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The relationship between company performance and CEO compensation for JSE versus ALTX listed companies in South Africa

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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Abstract

An examination of companies listed on the JSE main board and Alternate Exchange in South Africa over a five year sample period provides evidence that, after controlling for company size, performance, growth opportunities and industry, CEO's of Alternate Exchange companies are compensated 12% less than their JSE main board counter parts. Company performance is measured using both return on equity and annual percentage change share price while company size is measured by total assets and growth opportunities by Tobin's Q. The listing boards are contrasted using fixed effect time series panel regressions of companies on each index separately and then with the entire sample of companies while measuring the effect of index in the form of a dummy variable. No significant relationship between CEO compensation and company performance was found for ALTX listed companies while for JSE main board listed companies, company performance measured using annual change in share price was positively associated with CEO compensation which indicates that agency problems could be prevalent at ALTX listed companies. The difference in the relationship between CEO compensation and company performance for JSE main board versus ALTX listed companies is attributed to governance regulations. The presence of a designated advisor therefore results in CEO's receiving less compensation however comply or explain regulations requiring the presence of a remuneration committee, preventing CEO duality and board independence is associated with a stronger relationship between company performance and CEO compensation. The paper therefore highlights whether lower CEO compensation absolutely is preferable to CEO compensation that is better justified because of a dependence on company performance and how this consideration relates to a company being listed on either the JSE main board or the ALTX.

Declaration

I, _____, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Robert James Hurry

Signed at ……

On the …….. day of …… 20…..

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Chapter 1. Introduction

1.1 Purpose of the study

The purpose of this research is to determine whether governance regulations affect the relationship between the compensation of the CEO at a company and the performance of that company in a South African context. This is achieved by comparing whether there is a significant difference between the relationship of CEO compensation and company performance for Johannesburg Stock Exchange (JSE) Main Board listed versus Alternate Exchange (ALTX) listed companies in South Africa. JSE listed companies are subject to a number of additional corporate governance related regulations when compared to Alternate Exchange listed companies (JSE, 2014a) and this study intends to find the affects these regulations have on the agency problem at the root of excessive CEO compensation.

1.2 Context of the study

With the inception of the first stock exchange in 1856 and the rapid growth of companies largely attributed to the industrial revolution (Scholtz & Smit, 2012), a new form of manager was required to manage the destiny of companies which could no longer be handled successfully by the owner or conventional shareholders. The problem then arose that these managers, executives or agents (driven by self-interest) could not be relied upon to act in the best interest of the company and its shareholders or the principal (Eisenhardt, 1989). Corporate governance practices and different types of executive compensation have been used to address this issue with varied results (Eisenhardt, 1989). This misalignment has also led to the formulation of a number of theories regarding the principal and the agent.

The underlying assumption regarding agency theory holds that the agent or in this case the manager and the principal or shareholders of the company have divergent interests (Hill & Jones, 1992). The principal therefore uses incentives in conjunction with monitoring mechanisms in order to align the goals of the agent with that of the principal. In contrast stewardship theory dictates that managers will by default act in the interest of the company and therefore the company's goal should simply be to best enable the manager to do his or her job through structures and any other means necessary (L. Donaldson & Davis, 1991). When contrasted these theories bring into question whether high compensation is in fact necessary in order to align the goals and self-interested behaviour of the CEO with that of the business. The application of agency theory is further complicated by the fact that many listed companies do not have outright majority shareholders, limiting their ability to monitor and control the actions of the manager as a single unit which may encourage the rent seeking behaviour of management (Eisenhardt, 1989).

Public companies in South Africa are generally listed on the Johannesburg Stock Exchange or the Alternate Exchange. The Alternate Exchange (ALTX) is a board administered by the Johannesburg Stock Exchange (JSE) for small to mid-sized listings (JSE, 2014b). Smaller companies can use the exchange to raise capital with the eventual intention of becoming listed on the JSE main board. The ALTX board therefore lists companies of smaller size than the JSE and generally companies with shorter histories (JSE, 2014b). Companies on the ALTX are therefore deemed riskier than those on the JSE which are deemed to have a longer proven track record. ALTX listed companies have to comply with the same regulations as JSE listed companies with a few notable exceptions (JSE, 2012). Companies listed on the JSE must fully comply with the King report (All three of the revisions) on corporate governance while ALTX companies are exempt from two important points regarding CEO compensation (Governance & Directors, 2002). ALTX companies are however required to appoint a designated advisor who oversees the company's compliance with listing requirements(JSE, 2012). The King report dictates that companies must fully disclose executive remuneration figures as well as providing justification for the amount through a remuneration committee (Governance & Directors, 2002). Along with these figures, companies are also required to distinguish between the salary and performance based components of the remuneration figures (Oberholzer & Theunissen, 2012). The King code also stipulates that the position of chairman of the board and the CEO of the company should be held by different people (Governance & Directors, 2002). ALTX listed companies are exempt from the above points regarding remuneration and oversight (JSE, 2012). The greater level of corporate governance forced on companies regarding executive compensation should therefore in theory strengthen the relationship between company performance and executive compensation as well as guarding against possible rent seeking behaviour by executives (Core, Holthausen, & Larcker, 1999). A comparison between JSE and ALTX listed companies is therefore of particular interest because the listing boards can be used as proxies to compare the effects of corporate governance regulations regarding executive compensation on the relationship between CEO compensation and company performance.

