by Ante Pulic 1998; Thomas A. Stewart, 1997; Baruch Lev, 2001 and 2003; and Carrado, Hulten, & Sichel, 2004².

Value Added Intellectual Coefficient (VAIC) developed by Pulic (1998) is one of the easily obtained measures for Intellectual capital that has been used over the last decade. Taking a stakeholder perspective, VAIC is offered as a measure of the efficiency of the firm's physical, financial and intellectual capital to enhance stakeholder value. It consists of the sum of three components, namely; capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE). A full discussion on the calculation of the VAIC and its components is presented in section 3.3.

The problem with most Intellectual capital measures is that intellectual capital is difficult to translate into quantitative values. Information on this resource is often qualitative and subjective and the required information is unavailable to those outside the firm. However, VAIC overcomes those issues as it uses only publicly available, quantitative and audited information such as labour costs, which is considered an investment in human capital rather than a cost (Pulic, 1998; Chan, 2009). Further, VAIC provides a standardised and consistent basis for measuring performance and therefore enables an effective comparative analysis (Pulic & Bornemann, 1999). Nevertheless, VAIC has its limitations, as the information it uses cannot be attributed exclusively to intellectual capital, and "noise" still exists within the numbers (Brennan, 2001; and Zambon, 2004).

1.2 Motivation and objectives of the study

A number of financial crises in the 1980s and 1990s, both in South Africa and globally, have reignited the debate that continues to focus on serious deficiencies in corporate governance. This debate has resulted in the development of many governance guidelines and

² For a comprehensive review of tools available to measure IC, see, Bontis, Dragonetti, Jacobsen, and Roos, 1999; Bontis, 2001, and Zambon, 2004).

codes of best practice across the globe (Demirage et al., 2000; Malling, 2004; Rossouw, Watt, Malan, 2002).

However, despite this development, most previous studies on corporate governance have focused on developed countries (Renders et al., 2010; Shleifer & Vishny, 1997; and Vafeas & Theodorou, 1998). Although there is a growing number of research publications on developing countries in Asia (e.g., Abidin, Kamal, & Jusoff, 2009; Baek, Kang & Park, 2004; Haniffa & Hudaib, 2006), very few studies have addressed this issue in South Africa (Ho & Williams, 2003; Mangena & Chamisa, 2008; Okeahalam, 2004).

Earlier studies (Shleifer & Vishny, 1997; Vafeas & Theodorou, 1998) indicate that, due to differences in the corporate governance environment of each country, such as the legal system and capital markets, governance structures should be examined separately in each country. This would enable evidence of the influence of governance characteristics to be generalized across countries. Therefore, this study contributes to the literature in two ways:

One, in a departure from previous studies, this study examines the effectiveness of corporate governance mechanisms in South Africa, a developing country whose corporate governance system was drawn from the Anglo-Saxon model. The choice of South Africa can be motivated by a number of factors. Firstly, South Africa was among the first of the developing countries to publish its corporate governance guidelines and code of best practice when it did so in 1994 (Demirag et al., 2000; Mallin, 2004). Secondly, South Africa has experienced a number of corporate failures in recent years (for example: Fidentia, JCI-Randgold, & LeasureNet) which were blamed on weak corporate governance structures (Sarra, 2004; World Bank, 2003). Thirdly, South Africa is the largest African economy with considerable influence on the African continent.

Two, this study is directed at determining whether the proportion of non-executive directors, directors' ownership, leadership structure and board size³ influence the value added to a firm from its total resources. Prior studies focused on examining this association, with performance being defined in financial terms (Klein, 2002) and few studies use social concepts, that is, corporate, social and environmental factors (Frankforter, Berman & Jones, 2000). However, with changes in the economic environment and the increasing incorporation of intellectual capital into products and services, these studies have been criticised for using measures that rely on the physical capital rather than the total capital of the firm. Therefore,

³ Hereafter referred to as board attributes, except when an individual attribute needs to be explained specifically.

this study examines the association between board attributes and firm performance, with performance defined as the efficiency of value added by a firm's total resources. Further, the study recognises that a firm's total resources consist of physical and intellectual capital.

1.3 Research questions

The research questions that arise in seeking to address the objectives outlined above are:

- Is there a relationship between board attributes and the efficiency of value added by a firm's total resources?
- Is there a relationship between board attributes and the efficiency of value added by a firm's physical capital (represented by capital employed efficiency)?
- Is there a relationship between board attributes and the efficiency of value added by a firm's intellectual capital (represented by human capital efficiency and structural capital efficiency)?

1.4 Importance of the study

The study contributes to the literature in three ways:

- It fills a gap in the literature, by considering whether board attributes are associated with firm performance over time. In particular, the time frame of the study covers three years before and six years after the second King Report's effective dates, allowing for a comparison between the pre and post King II periods. This will provide a better understanding of the impact of the implementation of the King Report's recommendations on the South African corporate environment.
- The importance of the study to the literature is of particular interest, as South Africa was first among developing and emerging economies which published its corporate governance guidelines and best practice, in 1994. The substantial shift in South African regulations has happened as a consequence of political and economic changes in the 1990s. Among the reasons behind the impetus for overhauling corporate governance is the financial crisis in 1990s. Poor corporate governance structures were blamed for the crisis that hit emerging economies worse than developed economies. Therefore, good

corporate governance becomes a prerequisite for these emerging economies for long-term macroeconomic stability.

- The study further empirically examines the association between four board attributes and the Value Added by a firm's two major resources, Physical and Intellectual capital. An online search at the University of Cape Town library showed that there was no such PhD study in this area in South Africa, only studies on corporate governance in other emerging market countries.

1.5 Scope of the study

Although this study considers corporate governance in its entirety and provides an extensive review on corporate governance, the empirical study is limited to a few features of governance, that is, board composition, leadership structure (duality), directors' ownership and board size. These features are discussed based on prior empirical research. Even with this limited selection, the study endeavours to measure performance, with controls for firm size, profitability, return to investors and leverage.

It is also important to note that this study focuses on the recommendations of the King Report II. The King Report III was made public in September 2010 during the course of this study, and therefore was not included in this study, as the impact of its recommendation on South African companies needs some time to be realised.

1.6 Organization of the study

The study is organised as follows:

Chapter two starts with an overview of the features of corporate governance in South Africa, and then discusses the broader literature on the board attributes examined, with the first section covering studies related to the proportion of non-executive directors, the second section addressing the literature on the effects of the extent of directors' ownership on corporate performance, the third section focusing on the effect of leadership structures, and the fourth section dealing with board size. The chapter ends with a summary and conclusion, identifying the need for further research due to the inconclusive results of previous studies as well as the limited number of studies on the South African market.

Chapter three describes the research method in four sections. The first presents research hypotheses for the four variables (proportion of non-executive directors, directors' ownership, leadership structure and board size). The second section covers an overview of the methodology adopted. Section three presents econometric tests, and section four covers sampling.

Chapter four presents the tests done on the data, in three sections. The first section presents the test for linearity, the second covers tests for normality, and the process for improving the normality of the data. The third section presents the descriptive statistics for the pre and post King Report samples, and the pooled sample, and for industry samples, as well as the test for Multicollinearity.

Chapter five discusses the empirical results of the research on corporate governance and performance, as well as comparing the results with the findings of previous studies.

Chapter six presents the significance of the findings relative to prior empirical research, and a summary of the thesis a list of the main conclusions, and the limitations of the study and future research directions.

This chapter introduced the concept of corporate governance and its relevance to corporate performance, arguing for the use of new measures of firm performance. The motivation and importance of the study and its contribution to the current literature on corporate governance was presented, followed by the research question to be addressed. The scope of the study was presented thereafter and the chapter finishes by outlining the research in the next chapters.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Corporate governance looks at the structure of the rights and responsibilities of different stakeholders within the firm and the stakeholders in the wide community who have an interest in the firm (for example, customers, suppliers, government agencies, or the press). Before considering the literature related to board attributes, this section provides a brief history of corporate governance in South Africa.

At first, corporate governance arrangements were embodied in company legislations. The companies Act in South Africa would deal with matters such as the appointment of directors, the operations of the boards of directors and the like. However, like several other countries, South Africa experienced many corporate collapses in the 1990s and early 2000s, notably Fidentia, JCI-Randgold, and LeisureNet, some of which were blamed on weak corporate governance structures (World Bank, 2003). In response to the need to strengthen the corporate governance system in South Africa, the King Committee on corporate governance was formed in 1992, and in line with the international trend, it has considered corporate governance from a South African perspective. The result was the publication of the first King Report in November, 1994. Since then, both domestic developments (e.g., legislation such as the Employment Equity Act – No. 55 of 1998) and international (e.g. UK Combined Code of 1998) have motivated the revision of corporate governance, which led to the publication of the second King Report in March, 2002. The Second King Report is split into six chapters which discusses roles and functions of board of directors, risk management, internal audit, sustainability reporting, accounting and auditing and compliance and enforcement (Major issues covered by the King Report in Appendix A).

A prominent feature of the King Report (2002) is its adoption of the “inclusive approach” to corporate governance which encourages South African firms to consider a wider community of stakeholders, while codes in other countries (list of major international codes in appendix B) focused only on shareholder wealth maximization.

The King Report (2002) indicated that the board of directors should be the focal point of the corporate governance system. Further, it recommends (a) a unitary board structure with a balance between executive and non-executive directors, preferably with a majority of non-executive directors; (b) that the chairman of the board of companies should be an independent non-executive director and not the CEO of the firm; (c) that a significant portion of the total remuneration of executive directors be performance based. Adherence to the King Report's recommendations is voluntary. However, the JSE Securities Exchange obliged listed companies to adhere to these recommendations, or indicate the extent to which they have not complied with them.

This study investigates whether or not the attributes of the board affect a firm's performance. Prior studies that examined the relationship between board attributes and a firm's performance in financial terms used either financial accounting or market-based measures (Bhagat & Black, 1999; Conyon & Leech, 1994; Hermalin & Weisach, 1991; Vafeas & Theodorau, 1998; Yermack, 1996; and Zahra & Peace, 1989). Few studies have examined this relationship using the efficiency of value added as a measure of a firm's performance (Abidin et al., 2009; Clarke, Seng & Whiting, 2011; Firer & Williams, 2003; Ho & Williams, 2003; Williams, 2000).

The chapter reviews literature relevant to the attributes of boards of directors. This review helps to crystallise the research problem and highlight the specific areas in which the study seeks to make a contribution. In addition, the consideration of previous research allows for the development of the hypotheses that is posed in chapter three.

2.2 Board attributes

A review of previous studies shows that there are four board attributes often thought to impact on a firm's performance. These are board composition, ownership concentration on the board, leadership structure (duality), and board size (see for example: Ho & Williams, 2003; Mangena & Chamisa, 2008; Vafeas & Theodorau, 1998; Zahra & Peace, 1989). The theoretical and empirical studies relevant to these attributes are set out below.

2.2.1 Board composition

The proportion of non-executive directors⁴ on a firm's board of directors and its influence on the firm's performance have frequently been topics of debate (Ajinkya et al., 2005; Bhagat & Black, 1999; Beasley, 1996; Byrd & Hickman, 1992; Cotter, Shivdasani, & Zenner, 1997; Hermalin & Weisbach, 1991; Ho & Williams, 2003; Mangena & Chamisa, 2008; Rosenstein & Wyatt, 1990; Vafeas & Theodorou, 1998; Weisbach, 1988; Zahra & Peace, 1989).

An important issue in the recent debate on board reforms is the balance between executive and non-executive directors on the board with the emphasis being on making the board independent of management. Corporate governance guidelines recommend that companies should be headed and controlled by boards that can lead and monitor the company (King Report, 2002). The board should reflect a balance between executive and non-executive directors, preferably with a majority being non-executive directors who are independent of management, so that shareholders' and other relevant stakeholders' interests can be protected (Code 2.2.2, King Report, 2002).

Many theories, including agency theory and stakeholder theory, support the argument that the independent non-executive directors are instrumental to a firm's performance (Wang & Dewhirst, 1992). Proponents of agency theory (Fama & Jensen, 1983) argue that shareholders (principals) and managers (agents) have conflicting interests and goals. Consequently, monitoring what agents are doing becomes a central problem for the principals.

The board is one of the monitoring mechanisms that the shareholders can use to monitor top management (Fama & Jensen, 1983). According to the stakeholder perspective, non-executive directors are viewed as acting as representatives and protectors of the wider range of stakeholders. They are often appointed to help in managing the interests of a firm's various stakeholders (Johnson & Greening, 1999; and Wang & Dewhirst, 1992). Non-executive directors are either managers or important, expert decision makers in other enterprises, and the value of their capital depends on their performance as decision-making experts in other firms (Fama & Jensen, 1983). Non-executive directors' appointments provides a signal to external markets that they are decision-making experts, who can understand the importance of decision control, and can work with decision systems (Vafeas

⁴ A non-executive director is any director who has no connection with the company, either as current or past employee or as management or as a substantial customer or supplier of goods or services (King Report II, 2002).

& Theodouros, 1998). They need to fulfil their duties and responsibilities in order to protect their reputation capital so they can increase their future directorship opportunities (Beasley, 1996 and Shivdasani, 1993). Executive directors in turn have an important role in relation to non-executives as they are an important source of the information needed by the non-executive directors. Like non-executive directors, they are accountable to shareholders and have similar legal liability, but at the same time they have their own interests to look after, especially since they depend on the firm for their immediate livelihood (Zahra & Peace, 1989).

Although the above reasons may appear to be compelling, empirical evidence for the value of non-executive directors on the firm's performance have not produced any conclusive evidence in this regard. These studies fall into two groups; the first group examine the board's effectiveness in handling specific issues, such as CEO replacement, response to a takeover bid and acquisition of another company (Bhagat & Black, 1999; Weisback, 1988). The results of these studies reveal how different boards behave on individual tasks, which makes it easier for researchers to find statistically significant results (Bhagat & Black, 1999). The weakness of this approach is that boards may perform well on one individual task, but badly on others. That means that the effect of board composition on overall firm performance is not apparent. Therefore the second approach involves examining the relationship between board composition and overall firm performance (e.g. Agrawal & Knoeber, 1996; Dahya & McConnell, 2003; Dehaene, DeVuyst & Ooghe, 2001; Ho & Williams, 2003; and Mangena & Chamisa, 2008). This approach averts the weakness of the first approach, but at the same time causes other problems. One of these is that the measurement of firm performance should be looked at over a long period of time, and that leads to noisy data. This creates difficulties in explaining what various boards do differently that produce differences in a firm's performance, if such a relationship exists (Bhagat & Black, 1999). Therefore, one needs both approaches to obtain a full picture of how board composition affects board behaviour and firm performance.

The following section reviews studies, which evaluate how board composition influences board behaviour with respect to specific tasks. This is followed by a review of studies that assess how board composition affects or is related to overall firm performance.

2.2.1. a. CEO Replacement

There is general agreement that the replacement of a CEO, when necessary, is one of board's main tasks (Bhagat & Black, 1999; Weisbach, 1988). Executive directors are closely linked with CEOs; therefore none of them are likely to challenge the CEO in the boardroom. Consequently, this task falls upon the non-executive directors (Weisbach, 1988). Weisbach (1988) finds that boards with at least 60 percent non-executive directors are more likely to dismiss a poorly performing CEO than boards with a lower proportion of non-executive directors. Further, Weisbach (1988) asserts that the association between performance and CEO turnover is higher when boards are dominated by non-executive directors than it is in firms with boards dominated by executive directors. Interestingly, Weisbach (1988) found that non-executive directors are more likely to fire the CEO after one year of poor performance, neglecting the fact that the CEO may in fact be maximising the long-term value of the firm. This was supported by Denis & Denis (1999) who found that generally the performance of firms improved modestly after forcing a CEO to retire.

On the other hand, Mikkelsen, Partch, & Shah (1997) found an insignificant relationship between firm performance and CEO turnover during a low takeover period (1989-1993), and a significant relationship during an active takeover period (1984-1988), but no direct relationship between board composition and CEO turnover. Their results suggest that an active market for corporate control with the threat of a hostile takeover exerts stronger pressure on a firm to replace a poorly performing CEO. In other words, the active takeover market increases the effectiveness of the board's control over managers.

In conclusion, the above studies on the correlation between board composition and the replacement of the CEO provide some evidence that boards with a majority of non-executive directors behave differently to boards dominated by executive directors when they decide to fire the CEO. A higher proportion of non-executive directors lead to increased CEO turnover. However the difference seems marginal and it is uncertain if a majority or a large-majority of non-executives on the board performs better when it comes to important decision making such as forcing a CEO to leave.

2.2.1. b. Response to a takeover bid

Several studies suggest that non-executive directors play an important role in evaluating takeover bids (Brickley, Coles & Jarrell, 1997; Core, Guay & Rusticus (2006); Cotter, Shivdasani, & Zenner, 1997; and Shivdasani, 1993). Takeover bids have different

effects on shareholder wealth and the potential to damage or benefit the shareholders lies with decisions of the board who can accept the bid without a shareholders' vote (Cotter et al., 1997). Also, takeover bids are one of the few corporate events that can threaten the directorship of the non-executive directors on the board. This might be why non-executive directors are reluctant to accept a bid if its success could endanger their position on the board.

Cotter et al. (1997); and Core et al. (2006), assert that the examination of a takeover bid can provide evidence as to whether non-executive directors will increase shareholders' returns even when their position is threatened. Cotter et al. (1997) results indicate that target corporations with a majority of non-executives on the board realised nearly 20 percent greater stock price returns between 1989 and 1992 than targets without a majority of non-executive directors on the board. This implies that boards dominated by non-executive directors perform better in enhancing shareholder wealth during takeover bids. Furthermore, Cotter et al. (1997) assert that the higher returns for target shareholders with boards dominated by non-executive directors come at the expense of gains to bidders. They find that the correlation between larger target shareholder gains and board membership of a majority of non-executive directors is a result of higher initial takeover bid premiums and greater revision in the initial bid premium. Shivdasani (1993) and Core et al. (2006) examined the effect of boards of directors on firms that received hostile takeover bids. Both studies assert that board attributes are important determinants of the probability that a firm is a target of a hostile takeover attempt. In other words, hostile takeovers take place as a response to weakness in a firm's internal control mechanisms. In their results, Shivdasani (1993) and Core et al. (2006), indicate that the association between board composition and the probability of a hostile takeover are insignificant when the non-executive directors serve on fewer additional boards than their counterparts, as well as where their ownership in hostile takeover targets is minimal. This implies that non-executive directors are effective in reducing the likelihood of a hostile takeover when their ownership is large and additional directorships are many. Shivdasani's results are consistent with the results of Cotter et al. (1997); Rosenstein & Wyatt (1997); and Weisbach (1988). These results indicate that boards with a majority of non-executives directors enhance the company's control mechanisms and increase shareholder value.

Lee, Rosenstein, Rangan, & Davidson (1992) examined the effect of board composition on wealth gains in management buyouts. They assert that the existence of agency problems between shareholders and management will be clearer in this particular situation (management buyout). This is because managers have an incentive to reduce the

shareholders' value, as they are part of the transaction. Thus, independent, non-executive directors should play a crucial role in controlling management decisions and increasing the shareholders' value. The results indicate that independent, non-executive directors are important in increasing the returns from transactions in which management participates in taking the entire corporation privately. On the other hand, the evidence that the independent non-executives could positively increase shareholders returns in a unit management buyout is weak.

In conclusion, empirical results support the notion that boards with a majority of non-executive directors perform better in enhancing shareholder wealth during takeover bids. This is in line with the governance recommendation that boards with a majority of non-executive directors should protect and enhance the interests of shareholders and other relevant stakeholders.

2.2.1. c. Acquiring another company

The role of non-executive directors is viewed as particularly critical in acquisitions, because they provide management with expert advice, and are expected to represent shareholders' interests (Bhagat & Black, 1999; and Byrd & Hickman, 1992). According to Byrd & Hickman (1992) non-executive directors are important when companies acquire another company because of their experience and objectivity in the business. They are more objective in evaluating the benefits and costs of an acquisition and in their interpretation of the information they have about the target firm's industry or the target firm itself (Byrd & Hickman, 1992). In the light of this they suggest management should set up explicit objectives regarding the risk of governance failures with the non-executive directors and advisors during the negotiation process (Capron & Schnatterly, 2005). In their analysis, Byrd & Hickman (1992) found that less negative return to shareholders from takeover bids are associated with boards with a majority of non-executive directors. Their results show a nonlinear association between the proportion of non-executive directors on the board and shareholders' wealth effects of takeover bids. Consistent with Weisbach (1988), their results indicate that when the percentage of non-executive directors on the board is over 60 percent this relationship will be negative. This implies that boards comprised entirely of non-executive directors will not serve the shareholders, and might harm them by making the board less effective in its decision-making and advisory roles (Byrd & Hickman, 1992).

Boards with majority of non-executive directors can play a key role in advising management on their acquisition strategy, so that shareholders and other relative stakeholders' interests are protected and enhanced. Empirical results are, in general, in line with this notion. However, Byrd & Hickman's (1992) results indicate that if the proportion of non-executives on a board exceeds 60 percent, the relationship should be negative.

2.2.1. d. Takeover defences

The adoption of poison pills can be used to extract a higher price from a takeover bidder and can also be used to discourage a takeover bid (Brickley et al., 1997). Evidence on whether shareholders believe that boards with a majority of non-executive directors are more likely to use these defences in a shareholder manner is mixed. McWilliams & Sen (1997) found that the stock price reacts negatively to the announcement of a takeover bid when the board is dominated by executive directors. Further, the larger the executive directors' holdings in the firm, the more likely it is that the stock price reaction will become increasingly negative (McWilliams & Sen, 1997). The same applies where the CEO is also the Chairman. This result is consistent with Brickley et al. (1997) assertion that when firms led by boards with a majority of non-executive directors adopt poison pill defences, the stock price reaction is significantly positive, and significantly negative if the board is dominated by executive directors. In a more recent paper, Gompers, Ishi & Metrick (2002) found that firms with strong governance mechanisms are less likely to be takeover targets. In contrast, Bacon et al. (1997) found that stock price reaction to a dual-class re-capitalisation is negative for firms with a board dominated by a majority of non-executive directors, and positive for firms without such a board composition. However, the negative association between stock price returns for dual-class re-capitalisation and boards with a majority of non-executive directors is in conflict with the assumption that firms with majority non-executive directors act more to protect shareholder interests.

We can conclude that firms with boards dominated by majority non-executive directors are less likely to be a takeover target. Further, share price reaction to a takeover bid is positive if the board has a majority of non-executive directors.

2.2.1. e. CEO and other executive remuneration

The determination of the CEO's remuneration and that of other directors is one of the main board functions that has received much attention from researchers and regulatory institutions. Most governance codes make a remuneration committee compulsory (Wixley & Everingham, 2010). Consistent with the assumption that independent, non-executive directors will protect shareholders' interests, the governance code in South Africa requires that the remuneration committee should be headed by an independent non-executive director (King Report, 2002; Code 2.5.2). Several studies document that the higher the proportion of

independent non-executive directors on the board, the more the CEO is paid (Core, Holthausen & Larcker, 1999). According to Core et al. (1999) the element of CEO remuneration that is predicted by the make-up of the board is associated negatively with firm performance. This implies that independent directors do not perform well in developing incentive plans that will help to improve future performance. Yermack (1997) found that a majority of independent directors on the remuneration committee decreases the tendency for firms to award stock options shortly before the firm's stock price increases, so delivering an immediate paper profit to the option receiver. Conyon & Peck (1998) found that the proportion of non-executive directors on the board is not associated with the level of executive remuneration in U.K. firms. But their result indicates that executive pay and firm performance are aligned when the proportion of non-executive directors on the main board or on the remuneration committee is large.

Other studies examining the effect of a board's composition on firm performance in general found support for the notion that a majority of non-executive directors improve firm performance. For example, some studies showed that boards with majority non-executive directors perform better (e.g., Brown & Caylor, 2004; Weir et al., 2002), reduce the likelihood of financial fraud (e.g., Beasley 1996; Peasnell et al., 2001), enhance the value of the firm (Abidin et al., 2009; Ho & Williams, 2003); and reduce the incidence of listing suspensions (Charitou et al., 2007; and Mangena & Chamisa, 2008).

We can conclude that corporate governance guidelines give higher rating to firms with boards dominated by non-executive directors. In general, studies examining the effect of board composition on firm performance found mixed results.

Most literature related to the proportion of non-executive directors on the board showed that boards with a majority of non-executive directors are more active in protecting shareholders' interests. Further, boards with more non-executive directors are more able to replace the underperforming CEO and to enhance shareholders value in the case of a takeover bid and/or other M&A activities. A positive relationship between independent boards and firm performance was found among most previous studies.

However, some studies found a negative relationship or no relationship between board independence and performance. Although, the majority of those studies focused on developed countries, few studies examined this relationship using firm data from developing countries.

Research on the impact of the King Report (2002) has been limited and provides inconsistent results. Thus this study will follow the generally accepted "monitoring

hypotheses” on non-executive directors thought to have a positive impact on performance. This will be done by examining the relationship between the proportion of non-executive directors and the value added of total resources by South African listed firms between 2001 and 2009. This provides the literature with a new viewpoint on corporate governance in developing countries.

2.2.2 Directors’ ownership

Ownership structure is one of the internal governance mechanisms to control the agency problem. Following Jensen & Meckling (1976), several studies examine the relationship between ownership and performance (e.g., Adams & Santos, 2006; Bhagat & Black, 1999; Demsetz, 1983; Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Finkelstein, 1992; Ho & Williams, 2003; Mangena & Chamisa, 2008; McConnell et al., 2008; Morck et al., 1988). Fama (1980) suggests that directors’ ownership helps to reduce the conflict of interest that exists between directors and shareholders. Directors who hold large stake in the firm are more likely to monitor management in order to protect their investments (Jensen, 1993).

Empirical studies generally support this notion. For example, Morck et al. (1988) estimate a piece-wise linear regression in which the dependent variable is Tobin’s Q and the independent variable is the percentage of shares owned by directors. Using a cross-sectional sample of 371 Fortune 500 firms in 1980, their results indicate that when director ownership increases to 5 percent, Q rises. For ownership levels between 5 percent and 25 percent, Q falls, and then rises again with ownership over 25 percent. Morck et al. (1988) attribute the increase of Tobin’s Q with ownership to the convergence of interests between directors and shareholders, while the decreases reflect the entrenchment of management. They suggest that the explanation behind this relates to remuneration, and it may be that the directors exercise their stock options when firms are performing well. When Morck et al. (1988) use profit margin as an alternative dependent variable, they find a similar piece-wise linear relationship, even though the statistical significance of the estimates is lower. Bhagat & Black (1999) find a significant relationship between the amount of shares owned by directors and firm performance. They argue that the reason behind this phenomenon is that the increase in directors’ equity motivates directors to improve their monitoring of management and that improves firm performance. In contrast, they stress that this might be due to the inside information the directors have about the firm and its operations, thus they will increase their

ownership to benefit from the firm's success. The second finding is that the greater the value of the stocks owned by directors, the more likely they are to replace a poorly performing CEO. This finding is consistent with the assumption that director ownership increases the board's awareness of the influence of poorly performing management. Recently, McConnell et al. (2008) indicated that findings on an empirical cross-sectional relationship between directors' ownership and firm value has often been criticized for ignoring potential endogeneity that might occur when other factors impact on both value and ownership to develop in harmony with each other.

In contrast, Rosenstein & Wyatt (1997) examined the relationship between directors' ownership and firm performance using a sample of 170 executive director announcements between 1981 and 1985. They measure the stock price reaction to the appointment of executive directors to the board. Their findings are contrary to those of Morck et al. (1988), as they show that when executive directors own less than 5 percent of the total ordinary shares, the firm's performance declines. For ownership between 5 percent and 25 percent the firm's performance improves, whilst where ownership is more than 25 percent the firm's performance declines again.

More studies assume directors' ownership and performance to be endogenous. Demsetz (1983) indicated that there is no systematic relationship between directors' ownership and performance. Demsetz results were supported by Demsetz & Lehn, 1985; Cho, 1998; Holderness et al., 1999; and Demsetz & Villalonga, 2001. Cho (1998) tested a reverse relationship between ownership and performance, using a cross-sectional 2-SLS regression to model endogeneity. He found investment affects corporate value positively which in turn affects directors' ownership.

Another aspect of corporate governance was investigated by Ho & Williams (2003); and Abidin et al. (2009), who examined directors' ownership and the value added by a firms' intellectual capital. Ho & Williams (2003) tested the ownership and value added in three countries (South Africa, Sweden, and the UK) and found that the coefficient for directors' ownership is significantly positive for Swedish firms, but not significant for the South Africa and UK samples. Results from research by Abidin et al. (2009) support Ho & Williams' (2003) results for South African firms.

Mangena & Chamisa (2008) investigated the impact of directors' ownership on the incidence of listing suspensions by the JSE Securities Exchange of South Africa. They found an insignificant relationship between directors' ownership and the suspension of firms by the JSE Securities Exchange.

In conclusion, the agency theory supports the notion that greater directors' ownership affects firm performance positively. Empirical results support this notion (for example, Bhagat & Black, 1999; McConnell et al., 2008 and; Morck et al., 1988). However, other studies fail to establish any relationship (e.g., Abidin et al., 2009; Ho & Williams, 2003; Mangena & Chamisa, 2008; and Rosenstein & Wyatt, 1997). Other studies found that directors' ownership and performance are endogenous and, therefore, they concluded that there should be no relationship between directors' ownership and performance (Cho, 1998; Demsetz, 1983; Demsetz & Lehn, 1985; and Demsetz & Villalonga, 2001). Based on the inconclusive results of this research, and combined with the notion that greater director ownership in a firm is likely to provide better performance over time. This study tests the proposed relationship between directors' ownership and the value added by South African listed firms between 2001 and 2009.

2.2.3 Leadership structure (duality)

Corporate governance guidelines regard role duality as undesirable and recommend the separation of the positions of CEO and chairperson in listed companies to ensure a balance of power and authority so that no individual has unlimited powers of decision making (King Report, 2002). The agency theory states that combining the two positions constrains a board's oversight role. Fama & Jensen (1983) argue that combining the positions of CEO and chairperson enables the individual in these roles to establish a considerable power base which could limit the boards' ability to execute its duties. However, separating the functions of the board disperses power and authority and enhances the boards' ability to effectively implement decisions addressing the wider interests of stakeholders (Wang & Dewhirst, 1992).

In contrast, combining the two functions has advantages, such as enhancing the ability of the individual of those roles to develop better knowledge of the operations which enable them to direct the firm strategically and with less interference from the board (Haniffa & Hudaib, 2006).

Before presenting the advantages and disadvantages of separating the two functions, it makes sense to consider the functions of CEO and chairperson. The second King Report (2002) states that the main function of the Chairperson is "to preside over meetings of directors and ensure the smooth functioning of the board in the interests of good governance". The CEO has a crucial role to play in the firm's day-to-day operations. The

Report further emphasises that the chairman is supposed to be the main architect of the board and is involved in selecting directors (board composition), setting long-term strategies and plans (with the CEO) and overseeing the CEO's and top management's priorities and procedures. The functions of the CEO are to lead a company in its day-to-day business affairs, set long-term strategies and plans (with the chairperson and the board) and implement these strategies. Consistent with the King Report, Jensen (1993, p866) asserts that "the function of the chairman is to run board meetings and oversee the process of hiring, firing, evaluating, and compensating the CEO. Clearly the CEO cannot perform this function apart from his or her personal interest. Without the direction of an independent leader, it is much more difficult for the board to perform its critical function". Based on this, Jensen argues for the two functions to be separated. The independent chairman should, at a minimum, be given the right to initiate board appointments, board committee assignments, and join with the CEO in the setting of the board's agenda.

Following are the advantages and disadvantages of combining the two functions:

Disadvantages of combining the two functions of CEO and chairperson:

- Increases the agency problem (conflict between shareholders and managers), whereas separating them will not harm shareholders (Fama & Jensen, 1983).
- Results in the incumbent having a disproportionately large influence on members of the board which could reduce their ability to serve as an effective monitoring mechanism for decision control (Baliga, Moyer, & Rao, 1996; Jensen, 1993).

Advantages of combining the two functions:

- Enables more effective leadership and reduces the possible opportunistic behaviour by a chairperson who is an outsider (Brickley et al., 1997; Lipton & Lorsch, 1992).
- Enables the individual in these roles to respond quicker to market conditions (Pfeffer & Salancik, 1978).
- Reduces the cost of transferring the information between the CEO and chairperson (Brickley et al., 1997).
- Reduces the probability of a conflict of interest between two heads (Brickely et al., 1997).

- Reduces the cost associated with the chairperson remuneration (Vafeas & Theodorou, 1998).
- The board will be more organized which will enhance its effectiveness and restore the independent monitoring role of directors (Baliga et al., 1996).

Empirical results are mixed. Rechner & Dalton (1991) studied the relationship between CEO duality and firm performance over time (1978-1983) in order to provide multiple year-on-year comparisons between the financial performance of firms with dual structures and those with independent structures. Their results show that firms with dual structures underperform in terms of accounting performance measures when compared with those with independent governance structures. Pi & Timme (1993) examined the relationship between performance and duality in large commercial banks in the U.S.A for the period 1987-1990. They found that cost efficiency and return on assets declined when the CEO also served as the chairperson. Their results imply (as banks are more highly regulated than other firms) that where the CEO serves as chairperson, companies should underperform at least as much as the bank sample.

Baliag, et al. (1996) investigated the relationship between duality and firm performance of Fortune 500 companies at the end of 1990. They used a comprehensive set of performance measures. Their findings indicate that there is no significant difference in market reaction to the change from duality to non-duality or vice versa, however, there is weak evidence that when the CEO is also the chairperson this is negatively related to long-term performance.

Brickley et al. (1997) investigated whether the CEO/chairperson as an individual has any impact on firm performance, using a sample of 661 publicly traded companies in 1988. They found no evidence that uniting the two functions (CEO/chairperson) is related to lower accounting and market returns and that similarly, changes from duality to non-duality or vice versa did not affect the stock price. They conclude that the widespread practice of combining the two functions of the CEO and chairman is indeed efficient and generally consistent with shareholders' interests for large U.S firms. They maintain that regulations that enforce a split between the two functions are misguided and that more investigation into the costs and benefits of proper leadership structures is required before more definite conclusions can be reached.

Boyd (1995) integrates the agency and stewardship perspective of splitting the functions in an attempt to resolve the conflicting results presented by other researchers, using

a sample of 192 firms in 12 industry groups in 1980. He found a different correlation between sales growth and return on investment, as well as a different relationship between sales volatility and return on investment in companies with separate and joint functions. Joining the two functions in high sales volatility firms was associated with increased return, but with decreased return in high sales growth firms (Boyd, 1995). Boyd concludes that neither agency nor stewardship can conveniently or constantly predict the consequences of CEO/chairperson duality. Further analysis of the environmental factors shows that duality can have a positive correlation with firm performance under certain industry conditions and a negative relationship under other conditions (Boyd, 1995).

McWilliams & Sen (1997) examined the relationship between CEO duality and stock price reaction to anti-takeover amendments. They used a sample of 265 companies from 1980 through 1990. Their results provide evidence that for firms with an individual serving as both CEO and Chairperson and a board dominated by inside and affiliated directors, the reaction to an anti-takeover bid is negative and becomes increasingly negative when inside and affiliated board members (as dominating the board) increase their ownership percentages. For firms splitting the two functions, board and ownership structure do not explain the stock price reaction.

Beasley & Salterio (2001) examined the relationship between leadership structures and the extent of including (voluntarily) non-executive directors on the audit committee, and the breadth of knowledge and experience in financial reporting of the non-executive directors on the audit committee. Their findings indicate that firms that do not split the CEO/chairperson functions are significantly less likely to voluntarily include non-executive directors, with the relevant experience and knowledge in financial reporting, in the audit committee. Furthermore, their result shows that the concentration of power that results from uniting the two functions into one position will reduce firm monitoring by the board and increase the potential for less effective monitoring by including fewer non-executive directors with relevant financial reporting and knowledge on the audit committee.

The study by Ho & Williams (2003) in three countries (South Africa, Sweden, and the U.K.) investigates the relationship between duality and the efficiency of value added by a firm from its physical and intellectual capital. Their analysis provides evidence that the coefficients on duality are significant and negative in all three regressions, which is consistent with their hypotheses. Interestingly, results from Abidin et al. (2009), who tested the relationship between duality and value added by a firms' physical and intellectual capital

using 75 Malaysian firms found that there is no significant difference in the added value of total resources between firms with dual board structures and firms with separated board structures. However, Mangena & Chamisa (2008) examined the impact of duality on the incidence of suspension of listed firms from the JSE Securities Exchange. They found a positive relationship between companies with dual boards and the incidence of listing suspensions in South Africa.

In conclusion, the King Report (2002) recommends that the role of CEO and chairperson to be separated in listed firms to ensure a balance of power between the members of the board and management so that no one individual wields too much power and authority with regard to decision making. However, agency theory predicts a negative relationship between CEO/chairperson duality and performance. Some researchers (e.g., Beasley & Salterio, 2001; Mangena & Chamisa, 2008; Pi & Timme, 1993; and Rechner & Dalton, 1991) argue that separating the roles of CEO and chairperson improves firm performance. Baliag et al. (1996); Ho & Williams (2003) find a negative relationship between duality and performance. Another group of studies (e.g., Abidin et al., 2009; Brickley et al., 2001; and Boyd, 1995) found that there is no difference in performance between firms that separated the roles of CEO and chairperson and those that practice CEO duality. Based on the inconsistent results of previous studies, this study hypothesises that duality negatively impacts firms' added value from total resources, in South Africa.

2.2.4 Board size

Board structure is an instrument in the monitoring efficiency of internal governance mechanisms. Prior literature argues that board size is an important aspect of this governance mechanism (Jensen, 1993; Yermack, 1996), and is related to firm performance (Abidin et al., 2009; Anderson et al., 2004; Beasley & Salterio, 2001; Chaganti et al., 1985; Coles, Daniel, & Naveen, 2008; Haniffa & Hudaib, 2006; Goodstein, Gautum, & Boeker, 1994; and Karamanou & Vafeas, 2005). In contrast, other studies (e.g., Eisenberg et al., 1998; Jensen, 1993; Mangena & Chamisa, 2008; and Yermack, 1996) argue that larger boards are less cohesive, slow in making decisions, more difficult to coordinate and easier to control by the CEO.

The King Report (2002) recommends that boards should be of a size that allows for a diversity of expertise and experience to be effective monitors. The JSE Listing Requirements (2005) specify that the minimum number of directors for listed firms should be four directors.

The literature (e.g., Karamanou & Vafeas, 2005; and Jensen, 1993) suggests that a board must be small enough for true discussion and debate to take place among directors and large enough to have diverse business experience among them. Other studies suggest that firms structure their board in a manner that reflects the costs and benefits of monitoring a firm (e.g., Boone, Field, Karpoff, & Raheja, 2007; and Linck, Netter & Yang, 2008).

The findings of previous studies on this topic have shown mixed results. Chaganti et al. (1985) examined the relationship between board size and failure (as proxy for firm performance) on a sample of 42 firms in the retail industry during 1970-1976. Their findings indicate that firms with large boards have more chance of survival. The average board size of the failed companies was beneath the recommended range, whereas the companies that did not fail had board sizes consistent with the number recommended by the proposed board reform guidelines (Chaganti et al., 1985). They conclude that this may be because of the wider range of experts included on the larger boards, as well as the delegation of power to top management from the board, which seems to be beneficial.

A study by Beasley & Salterio (2001) examines the link between board size and the ability of the firm to include voluntary non-executive directors with relevant financial reporting knowledge and experience, on the audit committee, using a sample of 627 Canadian corporations for the year 1994. Their findings indicate that a larger board is more able to voluntarily increase the non-executive directors on the audit committees and, consequently, that will increase the capability of the audit committee to improve the monitoring system. Coles et al. (2004) examined the effect of board size on Tobin's Q as a measure of performance, and, in contrast to Yermack's results, they find that in firms that require a greater degree of advisement, such as large firms, and firms diversified across industries (complex firms), Q is positively associated with board size. They illustrate that the negative association between board size and Q, as documented by the previous studies, does not consider corporation size and complexity, and how this impacts on their need for extensive advisement. Coles et al. (2004) conclude that their result is in contrast with the findings of most of the previous studies (for example, Eisenberg et al., 1998; and Yermack, 1996) that a smaller board is more effective in enhancing value.

Similar to a study by Coles et al. (2004), Boone et al. (2005) study the determinants of board size on a sample of 1019 public firms in the U.S from 1988-1992. Their results indicate that larger and more diverse corporations are more likely to have larger boards. Firms with lower costs with regards to monitoring managers, as measured by the market-to-book ratio, R&D expenditure, and the return variance, have larger boards. They conclude that the size of

the board cannot be determined by uniform rules, but rather is a reflection of changes in the firm's competitive environment and managerial team.

Using another perspective to measure performance, Anderson et al. (2004) examined the effect of board size on the cost of debt financing and integrity of financial accounting reporting on a sample of 1052 firms from the Lehman Brothers Fixed Income database and the S&P 500 firms. Using this approach, (cost of debt, and financial accounting reporting) their results support the idea that a larger board is associated with better performance. They found that board and audit committee size are adversely associated with the cost of debt and that a larger board is more effective in monitoring of the financial accounting reporting. In a more recent study, Haniffa & Hudaib (2006) found a positive relationship between board size and operating performance. While Abdin et al. (2009) examined 75 Malaysian firms, using the value added by the firms' total resources, and found that larger boards contribute more towards firm performance. This suggests that a larger board size means that there are more ideas and skills that can be shared among board members.

However, studies that find a negative relationship between board size and performance include research by Yermack (1996) who studied the association between board size and Tobin's Q on a sample of 542 large U.S companies during the period 1984-1991. His results indicate a negative relationship between board size and Q. The results also provide evidence that the financial ratios related to profitability and operating efficiency seem to decrease when the size of the board increases. Bhagat & Black (2002) applied the same method used by Yermack (Tobin's Q) on a sample of 934 large U.S public firms in 1991. They found indirect evidence of a negative relationship between board size and Q. Their results show a significant negative coefficient for Q and insignificant positive sign for return on assets. Bhagat & Black (2002) attribute the differences between their results and Yermack's to the control factors that the latter included, such as firm size, directors ownership, and board independence) that may have an impact on board size effectiveness.

Consistent with Yermack (1996), Eisenberg et al. (1998) examined the correlation between board size and profitability on a sample of about 900 small Finnish companies for the period 1992-1994. Their results confirm Yermack's results also indicating a negative relationship between board size and return on assets (profitability). Furthermore, their findings support the assumption that smaller boards can mitigate problems of communication and co-ordination. Finally, the findings of Eisenberg et al. (1998) suggest that the existence of the board size effect is not confined to the Fortune 500 companies, but also present in small closely held companies, with less separation between ownership and control. Finally,

the optimal board size differs according to the firm's size. Beiner et al. (2004) argue that previous studies do not consider the interrelationship between board features and its impact on firm performance. Therefore, they investigate the interrelationship between board features such as board composition, ownership structure and leverage, in order to re-examine the effects of board size on Tobin's Q, in a sample of 165 Swiss corporations in 2001. Their results indicate that the association between board size and firm performance is not significant. These findings imply that Swiss companies choose their board optimally. The average Swiss board size is 6.59, just below the optimal board size suggested by Lipton & Lorsch (1992), and Jensen (1993) which was 7-8, but significantly below Yermack's results which present an average board size of 12.25 members. Nevertheless, this is significantly larger than Eisenberg et al. (1998), who present an average board size of 3.7 members in small Finnish companies.

In a study that included South Africa, Ho & Williams (2003) failed to detect a significant relationship between board size and performance. Mangena & Chamisa (2008) examined the relationship between board size and the incidence of listing suspensions in the South African firms. Their results indicate that there is insignificant relationship between board size and firm suspensions in South Africa and concluded that suspensions of South African listed firms occur regardless of board size.

In conclusion, corporate governance guidelines have recommended boards to examine their size, taking the complexity of the firm into consideration. Agency theory (Jensen, 1993) argues that larger board size should negatively affect firm performance. However, the literature suggests that board size must balance the right number of members to ensure the required experience but also to enable true discussion and debate. Consistent with agency theory, other studies (e.g., Bhagat & Black, 2002; Eisenberg et al., 1998; and Yermack, 1996) suggest that smaller boards are more correlated with performance. Other studies argue that larger board size is more effective in performance (e.g., Abidin et al., 2009; Beasley & Salterio, 2001; Chaganti et al., 1985; and Coles et al., 2004). Other studies could not find any relationship (e.g., Ho & Williams, 2003; Mangena & Chamisa, 2008). The inconsistent results of previous studies provide a solid ground for further research on the relationship between board size and performance. This study is similar to the work done by Ho & Williams (2003) and Abidin et al. (2009) from the aspect that it is using the same method as performance measures, and therefore hypothesises that a larger board should positively impact firm performance.

2.3 Summary and conclusion

The chapter starts with an introduction and overview of corporate governance in South Africa. It dealt with how major scandals, both in South Africa and internationally, reignited debate on corporate governance, which resulted in the publication of the first King Report in 1994. The chapter elaborated on domestic and international developments which motivated the revision of corporate governance in South Africa and lead to the publication of the second King report in 2002. The focus and recommendations of the King Report on boards of directors was discussed. Then the enforcement of the King Report recommendations by the listed firms through the JSE Listing Requirements was highlighted.

The relationship between four board characteristics (percentage of non-executive directors, directors' ownership, separation of the roles of CEO and chairman, and board size) and performance was discussed. Empirical studies support the notion that boards with majority non-executive directors; those that separate the role of CEO and chairman, those with large boards and those where directors have more ownership of the firms' equity perform better and are more effective at protecting and enhancing shareholder and other relevant stakeholder interests. This is reflected in regulations for companies. However, there are empirical studies which fail to find any relationship between board attributes and board performance, and several studies found a negative relationship between the variables tested. The following chapter presents the hypotheses developed based on the research questions and then the model used in measuring firm performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The objective of this study is to test the hypotheses that the attributes of a board of directors (proportion of non-executive directors on the board, leadership structure, ownership concentration, and board size) are correlated with firm performance. The study defines performance as the efficiency of value added by a firm's total resources, and its two components: the efficiency of Value Added by a firm's Physical Capital (TVAPC) and the efficiency of Value Added by a firm's Intellectual Capital (TVAIC). In the following sections a summary of the hypotheses developed based on the research questions is presented, followed by the model employed to quantify the variables chosen to test the relationship between corporate governance and firm performance. The Data collection process is then discussed, and characteristics of the sample are presented.

3.2 Summary of research hypotheses

Each of the research questions in section 1.3, as well as the discussion of literature of each board attribute in chapter two has corresponding hypotheses that expresses the relationship between the independent and dependent variables:

3.2.1 Proportion of non-executive directors on the board

H₀: There is a positive relationship between proportion of non-executive directors on the board and the efficiency of value added by a firm's total resource (TVAR) 3.2.1.a

H₀: There is a positive relationship between proportion of non-executive directors on the board and the efficiency of value added by a firm from its physical capital (TVAPC)
3.2.1.b

H₀: There is a positive relationship between proportion of non-executive directors on the board and the efficiency of value added by a firm from its intellectual capital (TVAIC)
3.2.1.c

3.2.2 Directors' ownership

H₀: There is a positive relationship between directors' ownership in the company's outstanding shares and the efficiency of value added by a firm total resource (TVAR) 3.2.2.a

H₀: There is a positive relationship between director's ownership and the efficiency of value added by a firm from its physical capital (TVAPC) 3.2.2.b

H₀: There is a positive relationship between director's ownership and the efficiency of value added by a firm from its intellectual capital (TVAIC) 3.2.2.c

3.2.3 Leadership structure (duality)

H₀: There is a positive relationship between separating the roles of the CEO and chairman and the efficiency of value added by a firm total resources (TVAR) 3.2.3.a

H₀: There is a positive relationship between separating the roles of the CEO and chairman and the efficiency of value added by a firm from its physical capital (TVAPC) 3.2.3.b

H₀: There is a positive relationship between separating the roles of the CEO and chairman and the efficiency of value added by a firm from its intellectual capital (TVAIC) 3.2.3.c

3.2.4 Board size

H₀: There is a positive relationship between the number of directors serving on the board of listed SA companies and the efficiency of value added by a firm's total resource (TVAR) 3.2.4.a

H₀: There is positive relationship between the number of directors serving on the board of listed SA companies and the efficiency of value added by a firm's from its physical capital (TVAPC) 3.2.4.b

H₀: There is positive relationship between the number of directors serving on the board of listed SA companies and the efficiency of value added by a firm's from its intellectual capital (TVAIC) 3.2.4.c

3.3 The Model

This section presents the theoretical and empirical bases for assuming a relationship between board attributes and a firm's performance, in the form of multiple regression models. Specifically, these models are used to obtain a better understanding of the relationship between the independent variables (board composition, leadership structure, board size, and directors' ownership) and the dependent variables, namely Value Added by a firm's total resources (TVAR) Total Value added by a firm from its physical capital (TVAPC) and Total Value Added by a firm from its Intellectual Capital (TVAIC), representing the performance measures and control variables.

As mentioned in chapter one, due to the introduction of knowledge into products and services, and the shortcomings of the financial accounting measures in capturing the real value created, a number of new methods were developed to report total capital of the firm, that is, physical and intellectual capital. A Value Added Intellectual Capital Coefficient (TVAR) is offered as a measure of the efficiency with which a firm uses its physical, financial and intellectual capital to enhance stakeholder value. Stakeholders include shareholders, employees, debtors, customers and governments (Riahi-Belkaoui, 2003).