Labour unrest and widening inequality in South Africa has brought many to question the high compensation CEO's in the country receive (Preston, 2014) and whether this high compensation is firstly necessary and secondly whether highly paid executives do in fact improve company performance. It has also been highlighted by the governor of the South African Reserve Bank, Gill Marcus, foregoing an annual salary increase to serve as an example to South African executives (Fin24, 2014). At the heart of this debate lies the relationship between management and shareholders and how shareholders can ensure that management acts in the best interests of the company. This has again been brought to the fore with CEO's in some cases earning almost 700

times the amount the average employee at their company earns (Preston, 2014). In the South African context it is therefore of particular interest whether executives do in fact earn their compensation by creating value for the company.

Previous research regarding the JSE listed companies alone has found that there is a relationship between CEO compensation and company performance (Oberholzer & Theunissen, 2012). Separate research has also found that there is also a relationship between company performance and CEO compensation for companies listed on the ALTX (Scholtz & Smit, 2012). This report will therefore attempt to compare this relationship for ALTX versus JSE listed companies in order to find whether the size, perceived risk of a company and corporate governance practices (Approximated in this case using the aggregate differences between ALTX versus JSE listed companies) is in any way related to the relationship of the CEO's compensation and the performance of the company.

It finally highlights the question whether considering the inequality in South Africa, South African executives should take responsibility to shift the South African mind set and compensation policy from a purely agency theory based approach towards that of Stewardship Theory. For South Africa to have any hope for a successful and sustainable economic future this issue will need to be resolved and the extent to which corporate governance can be used to address this issue is therefore of particular interest to this study.

1.3 Problem statement

1.3.1 Main problem

The central problem that this research proposes to solve is to compare the effect that company performance has on CEO compensation for companies listed on the JSE Securities Exchange versus companies listed on the JSE Alternate Exchange (ALTX).

1.3.2 Sub-problems

The first sub-problem is to determine the relationship between company performance and CEO compensation for companies listed on the JSE securities exchange and the JSE Alternate Exchange (ALTX) separately.

The second sub-problem is to determine the extent of the difference of the relationship between company performance and CEO compensation for companies listed on the JSE Alternate Exchange (ALTX) versus those listed on the JSE securities exchange.

1.4 Significance of the study

Excessive CEO compensation is of particular interest to shareholders and other stakeholders of a company, not only because of the more obvious effects on company profitability and shareholder returns but also due to deeper issues such as negative effects on worker morale and higher wage expectation (Wade, O'Reilly III, & Pollock, 2006). Inequality in South Africa as well as recent labour unrest make excessive CEO compensation even more serious because of potential bad publicity and even an ethical issues (Oberholzer & Theunissen, 2012). The study may provide guidance to board members and shareholders in determining remuneration policies for executives and the CEO of the company by providing objective insight into how CEO compensation affects company performance. The study may also provide insight, particularly in a South African context as to whether high CEO compensation in the country is in fact justified by detailing how this compensation relates to company performance. The study may therefore provide an objective measurement of whether CEO compensation in South Africa is excessive. Finally by comparing JSE versus ALTX listed companies, the study may also be used to distinguish whether the relationship between CEO compensation and company performance is dependent on the size of the company, the diversity of its shareholders and most importantly Corporate Governance practices and the regulations under which companies operate.

Finally the study could also be used to measure the effect of the King Code regulation, regarding having a compulsory remuneration committee and a separate chairman of the board and CEO, has on CEO compensation and its relationship with company performance when compared with the presence of a Designated Advisor. It could therefore also possibly be used to determine whether further and stricter regulation can be used as an effective tool to curb excessive CEO compensation or whether simply having greater oversight will have a more pronounced affect.

1.5 Delimitations of the study

- The study is limited to companies listed on the JSE Alternate Exchange (ALTX) and the JSE Securities Exchange main board.
- The study will also be limited to companies with sufficient historical data available to make standard analysis feasible.
- The study will assess the relationship between CEO compensation and company performance at discrete points in time rather than investigating the effects that time lags have on the relationship which has been discussed in other studies (Boschen & Smith, 1995).
- The study is limited to assessing company performance using purely financial indicators rather than other more subjective measures.

1.6 Definition of terms

JSE Securities Exchange: This is the main board of the Johannesburg Stock Exchange. It is the largest stock exchange in Africa and together with the ALTX lists over 400 companies (JSE, 2014b).

JSE Alternate Exchange (ALTX): The JSE Alternate Exchange was founded in 2003 and targets small to mid-sized listings. Listing on the ALTX provides companies with a number of benefits most notably greater access to capital (JSE, 2014b). When a company grows above the R25 Million in subscribed capital threshold and meets other regulations it is automatically moved onto the JSE main board (JSE, 2014a).

King Code: The King Code is a set of guidelines for good corporate governance for businesses. The King Code has had three revisions the most recent of which was published in 2009 (Institute of Directors, 2012). Compliance with the King Code is required in order to list on the JSE main board (JSE, 2014c).

1.7 Assumptions

- Substantially more JSE listed companies fully comply with all regulations stipulated by the King Code (And specifically the remuneration committee and independent chairman requirements) than ALTX listed companies. This would affect conclusions drawn about the effect corporate governance committees have on CEO compensation and company performance. It is deemed to be a reasonable assumption because the aspects of the King Code mentioned are not listing requirements for ALTX listed companies but are for JSE companies (JSE, 2012).
- Companies fully disclose all compensation that the CEO receives and in the appropriate period that it occurs. It is also assumed that CEO compensation figures are reported in a standard fashion and are consequently directly comparable. This is considered a safe assumption because listed companies are required by law to disclose the full compensation paid to executives (JSE, 2014c). This could distort the relationship between CEO compensation and company performance.
- Company Financial reporting and definitions used are the same and therefore directly comparable. Accounting and auditing standards are fairly strictly stipulated by the JSE and therefore this is considered a safe assumption (JSE, 2014c). If proved false however it could distort the relationship between CEO compensation and company performance.

Chapter 2. Literature Review

2.1 Introduction

Research at the nexus between executive compensation and firm performance is underpinned by a number of existing and well researched theories that attempt to describe this relationship such as agency theory. Managers contracts and how these are structured to include company performance when determining compensation are also key to this relationship along with, to a lesser extent, earnings management and the extent to which managers manipulate company earnings for their own gain (Beneish, 2001). Past findings regarding performance and executive compensation are key to this along with the methods used in the analysis and how the fairly complex constructs, company performance and executive compensation are measured.

In comparing this relationship for JSE main board versus ALTX listed companies the major differences between the listings are assumed to be related to firm size and corporate governance. The affects that firm size has on the relationship is therefore explored briefly. Corporate governance and most notably board independence are key considerations as well and include a large existing body of research regarding executive compensation.

2.2 Underlying Theory

2.2.1 Agency Theory

Agency theory as a subject first arose from risk-sharing literature by broadening it to include the agency problems that arise from parties having divergent goals (Eisenhardt, 1989). Central to this topic is the study of the relationship between one party (the principal) that delegates work to another party (the agent) (Eisenhardt, 1989). Agency Theory has been applied in a number of different fields such as economics and politics however in a business context it focusses on the relationship between shareholders as the principal and management as the agent. Agency theory focusses on the divergent interests of shareholders and management in a business and how this issue can be best resolved. In resolving this conflict, agency theory focusses on the contract between the principal and the agent and how it should be structured in order to best correct this misalignment. Agents or managers are driven to maximise their own personal utility which in effect leads to opportunistic behaviour and agency loss (Eisenhardt, 1989).

Three approaches have emerged from agency theory for the principal to address the conflict of interest with the agent (Dalton, Hitt, Certo, & Dalton, 2007). The first is that of independence, which specifies that the board of the company should remain independent from management and therefore remain able judge, monitor and direct the interests of managers towards that of the

company (Dalton et al., 2007). The second approach is that of equity and how by giving a shareholding of the business to the manager or linking the compensation of the manager to the performance of the business, the destinies of the two parties can be made to converge, thereby resolving the agency problem. The final approach relates to what Dalton et al. (2007) refer to as "market for corporate control" whereby the market itself controls the actions of the agent by disciplining the agent should their actions diverge too much from the interests of the company. The three approaches by principals to mitigate the leveraging by agents of their agency advantage outline how corporate governance and manager compensation are key to agency theory. These are topics which this paper will focus on directly when discussing the relationship between CEO compensation and company performance.

Agency theory therefore provides the theoretical base on which management compensation is determined as well as the affects corporate governance and transparency can have in conjunction with this. Agency theory has of course received much criticism and has also resulted in the development of other related theories such as stewardship theory (Cuevas-Rodríguez, Gomez-Mejia, & Wiseman, 2012) and stakeholder theory (Jensen, 2001), both of which are discussed below. Agency theory has been criticized for its simplified approach and the key assumptions related to this (Cuevas-Rodríguez et al., 2012). The approach that it takes to the behaviour of agents is also seen by some as overly negative and therefore exaggerates the divergence of the interests of the principle and the agent. In contrast to this a fundamentally more positive theory has emerged in stewardship theory where the predicted actions of agents are assumed to be far more benign (L. Donaldson & Davis, 1991).

2.2.2 Stewardship Theory

Stewardship theory is based on the premise that the intentions of agents should not be assumed to be entirely self-serving and nefarious (L. Donaldson & Davis, 1991). Managers, when presented with a choice between acting in the interest of the company and not, will choose to act in the interest of the company. Stewardship theory therefore dictates that the actions of managers are more likely to align with the interests of the company because in doing so the utility of the manager is maximized (L. Donaldson & Davis, 1991). Stewardship theory is underpinned by psychological and sociological research rather than from a purely economic standpoint on which agency theory is based (Davis, Schoorman, & Donaldson, 1997). This approach departs from agency theory in that it defines managers whose interests align with the interests of the principal (Or the shareholders) as stewards and managers whose interests do not align as agents (Davis et al., 1997). Researchers have also attempted to bring Stewardship Theory into the stable of agency theory by denoting that it is a simply a variation of agency theory where the irrational actions of the agent may in some cases lead

to stewardship (Albanese et al., 1997). Stewardship theory dictates that shareholder returns will be maximized by ensuring that the structures in place at the company are designed to enable the CEO to be effective and in control (Davis et al., 1997). In conjunction with this it also recommends that CEO's should be given substantial authority and discretion in doing their jobs (L. Donaldson & Davis, 1991). These factors sharply contrast with the strict corporate governance procedures prescribed by agency theory to address the agency problem (Eisenhardt, 1989). When these theories and their subsequent recommendations are applied to the relationship between CEO compensation, company performance and corporate governance, two clearly contrasting results can be expected.