Pulic (1998 & 2000) asserts that the performance of a firm, measured by the value created by that firm, is equal to the sum of its total resources (physical, financial, and intellectual capital). These comprise three components, capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE). The relationship among the above three components are expressed as follows:

$$VAIC_i = CEE_i + HCE_i + SCE_i \quad 3.1$$

Where:

$VAIC_i$ = the value added intellectual coefficient efficiency for firm i .

CEE_i = capital employed efficiency for firm i .

HCE_i = human capital efficiency for firm i

SCE_i = structural capital efficiency for firm i .

Pulic (1998) asserts that the higher the VAIC coefficient, the better the efficiency of VA by a firm's total resources.

3.3.1 Steps of calculating VAIC

The first step is to calculate a firm's ability to create value added (VA) for all stakeholders. VA can be defined in two ways: The subtractive method (see for example: Pulic, 1998; Evraert & Belkaoui, 1998; Chen, Cheng & Hwang, 2005 and Tan, Plowman, & Hancock, 2008), in its simplest form is the difference between output and input. Output represents net sales, and input contains all expenses incurred to create the sales revenue, except labour costs, which are considered to be a value creating variable (Pulic, 1998; Tan et al., 2008). This method expresses the value an economic entity adds to the goods and services it receives (purchases) from other firms, through its own economic (creative) activities.

The additive method (see, Ho & Williams, 2003; Riahi-Belkaoui, 2003) represents the sum of the distributed parts of the created wealth to stakeholders who participated in creating this added value, and is calculated as follows:

$$VA_i = Int_{Exp_i} + Dep_i + Div_i + Tax_{Exp_i} + Int_{Min} + Ear_{Ret} \quad 3.2$$

Where:

VA_i = value added for firm i

Int_{Exp_i} = interest expense for firm i

Dep_i = depreciation expense for firm i

Div_i = dividends declared for firm i

Tax_{Exp_i} = tax expenses for firm i

Int_{Min} = interest of minority shareholders in net income for firm i

Ear_{Ret} = earnings retained for firm i .

The second step is to establish the relationship between value added and capital employed (including physical and financial capital) (Pulic, 2000). CEE encompasses the efficiency that SCE and HCE fail to capture. Pulic (1998) argues that intellectual capital

cannot create value on its own, and so it must be combined with physical and financial capital. Thus CEE is calculated as VA divided by the book value of net assets.

$$CEE_i = \frac{VA_i}{BV_{Net_i}} \quad 3.3$$

Where:

CEE_i = capital employed efficiency for firm i ;

VA_i = value added for firm i . (see formal definition above);

BV_{Net_i} = book value of net assets for firm i .

CEE indicates how much new value has been created by an invested unit of capital employed (Pulic, 2000).

The third step is the calculation of HCE. Human capital (HC) encompasses the skills and experiences, productivities, knowledge and fit of employees within the working place. Pulic (1998) states that total salaries and wages costs are an indicator of a firm's human capital (HC) (see also Edvinsson, 1997 and Sveiby, 2001). Therefore HCE is calculated as follows:

$$HCE_i = \frac{VA_i}{HC_{Tot_i}} \quad 3.4$$

Where:

HCE_i = human capital efficiency for firm i

HC_{Tot_i} = total salary and wages costs for firm i

Pulic (2000) asserts that the value added human capital coefficient shows how much VA has been created by one monetary unit invested in employees. The higher the HCE ratio, the more the firm is using its HC efficiently.

The fourth step is the calculation of Structural capital (SC). SC includes IC items such as strategy, organisational net work, patents and brand names. The calculation of the structural capital efficiency requires two steps:

In order to calculate SCE we need to determine the value of a firm's structural capital (SC).

Pulic (1998) suggests a firm's total VA minus its human capital is an appropriate proxy for a firm's SC.

$$SC_i = VA_i - HC_{Tot_i} \quad 3.5$$

Where:

SC_i = structural capital for firm i

Thus, VA is impacted by the efficiency of HC and SC. SC is dependent upon HC, and greater HC translates into improved internal structures (Nazari and Herremans, 2007). Consequently, Pulic (1998) argues that the formula for the SCE calculation must differ from that of the HCE because HC and SC are in an inverse relationship. This results in HC decreasing as SC increases, which is inconsistent with the theoretical definition of SC. Therefore, Pulic (1998) calculates SCE as the ratio of a firm's SC divided by the total VA.

$$SCE_i = \frac{SC_i}{VA_i} \quad 3.6$$

Where:

SCE_i = structural capital coefficient value added for firm i ;

SCE is therefore the unit of SC within the firm, for every unit of value added, and as HCE increases, SCE increases.

For the purpose of this study, TVAR values are a proxy for total value added efficiency, TVAPC is a proxy for CEE values, and TVAIC is a proxy for the sum of HCE and SCE values. TVAR has been used in a number of studies which investigated the relationship between IC and performance in different countries (see, for example: Bontis et al., 2000; Ho & Williams, 2003; Mavridis, 2004; Abidin et al., 2009).

3.3.2 Control variables

For the purpose of empirical analysis and to minimise the impact of other variables that may explain the relationship between corporate governance and performance, five control variables are included in the regression models. These control variables were identified from a review of the relevant literature (see, for example, Abidin et al., 2009; Daily & Dalton, 1994; Demsetz & Lehn, 1985; Ho & Williams, 2003; Vafeas & Theodorou, 1998; Williams,

2001). The performance of firms is one of the methods used to evaluate managers. If a company is performing well, managers will be rewarded, whereas, if a company performs poorly managers will face pressure from shareholders and other stakeholders to improve firm performance. Return on assets, return on equity and dividend yield are the three measures of performances used in this study to control for firm performance (see for example: Demsetz & Lehn, 1985; Denis & Denis, 1994; Ho & Williams, 2003). Further, leverage is used in this study to evaluate the risk of high debt and its impact on the firm, while firm size is used because of its risk neutral effect on corporate ownership. Demsetz & Lehn (1985) suggest that the higher the firm risk, the more the scope for managerial discretion and increasing cost of agency (see for example: Demsetz & Lehn, 1985; Ho & Williams, 2003; Williams, 2001).

- Return on Assets (RoA)

Return on assets is essential to a comprehensive representation of operating performance. It gives an indication of how profitable a company's assets are in generating revenue. It is calculated as the ratio of net income after tax (less income from investments and net interest adjusted for tax) divided by the book value of total assets. RoA is assumed to have a positive relationship to the dependent variables (Abidin et al., 2009; Ho & Williams, 2003; Swartz & Firer, 2005).

- Return on Equity (RoE)

Return on equity measures how well a company uses reinvested earnings to generate additional earnings, equal to a financial year's after-tax income (before dividends to common stock holders but after dividends to preferred stock) divided by the book value of shareholder's equity. A positive relationship between RoE and dependent variables is assumed in this study (Abidin et al., 2009; Ho & Williams, 2003; Swartz & Firer, 2005).

- Leverage

A high proportion of debt may lead a firm to focus primarily on the needs of debt holders (Williams, 2001). This is inconsistent with the stakeholder view assumed by value added and TVAR; therefore, firms with a high leverage ratio may lack attractiveness to investors, and will have higher interest payments, which reflect on the risks and returns of the firm (Williams, 2001). Consistent with prior research (Ho & Williams, 2003; and Chan, 2009) leverage is measured as the total debt divided by the book value of total assets (excluding

investment in associates). A negative relationship between leverage and the chosen dependent variables is assumed (Ho & Williams, 2003; Swartz & Firer, 2005).

Dividend Yield (DY)

A dividend yield shows how much a company pays out in dividends each year relative to its share price. In the absence of any capital gains, the dividend yield is the return on investment for a share. Dividend yield is calculated by dividing dividend per share by share price. The Dividend Yield is assumed to have a positive relationship to the selected dependent variables (Abidin et al., 2009; Ho & Williams, 2003).

- Firm size

Firm size is an important variable that is used for most firm level studies because of its risk neutral effect on corporate ownership (Demsetz & Lehn, 1985). Large firms have economies of scale and scope, which is supposed to influence firm performance. Ho & Williams (2003) suggest that firm size is positively related to a firm performance. Size is measured as a natural log of annual sales, as reported in a firm's annual report. It is assumed that firm size has a positive relationship to the dependent variables (Abidin et al., 2009; Ho & Williams, 2003; Swartz & Firer, 2005).

3.4 Econometric testing

After determining the three main dependent variables, and control variables, to analyse the respective relationships defined in prior sections a linear multiple regression and ANOVA analysis will be used as a tool for hypotheses testing and to reveal the relationship between board attributes, control variables and firms performance based on the value added intellectual coefficient. The general regression model is given in the equation below:

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \epsilon_i;$$

Where:

Y_i is the dependent variable and represents either TVAR, TVAPC, TVAIP;

B_t represent the slope of the independent variables;

X_{ij} represent the independent variables (board size, directors' ownership, leadership structure of the board and the proportion of non- executive directors on the board) and control variables (ROA, ROE, DY, leverage and corporate size) for all cases and ε_i is normally distributed with a mean equal to zero.

The correlation of the important variables in the models for board attributes and firm performance will be analysed using linear correlation analysis. The variable having the highest correlation with the dependent variables will be highlighted.

Descriptive statistics will be used to analyse the basic features of the data y. The descriptive statistics used consist of the mean, median and mode to show the central tendency, standard error as a sign of multicollinearity. Maximum value will be used to compare the highest value of the variable in pre and post King Report periods. In contrast, the minimum will be used to compare the lowest value of the variable in the pre and post King Report periods. Further the skewness and kurtosis are used to measure the symmetry and the peak of the data.

Thereafter, ANOVA and regression analysis performed to determine the fitness of the model (R squared) which explains the percentage of the dependent variables explained by the independent variables.

3.5 Sampling

The sample for this study was selected from the JSE Securities Exchange on a random basis, and the properties of all the companies concerning the TVAR and other variables were obtained from the annual reports of the companies included in the final sample. The section provides reasons for the choice of companies that were included in the sample, and lists the characteristics of the sample and reason for the elimination of companies.

3.5.1 Sample selection criteria

Companies listed on the main board of the JSE from 2001 to 2009 formed the basis for this study's sample selection. Companies that were listed or delisted during this period were excluded from the sample, for consistency and for tracking reasons.

The main criterion that was applied in sample selection, apart from excluding the financial sector (due to the specific regulatory environment in which this sector operates), was the survival of the companies throughout the nine years covered by the study. Applying this criterion, the majority of the companies that ended up in the sample were companies with a large market capitalisation. The inclusion of such companies allows for a greater degree of comparison with the majority of the other studies, which obtained their sample from large companies (i.e. Yermack, 1996; Bhagat & Black, 2002; & Gedajlovic & Shapiro, 2002). There is also an argument that large companies are more aware of public perception and more likely to be representatives of, or leaders in, emerging trends in corporate governance.

Furthermore, large companies are likely to disclose more information in their annual reports than smaller companies as they are more likely to attract foreign investors, to borrow or to operate with other international firms.

The choice of large companies is reflective of the character of the JSE, where a few companies represent the majority of the market capital. (The largest 4 companies have represented an average of 33.5 percent of the JSE listed companies for the last nine years). Using weighted market capital figures obtained from I Net Bridge, the 99 companies included in the sample represent an average of 85.0 percent of the total market value of all listed companies on the JSE main board during the nine years under review.

A total of 66 companies were excluded for the reasons listed below:

- 17 companies (e.g., banks, insurance companies, investment companies) representing the financial sector were excluded due to the special disclosures of this sector in the financial statements.
- 26 property companies were excluded as they are more reliant on passive assets with little human involvement in creating value added.
- 10 de-listed companies.
- 12 companies which changed their financial year end. A change in financial year end results in financial information that spans a period that is usually considerably shorter or longer than one calendar year, therefore all companies that changed their financial year end and did not provide 12 months data for the nine years under review were excluded.

- Extreme values (outliers): The extreme values are likely to have an impact on the regression results. Therefore one company with an extremely high board size (24 members) was excluded.

The final sample comprises 99 companies, which represent 85.0 percent of the total market capital of all listed companies in the JSE. The annual reports for these companies were obtained from the Bloomberg database and if not available on the database, from company websites.

Data collection criteria

Financial information required for the study was compiled from the following statements: income, assets and liabilities, changes in shareholders equity, cash flow, value added, corporate governance, directors' reports, as well as from the notes on the financial statements.

Information on the board attributes of board composition, directors' ownership, CEO/chairman duality and board size are taken primarily from the 2001 to 2009 annual reports of each company. The difficulty encountered is with the directors' ownership as not all companies disclose the direct and indirect interest; therefore, this study used total directors' ownership (direct and indirect). Also, information on the dependent and control variables were obtained from the annual reports; companies sometimes differ in the way they disclose, therefore, some data were adjusted so that we have consistent data for variable calculations.

The following are the elements used to obtain the information needed to calculate the variables included in the analysis and the adjustments proceeded (if any):

- Total interest expense from the income statement and its notes: Some companies disclose a net interest income (expense). In this case the split between the two (income/expense) took place and interest income has been considered as income from investment.
- Depreciation expense and retained earnings as a re-investment for future growth from the income statement and the notes to the financial statement.
- Dividend to shareholders. The use of dividend declared for the year rather than the dividend paid is due to the fact that dividend declared represent the total dividend distributed by the firm to its shareholders (risk bearers), whereas dividend paid represents

the amount of money paid by the firm, irrespective of the financial year in which the related value was created.

- Tax expense from the income statement and its notes.
- Net income for minority shareholders from the income statements.
- Salaries, wages and other benefit as distribution to employees from the note to the financial statements.
- Net income to ordinary shareholders.
- Shareholders' equity from the balance sheet.
- Investments in associates and other non core investments have been deducted from the total assets in order to use figure which represents the operating assets.
- Closing share price at year end multiplied by number of ordinary shares was used to calculate the market capitalisation.
- For companies reporting in foreign currencies, the closing exchange rate at year end was used to translate the balance sheet elements, and the average exchange rate for the income statement elements.

It is important here to determine the definition of the total and net assets that was used in the calculation of the variables.

$$A_T = A_F + A_C - Inv \quad 3.7$$

Where:

A_T = Total assets

A_F = Fixed assets

A_C = Current assets

Inv = Investments

$$A_N = A_F + A_C - (Inv + Lib_C)$$

Where:

A_N = Net assets

Lib_C = total current liabilities

The above criteria were used to make the statistical calculations of variables uncomplicated and to allow for a consistent and logical comparison among the variables of the study for each company in the sample.

3.5.2 Sample Characteristics

The sample covers the period 2001 to 2009. Descriptive information regarding the distribution of the sample across industry group is given in table 3.5.1.

Table 3.5.1 sample sector split versus the JSE main board

Sectors	Sample	Weights (percent)	
		Sample	JSE Main board
Basic Materials	198	47.93	46.48
Consumer Goods	108	19.03	17.13
Consumer Services	180	11.99	11.95
Healthcare	18	1.64	2.55
Industrials	288	6.28	7.75
Oil and Gas	9	5.72	5.92
Technology	72	0.94	0.28
Telecommunications	9	6.47	7.94
Total	882	100	100

The spread of weights within the sectors in the sample is in line with the market sector weights. This gives credit to the sample selection criteria used. The sample fairly represents the market as illustrated in table 3.5.1 above, with Basic Materials dominating both the market and the sample with more than one third of the total market capitalisation.

The nine year's worth of data was chosen to overcome the shortcomings of an event study that centres its analysis on the response of the market in the short-term. It also reduces any abnormalities which may be caused by changes in the economy. Given that the objective of this study is the evaluation of whether board attributes impact on a firms' performance, the time frame chosen (nine years), offers a more effective alternative to other methods, such as event studies. The nine years cover the period following King I (pre King II) and the period that followed King II (issued in March 2003). This period gives the researcher an

opportunity to examine the difference between firm performance pre King II (2001 to 2003) and post King II (2004 to 2009)⁵.

3.6 Summary

The chapter has presented a summary of the hypotheses developed based on the research questions, and discusses the variables used for the measurement of performance. The chapter also discussed the method used for data collection, sample characteristics, restrictions applied on the sample and the time frame of the data chosen to overcome the negatives of using event studies. The next chapter presents statistic tests used to prepare the data for the regression test. This include test for linearity, descriptive statistics. Also, the treatment implemented on the data to meet the normality criteria.

⁵ We assumed that companies needed about six to nine months to implement the King report recommendations. Hence the effect of King II report on the performance will start showing in 2004 onwards.

CHAPTER FOUR

DATA PRESENTATION

4.1 Introduction

The observed data must meet the assumptions of the regression models of linearity, normality of the distribution and independence of variables across observations (Lynch, 2003; Keller, 2010). This chapter comprises three sections. Section 4.2 reports the linearity results. Section 4.3 presents tests for normality, which covers descriptive statistics of each variable included in the study, inferential tests of normality, such as the Kolmogorov-Smirnov test, as well as the examination of skewness and kurtosis. Section 4.4 covers the coefficient of correlation and multicollinearity and the chapter ends with a summary.

4.2 Test for linearity

One of the key questions of this study is whether there is a significant relationship between the selected variables. If the observed relationship is not strong, the calculated regression line will not have sufficient meaning to make a prediction. Therefore, two dimensional scatter plots are used (Appendix E) to check the linear relationship between TVAR, TVAIC and TVAPC and the predictor variables (board composition, director's ownership, leadership structure, and board size). The results from the given data indicate that the variables are not strongly related, as the data points do not form a systematic shape. All the points are widely scattered from the regression line and therefore, the relationship is weak and any prediction will be biased. To measure the relationship quantitatively, correlation coefficients are calculated, as shown in table 4.1

Table 4.1 Correlation Coefficient for pooled sample

	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporat e Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Board size	1											
Directors' interests	-.249**	1										
Leadership Structure	-.128**	0.063	1									
Board composition	.183**	-.332**	-.142**	1								
ROA	-0.009	0.037	0.011	0.011	1							
ROE	-0.003	0.028	-0.035	0.010	.855**	1						
DY	.081*	-0.032	-0.014	-0.019	.283**	.290**	1					
LEVERAGE	0.028	-0.019	-0.049	-0.012	-.405**	-0.038	-0.060	1				
CORP.SIZE	.508**	-.337**	-.185**	.254**	-0.04133	.080*	.105**	.187**	1			
TVAR	0.053	-0.007	-0.022	.115**	.668**	.647**	.224**	-.171**	.075*	1		
TVAPC	-.098**	.101**	-.066*	-.159**	.222**	.407**	.211**	.189**	-.092**	0.028	1	
TVAIC	.092**	-0.034	0.011	.169**	.610**	.489**	.195**	-.225**	.120**	.876**	-.320**	1
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

The above table suggest that there is a weak correlation between the dependent and independent variables. The highest correlation is between board size and corporate size at 0.508 which indicates that the larger the firm, the larger the board size. The second strongest correlation is between board composition and corporate size, at 0.254 implying that larger firms are more likely to have more non-executive directors in their boards. However, correlations between the independent variables and the dependent and control variables are in general weak enough to avoid collinearity issues, as none exceeds 0.8, which is used as an indicator of serious multicolinearity (Gujarati, 1992).

4.3 Test for normality

There are several methods to determine whether a variable is normally or non-normally distributed. This study used the simple examination of skewness and kurtosis (tested using the SPSS software analysis programme) and the inferential test of normality i.e. Kolmogorov-Smirnov. One sample test was carried out in order to determine whether to use non parametric or parametric tests. For all non-normal data, the Mann Whitney U test was used. All normal data tests were preceded by Levene's test for equality of mean, in order to cater for unequal sample size comparisons (Pre King II vs. Post King II samples). For significantly unequal means, t-tests results were adjusted for assumptions of unequal variance and vice versa for equal variances.

As mentioned above, data was classified into that from before and that after the publishing of King Report, and then re-classified into the JSE sectors. The descriptive statistics (mean, median, mode, minimum, maximum, standard deviation, variance, skewness

and kurtosis) for each dependent and the explanatory variable were then obtained, as shown below. Keller & Warrack (2002) suggest that the skewness of a good normal distribution ranges between -0.7 and 0.7. However, before looking at the descriptive statistics for the variables for each sector, it is important to look at the consolidated data as illustrated in table 4.2 below.

Table 4.2: Descriptive statistics – Pooled sample

	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Mean	10.72	0.09	0.09	0.61	0.08	0.16	0.04	0.49	3.62	3.61	0.70	2.91
Median	11.00	0.02	0.00	0.63	0.08	0.16	0.03	0.50	3.60	3.29	0.60	2.52
Mode	11.00	0.00	0.00	0.50			0.00		2.60			1.49
Standard Error	0.11	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.05	0.02	0.05
Standard Deviation	3.34	0.15	0.28	0.15	0.07	0.13	0.05	0.19	0.65	1.56	0.46	1.62
Sample Variance	11.18	0.02	0.08	0.02	0.00	0.02	0.00	0.04	0.42	2.45	0.21	2.61
Kurtosis	-0.15	5.72	6.42	0.89	1.04	0.56	32.01	-0.06	-0.03	6.18	6.20	5.65
Skewness	0.34	2.44	2.90	-0.60	0.32	-0.13	4.61	-0.40	0.19	1.64	1.93	1.78
Minimum	4.00	0.00	0.00	0.00	-0.13	-0.23	0.00	0.00	1.65	-3.02	-0.66	-3.03
Maximum	23.00	0.79	1.00	1.00	0.37	0.70	0.52	1.15	5.66	13.47	3.57	12.86
Count	891	891	891	891	891	891	891	891	891	891	891	891

As illustrated in table 4.2, the observed data exhibits that skewness and kurtosis for six of the variables (board size, board composition, RoA, RoE, leverage and corporate size) are within the range of normal distribution of ± 0.7 and ± 3.0 skewness and kurtosis respectively, whereas the other variables have a considerable amount of skewness and kurtosis, which is a violation of normal distribution.

Table 4.3: Descriptive statistics – Pooled, Pre and Post King Report samples

	Statistic measures	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Pooled sample	Std. Dev.	3.34	0.15	0.28	0.15	0.07	0.13	0.05	0.19	0.65	1.56	0.46	1.62
	Kurtosis	-0.15	5.72	6.42	0.89	1.04	0.56	32.01	-0.06	-0.03	6.18	6.20	5.65
	Skewness	0.34	2.44	2.90	-0.60	0.32	-0.13	4.61	-0.40	0.19	1.64	1.93	1.78
Pre King Report	Std. Dev.	3.43	0.16	0.39	0.16	0.06	0.12	0.05	0.18	0.66	1.29	0.45	1.32
	Kurtosis	-0.26	4.10	0.48	1.57	0.85	0.35	10.87	0.08	-0.10	4.32	9.20	3.32
	Skewness	0.39	2.09	1.57	-0.70	0.39	-0.33	2.65	-0.69	0.10	0.38	2.31	0.81
Post King Report	Std. Dev.	3.30	0.15	0.19	0.15	0.07	0.13	0.05	0.20	0.63	1.67	0.46	1.73
	Kurtosis	-0.07	6.89	22.24	0.22	1.16	0.60	41.57	-0.15	-0.10	5.74	4.90	5.28
	Skewness	0.32	2.66	4.92	-0.50	0.27	-0.08	5.51	-0.29	0.31	1.85	1.76	1.91

Some variables, such as board size, composition of the board, RoA, RoE, leverage and corporate size, have skewness within the range of normal distribution in all three samples. TVAR and TVAIC, however, have skewness within the range of normal distribution only in the pre King Report period. Other variables in general have high skewness, and kurtosis, which indicates a violation of normal distribution.

There are multiple options for dealing with non-normally distributed data. The first step is to establish whether the lack of normality has a valid reason (these are real observed data points) or is due to mistakes in data entry or missing values. All dependent variables used are screened for outliers using the formula: Median $\pm$ (3* Interquartile Range). Although, 2.5 multiplied by the interquartile range is the norm, this study used 3.0 to obtain a larger sample size (Wilson, 1995). This has resulted in the exclusion of 43 observations representing 4.8% of the total sample.