2.2.3 Stakeholder Theory

Stakeholder theory in contrast to agency theory and stewardship theory, argues that the managers of a company should act with the interests of all stakeholders of the company in mind. It moves beyond considering only the manager and the company itself or the agent and principal and instead focusses on all stakeholders of the business including but not limited to customers, investors, suppliers and employees (T. Donaldson & Preston, 1995). The theory does however neglect to present how managers should make the trade-offs required to manage the interests of stakeholders. It also therefore fails to provide guidance regarding how to align manager's objectives with that of the firm's stakeholders. Along with this it would be impossible to attempt to incentivize management based on the way the interests of stakeholders are served because of the number of stakeholders generally involved as well as the divergence of their interests (T. Donaldson & Preston, 1995). To counter this limitation Jensen (2001) developed enlightened stakeholder theory which posits that trade-offs should be made with maximization of the firm value over the long term as the goal. Jensen (2001) also states that in basing decisions on how to best maximise the long term value of the firm, the interests of the firm are served. In the context of this study, enlightened stakeholder theory therefore states that managers should be incentivised to maximize the long term value of the firm and therefore compensation should be similarly aligned with this. The focus on long term value creation by firms will also ensure that society uses its resources the most efficiently in achieving this goal (Jensen, 2001). Jensen (2001) proposes that the Economic Value Added (EVA) is the most effective existing measure of this value however he also acknowledges its limitations when used on a year-to-year basis as well as how it neglects value creation in lower levels of the firm. In the context of executive compensation, enlightened stakeholder theory therefore dictates that the compensation of the CEO of a firm should be dependent on the EVA created by the firm rather than its conventional performance based on returns and profitability.

2.3 Relationship between managers compensation and firm performance

Investigation into CEO compensation has increased a huge amount since the 1990's hand in hand with the rising of compensation received by CEO's (Preston, 2014). It is therefore particularly interesting to assess whether this rise in compensation has been matched by increased company performance or whether it can instead be attributed to the exercising of agency advantage enjoyed by managers. Key to this relationship is the way in which company performance and executive compensation can be objectively measured.

Over the past 10 years, research into the subject of company performance and CEO compensation has grown substantially internationally and more recently in a South African context as well. This research has largely been driven by questions regarding high executive remuneration figures especially considering the inequality so prevalent in South Africa. Initial research conducted by Murphy (1985), the best known research into the topic, found a strong positive relationship between CEO compensation and company performance using over 100 Fortune 500 companies in the United States between 1964 and 1984. Further research by Jensen and Murphy (1990b) found that while significant, executives are still very poorly compensated for the amount of shareholder value created and therefore suggest increasing the equity component of executive compensation packages. Gregg, Machin, and Szymanski (1993)'s analysis of United Kingdom based companies however found a weak relationship in the 1980's and one that disappeared entirely from 1988 onwards which it is important to note was a recessionary period. Griner (1996) then found a significant relationship between company performance and CEO compensation when controlling for company size. More recent research (Girma, Thompson, & Wright, 2007; Gregg, Jewell, & Tonks, 2010) focussing on United Kingdom based companies however have not found any relationship between firm performance and executive compensation or that it is limited to high performing companies. The inconsistency in findings has led more recent research to focus on the relationship at an industry specific level. In a South African context however, possibly due to continued media attention that high CEO compensation has received, there has been fairly recent research into the nature of the relationship (Bradley, 2013; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012; Theunissen, 2010). This research has however proved inconclusive with Bradley (2013) finding no relationship between company performance and CEO compensation for JSE listed companies while Scholtz and Smit (2012) found a strong relationship between CEO compensation and company performance for ALTX listed companies. Scholtz and Smit (2012) however measured company performance using turnover, share price and total assets (usually used as measures of company size and growth) while Bradley (2013) used more conventional measures of Return on Equity, Return on Assets and Earnings per Share but found a significant relationship between CEO compensation and company

size similar to the findings by Scholtz and Smit (2012). Bradley (2013) and Scholtz and Smit (2012) found no significant relationship between the profits earned by the company and the compensation of the CEO. It is however noted that Bradley (2013) used Performance or Return on Assets as the dependant variable in contrast to Scholtz and Smit (2012) who used Compensation as the dependant variable. Research into other papers reveals that the majority of previous researchers have either performed regressions using either both combinations or with compensation as the dependant variable and company performance as the explanatory variable (Gregg et al., 2010; Murphy, 1985; Scholtz & Smit, 2012).

The above research was performed predominantly using a linear regression analysis (LRA) approach to determine the relationship between company performance and executive compensation with the exception of Oberholzer and Theunissen (2012) who used a Data Envelopment Analysis (DEA) technique and found substantially different results to that of existing research. Due to the limited existing research regarding DEA in the relation to the topic, LRA will instead be used in the analysis.

2.3.1 Earnings Management, managers contracts and managerial power

Earnings management is the manipulation of financial and accounting values (mainly by changing the period in which they are occurred) of a business by management for a variety of reasons. In certain cases management may withhold the reporting of profits in one year in order to offset poor profits in a subsequent year. Managers can also overstate profits in order to secure their own jobs or even an improvement in their compensation. Key to this consideration is the concept of Managerial Power which discusses the extent to which managers can use their power within a company to improve their own compensation (Frydman & Jenter, 2010). In favour of this proposition and rent extraction by management is the criticism that managers regularly benefit from the good performance of the company while they are rarely punished for poor performance of the company (Frydman & Jenter, 2010). Options backdating and spring loading (in which options are granted directly before positive news is released by the company resulting in a jump in the share price) have been used in the past by executives to extract greater remuneration from the company and are examples of abuses of managerial power. These issues have been proven to be more prevalent in companies with weak boards, powerful CEO's (Frydman & Jenter, 2010) and this consideration shows that governance practices within a company could also have an effect on CEO compensation which is discussed below.

2.3.2 Company performance

Company performance can be measured by a number of both accounting and market related values but no single measure has been shown to reliably represent the construct in its entirety. It is noted

that the availability and consistency of data makes the usage of accounting measures preferable to more subjective measures or those open to manipulation (Murphy, 1999). The measurement of company performance and the variables used vary between existing pieces of research into the topic however these variables generally include a combination of a measure of earnings as a percentage of capital, a measure related to the price per share of the company and finally a measure of the size of the business (Bradley, 2013; Griner, 1996; Murphy, 1985; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012). Return on Equity as a percentage is the most commonly used measure of performance however it has received criticism for being vulnerable to gearing which could be used by management to adjust the value and extract greater rent from the company. Use of return on assets has been suggested as a means to counteract this (Bradley, 2013) however it does not give a fair refection of returns as a percentage of shareholder equity invested. Other researchers have therefore included the debt to equity ratio of the company as an additional control variable to measure any manipulation of returns using leverage and the extent to which this affects CEO compensation (Jaiteh, 2011).

A measure of the change in share price is generally measured using the annual percentage change in share price (Griner, 1996) and is also used as a measure of firm performance and is particularly appropriate when applied with agency theory because the purpose of compensation is to align executive interests with that of shareholders (Gregg et al., 2010). Past research also reveals that the effect of company size is significant on CEO Compensation (Bradley, 2013; Griner, 1996; Oberholzer & Theunissen, 2012) and this is most commonly measured using total assets of the company. Past research has also included a measure of the growth opportunities or perceived growth opportunities that the company has which in most cases is represented using Tobin's Q (Ozkan, 2011). Tobin's Q is calculated by dividing the sum of the market value of the firm's equity and liabilities by the book value of the firm's equity and liabilities (Ozkan, 2011) as shown in Equation 4.

2.3.3 Executive compensation

The compensation received by CEO's is generally made up of the following basic components: salary, annual bonus, long term incentives, option grants and stock grants however packages can differ substantially (Frydman & Jenter, 2010). The importance of each of these components has changed from the 1950's until the present. CEO Compensation initially consisted of only a Salary and Bonus however post 1960 firms began offering longer term incentives to CEO's in the form of bonus plans based on multi-year performance in order to encourage a more long term and sustainable approach to management from CEO's (Ozkan, 2011).

Most strikingly, compensation in the form of share options has also been included more significantly from the 1980's in order to address the agency problem and better align the goals and management with that of the company (Jensen & Murphy, 1990b). A stock option is a contract offered to executives that allows executives to purchase shares at a future date at a value specified (Murphy, 1985). The diversity and complexity of CEO compensation packages makes accurate measurement of the actual package value problematic as detailed later in this section. The growth in stock options as a form of CEO compensation is largely attributed to changes in tax policies and accounting practices that made the cost of options and performance related remuneration more favourable (Frydman & Jenter, 2010). The use of stock options as a percentage of CEO compensation has declined since 2004 however which may be attributed to the financial crises of 2008 and subsequent declines in stock markets (Frydman & Jenter, 2010).

Valuation of stock options as a component of a CEO's remuneration package is particularly problematic because they can either be measured at the time they are offered by using a valuation technique such as Black-Scholes (Murphy, 1985) or at the date they are exercised however this is susceptible to the direct relationship between stock price growth and the value of the option (Murphy, 1985). Research in the South African context and more recent research internationally has excluded long term incentives in the form of stock options from the measurement of remuneration mainly because the assessments focus on the short term, the declining usage of stock options in remuneration packages and finally for better comparability with other studies (Bradley, 2013; Gregg et al., 2010; Scholtz & Smit, 2012). Due to the possible differences in remuneration policies and the use of stock options between the JSE main board and ALTX assessed it is however deemed prudent to include the value of share options in the final compensation figures used for CEO's. Share appreciation rights are used similarly to share options and have become more common lately in compensation packages in South Africa. The technique used to value share options and share appreciation rights is detailed below.

CEO's in certain cases also own shares in the company at which they work which have been accumulated either through the general purchase, the exercising of options or share appreciation schemes. The relationship between stock holding in a company and both company performance and CEO compensation has been the subject of significant research (Jensen & Murphy, 1990b). Any gains in shares owned by CEO's are however neglected in the calculation of CEO compensation for the research performed due to the mechanical relationship that exists between company performance as measured by annual share price growth and the growth in a CEO's stock holding (Mehran, 1995).

The effects of the Taxation on the amount earned by the CEO further complicates accurately assessing executive compensation especially when executives from different geographical areas are compared (Murphy, 1999). When research is limited to a single country however taxation has generally been excluded from analysis with researchers focussing on pre-taxation income (Bradley, 2013; Griner, 1996; Murphy, 1985; Scholtz & Smit, 2012).