Table 4.4: Descriptive statistics – pooled sample excluding outliers

	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Mean	10.68	0.09	0.09	0.61	0.08	0.16	0.04	0.49	3.60	3.37	0.66	2.66
Median	10.00	0.02	0.00	0.63	0.07	0.16	0.03	0.50	3.59	3.24	0.60	2.46
Mode	11.00	0.00	0.00	0.50			0.00		2.67			1.66
Standard Error	0.11	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.04	0.01	0.04
Standard Deviation	3.31	0.15	0.29	0.16	0.07	0.12	0.05	0.19	0.64	1.09	0.36	1.15
Sample Variance	10.97	0.02	0.08	0.02	0.00	0.02	0.00	0.04	0.40	1.18	0.13	1.32
Kurtosis	-0.26	5.22	6.16	0.88	1.22	0.35	34.19	-0.06	-0.16	1.06	1.16	0.97
Skewness	0.30	2.37	2.85	-0.62	0.27	-0.23	4.76	-0.38	0.11	0.18	0.80	0.41
Minimum	4.00	0.00	0.00	0.00	-0.13	-0.23	0.00	0.00	1.65	-0.34	-0.66	-3.03
Maximum	23.00	0.72	1.00	1.00	0.37	0.49	0.52	1.15	5.34	6.48	1.93	6.11
n	848	848	848	848	848	848	848	848	848	848	848	848

Although, there was a remarkable improvement in the skewness of the variables, particularly TVAR, TVAPC and TVAIC, we can see that dividend yield continues to have high skewness. A data transformation is therefore necessary for this variable. The three most popular methods of transformation are logarithm, square root and inverse, which are all capable of improving the normality of the distribution and are expected to give much better results. In this transformation, the square root of every value was taken for the DY. The result reported a skewness of 0.57 and kurtosis of 2.01, which is within the range of normal distribution, as shown in table 4.5 below.

In the same table, we report the unrefined values of the variables (before outlier deletion and data transformation) in order to make comparisons with prior empirical studies. Board size, directors' interest, leadership structure, and board composition are reported below.

Table 4.5: Descriptive statistics – pooled sample excluding outliers

	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Mean	10.68	0.09	0.09	0.61	0.08	0.16	0.16	0.49	3.60	3.37	0.66	2.65
Median	10.00	0.02	0.00	0.63	0.07	0.16	0.18	0.50	3.59	3.24	0.60	2.46
Mode	11.00	0.00	0.00	0.50			0.00		3.08			1.75
Standard Error	0.11	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.04	0.01	0.04
Standard Deviation	3.31	0.15	0.29	0.16	0.07	0.12	0.11	0.19	0.64	1.09	0.36	1.13
Sample Variance	10.97	0.02	0.08	0.02	0.00	0.02	0.01	0.04	0.40	1.18	0.13	1.27
Kurtosis	-0.26	5.22	6.16	0.88	1.22	0.35	1.94	-0.06	-0.16	1.06	1.16	0.80
Skewness	0.30	2.37	2.85	-0.62	0.27	-0.23	0.52	-0.38	0.11	0.18	0.80	0.31
Minimum	4.00	0.00	0.00	0.00	-0.13	-0.23	0.00	0.00	1.65	-0.34	-0.66	-3.03
Maximum	23.00	0.72	1.00	1.00	0.37	0.49	0.72	1.15	5.34	6.48	1.93	5.34
n	848	848	848	848	848	848	848	848	848	848	848	848
*DY data was transformed using the square root transformation method.												
Unrefined values of variables (before data cleaning, outlier deletion and transformation)												
Mean	10.72	0.09	0.09	0.61	0.08	0.16	0.04	0.49	3.62	3.61	0.70	2.91
Median	11.00	0.02	0.00	0.63	0.08	0.16	0.03	0.50	3.60	3.29	0.60	2.52
Mode	11.00	0.00	0.00	0.50			0.00		2.60			1.49
Standard Error	0.11	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.05	0.02	0.05
Standard Deviation	3.34	0.15	0.28	0.15	0.07	0.13	0.05	0.19	0.65	1.56	0.46	1.62
Sample Variance	11.18	0.02	0.08	0.02	0.00	0.02	0.00	0.04	0.42	2.45	0.21	2.61
Kurtosis	-0.15	5.72	6.42	0.89	1.04	0.56	32.01	-0.06	-0.03	6.18	6.20	5.65
Skewness	0.34	2.44	2.90	-0.60	0.32	-0.13	4.61	-0.40	0.19	1.64	1.93	1.78
Minimum	4.00	0.00	0.00	0.00	-0.13	-0.23	0.00	0.00	1.65	-3.02	-0.66	-3.03
Maximum	23.00	0.79	1.00	1.00	0.37	0.70	0.52	1.15	5.66	13.47	3.57	12.86
n	891	891	891	891	891	891	891	891	891	891	891	891

Outliers have been removed (from dependent variables) by a measure of $median \pm 3 * interquartile\ range$. The raw data for all variables are also given for central tendency comparison.

The average board size of this study is 10.68 (10.72 before outlier deletion) over the nine years. This is higher than the average board size of other South African studies, such as the 7.6 and 9.0 board members reported by Mangena & Chamisa (2008), and Motara & Grant (2007) respectively, but below Ho & Williams (2003) South African sample of 13.0 directors and higher than their sample of UK and Swedish boards, of 9.5 and 9.3 respectively. Comparisons with international board size show 8.0 board members for Malaysian companies (Abidin et al., 2009), 7.7 in Singapore (Cheng & Courtenay, 2006), 8.2 in Australia (Cotter & Silvester, 2003) and 8.25 in the US (Charitou et al., 2007). Further, the board size for South African companies has increased over the nine years under review; from 10.45 directors in 2001 to 10.93 in 2009 (appendix 3 shows a yearly comparison of all variables).

Directors' ownership averaged 9.0% for the nine years, compared to the 23.2% of Mangena & Chamisa (2008), and the 9.7% of Ho & Williams (2003). Directors' ownership figures in this study are also lower than that shown in international studies such as that of Abidin et al., (2009), who reported 11.7% for Malaysian firms, Charitou et al., (2007) which showed 15.2% for US firms, and Ho & Williams (2003) which revealed 6.4% and 1.8% for UK and Swedish firms, respectively.

The total number of firms in the study with a dual board structure is 79, representing a 9.3% of the total sample, with a dramatic decline in the number of firms with a dual board over the years 2001 to 2005. The implementation of the JSE Listing requirements, which made the separation of the two functions of CEO and chairperson compulsory, has resulted in all listed firms having a separate board structure from 2006 onward. Magena & Chamisa (2008) show that about 41.0% of their sample have a dual structure, while Ho & Williams' (2003) study showed 38.6%, 79.4% and 43.3% of South African, UK and Swedish firms respectively had a dual board structure. Abidin et al., (2009) reported 29.3% of their sample of Malaysian firms have a dual board structure.

On average, 61% of board members in this study are non-executive, compared to Mangena & Chamisa's (2008) board composition of 41.3%, and Ho & Williams' (2003) 51.9% for South African firms, and Motara & Grant's (2007) 56%. Malaysian firms were shown to have boards with 38.6% non executive directors (Abidin et al., 2009), and firms in Singapore 36.9% (Cheng & Courtenay, 2006). Other studies showed 50.9% for Australian firms (Cotter & Silvester, 2003) and 76.9 for US firms (Charitou et al., 2007). We report that percentage of non-executive directors in the boards has increased from 55% in 2001 to 68% in 2009, implying that South African firms continue to implement the King Report's recommendation to establish boards with a majority of non-executive directors.

Dependent variables

On average, the value added intellectual coefficient (TVAR) of the firms in this study is 3.45 and improves to 3.61 after the exclusion of outliers. This is lower than the findings of Ho & Williams (2003) who reported an average of 4.27, 5.32 and 2.69 TVAR for South African, UK and Swedish firms respectively. Also, the TVAR reported by Abidin et al., (2009) for Malaysian firms were higher, at 5.02. Clarke, Seng, & Whiting (2011) report an average TVAR of 0.42 for Australian firms. Over the nine years of this study, TVAR values have improved from 3.221 in 2001 to 3.730 in 2007, and then declined to 3.366 in 2009.

The total value added efficiency of physical capital (TVAPC) averaged 0.66 (this improved to 0.70 after the exclusion of outliers) compared to 1.36, 2.69 and 0.84 for South African, UK and Swedish firms respectively, reported by Ho & Williams, (2003). Over the nine years, the average TVAPC increased from 0.639 in 2001 to 0.688 in 2005 and then declined to 0.571 in 2009.

The total value added efficiency of intellectual capital (TVAIC) of the firms in this study averaged 2.79 (2.91 excluding the outliers), compared to 2.91, 2.43 and 1.85 for South African, UK and Swedish firms respectively, reported by Ho & Williams, (2003). This value is higher than the average TVAIC of 1.09 reported by Clarke et al. (2011) for Australian firms, but lower than the average of 4.83 reported by Abidin et al. (2009) for Malaysian firms. Similar to the trend for TVAR, the average TVAIC has increased from 2.582 in 2001 to 3.066 in 2007 and declined slightly to 2.795 in 2009.

Table 4.6: Descriptive statistics – pre and post King Report

	Statistic measures	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Pre King Report	Mean	10.52	0.10	0.20	0.57	0.07	0.14	0.17	0.48	3.45	3.25	0.65	2.54
	Median	10.00	0.02	0.00	0.58	0.07	0.14	0.19	0.50	3.42	3.11	0.60	2.32
	Mode	10.00	0.00	0.00	0.50			0.00		2.60			1.49
	Std Dev	3.39	0.15	0.40	0.16	0.06	0.12	0.12	0.18	0.66	1.09	0.34	1.10
	Minimum	4.00	0.00	0.00	0.00	-0.08	-0.21	0.00	0.00	1.65	-0.30	-0.07	-0.59
	Maximum	20.00	0.69	1.00	1.00	0.26	0.46	0.56	0.87	5.20	6.48	1.83	5.32
	n	292	292	292	292	292	292	292	292	292	292	292	292
Post King Report	Mean	10.77	0.08	0.04	0.63	0.08	0.17	0.15	0.50	3.69	3.43	0.66	2.72
	Median	11.00	0.02	0.00	0.64	0.08	0.18	0.17	0.50	3.67	3.32	0.60	2.52
	Mode	11.00	0.00	0.00	0.67			0.00		2.74			1.47
	Std Dev	3.27	0.15	0.19	0.15	0.07	0.13	0.11	0.20	0.61	1.08	0.37	1.11
	Minimum	4.00	0.00	0.00	0.17	-0.13	-0.23	0.00	0.01	1.71	-0.34	-0.66	-0.44
	Maximum	23.00	0.72	1.00	1.00	0.37	0.49	0.72	1.15	5.34	6.48	1.93	5.34
	n	556	556	556	556	556	556	556	556	556	556	556	556

Further to the above discussion on the descriptive statistics, table 4.6 shows the movement of the values of the variables between before and after the King Report. We can see that board size has increased in the post King Report period. This is also noticed for board composition, with more non-executive directors on boards, and with leadership structure, showing more companies separating the two functions of CEO and chairman, which is in line with the King Report's recommendation and with the hypotheses of this study. However, directors' interest has declined in the post King Report period, which is inconsistent with the hypotheses that increasing director interest in company shares will align their interests with shareholders' interests and, consequently, improve performance. TVAR and TVAIC did increase in the post King Report period, while TVAPC remained at the same level.

4.7 Descriptive statistics – Industries listed on JSE

Secotor	Statistic measures	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Basic Materials	Mean	10.71	0.03	0.12	0.66	0.07	0.13	0.13	0.47	3.76	3.41	0.44	2.94
	Median	10.00	0.00	0.00	0.70	0.07	0.13	0.14	0.46	3.73	3.36	0.41	2.88
	Std Dev	3.28	0.06	0.32	0.16	0.08	0.13	0.11	0.18	0.67	1.43	0.26	1.30
Consumer Goods	Mean	12.21	0.05	0.02	0.67	0.09	0.18	0.21	0.42	3.84	3.42	0.58	2.84
	Median	12.00	0.01	0.00	0.67	0.09	0.16	0.22	0.46	3.78	3.29	0.61	2.78
	Std Dev	2.86	0.10	0.14	0.14	0.05	0.10	0.11	0.20	0.53	0.65	0.21	0.63
Consumer Services	Mean	10.64	0.11	0.05	0.62	0.09	0.19	0.16	0.46	3.58	3.52	0.72	2.73
	Median	11.00	0.05	0.00	0.62	0.08	0.20	0.19	0.45	3.60	3.38	0.63	2.46
	Std Dev	2.74	0.15	0.23	0.15	0.06	0.12	0.09	0.21	0.61	0.92	0.36	0.99
Healthcare	Mean	12.06	0.02	0.25	0.61	0.10	0.20	0.09	0.49	3.54	3.41	0.63	2.78
	Median	12.00	0.01	0.00	0.60	0.12	0.16	0.13	0.51	3.50	2.90	0.71	2.12
	Std Dev	2.08	0.01	0.45	0.15	0.04	0.10	0.08	0.21	0.31	0.94	0.24	0.93
Industrials	Mean	10.18	0.12	0.11	0.56	0.07	0.16	0.17	0.54	3.48	3.28	0.77	2.46
	Median	10.00	0.02	0.00	0.59	0.07	0.17	0.18	0.56	3.39	3.09	0.75	2.15
	Std Dev	3.81	0.19	0.32	0.14	0.06	0.12	0.12	0.18	0.59	1.02	0.36	1.08
Oil & Gas	Mean	10.67	0.11	0.00	0.59	0.12	0.23	0.18	0.49	4.87	4.42	0.45	3.97
	Median	12.00	0.00	0.00	0.62	0.11	0.22	0.18	0.50	4.81	4.34	0.44	3.96
	Std Dev	4.39	0.16	0.00	0.16	0.03	0.06	0.03	0.04	0.18	0.42	0.07	0.40
Technology	Mean	10.01	0.10	0.10	0.57	0.05	0.10	0.11	0.56	3.24	2.89	0.77	1.87
	Median	10.00	0.02	0.00	0.57	0.04	0.08	0.00	0.60	3.24	2.78	0.80	1.58
	Std Dev	2.69	0.15	0.31	0.15	0.06	0.13	0.13	0.15	0.59	1.08	0.49	1.03
Pooled sample	Mean	10.68	0.09	0.09	0.61	0.08	0.16	0.16	0.49	3.60	3.37	0.66	2.65
	Median	10.00	0.02	0.00	0.63	0.07	0.16	0.18	0.50	3.59	3.24	0.60	2.46
	Std Dev	3.31	0.15	0.29	0.16	0.07	0.12	0.11	0.19	0.64	1.09	0.36	1.13

As shown in table 4.7, the average board size for Consumer Goods is the largest among the different industries while Technology firms have the smallest board sizes. Basic Material firms and Consumer Services firms have board sizes similar to the pooled sample, which is expected, as the two sectors are strongly represented in the sample with 22% of the pooled sample for each sector. Directors' interest is high in Industrial companies while directors serving in the boards of Healthcare and Basic Material firms have the lowest interest in the companies' shares. Healthcare sector comprise two companies (16 observations) and this small sample makes it difficult to draw conclusions. The low level of directors' interest for Basic Material firms could be due to the size of the companies by market capitalisation, as they are the largest group on the JSE. The mean of the board composition for basic material and consumer goods firms is the highest, while firms in the industrial sector have the lowest proportion of non-executive directors. This illustrates that, as market capitalisation increases, companies become more exposed to public scrutiny, and the need for good corporate governance becomes more obvious.

The average TVAR is highest for firms in the Oil and Gas sector, and lowest for those in the Technology sector. The highest TVAPC is for firms in the Industrial and Technology sectors, at 0.77, while the lowest is for Basic Materials firms. TVAIC is highest for Oil and Gas and Basic Materials companies and lowest for Technology firms, at 1.87.

Table 4.7: Bivariate Pearson Correlations

	Board size (No)	Directors' ownership (%)	Leadership Structure (0&1)	Board composition (%)	ROA (%)	ROE (%)	DY (%)	LEVERAGE (%)	Corporate Size log(No)	TVAR (No)	TVAPC (No)	TVAIC (No)
Board size	1.000											
Directors' interests	-.253-**	1.000										
Leadership Structure	-.132-**	0.058	1.000									
Board composition	.171**	-.327-**	-.148-**	1.000								
ROA	-0.025	0.049	0.005	0.006	1.000							
ROE	-0.016	0.040	-0.043	-0.001	.852**	1.000						
DY	.084*	-0.034	-0.025	-0.015	.278**	.294**	1.000					
LEVERAGE	0.037	-0.026	-0.060	-0.030	-.407-**	-0.036	-0.053	1.000				
CORP.SIZE	.499**	-.334-**	-.195-**	.241**	-.071-*	0.059	.111**	.199**	1.000			
TVAR	0.040	-0.003	-0.018	.108**	.660**	.641**	.230**	-.180-**	0.050	1.000		
TVAPC	-.105-**	.099**	-.073-*	-.144-**	.259**	.396**	.185**	.171**	-.103-**	0.021	1.000	
TVAIC	.082*	-0.030	0.019	.167**	.596**	.466**	.198**	-.240-**	.101**	.855**	-.261-**	1.000
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

Despite improvement in the correlation between variables after the exclusion of outliers, and transformation of data, the correlation in general remains weak between the chosen independent, dependent and control variables. Board size and board composition is shown to have a positive effect on TVAR and TVAIC, but a negative effect on TVAPC, implying that if the board size increases by one director, TVAR and TVAIC will increase by 4% and 8.2% respectively, but TVAPC will decline by 10.5%. A 1.0% increases in board composition will result in 10.8% and 16.7% increases in TVAR and TVAIC, and a 14.4% decline in TVAPC. Directors' interest has a positive effect on TVAPC, no effect on TVAR, and a negative effect on TVAIC, that is, if directors' interest increases by 1.0% TVAPC will increase by 9.9%, TVAR will remain unchanged, and TVAIC will decline by 3.0%. Leadership structure has a positive effect on TVAIC, and a negative effect on TVAR and TVAPC. This implies that when a board has separate CEO and chairperson functions, TVAIC will increase by 1.9%, TVAR and TVIPC will decline by 1.8% and 7.3% respectively.

Table 4.8: Multicollinearity

Multicollinearity	Tolerance	VIF
Board size	.745	1.343
Directors' interests	.826	1.211
Leadership Structure	.941	1.062
Board composition	.818	1.222
ROA	.167	5.987
ROE	.188	5.309
DY*	.892	1.121
LEVERAGE	.647	1.546
CORP.SIZE	.655	1.526

According to Cuthbertson (1996), multicollinearity takes place in the model when the independent variables are related to each other. Assessing the tolerance and variance inflation factor of each independent variable are two methods of measuring multicollinearity. Also, the high standard error of the variables is a sign of high collinearity.

All variables selected have a VIF below 3.0 except RoA and RoE at 5.897 and 5.309 respectively, which is substantially below the critical value of 10.0 (Natter, Wasserman, & Kutner, 1989). Based on the correlations and VIF values, multicollinearity does not appear to be a serious concern in this study.

4.4 Summary

This chapter describes how the data were tested for normality so that we can run the multiple regression tests. In order to do so, the correlation coefficient and descriptive statistics were presented in the first section. Data cleaning and data transformation were used to improve the model's fitness. Data cleaning involved excluding outlier value, with outliers defined as $\text{Median} \pm 3 \times \text{interquartile range}$, which resulted in the removal of 43 observations. Transformations were used to improve normality, to stabilise variance and convert scales to an interval measurement.

Descriptive statistics for the independent and dependent variables are discussed, and comparisons made with previous studies. Further, descriptive statistics for the pre and post King Report periods and the different industries were discussed in order to track the movement in the data after the implementation of the King Report, and to assess how different industries implemented the recommendations of the Report.

Finally, the chapter discussed correlations between the independent, dependent and control variables, which were shown to remain weak even after normality was assured. Multicollinearity problems between independent variables was examined and disregarded as an issue in this study. In the following chapter, the findings of the multiple regression models for each independent variable are presented. Three models are used: a pooled sample, a pre King Report sample, and a post King Report sample.

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CHAPTER FIVE

ANALYSIS OF FINDINGS

5.1 Introduction

This chapter presents the findings of the multiple regression models for each chosen independent variable. There are four models presented in the chapter. The first (*Full Model*) is a multiple regression model to test ANOVA and the regression between the dependent variables (TVAR, TVAPC, TVAIC) and the independent variables (board size, leadership structure, directors' ownership and proportion of non-executive directors on the board) and the control variables (ROA, ROE, DY, Leverage, and Corporate Size) for all sample data (n) of the 848 observations. The second model tests the dependent variables against independent and control variables for the pre King Report II period (*The Pre King Model*) with the total sample (n) being 292 observations. The third model tests the regression between the dependent and independent and control variables for sample data for the post King Report II period (*The Post King Model*) with the total sample (n) being 556 observations. Fourth model test the regression between the variables on a yearly bases.

The objective of this investigation is to check for signs of any relationship between the independent variables and the predicted variables (TVAR, TVAPC, and TVAIC), and to measure the strength of any relationship found. A second objective is to investigate whether there is a difference between the performances for the models in the pre King and post King II periods.

5.2 Multiple Regression Model

In this section the regression models for each of the dependent variables (the performance measurements) are built using the full data set ($n = 848$).

$$\text{General Model: } Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \beta_5 X_{i5} + \beta_6 X_{i6} + \beta_7 X_{i7} + \beta_8 X_{i8} + \beta_9 X_{i9} + \varepsilon_i$$

Where:

Y_i is the dependent variable and represents either TVAR, TVAPC, TVAIP.

$X_{i1}.....X_{i4}$ are the independent variables, boards size, directors' ownership, leadership structure and proportion of non-executive directors on the board respectively;

$X_{i4}.....X_{i9}$ are the control variables, RoA, RoE, Dividend Yield, Leverage, and Corporate size respectively;

ε_i error term.

5.2.1 Efficiency of value added by a firm's total resources (TVAR)

$TVAR_i = \beta_0 + \beta_1 \text{board size}_i + \beta_2 \text{directors' ownership}_i + \beta_3 \text{leadership structure}_i + \beta_4 \text{proportion of non-executive director}_i + \beta_5 \text{RoA}_i + \beta_6 \text{RoE}_i + \beta_7 \text{DY}_i + \beta_8 \text{leverage}_i + \beta_9 \text{corporate size}_i + \varepsilon_i$

Table 5.2.1: Regression of Independent variables and Control Factors on TVAR

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
0.688	0.473	0.468	0.792	0.825	
ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	472.635	9	52.515	83.638	.000***
Residual	526.170	838	0.628		
Total	998.805	847			
Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coefficients	Std. Error	Beta		
(Constant)	1.674	0.216		7.750	0.000***
Board size	0.001	0.010	0.002	0.086	0.932
Directors' interests	0.056	0.201	0.008	0.280	0.779
Leadership Structure	-0.024	0.098	-0.006	-0.250	0.803
Board composition	0.312	0.194	0.045	1.607	0.103
ROA	10.684	1.023	0.641	10.440	0.000***
ROE	0.449	0.509	0.051	0.882	0.378
DY*	0.324	0.254	0.034	1.275	0.203
LEVERAGE	0.270	0.175	0.048	1.542	0.123
CORP.SIZE	0.118	0.053	0.069	2.222	0.026**
***/**/* Significant at 1%/5%/10% levels					

***/**/* Significant at 1%/5%/10% levels

$TVAR_i$ = total value added by a firm's total resources for company i ; Board Size: number of directors serving on the board of a company i ; Directors' Ownership: ratio of the number of shares held by directors to the total number of issued shares of the company i . Leadership Structure: dummy variable for the same individual serving as the CEO and Chairman of a company i coded one, otherwise zero; Proportion of non-executive directors:

ratio of number of directors not directly employed by or having professional ties with the company i to total Board Size; ε_i residual term.

As shown in table 5.2.1 above, the analysis of variance (ANOVA) test returns a significant p-value of 0.000 which indicates that there is sufficient evidence to infer that at least one of the explanatory variables is linearly related to the value added coefficient of firm's total resources (TVAR) and the model seems valid. The R^2 value, which indicates the explanatory power of the independent variables, is 47.3%. This means that 47.3% of the variation in the TVAR can be explained by variation in the independent and control variables.

According to Keller & Warrack (2003), there is no critical value for R^2 that enable a conclusion to be drawn, however, the higher the R^2 value, the better the model fits the data. In this study, the R^2 of 47.3% is higher than Ho & Williams' (2003) R^2 of 26.2% for their South African sample, and Firer & Williams' (2003) 4.8%, 30.9% and 43.5% for the three models they use. However, Mangena & Chamisa (2008) reported a R^2 of 62.6% and 64.7% for the two models they used. Comparison with international studies, show that Clarke et al. (2011) report R^2 of 27%, 23.2%, 1.3% and 39.3% for the models they use on Australian firms, whereas, Abidin et al. (2009) report R^2 of 82.5% for their model using data from Malaysian firms.

5.2.1.1 The impact of board composition on TVAR

The coefficient for percentage of non-executive directors on the board ($t = 1.607$) is moderately statistically significant at the 10% level. The coefficient is positive at 0.312, which means that for each additional increase in the percentage of non-executive directors on the board, TVAR increases on average by 0.312, holding other explanatory variables constant. Hence, it can be inferred that hypothesis 3.2.1.a is supported. This is consistent with the findings of Ho & Williams (2003) and Mangena & Chamisa (2008) with respect to South African firms. The findings are consistent with those of international studies, such as Abidin et al. (2009) and Cheng & Courtenay (2006) examining Malaysian and Singaporean firms respectively. This suggests that non-executive directors are more effective in adding value to the firm, which is in line with this study's expectation and the King Report's notion that more non-executive directors on the board improves a firm's performance.

5.2.1.2 Impact of directors' ownership on TVAR

Table 5.2.1 demonstrates that the coefficient for directors' ownership ($t = 0.280$) is insignificant even at the 10% level. This reveals that there is insufficient evidence to infer that there is a linear relationship between directors' ownership and TVAR with regards to South African firms. Hence, hypothesis 3.2.2.a is rejected. However, it is interesting to observe that the coefficient is positive, which supports the notion that greater director ownership supports better performance. This result is consistent with the findings of Ho & Williams (2003), Mangena & Chamisa (2008), and Abidin et al. (2009) for South African, and Malaysian firms respectively, but inconsistent with Ho & Williams' (2003) findings for Swedish firms. The insignificant coefficient in this study may mean that directors of South African companies are not motivated by equity interests in the company. This is supported by the decline in directors' ownership noted in table 4.6, and confirms the findings of Waweru, Gelinas & Uliana (2009). This may be due to the fact that South African directors already receive high rewards in the form of salaries and allowances.

5.2.1.3 Impact of leadership structure (CEO/chairman) on TVAR

Table 5.2.1 shows that the CEO/chairman duality ($t = -0.250$) is insignificant even at 10% level. This means that there is no significant difference in the TVAR between firms that separate the roles of CEO and chairman and those that practice CEO/chairman duality. Therefore, hypothesis 3.2.3.a is rejected and it can be concluded that there is no evidence to support the notion that there is a relationship between CEO/chairman duality and TVAR.

The result is inconsistent with Ho & Williams' (2003) findings of a significant relationship between duality and TVAR for South African, Swedish and UK firm's samples. However, it is consistent with studies by Cheng & Courtenay (2006), Mangena & Chamisa (2008) and Abidin et al. (2009) on Singaporean, South African and Malaysian firms respectively. The estimated coefficient is positive and thus consistent with the hypothesis, and the findings of Mangena & Chamisa (2008) and Abidin et al. (2009), but is contrary to findings of similar studies (e.g., Beasley, 1996; Ho & Williams, 2003). Judge et al. (2003) argues that, even with the existence of a formal law that separates the roles of CEO and chairman, informal activity may still undermine this practice, and thus firm performance. So, even though most of the firms in this study separate the two roles, it may be a case of form over substance, and hence the company fails to harvest the benefit of the separation of the two roles.

5.2.1.4 Impact of board size on TVAR

The result of the regression analysis table (5.2.1) shows that the coefficient for total number of directors (board size) is insignificant even at 10% level. This suggests that there is no difference in the TVAR between firms that have large boards and firms with small boards, hence, hypothesis 3.2.4.a is rejected.

However, the coefficient is positive, which is consistent with this study's hypothesis which predicts a positive relationship between board size and performance. The results of this examination of board size are consistent with research by Ho & Williams (2003) and Mangena & Chamisa (2008) on South African firms, and Yermak (1996) and Eisenberg et al. (1998), who tested the impact of board size on the performance of US firms. However, the results are opposite to the findings of Abidin et al. (2009), who concluded that larger board size is statistically significant and associated with TVAR in Malaysian firms.

5.2.1.5 Control factors

The regression results for the control factors included in the analysis shown in Table 5.2.1 indicates that RoA and corporate size are significant at 1% and 5% level respectively. However, the coefficient for the remaining three control factors (RoE, DY and leverage) is found to be insignificant, even at 10% level. As expected, all relationships between the control factors and TVAR are positive.

5.2.2 Total value added by a firm's physical capital (TVAPC)

TVAPC_i = $\beta_0 + \beta_1 \text{board size}_i + \beta_2 \text{directors' ownership}_i + \beta_3 \text{leadership structure}_i + \beta_4 \text{proportion of non-executive directors}_i + \beta_5 \text{RoA}_i + \beta_6 \text{RoE}_i + \beta_7 \text{DY}_i + \beta_8 \text{leverage}_i + \beta_9 \text{corporate size}_i + \varepsilon_i$

Table 5.2.2: Regression of independent variables and control factors on TVAPC

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
0.428	0.183	0.174	0.327	1.715	
ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	20.131	9	2.237	20.873	.000***
Residual	89.800	838	0.107		
Total	109.931	847			
Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coefficients	Std. Error	Beta		
(Constant)	0.870	0.089		9.749	0.000
Board size	-0.005	0.004	-0.042	-1.167	0.244
Directors' interests	-0.058	0.083	-0.024	-0.696	0.486
Leadership Structure	-0.128	0.040	-0.102	-3.185	0.001***
Board composition	-0.197	0.080	-0.085	-2.459	0.014**
ROA	-0.912	0.423	-0.165	-2.158	0.031**
ROE	1.296	0.210	0.444	6.166	0.000***
DY*	0.336	0.105	0.106	3.199	0.001***
LEVERAGE	0.283	0.072	0.152	3.917	0.000***
CORP.SIZE	-0.099	0.022	-0.174	-4.512	0.000***
***/**/* Significant at 1%/5%/10% levels					

Where: TVAPC is the total value added efficiency of a company i. from its physical capital; other variables are defined in table 5.2.1.

Table 5.2.2 shows the values of variance are statistically significant, which means that there is sufficient evidence to infer that there is at least one independent variable which is linearly related to TVAPC. The R² value of 18.3% indicates that 18.3% of TVAPC is accounted for by variation in the independent variables and control variables. This is compared to the findings of Ho & Williams (2003) of an R² for TVAPC of 47.9% for South African firms, while their finding for Swedish firms' R² is 27.3%.

The coefficients representing the four independent variables are statistically significant in only two cases. First, the coefficient for board composition is significant at 5% level; hence, hypothesis 3.2.1.b is supported. However board composition has a negative relationship to TVAPC. This implies that for each additional increase in the percentage of non-executive directors on a board, TVAPC will decline by 0.197%, holding other

explanatory variables constant. This result is consistent with the findings of Ho & Williams (2003) and Mangena & Chamisa (2008) of a significant coefficient of board composition and performance for their South African samples only. Second, the coefficient representing leadership structure in the regression is negative and statistically significant at 1% level. This means that there is a significant difference in the TVAPC for firms which separate the roles of CEO and chairman. Hence, hypothesis 3.2.3.b is supported. This result is consistent with the research of Mangena & Chamisa (2008), but contradicts that of Ho & Williams (2003) of an insignificant relationship between leadership structure and TVAPC for three firms' samples (South African, Sweden and UK).

The coefficients of the other two independent variables (board size and directors' ownership) are insignificant, even at 10% level, which is consistent with research by Ho & Williams (2003) and Mangena & Chamisa (2008) which shows an insignificant relationship between board size and directors' ownership and performance in South African firms, and the findings of Peasnell et al. (2001) for US firms and findings by Clarke et al. (2011) for Australian firms.

However, the coefficient is negative for all independent variables, which is contrary to the theoretical model stated in the hypothesis, which predicts a positive relationship between the four independent variables and TVAPC.

Control factor regression results show that all five factors are significant at 1% level, except for RoA which is significant at 5% level. As expected, the relationship between RoE, DY and Leverage and TVAPC is positive, while RoA and corporate size are negatively related to the dependent variable.

5.2.3 Total value added by a firm's intellectual capital (TVAIC)

$TVAIC_i = \beta_0 + \beta_1 \text{board size}_i + \beta_2 \text{directors' ownership}_i + \beta_3 \text{leadership structure}_i + \beta_4 \text{proportion of non-executive director}_i + \beta_5 \text{RoA}_i + \beta_6 \text{RoE}_i + \beta_7 \text{DY}_i + \beta_8 \text{leverage}_i + \beta_9 \text{corporate size}_i + \varepsilon_i$

Table 5.2.3: Regression of independent variables and control factors on TVAIC

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
0.647	0.419	0.412	0.849	.719	
ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	435.489	9	48.388	67.078	.000***
Residual	604.504	838	0.721		
Total	1039.993	847			
Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coefficients	Std. Error	Beta		
(Constant)	0.490	0.232		2.115	0.035
Board size	0.004	0.010	0.012	0.380	0.704
Directors' interests	0.211	0.216	0.028	0.978	0.329
Leadership Structure	0.136	0.105	0.035	1.297	0.20
Board composition	0.522	0.208	0.073	2.510	0.012**
ROA	14.872	1.097	0.874	13.559	0.000***
ROE	-2.474	0.545	-0.275	-4.539	0.000***
DY*	0.040	0.273	0.004	0.148	0.882
LEVERAGE	0.330	0.188	0.058	1.757	0.079*
CORP.SIZE	0.239	0.057	0.137	4.219	0.000***
***/**/* Significant at 1%/5%/10% levels					

***/**/* Significant at 1%/5%/10% levels

Where: TVAIC is the total value added efficiency of a company i from its IC (Human capital and Structural capital); other variables are defined in table 5.2.1.

Table 5.2.3 shows that the value of the variance test is significant at 0.000, indicating that there is sufficient evidence to infer that at least one of the independent variables is linearly related to TVAIC. The R^2 value, which indicates the explanatory power of the independent variables, is 41.9%. This means 41.9% of TVAPC is accounted for by variation in the independent variables and control variables. This is compared to Ho & Williams' (2003) R^2 for TVAPC of 38.6% for their South African sample, while their Swedish sample's R^2 is 35.5% and their UK firms sample 30.4%. In addition, TVAIC has greater explanatory power than TVAPC, as shown by its standardised coefficients, and therefore generally is more dominant in TVAR when predicting performance.

Consistent with hypothesis 3.2.1.c, regression analysis findings show that the coefficient for board composition is positive and statistically significant ($p < .05$). The positive relationship suggests that the likelihood of TVAIC increases with an increase in non-

executive directors on a board. This is consistent with the hypothesis of this study as well as the findings of other studies such as Mangena & Chamisa (2008), and Chen et al. (2006) for Singaporean firms, but contrary to those of Ho & Williams (2003) for their sample of South African firms.

Despite the fact that other independent variables coefficients are insignificant even at the 10% level, the coefficients are positive for all variables, which is in line with the expected relationship between independent variables and TVAIC. Hence, hypotheses 3.2.2.c, 3.2.3.c and 3.2.4.c are rejected. These findings are consistent with the research findings of Ho & Williams (2003) for all variables except for the leadership structure (duality) variable, which they found to be statistically significant for the three samples (South Africa, Sweden and UK), while directors' ownership was significant for their Swedish sample only.

Control factors regression results show that three factors (RoA, RoE, corporate size) coefficient are significant at 1% level, while leverage is significant at the 10% level, DY is insignificant even at the 10% level. All control factors have a positive relationship except RoE, which has a negative relationship to TVAIC. It is notable that the RoA coefficient is very high in both TVAR and TVAIC, and statistically significant ($p < .01$), which is consistent with the findings of Ho & Williams (2003) and Clarke et al. (2011) for South African and Australian firm samples respectively.

5.3 Pre King vs. Post King periods

As this study's objective is to test whether the second King Report recommendations regarding board attributes have had an impact on firm performance, and as the data covers two periods (the three years prior to the effective date of the King II report, and the six years after its effective date), it is important to test the data for each period separately and see the impact of the implementation of King II on performance, measured by the value added by a firm's total resources (TVAR) method.

In this section multiple regression models are used to test the correlation between the data from the two time periods (pre and post King II periods) using the same set of independent variables, (board size, directors' ownership, leadership structure and proportion of non-executive directors on the board) and control variables. To further compare the pre and post King Periods, different models are fitted to the two different data sets for each of the dependent variables.

5.3.1 Efficiency of value added by a firm's total resources (TVAR)

Table 5.3.1: Regression of independent variables and control factors on TVAR for pre and post King Report periods

TVAR	Pre King Report					Post King Report				
R ²	0.459					0.490				
Adjusted R ²	0.442					0.482				
F	26.593					58.389				
P <	.000a					.000a				
Std. Error	0.814					0.777				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coff.	Std. Error	Beta			Coff.	Std. Error	Beta		
(Constant)	1.601	0.377		4.251	0.000	1.609	0.271		5.933	0.000
Board size	-0.011	0.016	-0.034	-0.673	0.501	0.009	0.012	0.027	0.761	0.447
Directors' interests	-0.358	0.356	-0.050	-1.007	0.315	0.362	0.247	0.049	1.465	0.144
Leadership Structure	-0.127	0.125	-0.046	-1.021	0.308	0.128	0.181	0.022	0.709	0.479
Board composition	-0.257	0.318	-0.038	-0.806	0.421	0.723	0.251	0.099	2.883	0.004
ROA	15.948	2.264	0.892	7.043	0.000	9.179	1.137	0.569	8.070	0.000
ROE	-1.676	1.102	-0.180	-1.521	0.129	1.110	0.568	0.129	1.952	0.051
DY	-0.690	1.096	-0.028	-0.629	0.530	0.779	0.661	0.037	1.178	0.239
LEVERAGE	0.883	0.338	0.148	2.612	0.009	0.039	0.204	0.007	0.191	0.849
CORP.SIZE	0.207	0.090	0.125	2.302	0.022	0.071	0.066	0.040	1.081	0.280

Where: Pre King Report, means the three years prior to the effective date of King Report II (2001-2003), and the post King Report II is the six years after the effective date of the King Report II (2004-2009).

TVAR for pre and post King II differs as shown in table 5.3.1. The analysis of variance returns a significant p-value for both models, with the post King Report explaining a higher proportion of the variation in the TVAR R² value of 48.2%. This is 1% higher than the R² value for the pooled sample, as presented in table 5.2.1 above. The coefficient for board composition is positive and significant at 1% level in the post King Report sample. The coefficient of all the other independent variables was positive and insignificant for the post King Report sample, as opposed to the negative coefficient found for the pre King Report sample. This result reiterates the results presented in table 5.2.1 for the pooled sample, which indicate that only board composition is statistically significant. Also, the degree of significance for board composition is high in the post King Report, which supports the argument that the implementation by the South African listed firms of the recommendations of the King Report regarding the board composition will impact their performance positively.

The regression results for the control factors show that the coefficients for RoA, leverage and corporate size were positive and statistically significant for the pre King Report sample, while the coefficients for RoA and RoE were positive and significant for the post King Report sample. The positive coefficients in the post King Report sample support the expectation of this study of a positive relationship between TVAR and the independent

variables. However, the results support only hypotheses 3.2.1a, while all other hypotheses are not supported.

5.3.2 Total value added by a firm's physical capital (TVAPC)

Table 5.3.2: Regression of independent variables and control factors on TVAPC pre and post King Report samples

TVAPC	Pre King Report					Post King Report				
R ²	0.158					0.212				
Adjusted R ²	0.132					0.199				
F	5.901					16.367				
P <	.000a					.000a				
Std. Error	0.319					0.331				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coff.	Std. Error	Beta			Coff.	Std. Error	Beta		
(Constant)	0.832	0.147		5.648	0.000	0.882	0.115		7.641	0.000
Board size	-0.011	0.006	-0.107	-1.692	0.092	-0.001	0.005	-0.005	-0.112	0.911
Directors' interests	0.090	0.139	0.040	0.647	0.518	-0.113	0.105	-0.045	-1.075	0.283
Leadership Structure	-0.165	0.049	-0.191	-3.374	0.001	-0.091	0.077	-0.046	-1.186	0.236
Board composition	-0.087	0.125	-0.041	-0.696	0.487	-0.250	0.107	-0.100	-2.343	0.020
ROA	-0.426	0.886	-0.076	-0.481	0.631	-1.081	0.484	-0.196	-2.232	0.026
ROE	0.719	0.431	0.247	1.667	0.097	1.565	0.242	0.530	6.467	0.000
DY	0.566	0.429	0.074	1.320	0.188	0.817	0.282	0.114	2.901	0.004
LEVERAGE	0.366	0.132	0.195	2.770	0.006	0.260	0.087	0.140	2.988	0.003
CORP.SIZE	-0.076	0.035	-0.147	-2.169	0.031	-0.104	0.028	-0.171	-3.687	0.000

Where: Pre King Report, means the three years prior to the effective date of King Report II (2001-2003), and the post King Report II is the six years after the effective date of the King Report II (2004-2009).

The analyses of variance for TVAPC returns a significant p-value for both pre and post King Report models, with the post King Report sample explaining a higher proportion of variation in the TVAR R² value of 19.9%. This is 1% higher than the R² value for the pooled sample, as presented in table 5.3.2. The coefficients for board size and leadership structure are negative and statistically significant for the pre King Report sample, while the coefficient of board composition is statistically significant, at 5% level, in the post King Report sample only. The negative relationship is in contrast to the hypothesis stated in chapter three, section 3.2. The coefficients of all the other independent variables are negative and insignificant for both pre and post King Report samples except for directors' ownership which is positive in the pre King Report sample only. This result reiterates the results presented in table 5.2.2, which indicate that board composition is statistically significant at 5% level.

The regression results for the control factors show that coefficients for RoA, leverage and corporate size were positive and statistically significant for the pre King Report sample,

while the coefficients for all control factors were positive and significant for the post King Report sample, except RoA which is negative and significant with regard to TVAPC.

5.3.3 Total value added by a firm's intellectual capital (TVAIC)

Table 5.3.3 Regression of independent variables and control factors on TVAIC pre and post King Report samples

TVAIC	Pre King Report					Post King Report				
R ²	0.404					0.430				
Adjusted R ²	0.385					0.421				
F	21.244					45.802				
P <	.000a					.000a				
Std. Error	0.866					0.842				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Coff.	Std. Error	Beta			Coff.	Std. Error	Beta		
(Constant)	0.574	0.400		1.435	0.153	0.406	0.294		1.382	0.168
Board size	-0.005	0.017	-0.016	-0.303	0.762	0.010	0.013	0.031	0.818	0.414
Directors' interests	-0.164	0.379	-0.022	-0.432	0.666	0.445	0.268	0.059	1.659	0.098
Leadership Structure	0.080	0.132	0.029	0.604	0.547	0.261	0.196	0.044	1.333	0.183
Board composition	-0.024	0.338	-0.003	-0.070	0.944	0.875	0.272	0.116	3.218	0.001
ROA	17.620	2.408	0.972	7.318	0.000	14.144	1.232	0.855	11.477	0.000
ROE	-3.291	1.172	-0.350	-2.809	0.005	-2.284	0.616	-0.258	-3.709	0.000
DY	-0.956	1.166	-0.039	-0.820	0.413	-0.098	0.717	-0.005	-0.136	0.892
LEVERAGE	0.497	0.359	0.082	1.384	0.167	0.266	0.221	0.048	1.200	0.231
CORP.SIZE	0.312	0.096	0.187	3.269	0.001	0.196	0.072	0.107	2.729	0.007

Where: Pre King Report, means the three years prior to the effective date of King Report II (2001-2003), and the post King Report II is the six years after the effective date of the King Report II (2004-2009).

The results, shown in table 5.3.3, indicate that the regression models for both pre and post King Report samples are statistically significant, with the pre King Report sample explaining a higher proportion of variation in TVAIC (43.0%).

The coefficient for board composition is statistically significant and positive at 1% level. Among the other three independent variables, the coefficients were only moderately statistically significant in the regression for board size for the post King Report sample only. Similar to the result noted in table 5.3.1, the relationship between the independent variables and dependent variable is positive in the post King Report sample, which is consistent with the study's hypothesis.

Three out of the five control factors are statistically significant at 1% level, with both RoA and Corporate size having a positive relationship in both samples, while RoE is negative in both samples. The other two control factors (DY and Leverage) are not statistically significant in both pre and post King Report samples.

Based on the results shown in tables 5.3.1, 5.3.2 and 5.3.3, board composition is placed first determinant or indicator of value for TVAR, TVAPC and TVAIC in the post King Report sample. This is in line with the results presented in tables 5.2.1, 5.2.2 and 5.2.3, which confirm the importance for firm performance of having a majority of non-executive directors on the board, as the King Report recommended.

5.4 Yearly regression test

Table 5.4.1 Regression of independent variables and control factors on TVAR – yearly basis

TVAR	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.045	-0.351	0.271	0.289	16.905	-0.612	-0.276	1.129	0.566
	P-value	0.054	0.428	0.089	0.475	0.000	0.713	0.646	0.015	0.000
	R ²	0.963								
2002	Coefficients	-0.020	0.537	-0.149	-0.399	23.534	-5.453	0.322	1.714	0.557
	P-value	0.619	0.429	0.571	0.548	0.000	0.021	0.737	0.011	0.001
	R ²	0.928								
2003	Coefficients	0.048	0.886	-0.358	0.669	16.913	-2.689	0.038	1.363	0.236
	P-value	0.065	0.169	0.187	0.273	0.000	0.122	0.965	0.012	0.060
	R ²	0.949								
2004	Coefficients	0.008	1.074	0.046	0.977	17.117	-1.237	0.297	1.696	0.173
	P-value	0.752	0.082	0.864	0.101	0.000	0.442	0.661	0.001	0.152
	R ²	0.954								
2005	Coefficients	0.024	1.038	0.350	0.881	12.932	-0.520	0.888	0.242	0.322
	P-value	0.336	0.061	0.189	0.126	0.000	0.715	0.306	0.623	0.009
	R ²	0.959								
2006	Coefficients	-0.013	0.618		1.348	10.598	0.478	1.215	0.144	0.398
	P-value	0.630	0.251		0.006	0.000	0.722	0.156	0.751	0.005
	R ²	0.965								
2007	Coefficients	0.006	0.673		1.074	9.212	1.394	0.307	0.193	0.397
	P-value	0.866	0.281		0.065	0.000	0.315	0.779	0.696	0.019
	R ²	0.958								
2008	Coefficients	-0.031	0.349		2.111	9.394	0.113	0.408	0.076	0.393
	P-value	0.330	0.514		0.000	0.000	0.927	0.572	0.876	0.004
	R ²	0.962								
2009	Coefficients	0.046	0.658		1.835	10.001	0.543	1.470	0.475	0.091
	P-value	0.331	0.391		0.013	0.011	0.759	0.188	0.400	0.655
	R ²	0.924								

Table 5.4.1 reports the regression test between the independent and control variables and TVAR on a yearly basis. The coefficient value of all years is high with R² above 92.4%. However, the significance of the variables varies, with board composition positive and statistically significant in five of the nine years, followed by directors' interest and board size, which have significant coefficients in two of nine years covered in this study. These results confirm that South African listed firms which have a higher proportion of non-executive directors perform better than firms with fewer non-executive directors on their board.

Table 5.4.2 Regression of independent variables and control factors on TVAPC – yearly basis

TVAPC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.003	0.193	-0.149	0.082	-1.314	1.185	1.146	0.205	-0.076
	P-value	0.7173	0.3340	0.0279	0.6280	0.3513	0.0999	0.0735	0.3184	0.1954
	R ²	0.241								
2002	Coefficients	-0.027	0.027	-0.153	-0.234	-0.782	0.967	0.334	0.240	-0.015
	P-value	0.054	0.919	0.092	0.323	0.648	0.271	0.675	0.360	0.831
	R ²	0.179								
2003	Coefficients	-0.007	-0.032	-0.190	-0.219	0.422	0.366	0.295	0.577	-0.123
	P-value	0.556	0.914	0.123	0.452	0.812	0.637	0.742	0.027	0.059
	R ²	0.138								
2004	Coefficients	0.014	-0.036	-0.067	-0.354	-0.639	1.494	1.145	0.501	-0.132
	P-value	0.197	0.887	0.537	0.168	0.674	0.026	0.024	0.031	0.025
	R ²	0.320								
2005	Coefficients	0.009	-0.158	-0.149	-0.322	-2.037	2.300	0.389	0.248	-0.164
	P-value	0.363	0.468	0.143	0.168	0.066	0.000	0.696	0.188	0.004
	R ²	0.395								
2006	Coefficients	-0.014	-0.212		-0.186	-1.176	1.843	0.511	0.382	-0.088
	P-value	0.263	0.416		0.446	0.303	0.004	0.749	0.077	0.291
	R ²	0.296								
2007	Coefficients	0.004	0.162	0.000	-0.148	-1.414	1.709	3.058	0.001	-0.080
	P-value	0.798	0.594		0.610	0.223	0.009	0.192	0.995	0.391
	R ²	0.168								
2008	Coefficients	-0.022	-0.069	0.000	0.136	-0.755	0.950	1.068	0.240	-0.081
	P-value	0.138	0.792		0.648	0.527	0.110	0.053	0.317	0.286
	R ²	0.181								
2009	Coefficients	-0.026	-0.113		-0.238	-0.390	1.000	0.696	0.159	0.068
	P-value	0.137	0.712		0.484	0.794	0.151	0.348	0.479	0.441
	R ²	0.154								

The values of coefficients are in general low, with the R² of 2005 sample reflecting the highest, at 39.5%, while 2003 has the lowest value, at 13.8%. Consistent with the results presented in table 5.3.2, leadership structure is the only independent variable which is negative and statistically significant with TVAPC for the first two years of the pre King II Report sample (2001 and 2002), while other independent variables are in general negative and not significant across all years.