Previous research has generally measured executive compensation by analysing the total compensation received by the executive rather than performing separate analysis on each component of compensation such as salary, bonus and long term incentives (Bradley, 2013; Oberholzer & Theunissen, 2012; Ozkan, 2011). Griner (1996) performed separate analysis for Salary, Salary and Bonus, Salary, Bonus and options taken and finally Salary, Bonus, Options Taken and Options granted as measures of CEO compensation in order to find how each component is effected by firm performance. Griner (1996) found that CEO compensation using any of the above measurements of compensation had a significant positive relationship with company performance measured using Return on Equity. No significant relationship was found between any measure of compensation and Shareholder return by Griner (1996) either which further shows that Total compensation can be used as an adequate representation of CEO remuneration rather than needing to separate compensation into its components.

Based on conventional agency theory and existing research the first hypothesis proposed is that CEO's are compensated accordingly for good company performance in order to align the goals of the agent with that of the principal.

2.3.4 Valuation of share options and appreciation rights

Although results in previous studies have found that the inclusion of share options in executive compensation has a negligible effect on the relationship between performance and compensation however it is considered prudent to include both share options and share appreciation rights in the calculation of compensation for the purposes of this study. This is due to the comparative nature of the study in that the share option policies may differ substantially between the JSE and ALTX indices. In line with previous research share options are valued using the Black Scholes method for calculating the present value of share options on issue (Black & Scholes, 1973; Murphy, 1985).

Share appreciation rights are generally defined as a means with which to compensate employees based on the increase in share price from a given date until a future date. Appreciation rights are structured similarly to share options however the appreciation rights are automatically exercised by the company for the employee and are either paid for entirely by the company or with the employee only paying a much lower nominal fee (Whittington, 2011). Share Appreciation schemes are valued

similarly to share options using the Black Scholes method which falls in line with conventional theory regarding share appreciation rights valuation (Whittington, 2011). Share Appreciation rights are however valued using a strike price of either zero or a value far lower than conventional options.

It is however noted that past research has proposed that because the Black and Scholes technique values the share options from the perspective of how much they cost the company to issue, the true value of the share options may be lower in the hands of risk averse executives (Hall & Murphy, 2000). While Hall and Murphy (2000) propose a different valuation technique to counteract this, it is considered beyond the scope of this research and Black and Scholes technique is used. The valuation of options in this study is therefore subject to the same assumptions on which the Black Scholes models is based namely: no dividends are paid out by the stock during the options life, markets are efficient, no commissions for options trading are paid, a risk free rate exists and finally the returns of companies are log-normally distributed (Black & Scholes, 1973).

2.3.4 Remuneration policies

The purpose of remuneration policies at a company is to attract, motivate and retain managers of a company at the lowest possible cost to the company (Jensen, Murphy, & Wruck, 2004). Remuneration policy can generally be divided into three related aspects namely: The total expected benefits, how the remuneration package is composed and finally how pay and performance are linked. A remuneration policy needs to balance all of the above dimensions in order to best achieve the goals of remuneration policy outlined above (Jensen et al., 2004). Remuneration policies are usually determined by the remuneration committee of a company if one exists or the board of directors at the company. It has even been suggested that regression techniques similar to those used in this study be used to determine the appropriate compensation for management because it removes any danger of subjectivity and guarantees fairness (Baker, Jensen, & Murphy, 1988) this has not however been widely implemented in practice.

2.3.5 Hypothesis 1

As company performance for JSE and ALTX listed companies' increases, the total compensation of the CEO of the company increases.

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \sum_i \delta_i Control\ Var_i + \rho \quad (1)$$

Where COMP = Total CEO Compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value

Control variables are made up of Total Assets, Industry of Company and the Debt/Equity Ratio

The first hypothesis is that one of the possible performance measure coefficients of α or β in Equation 1 is greater than zero with statistical significance.

2.4 The effect of listing board on CEO Compensation and Firm Performance

The second goal of this report is to explore any differences between the relationship of CEO Compensation and Firm Performance for JSE Main Board listed companies versus those listed on the ALTX. The first consideration in this comparison is that of Corporate Governance, its development, application and how it relates to the South African context specifically. Specific investigation into how the regulations for listing on the boards differ will also be key to this comparison. These differences will then be combined with existing theory and research in corporate governance related topics in order to formulate the second hypothesis.

2.4.1 Corporate Governance

Corporate governance as a concept first arose with questions relating to the growing power of executives at companies and the increasing scope for abuse of this power (Scholtz & Smit, 2012). Corporate governance also forms part of one of the control mechanisms specified by agency theory to counteract the agency problem and monitor the actions of executives to ensure their actions are in the interests of shareholders at the company. A number of legally binding and voluntary frameworks have therefore been created to encourage companies to improve their governance procedures as well as in some cases to increase the liability of executives at companies. The Cadbury, Hampel and Greenbury reports published in the United Kingdom in the 1990's serve as examples of this, emphasizing the independence of the board at a company, transparency and the monitoring role the board should play at companies (Ozkan, 2011).