Table 5.4.3 Regression of independent variables and control factors on TVAIC – yearly basis

TVAIC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.048	-0.559	0.410	0.210	16.163	-1.527	-1.204	0.513	0.528
	P-value	0.074	0.324	0.033	0.664	0.000	0.453	0.505	0.379	0.002
	R ²	0.525								
2002	Coefficients	0.003	-0.120	-0.006	-0.493	19.198	-4.313	-0.467	0.398	0.311
	P-value	0.944	0.879	0.981	0.477	0.000	0.095	0.842	0.604	0.125
	R ²	0.405								
2003	Coefficients	0.021	0.427	-0.350	0.235	17.485	-3.738	-0.798	0.392	0.180
	P-value	0.449	0.544	0.222	0.730	0.000	0.041	0.702	0.514	0.232
	R ²	0.364								
2004	Coefficients	-0.013	0.724	0.029	0.784	19.162	-3.374	-0.856	1.070	0.166
	P-value	0.661	0.321	0.926	0.282	0.000	0.076	0.547	0.103	0.317
	R ²	0.427								
2005	Coefficients	0.006	0.821	0.391	0.485	16.355	-3.088	-0.489	0.243	0.296
	P-value	0.824	0.192	0.182	0.471	0.000	0.045	0.865	0.653	0.068
	R ²	0.489								
2006	Coefficients	0.015	0.358	0.000	0.879	14.006	-2.772	3.712	0.222	0.242
	P-value	0.634	0.565		0.134	0.000	0.064	0.332	0.665	0.227
	R ²	0.499								
2007	Coefficients	0.024	0.049	0.000	0.528	13.749	-2.315	-5.076	0.380	0.266
	P-value	0.547	0.946		0.449	0.000	0.137	0.367	0.505	0.237
	R ²	0.456								
2008	Coefficients	-0.014	-0.120	0.000	1.176	12.603	-2.356	-0.099	0.069	0.228
	P-value	0.684	0.847		0.098	0.000	0.093	0.939	0.902	0.204
	R ²	0.460								
2009	Coefficients	0.070	0.118	0.000	0.942	13.313	-1.330	0.227	0.206	-0.128
	P-value	0.124	0.880		0.278	0.001	0.452	0.904	0.719	0.568
	R ²	0.400								

Although the values of coefficients are high compared to those presented in table 5.4.2, with a R² range of 40.0% to 52.5%, the regression test of independent variables and TVAIC is significant only for board size and leadership structure for the 2001 sample and for board composition for the 2008 sample. The results are inconsistent with those presented in table 5.3.3 particularly for board composition and directors' interest, which showed a significant relationship to TVAIC in the post King Report sample.

Support for the hypotheses

Table 5.5, shows the results that support, or refute the hypotheses. Overall, empirical findings fail to show an unconditional link between board attributes and firm performance. However, results show some significant associations between individual board attributes and individual measures of firm performance in the firms examined in this study.

We find support for the view that an increase in the percentage of non-executive directors on a board impacts TVAR and TVAIC positively, but reduces TVAPC in the pooled and post King Report samples compared to a negative and insignificant relationship in

the pre King Report period sample. This is particularly important to regulators as the King Report specifies the need for a board dominated by non-executive directors. Further, the comparison of the results of pre and post King Report highlight the impact of the implementation of the King Report recommendations regarding the non-executive directors by the South African companies and support the notion that more non-executive directors on the board enhance firm performance. The results imply that the request for a majority of non-executive directors on the board by the King Report are very important as non-executive directors possess a diverse knowledge, skills and experience which may improve board processes and decision making and consequently performance. The results also have implication on the South African capital market as they may improve investor confidence thus attracting more foreign investors.

However, the other three board attributes (directors' ownership, CEO/chairman duality and board size) in general have insignificant relationships with performance. Looking at each one of these attributes; directors' ownership insignificant relationships with performance could be due to the fact that South Africa experienced a wave of emigration of qualified people since the political transformation in the early 1990s, which has resulted in a shortage of supply of management (Uliana, 1988). Consequently, the reward of these qualified and skilled people in the market was mainly in the form of salaries and other allowances instead of shares and other long term incentive plans. This may provide regulators in South Africa a signal to focus more on the incentives of the directors of public companies so that their interests are aligned with the shareholders and other relevant stakeholders. This should be after taking into account the individual firm response to several competitive, financial and environmental characteristics.

The insignificance and mixed impact of board size on the three performance measures could be due to the difference of the culture, size and nature of the South African firms. While the second King Report (2003) did not determine the board size, the third King Report (2010, 2.18.5) recommended companies to have at least two directors. Further, King III recommends that each board should consider its size, diversity and demographics to make it effective. The King Report recommendations regarding the board size would be enhanced if it added that nature and complexity of the business should also be considered by the board to determine its size.

The analysis suggests that firms with an independent board structure (dominated by non-executive directors), should choose their leadership structure (CEO duality or non duality) based on the costs and benefits of the alternative structures taking into account their

business and economic environments. However, while the second King Report recommended that the two roles should be separated, the JSE Listing Requirements made the separation of the two roles compulsory, and that is why all companies in the sample have totally separated the two roles after 2006, a year after the effective date of the JSE Listing Requirements, hence companies may be failing to harvest the benefit of the separation of the two roles.

Overall, results regarding the three board attributes on performance should be expected from the perspective that changing governance structure and behaviour will not come overnight, as behaviour change is a long term process. Judgement that corporate governance is not making difference may be premature. This may be a case of form over substance, and companies have yet to harvest the benefit of the King Report recommendations regarding the board attributes.

Table .1: Comparing the results to the hypotheses

Hypotheses	Direction of results	Hypotheses Supported?		
		Pooled	Pre King	Post King
H1a: Board composition increase TVAR	+/-/+	Yes	No	Yes
H1b: Board composition increase TVAPC	-/-/-	Yes	No	Yes
H1c: Board composition increase TVAIC	+/-/+	Yes	No	Yes
H2a: Increases in directors ownership increase TVAR	+/-/+	No	No	No
H2b: Increases in directors ownership increase TVAPC	-/+/-	No	No	No
H2c: Increases in directors ownership increase TVAIC	+/-/+	No	No	Yes
H3a: Separating CEO/chairman rules increase TVAR	-/-/+	No	No	No
H3b: Separating CEO/chairman rules increase TVAPC	-/-/-	Yes	Yes	No
H3c: Separating CEO/chairman rules increase TVAIC	+//+	No	No	No
H4a: The size of board of directors increases TVAR	+/-/+	No	No	No
H4b: The size of board of directors increases TVAPC	-/-/-	No	Yes	No
H4c: The size of board of directors increases TVAIC	+/-/+	No	No	No

The direction of the results with each of the three samples, pooled, pre and post King Report samples respectively

5.5 Summary and discussion

In this chapter we have introduced the general regression model. We then introduced the results of a multiple regression of the relationship between the independent variables and TVAR for the pooled sample, followed by an analysis of regression for the pre and post King

Report samples. The results revealed that, among the independent variables, board composition has a positive and moderately significant relationship to TVAR, and a statistically significant relationship to TVAIC. This indicates that the greater the number of non-executive directors in the board of South African firms the more these firms generate value by using their total resources as well as their intellectual capital. However, board composition has a significantly negative relationship to TVAPC, implying that an increase in non-executive directors on a board will result in a decline in a value added by a firm's physical capital. An analysis of the coefficients on pre and post King Report firm samples, showed that board composition has a similar relationship to other dependent variables in the post King Report sample only, but the coefficient was not significant for the three dependent variables in the pre King Report sample. The results imply that the recommendation of the King Report for a majority of non-executive directors has been taken seriously by South African listed firms, who have since appointed more non-executive directors to their boards.

The second observation is on CEO-chairman separation on the board, and here there is a negative and significant relationship to TVAPC for the pooled sample as well as for the pre King Report sample. This implies that companies that separate the roles of the CEO and chairman generate more value from their total resource as well as from their physical capital than companies that combine the two roles in one individual. Also, we find a negative but not significant relationship between leadership structure and TVAR for the pooled and the pre King Report sample, and a positive and not significant relationship for the post King Report sample. We also find a positive and not significant relationship to TVAIC in all three samples.

The relationship between directors' interest and TVAR is insignificant with regard to the three dependent variables. However, it has a positive relationship to TVAR in all three samples (pooled, pre and post King Report) as well as a positive relationship to TVAIC in the pooled and post King report samples, while a negative relationship to TVAIC in the pre King Report sample. Evidence to suggest that large boards perform better is limited, as board size is significant and positive only to TVAPC in the pre King Report sample, while it has a positive and insignificant relationship with TVAR and TVAIC in the pooled sample and post King Report sample. This implies that the size of the board does not have an impact on the value generated for South African firms by their total resources and intellectual capital.

In general, the results of this study are consistent with the results reported by Ho & Williams (2003) and Mangena & Chamisa (2008) for their South African samples, and Abidin et al. (2009) for their Malaysian sample with regard to board composition and board

size, but contrary to their result for the influence of directors' interest and leadership structure.

CHAPTER SIX

SUMMARY AND CONCLUSION

This chapter highlights the significance of the study for academia and for policy makers. A summary of the study is followed by the main findings. This chapter also presents the limitations of the study and discusses opportunities for future research emanating from the study.

6.1 Significance of the study

This study contributes to the literature on corporate governance in South Africa, and indeed other developing markets and the world, by providing a longitudinal empirical analysis of the relationship between board features and firm performance. A systematic relationship between board attributes and firm performance does not exist. However the positive relationship between board composition and TVAR, TVAIC and the negative relationship to TVAIC is shown to be consistent with studies using the same performance measures in the South African context (Ho & Williams, 2003). Although this relationship indicates that an increase in the number of non-executive directors on a board increases TVAR and TVAIC and decreases TVAPC in the post King II Report sample, this relationship was negative and insignificant in the pre King II Report sample with regard to all three performance measures. In addition, the analysis of the relationship between corporate governance and performance over time provides clarity on the impact of the rules and recommendations of the King Report. This was observed in the percentage of non-executive directors on boards increasing substantially over the years covered by this study.

Separating or combining the roles of CEO and chairman, board size and directors' ownership are associated with one individual performance measure or another but not consistently associated across all performance measures.

This study has provided clarity on the relationship between corporate governance and performance by measuring performance by the efficiency of the value added by a firm's total resources, as well as its two major components, physical and intellectual capital. This has shown that measures of performance cannot be interchanged. For example, comparisons with

findings in the literature that board size has a positive relationship with performance are not entirely authentic, as different measures were used. It is not uncommon, (as in this study), that a study using the efficiency of value added by a firm's total resources (TVAR) as a proxy for performance compares its finding with another study that uses return on assets (RoA) or return on equity (RoE). Different measures give different correlations; therefore, it is only useful to compare studies using the same measure (for example, TVAR vs TVAR, RoE vs RoE).

6.2 Summary of the thesis

Like several other countries, South Africa experienced many corporate collapses in the 1990s and early 2000s notably those of Fidentia, JCI-Randgold, and LeisureNet, some of which were blamed on weak corporate governance structures (World Bank, 2003). In response to the need to strengthen the corporate governance system in South Africa, the King Committee on Corporate Governance was formed in 1992, and in line with the international trend, it considered corporate governance from a South African perspective. The result was the publication of the first King Report in November 1994. Since then, both domestic developments (e.g., legislation such as the Employment Equity Act – No. 55 of 1998) and international guides (e.g., the UK Combined Code of 1998) have motivated for a revision of corporate governance, which lead to the publication of the second King Report in March, 2002.

We have presented descriptive statistics of the four board attributes and compared the results with previous studies. A higher percentage of non-executive directors as board members has been claimed to improve firm performance. Although the literature review suggests this relationship, other studies find more non-executive directors leads to a reduction in firm performance (as confirmed by the study in one case, related to TVAPC). Others find no significant relationship between board composition and firm performance. The analysis of the positive influence of board composition on performance, TVAR and TVAIC confirms this relationship, while the effect of board composition on TVAPC was negative in all samples tested.

Studies on the influence of the separation of the roles of CEO and chairman of the board also generated mixed results. Some studies have argued for separating the two roles, others for duality, while others report that this has no influence on firm performance. The

results related to the impact of leadership structure on firm performance are also mixed, having a negative and significant relationship to TVAPC in the pre King Report and pooled samples only. The results seem to agree that board size and the extent of directors' ownership of a firm's equity do not matter for firm performance. This result is consistent with the findings of Ho & Williams (2003) and Mangena & Chamisa (2008) who failed to find any relationship between board size and directors' ownership and firm performance in their South African samples.

6.3 List of the main conclusions

The main conclusion of the univariate analysis followed by the bivariate relationship between four independent measures of governance and three measure of performance, together with control factors are:

Board composition

Results of a board composition's impact on firm performance in the South African listed firms included in this study confirmed the importance of having boards with a majority of non-executive directors which, improves the process of decision making, and consequently performance. The impact of a majority of non-executive directors on a board is clearer when comparing firms in the pre and post King Report periods, as noted in chapter five. This is an important finding to both regulators and companies in the light of recent corporate failures in South Africa that have been blamed on poor corporate governance structures.

CEO/ chairman separation

In general, CEO/chairman duality or separation was not shown to have a consistent impact on firm performance. This may be due to the impact of the JSE listing requirements, which forced listed companies to separate the two roles without considering the cost and benefit of different board structures. In addition, the length of time taken to show the impact of behaviour change could also be a factor in the inconclusive findings.

Directors' ownership

The inconsistent results of the influence of directors' ownership on performance across the three models show that directors in South African firms are not motivated by equity, but prefer receiving their rewards in term of salaries and other allowances. The alignment of directors' interest and shareholders' interest was not supported by the results. This is an area on which regulators and shareholders may want to place more emphasis. To some extent this was addressed by the third King Report (2010, p 43), which states that "companies should adopt remuneration policies and practices that create value for the company over the long term. The policies and practices should be aligned with the company's strategy, reviewed regularly and be linked to the executive's contribution to performance", further, it states that "the remuneration policy should address base pay and bonuses, employee contracts, services and retirement benefits and share-based and other long-term incentive schemes".

Board Size

Results regarding board size and performance also did not show a significant relationship between the two. Size is determined by many factors including the nature and complexity of the business. It is important, therefore, for regulators to be more specific with regard to recommendations regarding board size, rather than simply requesting companies to have at least two directors (CEO and CFO) as specified in the third King Report (2010).

6.4 Limitations of the study

An important limitation of this study is the use of VAIC as a proxy for firm performance. Performance measurement of intellectual capital is still in its infancy and thus this proxy may not be representative of a firm's intellectual capital. However, no universally accepted method of measuring intellectual capital exists (Zambon, 2004), and VAIC is one of the easily obtained measures for intellectual capital and has been used over the past ten years. The same model specifications were used for the analysis of all three dependent variables that are thought to measure performance, so that a comparison could be made. However, other studies employing different control variables could reveal different results.

The study has focused on only four board attributes, ignoring other aspects of corporate governance that could affect firm performance, such as institutional investors, number of board meetings and board committees.

Information about the board of directors in each firm is available in the annual reports of listed companies only, and therefore this study only examined listed companies. Inferences cannot be drawn about all companies in South Africa from this, including parastatal and non-governmental firms which form a crucial part of the economy.

6.5 Future research directions.

The literature review for this study elaborated on research undertaken on a limited set of issues concerning the development of corporate governance. Further research could address the impact of a wider range of corporate governance variables on the efficiency of the Value Added to a firm.

Further research could also focus on distinguishing between independent and non-independent non-executive directors, an issue which was emphasised in King Report III. A study comparing the criteria for independent non-executive director across countries and its impact on performance which sheds light on these criteria should be useful.

The inclusion of different board committees is required by King Report III. The availability of different committees and their impact on performance could be a topic for future research. In addition, the King III Report (2010) has expanded on new aspects of corporate governance, such as risk management, internal audits and integrated sustainability reporting and disclosure, which provide new space for further research.

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APPENDICES

Appendix A: Major chapters and sections of the second King Report (2002).

The King Report split into six chapter, following are the main chapters and sections covered in each chapter.

	Descriptive
Chapter one:	Boards and directors
Sub-sections:	a. roles and functions of the board; b. the chairperson; c. roles of the CEO; d) roles of non-executive directors; e) directors selection and development; f) directors appraisal; g) disqualification of directors; h) committees of the board and; i) role of company secretary
Chapter two:	Risk management
Sub-sections:	a) definitions; b) responsibilities for risk management; c) assimilating risk to the control environment and; d) application of risk management.
Chapter three:	Internal audit
Sub-sections:	a) status of internal audit; b) role and function of internal audit and; c) scope of internal audit.
Chapter four:	Integrated sustainability reporting

Sub-sections:	a) introduction and scope of review; b) stakeholder relations; c) ethical practice and organizational integrity; d) safety, health and the environment; e) social and transformation issues including black economic empowerment and; f) human capital.
Chapter five:	Accounting and auditing
Sub-sections:	a) auditing; b) non-audit services; c) legal backing for and monitoring of compliance with accounting standards; d) information technology and; e) accessible of financial information.
Chapter six:	Compliance and enforcement
Sub-sections:	a) legal mechanisms; b) enforcement of existing remedies; c) principles of disclosure; d) role of the media; e) encouraging shareowner activism; f) the role of organized business and; g) enforcement in other jurisdictions.

Appendix B: World latest Corporate governance Codes

Source: http://www.ecgi.org/codes/all_codes.php

Country	Description
Algeria	Code Algérien de Gouvernance d'Entreprise 2009
Argentina	Código de Mejores Prácticas de Gobierno de las Organizaciones para la República Argentina January 2004

Australia	Corporate Governance Principles and Recommendations 3 June 2010
Austria	Austrian Code of Corporate Governance January 2009
Bahrain	Corporate Governance Code Kingdom of Bahrain 16 March 2010
Bangladesh	Principles of Good Corporate Governance and Best Practice Recommendations March 2003
Belgium	The 2009 Belgian Code on Corporate Governance 12 March 2009
Brazil	Code of Best Practice of Corporate Governance (4th edition) September 2009
Canada	Corporate Governance: Guide to Good Disclosure (January 2006) January 2006
China	Provisional Code of Corporate Governance for Securities Companies 15 January 2004
Commonwealth	CACG Guidelines: Principles for Corporate Governance in the Commonwealth November 1999
Cyprus	Cyprus Corporate Governance Code (2nd edition, March 2006) March 2006
Czech Republic	Corporate Governance Code based on the OECD Principles (2004) June 2004
Denmark	Recommendations on Corporate Governance August 2011
Egypt	Code of Corporate Governance for Listed Companies 13 February 2011
Finland	Finnish Corporate Governance Code 2010 15 June 2010
France	Recommendations on corporate governance - Revised 2011 31 March 20112003
Germany	German Corporate Governance Code as amended on 26

	May 2010 26 May 2010
Ghana	Corporate Governance Guideleines on Best Practices 2010
Greece	SEV Corporate Governance Code For Listed Companies 24 March 2011
Hong Kong	Hong Kong Code on corporate governance 19 November 2004
Hungary	Corporate Governance Recommendations 11 March 2008
Iceland	Corporate Governance Guidelines June 2009
India	Corporate Governance Voluntary Guidelines 2009 24 December 2009
Indonesia	Code of Good Corporate Governance 2006 January 2007
International	Sovereign Wealth Funds: Generally Accepted Principles and Practices (GAPP) - Santiago Principles October 2008
Ireland	Corporate Governance Code for Irish Domiciled Collective Investment Schemes September 2010
Italy	New Regulation on Banks' Organisation and Corporate Governance 4 March 2008
Jamaica	Code on Corporate Governance (Final) 25 October 2006
Japan	Principles of Corporate Governance for Listed Companies December 2009
Kenya	- Principles for Corporate Governance in Kenya 2002

Latin America	Latin America corporate governance white paper 2003.
Lithuania	Corporate governance Code for the companies listed in the National Stock Exchange of Lithuania 23 April 2003.
Macedonia	White paper on corporate governance in South-Eastern Europe June 2003
Malaysia	Malaysian Code on Corporate Governance (Revised 2007) 1 October 2007
Malta	Principles of Good Corporate Governance: Revised Code for Issuers of Listed Securities 3 November 2005
Mexico	Código de Mejores Prácticas Corporativas 2010 2010
Morocco	Code Marocain de Bonnes Pratiques de Gouvernance des Etablissements et Entreprises Publics (EEP) 2 February 2011
New Zealand	Corporate Governance in New Zealand: Principles and Guidelines - A Handbook for Directors, Executives and Advisers 16 March 2004
Nigeria	Code of Corporate Governance 27 January 2011
Norway	The Norwegian Code of Practice for Corporate Governance 21 October 2010.
OECD	OECD Guidelines on Corporate Governance of State-Owned Enterprises September 2005
Pakistan	Stock Exchange Code of corporate governance 4 March 2002 (with its revision 28 March 2002.
Pan-European	EFAMA Code for External Governance 6 April 2011
Peru	Principios de Buen Gobierno para las sociedades

	Peruanas July 2002.
Poland	Code of Best Practice for WSE Listed Companies 19 May 2010.
Portugal	CMVM Corporate Governance Code 2010 (Recommendations) 8 January 2010
Romania	Bucharest Stock Exchange Corporate Governance Code 22 January 2009
Russia	The Russian Code of corporate conduct 4 April 2002
Saudi Arabia	Corporate Governance Regulations in the Kingdom of Saudi Arabia 12 November 2006
Singapore	Guidelines on Corporate Governance for Banks, Financial Holding Companies and Direct Insurers which are incorporated in Singapore 9 December 2010
Slovakia	Corporate Governance Code for Slovakia January 2008
Slovenia	Corporate Governance Code 8 December 2009
South Africa	King Report on Corporate Governance for South Africa King Report II, (March 2002), King Report III (July 2010)
South Korea	Code of Best Practices for Corporate Governance February 2003
Spain	Unified Good Governance Code 19 May 2006
Sweden	The Swedish Code of Corporate Governance January 2010
Switzerland	Swiss Code of Best Practice for Corporate Governance 21 February 2008
Taiwan	Taiwan corporate governance best-practice principles 2002.

Thailand	The Principles of Good Corporate Governance For Listed Companies 2006 March 2006
The Netherlands	Governance Principles for Insurance Companies 15 December 2010
The Philippines	Code of Corporate Governance 2002
The World	ICGN statement on Global corporate governance principles 9 July 1999.
Tunisia	Guide de Bonnes Pratiques de Gouvernance des Entreprises Tunisiennes 25 June 2008
Turkey	Corporate Governance Principles February 2005
United Kingdom	Corporate Governance Guidance and Principles for Unlisted Companies in the UK November 2010
USA	Report of the New York Stock Exchange Commission on Corporate Governance 23 September 2010

Appendix C: Empirical studies on corporate governance

Researcher	Performance measures	Sample & country	Findings
Demsetz & Lehn 1985	Accounting profit	511 firms from Corporate Data Exchange Banking and Finance & Fortune 500. 1980-1981. U.S.A	• Negative relationship between directorate ownership and performance.
Kesner. 1988	Variety of performance measures	250 firms from the Fortune 500 firms. 1983	• Positive and significant correlation between director's ownership and performance in rapid growth companies.
Morck et al. 1988	Tobin's Q	371 Fortune firms 1980 U.S.A	• Director's ownership from 0percent-5percent, Q increased 30percent, Q decreased with ownership between 5percent-25percent, and finally, Q rose slowly as board ownership increased beyond 25percent.
Finkelstein, 1992	Return on equity. Natural logarithm of	1763 managers serving on 102 large U.S firms from Ward's Directory of	• Positive and significant relationship between

	sales. Number of acquisitions.	50000 largest U.S corporations.	level of directors' ownership and firm performance.
Rosenstein & Wyatt 1997	Stock price reaction to the appointment of inside directors on the board.	170 inside directors from the "Who's News" section of Wall Street Journal. 1981-1985. USA	When directors own less than 5percent, stock price declined. For ownership between 5percent and 25percent, stock price increased. Over 25percent ownership, stock price declined again.
McWilliams & Sen, 1997	Stock price reaction to anti takeover amendments	265 firms proposing anti takeover amendments for which data are available. 1980-1990	Performance negatively related to directors' ownership on the board.
Bhagat & Black, 1999	Variety of performance measures	1724 publicly owned US firms from S&P'S 500ExecuCompDatabase. 1992-1996. USA	Positive and significant relationship between directors' ownership and performance.
Gedajlovic & Shapiro, 2002	Profitability.	334 listed Japanese companies from World Scope Disclosure. 1986-1991.	Negative correlation with firm performance
Ho & Williams, 2003	Efficiency of value added by a firm's total	286 Publicly held companies in South Africa, Sweden, and the	Result failed to show unconditional link between board attributes and firm

	resources	UK. 1998	performance across any of the three nations, rather results show some significant link between individual board feature and individual measure of firm performance.
Chaganti et al., 1985	Firm's failure	42 retailing firms. 1970-1976. U.S.A	• Non-failed firms tended to have larger boards. • Firms with larger boards have greater chances for survival. • Board Size and corporate failure are related.
Goodstein et al., 1994	Number of services added. Number of service divested. –Number of services reorganised.	Cross-sectional data of 334 hospitals. 1980-1985. U.S.A	• Negative correlation between Board Size and performance.
Yermack, 1996	Tobin's Q	Panel of 452 large U.S firms. 1984-1991. U.S.A	• Significant negative Board Size effect. • Smaller board fire CEOs more

			frequently. • Large changes in Board Size have significant price impact. • CEO remuneration less performance dependent if Board Size is large or not.
Eisenberg et al., 1998	Return on assets	785 small Finnish firms. 1992-1994 Finland	• Significant negative correlation between Board Size and performance. • Bad performance implies larger board changes
Beiner et al., 2004	Tobin's Q	165 publicly firms contained in the Swiss performance Index. 2001. Switzerland	• Insignificant correlation between Board Size and firm performance.
Coles et al., 2004	Tobin's Q.	8165 firms from compact disclosure and IPRC. 1992-2001 U.S.A	• Tobin's Q positively related with Board Size for firms that have greater advising requirements.
Boone et al., 2005	-Market-to-book ratio. -R&D expenditure.	1019 IPOS firms. 1988-1992 U.S.A	• Larger & more diverse firms have larger boards. • Firms with lower cost

	-Return variance.		of monitoring managers have larger boards. • Board Size is a reflection of changes in the firm's competitive environment and managerial term.
Anderson et al., 2004	-Cost of dept financing. -Integrity of financial accounting reporting.	1052 firms from the Lehman Brothers Fixed Income database, and the S&P 500. 1992 U.S.A	• Board Size is positively related to performance.
Beasley & Salterio. 2001	-Number of non-executive directors on serving voluntary on the audit committee.	627 firms included in the Report on Business 1000 Canadian firms. 1994. Canada	• Larger boards are positively related to firm performance.
Mangena & Chamisa, 2008	Suspension from the JSE Securities Exchange as a measure of corporate governance	81 suspended firms from the JSE Securities Exchange	• NED is significant and negative with suspension; • Board size and Duality was insignificant; • Directors shareholding insignificant

Abidin et al., 2009	Efficiency of value added by a firm's total resources	75 Malaysia firms	• NED and larger board are significant and positive impact on firm performance • Duality and directors ownership are insignificant for firm performance
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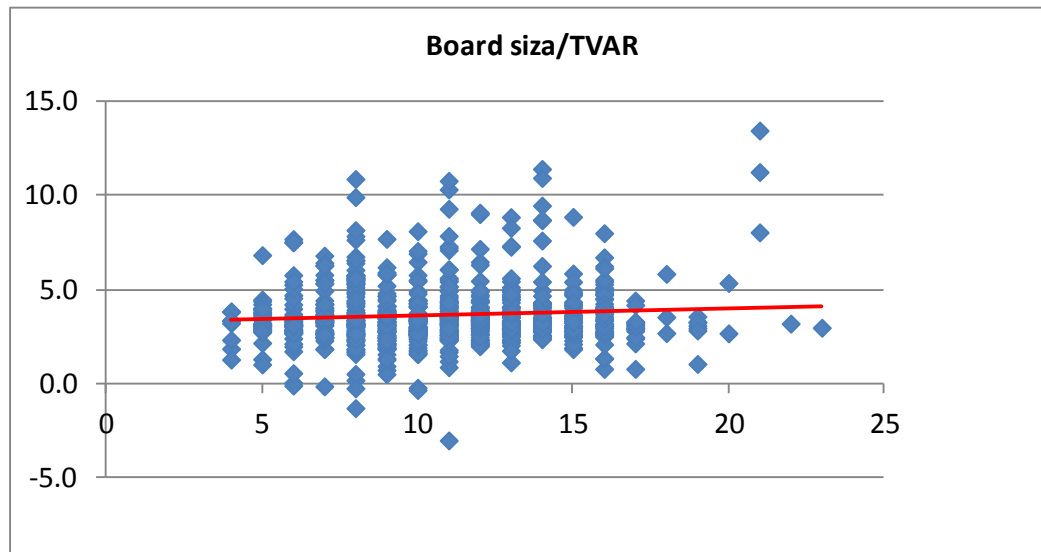
University of Cape Town

Appendix D: VAIC calculation

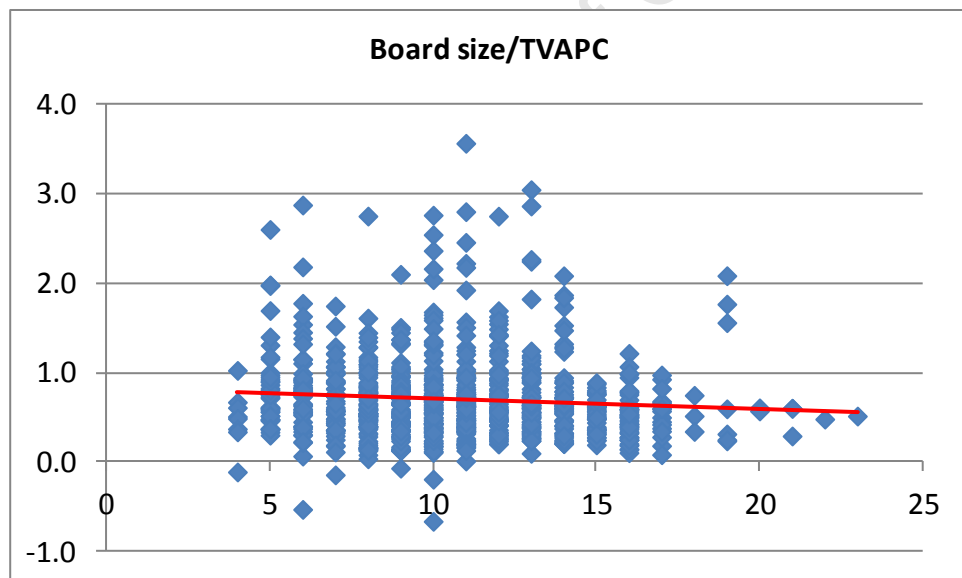
Summary of basic information for company <i>i</i>			
Company		A	B
Interest Expense		748,000	25,642
Depreciation expense		1,248,000	35,898
Dividends		679,667	52,816
Tax expense		1,101,000	1,613
Equity of minority interests		612,000	8,277
Earnings retained		3,020,333	86,951
Book value of net assets (BVi)		26,609,000	524,720
Salaries & wages (HCi)		1,296,000	188,117
Equation used in calculation		Company A	Company B
$VA_i = Int_{exp} + Dep_i + Div_i + Tax_{exp} + Int_{ym} + Eor_{ret}$		7,409,000	211,197
$CCE_i = \frac{VA_i}{SP_{HCi}}$		0.278	0.402
$HCE_i = \frac{VA_i}{HC_{Tot}}$		5.717	1.123
$SC_i = VA_i - HC_{Tot}$		6,113,000	23,080
$SCE_i = \frac{SC_i}{VA_i}$		0.825	0.109
$VAIC_i = CCE_i + HCE_i + SCE_i$		6.820	1.634
$TVAC_i = HCE_i + SCE_i$		6.542	1.232
$TVAPC_i = CCE_i$		0.278	0.402

Appendix E: Scatter plots

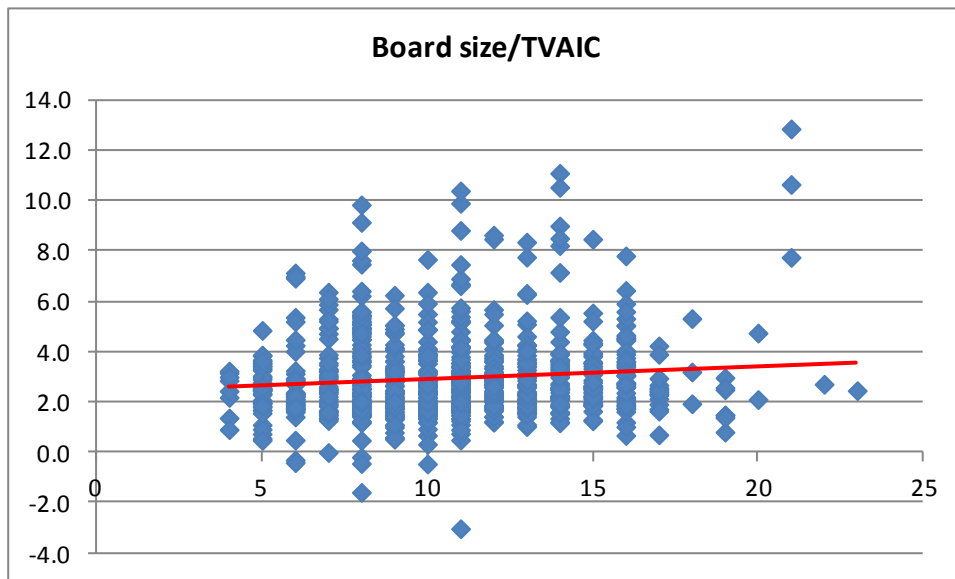
Graph 1: scatter plots board size vs TVAR



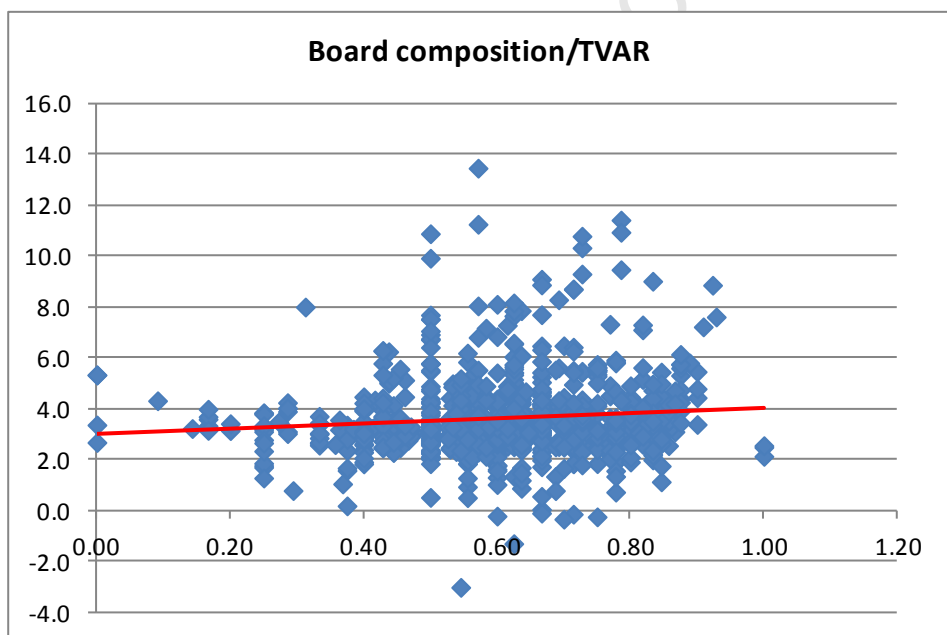
Graph 2: scatter plots board size vs TVAPC



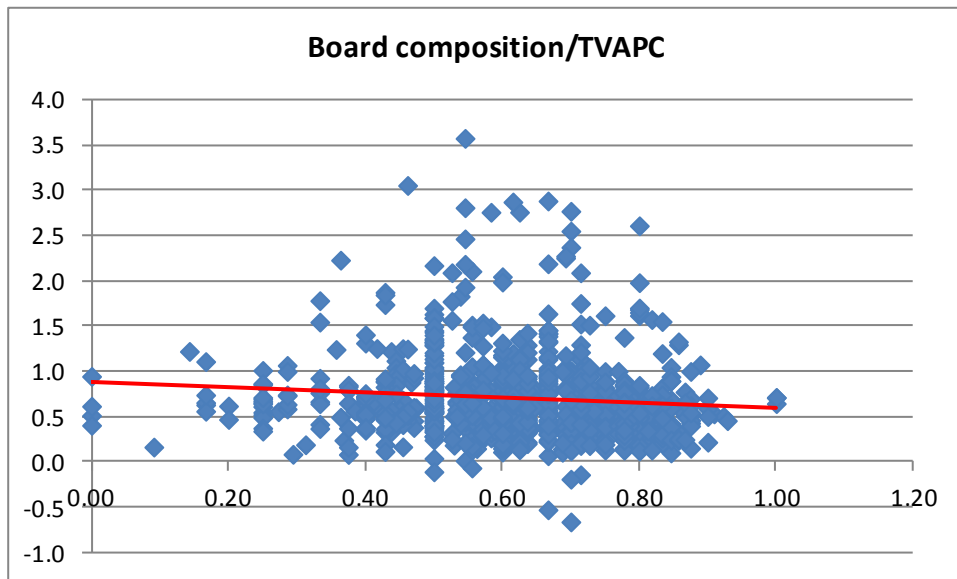
Graph 3: scatter plots board size vs TVAIC



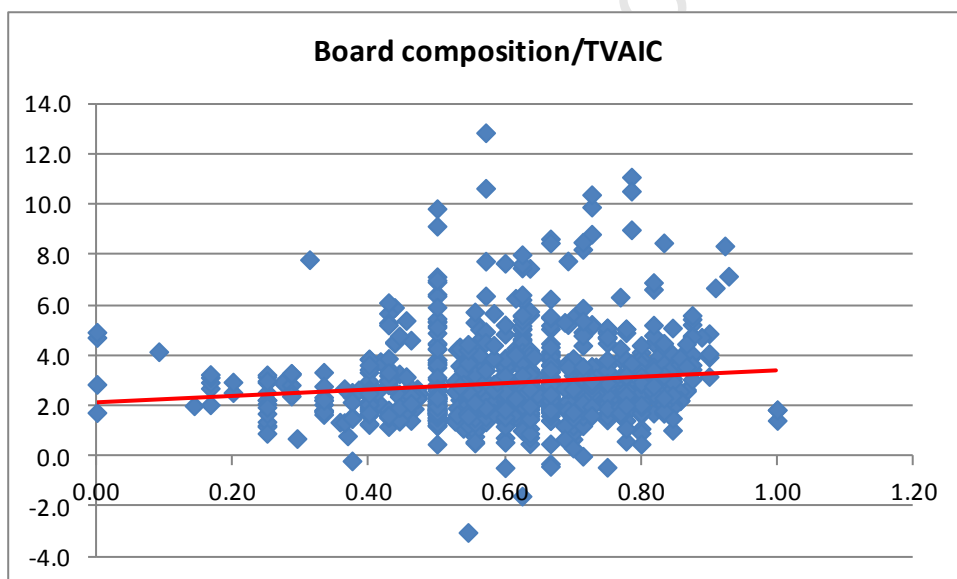
Graph 4: scatter plots board composition vs TVAR



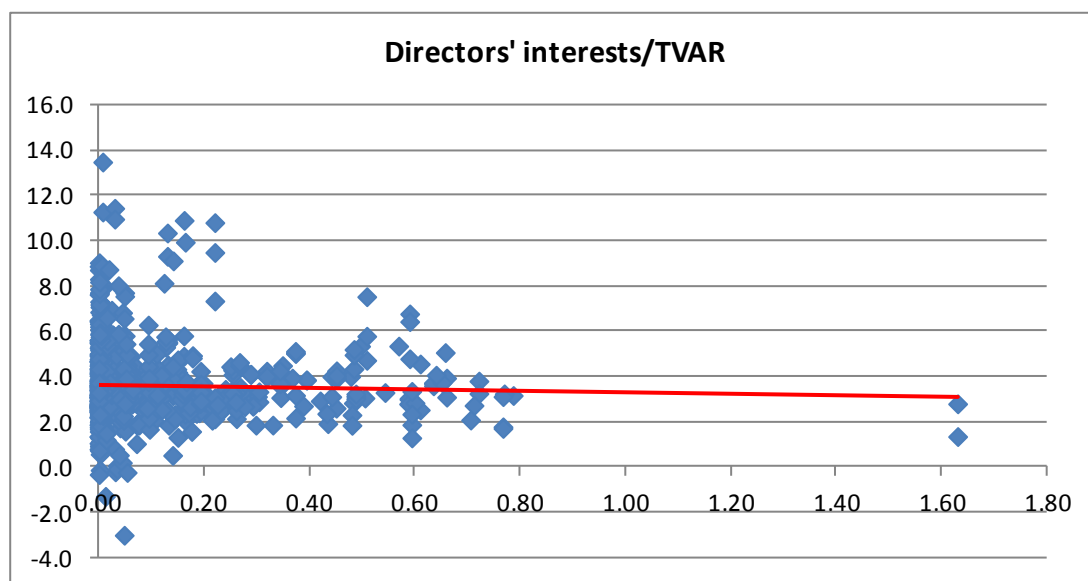
Graph 5: scatter plots board composition vs TVAPC



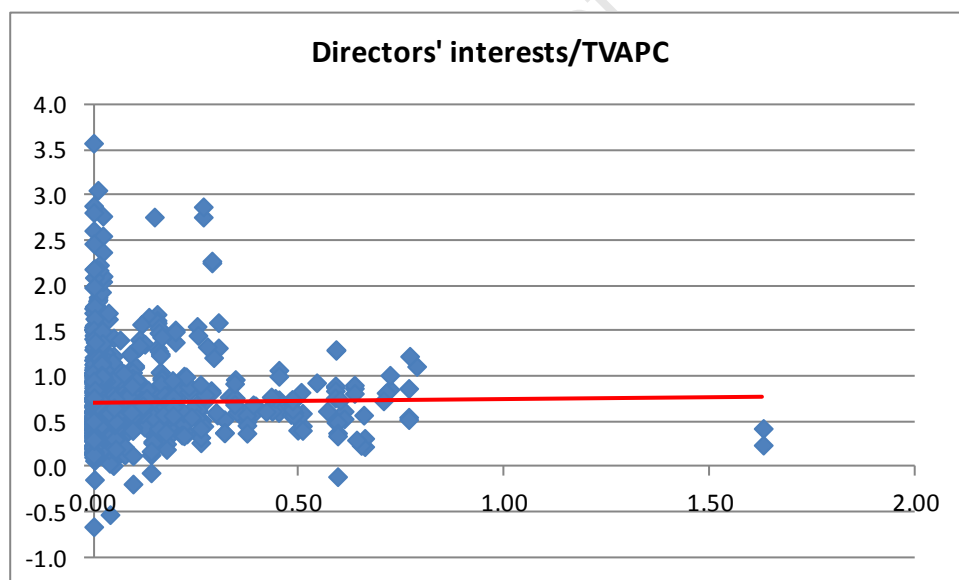
Graph 6: scatter plots board composition vs TVAIC



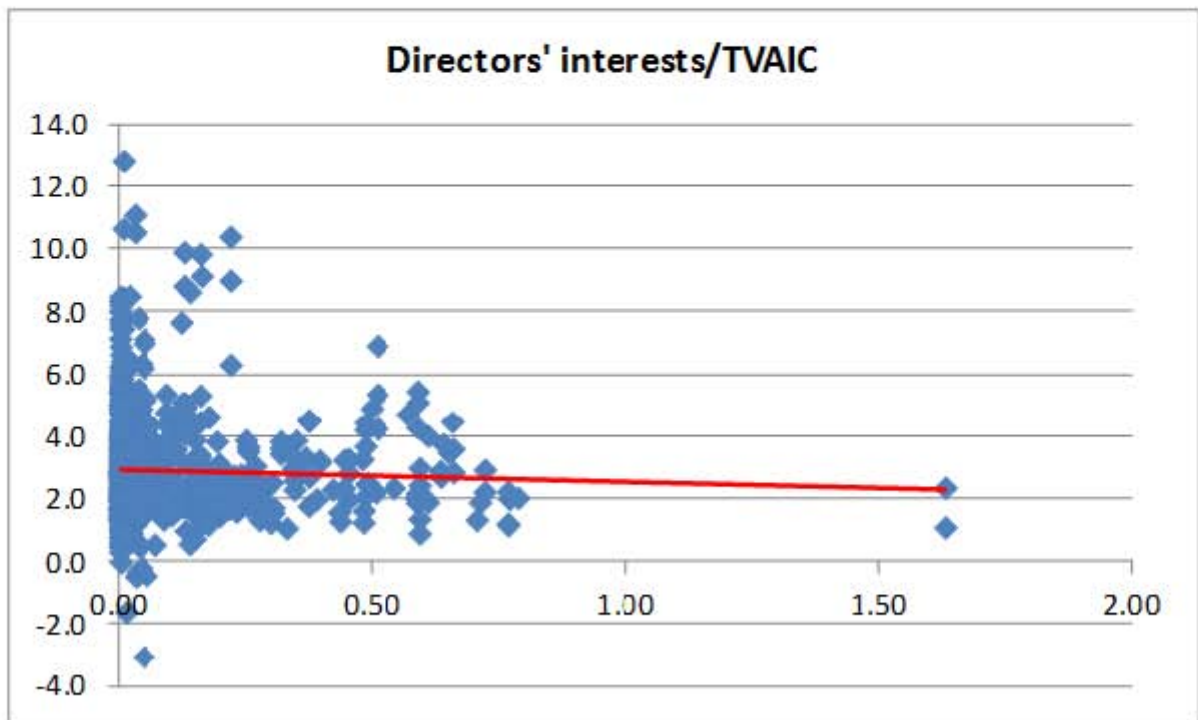
Graph 7: scatter plots board composition vs TVAR



Graph 8: scatter plots board composition vs TVAPC



Graph 9: scatter plots board composition vs TVAIC



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Table 1: Yearly descriptive statistics of all variables

	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate Size	TVAR	TVAPC	TVAIC
2001	Mean	10.45	0.11	0.26	0.55	0.07	0.13	0.16	0.47	3.37	3.22	0.64	2.58
	Std Devn	3.74	0.17	0.44	0.17	0.06	0.11	0.12	0.19	0.67	1.19	0.31	1.19
	Mini	4.00	0.00	0.00	0.00	-0.08	-0.21	0.00	0.00	1.85	0.19	0.08	-0.19
	Maxi	19.00	0.79	1.00	0.90	0.25	0.46	0.55	0.82	5.11	7.70	1.55	6.25
	n	96	96	96	96	96	96	96	96	96	96	96	96
2002	Mean	10.38	0.10	0.22	0.58	0.07	0.13	0.18	0.48	3.46	3.23	0.65	2.59
	Std Devn	3.15	0.16	0.41	0.17	0.07	0.12	0.12	0.18	0.68	1.39	0.34	1.39
	Mini	5.00	0.00	0.00	0.00	-0.08	-0.17	0.00	0.04	1.65	-3.02	0.01	-3.03
	Maxi	20.00	0.77	1.00	0.90	0.26	0.42	0.56	0.76	5.20	6.48	1.83	5.68
	n	97	97	97	97	97	97	97	97	97	97	97	97
2003	Mean	10.57	0.10	0.12	0.59	0.08	0.15	0.18	0.49	3.50	3.35	0.70	2.65
	Std Devn	3.23	0.16	0.32	0.14	0.06	0.12	0.11	0.17	0.65	1.10	0.36	1.14
	Mini	5.00	0.00	0.00	0.17	-0.06	-0.16	0.00	0.00	2.25	0.51	-0.07	0.58
	Maxi	17.00	0.77	1.00	1.00	0.27	0.42	0.55	0.75	5.15	7.86	1.75	7.47
	n	95	95	95	95	95	95	95	95	95	95	95	95
2004	Mean	10.67	0.10	0.11	0.59	0.08	0.15	0.17	0.49	3.54	3.36	0.67	2.69
	Std Devn	3.33	0.16	0.32	0.14	0.06	0.11	0.13	0.18	0.61	1.09	0.37	1.14
	Mini	5.00	0.00	0.00	0.17	-0.11	-0.23	0.00	0.06	2.47	0.04	-0.19	-0.30
	Maxi	19.00	0.77	1.00	1.00	0.22	0.39	0.64	0.90	5.23	6.42	1.87	5.41
	n	96	96	96	96	96	96	96	96	96	96	96	96
2005	Mean	10.67	0.10	0.11	0.59	0.09	0.18	0.15	0.48	3.59	3.54	0.69	2.85
	Std Devn	3.33	0.16	0.32	0.14	0.06	0.12	0.11	0.19	0.60	1.29	0.36	1.33
	Mini	5.00	0.00	0.00	0.17	-0.04	-0.06	0.00	0.07	2.55	-0.10	0.11	-0.40
	Maxi	19.00	0.77	1.00	1.00	0.26	0.70	0.47	1.15	5.27	7.52	1.99	6.93
	n	96	96	96	96	96	96	96	96	96	96	96	96
2006	Mean	10.85	0.09	0.00	0.62	0.10	0.20	0.13	0.50	3.65	3.62	0.68	2.94
	Std Devn	3.71	0.22	0.00	0.16	0.07	0.11	0.09	0.19	0.57	1.23	0.35	1.28
	Mini	4.00	0.00	0.00	0.20	-0.13	-0.16	0.00	0.05	2.62	0.56	0.07	0.49
	Maxi	23.00	1.63	0.00	0.90	0.25	0.49	0.28	1.05	5.23	7.69	1.78	7.49
	n	93	93	93	93	93	93	93	93	93	93	93	93
2007	Mean	10.69	0.09	0.00	0.65	0.09	0.19	0.12	0.50	3.73	3.73	0.66	3.07
	Std Devn	3.20	0.22	0.00	0.16	0.07	0.12	0.08	0.19	0.57	1.39	0.38	1.43
	Mini	4.00	0.00	0.00	0.25	-0.13	-0.19	0.00	0.05	2.63	-0.14	-0.53	0.00
	Maxi	22.00	1.63	0.00	0.91	0.37	0.45	0.27	0.93	5.25	7.85	1.93	7.64
	n	93	93	93	93	93	93	93	93	93	93	93	93
2008	Mean	10.69	0.07	0.00	0.67	0.08	0.18	0.19	0.51	3.78	3.66	0.66	2.99
	Std Devn	3.06	0.15	0.00	0.14	0.08	0.14	0.12	0.19	0.59	1.23	0.37	1.26
	Mini	4.00	0.00	0.00	0.25	-0.13	-0.20	0.00	0.03	2.61	1.02	0.14	0.56
	Maxi	17.00	0.71	0.00	0.88	0.34	0.49	0.71	0.92	5.34	7.17	1.98	6.63
	n	90	90	90	90	90	90	90	90	90	90	90	90
2009	Mean	10.93	0.06	0.00	0.68	0.06	0.14	0.17	0.51	3.82	3.37	0.57	2.79
	Std Devn	3.08	0.14	0.00	0.13	0.07	0.13	0.11	0.21	0.66	1.36	0.38	1.37
	Mini	4.00	0.00	0.00	0.33	-0.12	-0.18	0.00	0.01	1.71	-0.34	-0.66	-0.44
	Maxi	17.00	0.71	0.00	0.93	0.21	0.49	0.72	0.87	5.66	7.61	1.57	7.16
	n	92	92	92	92	92	92	92	92	92	92	92	92