Corporate governance practices in South Africa have improved immeasurably post isolation and many have attributed the dramatic increase in Foreign Direct Investment to this (Vaughn & Ryan, 2006). The improvement in corporate governance in South Africa began with the breakup of the six large mining houses that had considerable power over the economy. Stricter JSE listing regulations were also introduced to diversify the shareholding of companies and decrease the number of non-voting shares in issue (Vaughn & Ryan, 2006). The first King Report was also published in 1994 and in 2002 even more comprehensive corporate governance regulations were added in the second iteration of the King code (Governance & Directors, 2002). More recently King III has been introduced with further improvements. The King Code is a set of voluntary regulations recommended to companies which encourage good governance, transparency and fairness (Institute of Directors, 2012). The King Code encourages board independence by requiring a company's board to have a majority of non-executive directors. It also stipulates that the role of CEO at a company

and the chairman of the board be held by separate people (Institute of Directors, 2012). This issue of CEO duality is of particular interest for the purposes of this research and is further detailed below. Full compliance with the King Code (or failing compliance an adequate explanation of why) is a requirement for a company to list on the JSE main board while compliance with the majority of the King Code is required for listing on the ALTX with a few key exceptions (JSE, 2012, 2014a).

CEO compensation is generally determined by the board of directors of the company and corporate governance and governance relating to board composition and independence is of particular interest to this report. A chairman that is independent of the CEO as well as ensuring board independence are regarded by Jensen et al. (2004) as key factors in reducing the agency problem at a company. The independence of the board and the level of influence the CEO has over the board and its effect on the level of CEO compensation as well as firm performance has been the subject of much research (Core et al., 1999).

2.4.2 Listing requirements for JSE versus ALTX listed companies

Key to the comparison of CEO compensation and company performance for JSE and ALTX listed companies in South Africa is an assessment of the requirements for listing on the boards and more specifically any differences in the corporate governance regulations for companies intending to list. The major differences between the listing requirements for the JSE Main Board and the ALTX are shown in Table 1 to highlight the major differences between the companies that will be assessed as well as informing the research performed and conclusions drawn from the comparison.

Table 1: Key differences between JSE and ALTX listing requirements

JSE Main Board	JSE Alternate Exchange	Regulation Source
A share capital of at least R25 000 000	A share capital of at least R2 000 000	JSE Listing Requirements
A minimum of 20% of each class of equity securities must be held by the public	A minimum of 10% of each class of equity securities must be held by the public	JSE Listing Requirements
The number of public shareholders must be at least 300	The number of public shareholders must be at least 100	JSE Listing Requirements
The board must have an appropriate balance of power with a majority of non-executive directors. This majority of non-executive directors should be independent.	At least 3 directors, or 25% of the directors must be non-executive.	King III Report and JSE Listing Requirements
The company must have a chief executive officer and a chairman and these positions may not be held by the same person.		King III Report
The company must appoint an audit and a remuneration committee. If required by the nature of the business and composition of the board of directors, a risk and nomination committee is also required.	The company must appoint an audit committee that must fulfil the role as set out in the King Code	King III Report
	The company must appoint a Designated Advisor or DA to oversee the listing process as well as the company's continued compliance with listing regulations and general good governance.	JSE Listing Requirements

Sources: (Governance & Directors, 2002; JSE, 2012, 2014c)

Clearly from Table 1, the differences between JSE Main Board and ALTX listing requirements are related to the size of the company (Shown by the share capital requirement) and corporate governance. Of particular interest for the purposes of this research will be the points relating to the independence of the Board and the CEO Duality. Table 1 shows that ALTX listed companies are able to have the positions of chairman of the board and CEO held by the same person which of course leads to CEO duality. The board of JSE listed companies are also required to have a majority of non-executive directors on the board which as stated above determines the CEO's compensation while ALTX listed companies are only required to have a board composed of 25% non-executive directives. Executives and management would therefore have substantially greater power in ALTX listed companies. ALTX companies are however required to appoint a designated advisor to oversee the company's compliance with listing requirements. Finally Table 1 also highlights that JSE listed companies are required to have an independent remuneration committee which would substantially increase the oversight of remuneration policies and the process of determining the CEO's compensation.

2.4.3 Corporate Governance, Firm Performance and CEO compensation

Corporate governance and its effects on firm performance as well as CEO compensation has been the subject of significant research making use of a number of techniques. The majority of the research has focussed on the context of companies in the United States although more recently research focussing on the United Kingdom, Australia and Japan has been performed. No research focussing specifically on the topic in South Africa could be found however a number of articles include corporate governance considerations as secondary considerations in their research into CEO compensation and firm performance (Bradley, 2013; Scholtz & Smit, 2012).

Corporate governance is an extremely broad topic as detailed in the above section and for the purposes of this research, the points in which JSE Main Board and ALTX listing requirements differ in terms of corporate governance regulations will be focussed on. The first major difference is that of JSE listing requiring a majority of non-executive directors while ALTX only requires 25% of the board to be non-executive. Core et al. (1999) found that for companies in the United States in the 1980's, contrary to Managerial Power and Agency Theories, both a higher percentage of executive directors and the size of the board are positively and significantly associated with the total compensation of the CEO. Board independence and company performance research performed by Baysinger and Butler (1985), found that greater board independence resulted in improved firm performance in the next 10 years which corresponds with conventional agency theory. More recently, in a Japanese context, Basu, Hwang, Mitsudome, and Weintrop (2007) found results contradictory to Core et al. (1999), in that by having at least one external or non-managerial director on the board results in

lower total compensation enjoyed by the CEO, a result which corresponds with managerial power theory.