Table 2: Descriptive statistics by Sectors

Secotor	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	Leverage	Corporate Size	VAIC	TVAPC	TVAIC
Basic Materials	Mean	10.69	0.08	0.09	0.60	0.08	0.18	0.17	0.51	3.58	3.51	0.81	2.70
	Std Dev	3.58	0.18	0.29	0.15	0.06	0.12	0.12	0.18	0.60	1.13	0.41	1.23
Consumer Goods	Mean	10.29	0.07	0.12	0.63	0.06	0.12	0.15	0.48	3.65	3.12	0.49	2.63
	Std Dev	3.51	0.15	0.33	0.16	0.09	0.16	0.13	0.21	0.78	1.67	0.42	1.55
Consumer Services	Mean	10.67	0.11	0.11	0.61	0.08	0.14	0.14	0.46	3.60	3.52	0.54	2.98
	Std Dev	3.18	0.21	0.32	0.16	0.07	0.12	0.10	0.19	0.59	1.30	0.24	1.33
Healthcare	Mean	8.67	0.09	0.00	0.58	0.06	0.15	0.19	0.54	3.57	3.27	0.84	2.43
	Std Dev	3.24	0.19	0.00	0.14	0.06	0.15	0.08	0.18	0.77	1.00	0.33	1.12
Industrials	Mean	10.79	0.10	0.09	0.61	0.08	0.18	0.17	0.50	3.61	3.52	0.70	2.82
	Std Dev	3.20	0.16	0.29	0.14	0.06	0.12	0.11	0.19	0.63	1.24	0.35	1.27
Oil & Gas	Mean	10.44	0.11	0.00	0.66	0.07	0.13	0.09	0.41	3.89	3.53	0.34	3.20
	Std Dev	3.97	0.19	0.00	0.19	0.05	0.08	0.09	0.05	0.80	0.58	0.00	0.57
Technology	Mean	11.10	0.07	0.07	0.64	0.08	0.16	0.16	0.48	3.55	3.35	0.66	2.69
	Std Dev	2.81	0.13	0.26	0.19	0.06	0.10	0.11	0.20	0.61	1.02	0.21	1.09
Telecommunication	Mean	10.33	0.15	0.00	0.59	0.09	0.17	0.14	0.48	3.66	3.69	0.49	3.20
	Std Dev	3.81	0.25	0.00	0.19	0.05	0.09	0.11	0.12	0.60	0.90	0.00	0.90

Table 3: Yearly regression analysis of Independent variables and Control Factors on TVAR.

VAIC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.045	-0.351	0.271	0.289	16.905	-0.612	-0.276	1.129	0.566
	P-value	0.054	0.428	0.089	0.475	0.000	0.713	0.646	0.015	0.000
	R ²	0.963								
2002	Coefficients	-0.020	0.537	-0.149	-0.399	23.534	-5.453	0.322	1.714	0.557
	P-value	0.619	0.429	0.571	0.548	0.000	0.021	0.737	0.011	0.001
	R ²	0.928								
2003	Coefficients	0.048	0.886	-0.358	0.669	16.913	-2.689	0.038	1.363	0.236
	P-value	0.065	0.169	0.187	0.273	0.000	0.122	0.965	0.012	0.060
	R ²	0.949								
2004	Coefficients	0.008	1.074	0.046	0.977	17.117	-1.237	0.297	1.696	0.173
	P-value	0.752	0.082	0.864	0.101	0.000	0.442	0.661	0.001	0.152
	R ²	0.954								
2005	Coefficients	0.024	1.038	0.350	0.881	12.932	-0.520	0.888	0.242	0.322
	P-value	0.336	0.061	0.189	0.126	0.000	0.715	0.306	0.623	0.009
	R ²	0.959								
2006	Coefficients	-0.013	0.618		1.348	10.598	0.478	1.215	0.144	0.398
	P-value	0.630	0.251		0.006	0.000	0.722	0.156	0.751	0.005
	R ²	0.965								
2007	Coefficients	0.006	0.673		1.074	9.212	1.394	0.307	0.193	0.397
	P-value	0.866	0.281		0.065	0.000	0.315	0.779	0.696	0.019
	R ²	0.958								
2008	Coefficients	-0.031	0.349		2.111	9.394	0.113	0.408	0.076	0.393
	P-value	0.330	0.514		0.000	0.000	0.927	0.572	0.876	0.004
	R ²	0.962								
2009	Coefficients	0.046	0.658		1.835	10.001	0.543	1.470	0.475	0.091
	P-value	0.331	0.391		0.013	0.011	0.759	0.188	0.400	0.655
	R ²	0.924								

Table 4: Yearly regression analysis of Independent variables and Control Factors on TVAPC.

TVAPC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.003	0.193	-0.149	0.082	-1.314	1.185	1.146	0.205	-0.076
	P-value	0.717	0.334	0.028	0.628	0.351	0.100	0.074	0.318	0.195
	R ²	0.241								
2002	Coefficients	-0.027	0.027	-0.153	-0.234	-0.782	0.967	0.334	0.240	-0.015
	P-value	0.054	0.919	0.092	0.323	0.648	0.271	0.675	0.360	0.831
	R ²	0.179								
2003	Coefficients	-0.007	-0.032	-0.190	-0.219	0.422	0.366	0.295	0.577	-0.123
	P-value	0.556	0.914	0.123	0.452	0.812	0.637	0.742	0.027	0.059
	R ²	0.138								
2004	Coefficients	0.014	-0.036	-0.067	-0.354	-0.639	1.494	1.145	0.501	-0.132
	P-value	0.197	0.887	0.537	0.168	0.674	0.026	0.024	0.031	0.025
	R ²	0.320								
2005	Coefficients	0.009	-0.158	-0.149	-0.322	-2.037	2.300	0.389	0.248	-0.164
	P-value	0.363	0.468	0.143	0.168	0.066	0.000	0.696	0.188	0.004
	R ²	0.395								
2006	Coefficients	-0.014	-0.212		-0.186	-1.176	1.843	0.511	0.382	-0.088
	P-value	0.263	0.416		0.446	0.303	0.004	0.749	0.077	0.291
	R ²	0.296								
2007	Coefficients	0.004	0.162	0.000	-0.148	-1.414	1.709	3.058	0.001	-0.080
	P-value	0.798	0.594		0.610	0.223	0.009	0.192	0.995	0.391
	R ²	0.168								
2008	Coefficients	-0.022	-0.069	0.000	0.136	-0.755	0.950	1.068	0.240	-0.081
	P-value	0.138	0.792		0.648	0.527	0.110	0.053	0.317	0.286
	R ²	0.181								
2009	Coefficients	-0.026	-0.113		-0.238	-0.390	1.000	0.696	0.159	0.068
	P-value	0.137	0.712		0.484	0.794	0.151	0.348	0.479	0.441
	R ²	0.154								

Table 5: Yearly regression analysis of Independent variables and Control Factors on TVAIC.

TVAIC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
2001	Coefficients	-0.048	-0.559	0.410	0.210	16.163	-1.527	-1.204	0.513	0.528
	P-value	0.074	0.324	0.033	0.664	0.000	0.453	0.505	0.379	0.002
	R ²	0.525								
2002	Coefficients	0.003	-0.120	-0.006	-0.493	19.198	-4.313	-0.467	0.398	0.311
	P-value	0.944	0.879	0.981	0.477	0.000	0.095	0.842	0.604	0.125
	R ²	0.405								
2003	Coefficients	0.021	0.427	-0.350	0.235	17.485	-3.738	-0.798	0.392	0.180
	P-value	0.449	0.544	0.222	0.730	0.000	0.041	0.702	0.514	0.232
	R ²	0.364								
2004	Coefficients	-0.013	0.724	0.029	0.784	19.162	-3.374	-0.856	1.070	0.166
	P-value	0.661	0.321	0.926	0.282	0.000	0.076	0.547	0.103	0.317
	R ²	0.427								
2005	Coefficients	0.006	0.821	0.391	0.485	16.355	-3.088	-0.489	0.243	0.296
	P-value	0.824	0.192	0.182	0.471	0.000	0.045	0.865	0.653	0.068
	R ²	0.489								
2006	Coefficients	0.015	0.358	0.000	0.879	14.006	-2.772	3.712	0.222	0.242
	P-value	0.634	0.565		0.134	0.000	0.064	0.332	0.665	0.227
	R ²	0.499								
2007	Coefficients	0.024	0.049	0.000	0.528	13.749	-2.315	-5.076	0.380	0.266
	P-value	0.547	0.946		0.449	0.000	0.137	0.367	0.505	0.237
	R ²	0.456								
2008	Coefficients	-0.014	-0.120	0.000	1.176	12.603	-2.356	-0.099	0.069	0.228
	P-value	0.684	0.847		0.098	0.000	0.093	0.939	0.902	0.204
	R ²	0.460								
2009	Coefficients	0.070	0.118	0.000	0.942	13.313	-1.330	0.227	0.206	-0.128
	P-value	0.124	0.880		0.278	0.001	0.452	0.904	0.719	0.568
	R ²	0.400								

Table 6: Regression analysis of Independent and Control variables on TVAR per sector.

VAIC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
Basic Materials	Coefficients	0.016	-0.925	-0.204	-0.623	4.580	5.192	-1.242	-0.591	0.267
	P-value	0.5496	0.5650	0.3777	0.2968	0.1808	0.0088	0.4562	0.2531	0.0654
	R ²	0.581								
Consumer Goods	Coefficients	0.018	-0.461	-0.263	0.213	6.343	0.355	-1.814	0.424	0.435
	P-value	0.371	0.416	0.508	0.587	0.021	0.795	0.046	0.271	0.000
	R ²	0.431								
Consumer Services	Coefficients	0.052	0.436	0.072	0.397	9.803	0.878	3.915	0.059	0.008
	P-value	0.001	0.175	0.695	0.193	0.000	0.130	0.012	0.778	0.928
	R ²	0.666								
Healthcare	Coefficients	-0.107	14.625	0.118	4.172	3.768	3.173	9.032	0.462	-0.372
	P-value	0.280	0.220	0.629	0.000	0.756	0.536	0.437	0.833	0.311
	R ²	0.987								
Industrials	Coefficients	-0.005	-0.276	0.100	1.008	15.444	-2.247	0.199	0.897	-0.150
	P-value	0.764	0.291	0.521	0.004	0.000	0.059	0.804	0.046	0.170
	R ²	0.459								
Technology	Coefficients	0.032	1.929	-0.596	-1.120	16.587	-2.509	6.373	4.646	-0.160
	P-value	0.404	0.026	0.068	0.160	0.007	0.332	0.005	0.000	0.426
	R ²	0.628								

Table 7: Regression analysis of Independent and Control variables on TVAPC per sector.

TVAPV	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
Basic Materials	Coefficients	-0.006	-0.170	-0.009	-0.091	0.775	0.510	1.602	0.040	-0.012
	P-value	-1.134	-0.514	-0.190	-0.740	1.103	1.260	4.672	0.373	-0.388
	R ²	0.455								
Consumer Goods	Coefficients	-0.012	-0.260	0.030	0.179	-0.131	1.460	0.242	0.272	-0.156
	P-value	0.015	0.060	0.756	0.061	0.841	0.000	0.268	0.004	0.000
	R ²	0.696								
Consumer Services	Coefficients	-0.007	0.173	-0.132	0.098	-0.100	1.005	1.156	0.492	0.063
	P-value	0.444	0.366	0.229	0.588	0.892	0.004	0.212	0.000	0.244
	R ²	0.238								
Healthcare	Coefficients	-0.067	-1.328	-0.238	-0.515	-7.501	3.218	22.874	-2.651	-0.064
	P-value	0.366	0.876	0.227	0.272	0.427	0.416	0.032	0.148	0.811
	R ²	0.891								
Industrials	Coefficients	-0.002	-0.149	-0.077	-0.149	-2.335	1.563	0.301	0.163	-0.136
	P-value	0.761	0.207	0.270	0.339	0.036	0.004	0.404	0.419	0.006
	R ²	0.132								
Technology	Coefficients	-0.005	-0.122	-0.293	-0.238	9.465	-3.249	0.485	-0.155	0.276
	P-value	0.842	0.821	0.156	0.638	0.016	0.052	0.727	0.764	0.035
	R ²	0.269								

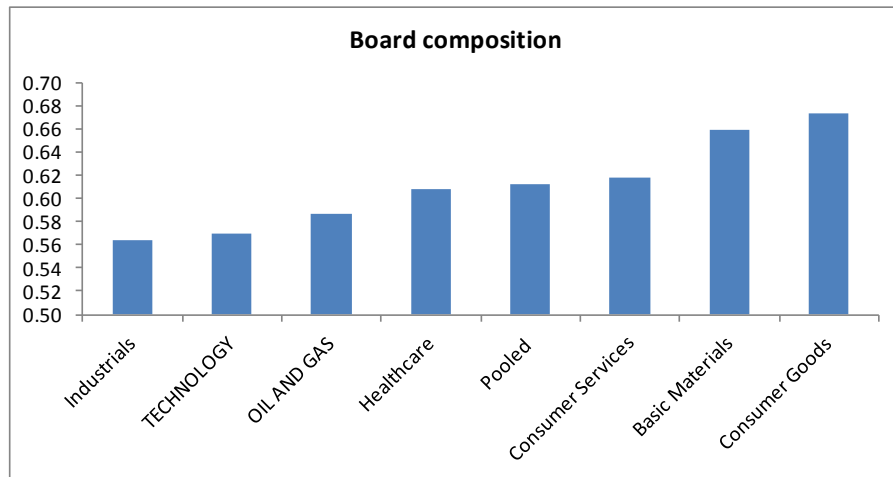
Table 8: Regression analysis of Independent and Control variables on TVAIC per sector.

TVAIC	Statistic measures	Board size	Directors' interests	Leadership Structure	Board composition	ROA	ROE	DY*	LEVERAGE	Corporate size
Basic Materials	Coefficients	0.022	-0.209	-0.185	-0.378	3.924	4.465	-2.632	-0.630	0.296
	P-value	0.3954	0.8943	0.4138	0.5173	0.2407	0.0210	0.1073	0.2132	0.0369
	R ²	0.516								
Consumer Goods	Coefficients	0.029	-0.203	-0.289	0.000	6.504	-1.071	-2.007	0.135	0.592
	P-value	0.152	0.719	0.466	1.000	0.017	0.431	0.027	0.723	0.000
	R ²	0.399								
Consumer Services	Coefficients	0.060	0.043	0.213	0.295	16.043	-3.162	1.625	0.688	-0.075
	P-value	0.002	0.910	0.333	0.417	0.000	0.000	0.379	0.007	0.487
	R ²	0.586								
Healthcare	Coefficients	-0.040	15.953	0.356	4.687	11.268	-0.045	-13.842	3.113	-0.308
	P-value	0.723	0.257	0.246	0.000	0.445	0.994	0.325	0.259	0.471
	R ²	0.982								
Industrials	Coefficients	-0.006	-0.048	0.226	1.068	17.702	-3.646	-0.282	0.408	0.075
	P-value	0.708	0.863	0.172	0.004	0.000	0.004	0.739	0.391	0.518
	R ²	0.459								
Technology	Coefficients	0.016	2.929	-0.064	-0.746	-0.302	2.960	6.521	2.633	-0.326
	P-value	0.681	0.001	0.846	0.361	0.961	0.267	0.005	0.002	0.118
	R ²	0.574								

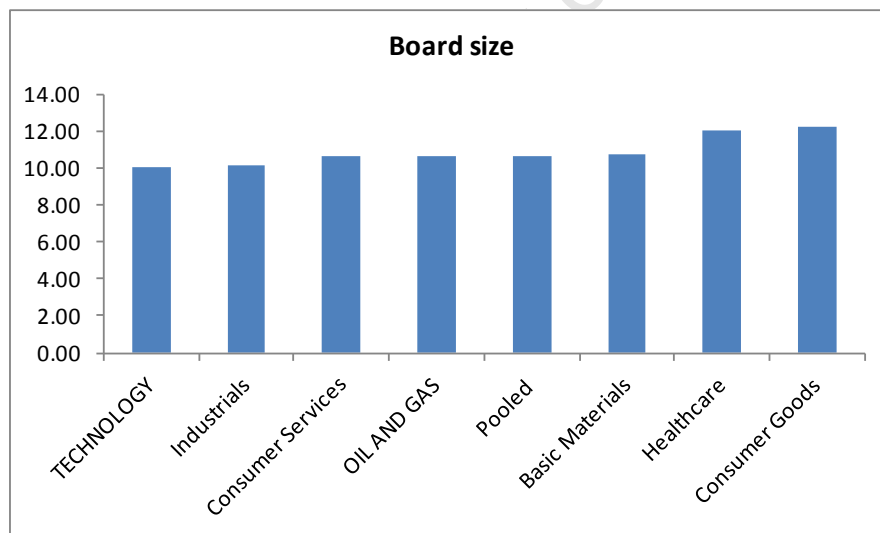
Index of graphs

Descriptive statistics of variables included in this study.

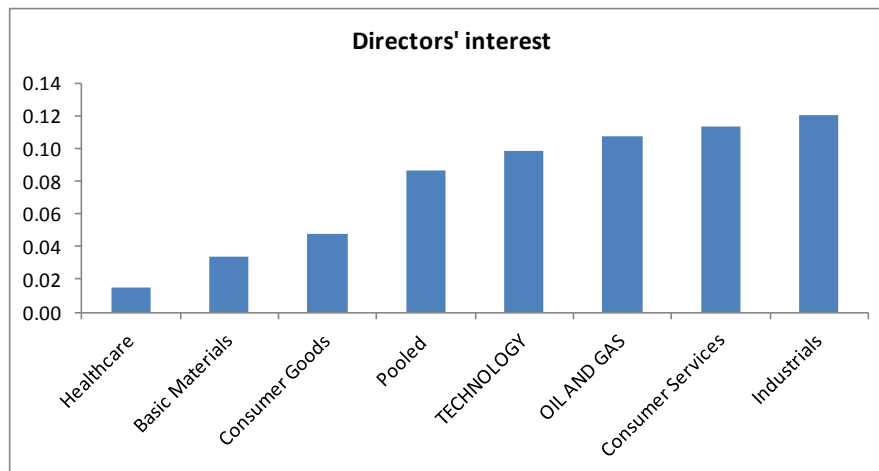
Graph 1: Average board composition in the pooled sample, and JSE sectors



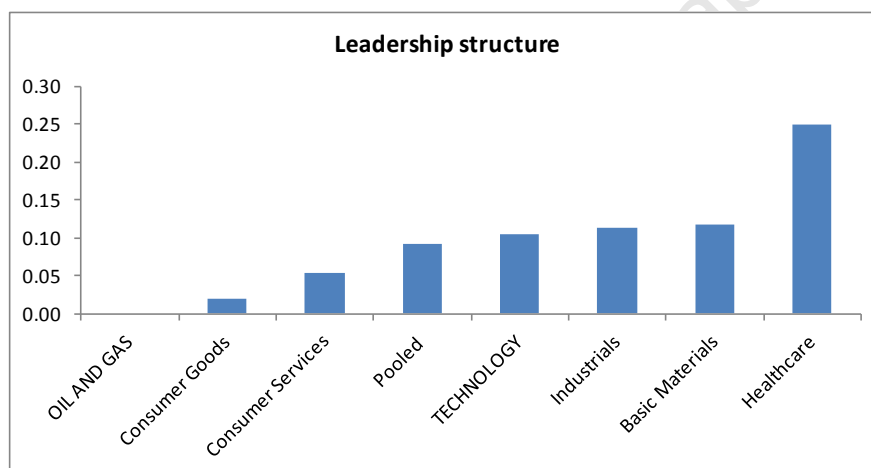
Graph 2: Average board size in the pooled sample, and JSE sectors



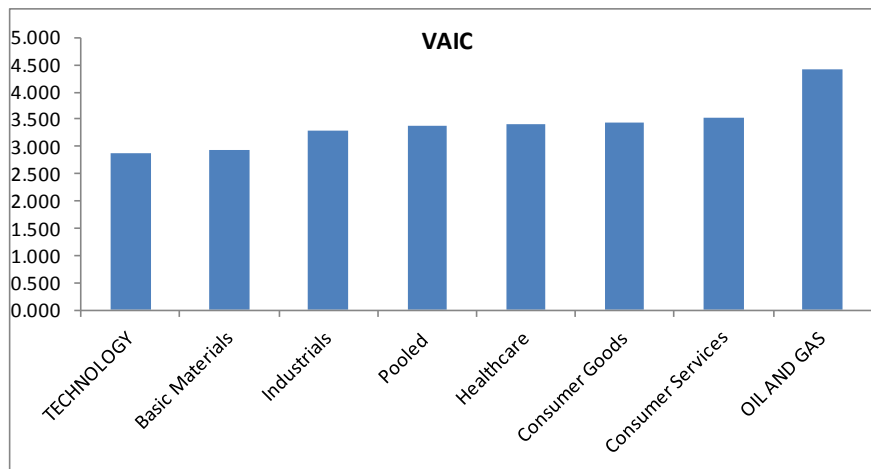
Graph 3: Average directors' interest in the pooled sample, and JSE sectors



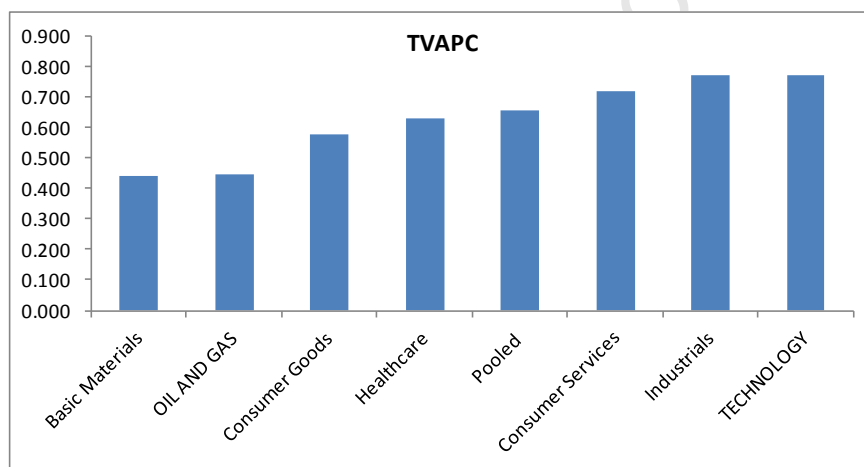
Graph 4: Average leadership structure (duality) in the pooled sample, and JSE sectors



Graph 5: Average TVAR in the pooled sample, and JSE sectors



Graph 6: Average TVAPC in the pooled sample, and JSE sectors



Graph 7: Average TVAIC in the pooled sample, and JSE sectors