The next major difference between ALTX and JSE main board listing requirements is that of CEO Duality. Core et al. (1999) found that as hypothesized, CEO Duality has a positive significant relationship with CEO compensation which corresponds with Managerial Power theory that increased CEO power over the board will result in greater rent extraction. Research by Conyon (1997) for listed companies in the United Kingdom did not however find a significant relationship with CEO Duality and CEO compensation. In terms of CEO Duality and Company Performance, both Rechner and Dalton (1991) and L. Donaldson and Davis (1991) found evidence in favour of Stewardship Theory and contradictory to agency theory in that CEO Duality and therefore CEO decision making power, resulted in greater returns on equity, returns on investment and even profit margins. The effect that CEO Duality has on a company and executive compensation is difficult to define definitively from previous research and therefore conclusions made by Core et al. (1999), one of the best known pieces on the topic, will be used.

Finally JSE Main Board listing requires a remuneration committee to be appointed to oversee compensation of executives. Findings by L. Donaldson and Davis (1991) show that the introduction of a Remuneration Committee at a company, in line with conventional Agency Theory, has a significant, negative association with total compensation of the CEO. These findings entail that by introducing greater oversight into the CEO remuneration determination process, the remuneration of the CEO is decreased. Remuneration committees are also largely responsible for the determination of remuneration policy at a company which has a significant effect on how the CEO is compensated and the relationship between pay and performance (Jensen et al., 2004).

Clearly from the above research, ALTX listed companies, because of the less stringent corporate governance regulations enforced on them should experience greater rent extraction behaviour from executives than JSE Main Board listed companies. The stricter listing regulations regarding corporate governance for JSE versus ALTX companies result in the proposed hypothesis that JSE CEO Compensation will be relatively lower than that of ALTX CEO's when company performance is controlled for.

It is important to note however that listing regulations for JSE main board companies are applied by the Johannesburg Stock Exchange on a comply or explain basis (Institute of Directors, 2012; JSE, 2014a). A number of in some cases large companies violate governance related listing regulations and have violated regulations over an extended period. The number of suspensions of companies from the JSE historically, which is high relative to the global average still however points to the fact

that that governance regulations and listing requirements still have some control over companies (World Bank, 2008). In further support of this is the Mangena and Chamisa (2008) finding that there were significant relationships between a number of violations in King code related regulations and company suspension from the JSE listing.

While ALTX listed companies may be exempt from several King code related governance regulations, ALTX listed companies are required to appoint a registered Designated Advisor or DA (JSE, 2012). The DA is responsible for ensuring that the company complies with all ALTX listing requirements. DA's have a number of other related responsibilities regarding the behaviour of the company and other governance considerations. DA's are also required to attend board meetings as well as verifying the credentials of the board of directors. Regular reviews of a company's performance and financial health must also be performed by the DA (JSE, 2012).

The existence of designated advisors for ALTX listed further complicates any conclusions drawn regarding corporate governance regulation differences between JSE and ALTX listings. Having a dedicated DA overseeing the company's compliance with the ALTX listing requirements may in fact have more impact regarding how well a company is governed than simply having more stringent listing requirements with regards to JSE listed companies without someone responsible for ensuring compliance.

2.4.4 Hypothesis 2

CEO's of ALTX listed companies in South Africa earn relatively more than CEO's of JSE Main Board listed companies when company performance and company size are controlled for.

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \varepsilon Listing + \sum_i \delta_i Control\ Var_i + \rho \qquad (2)$$

Where COMP = Total CEO compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value, Listing = Board the company is listed on.

Control Variables are made up of Total Assets, Industry of Company and the Debt/Equity Ratio

The second hypothesis is that the Listing coefficient ε is greater than zero with statistical significance in the proposed Equation 2.

2.5 Conclusion of Literature Review

Key to the relationship between company performance and CEO compensation is the concept of agency theory and the fundamental misalignment of interests of managers and stakeholders in a business. Agency theory dictates that management or agents are driven by self-interest and in order to align the interests of managers and shareholders, the compensation of the agent should be

structured in such a way as to ensure that it is in the managers interest to act in the interests of the company (Eisenhardt, 1989). The other recommendation of agency theory is to use governance and monitoring techniques to ensure that the principal is able to assess whether the agent is in fact acting in the interest of the company. The contrasting theory regarding the relationship between managers and the shareholders is that of Stewardship Theory which expects far more benign behaviour from managers (Davis et al., 1997). This theory anticipates that the steward or manager will act in the best interest of the company and should therefore be given as much power as possible in order to facilitate this and maximize returns. These contrasting theories coupled with existing research into the relationship between company performance and CEO compensation are used to develop the first hypothesis that company performance should in fact have a positive relationship with CEO compensation.

Central to the analysis of the effect that ALTX versus JSE Main Board listing has on a company are the differences in regulations governing companies on the boards. Research reveals that apart from size of the company a number of corporate governance related regulations differ between the two boards. Firstly ALTX listed companies are able to have the position of CEO and Chairman of the Board occupied by the same person while JSE listed companies are not able to do this. The composition of the board is also subject to different regulations where JSE listed companies are required to include a majority of non-executive directors while ALTX listed companies only require 25% of the board to be non-executive. JSE listed companies are also required to have a remuneration committee to provide oversight of the CEO compensation determination process while ALTX companies are not required to. These considerations coupled with existing research into the topic as well as agency theory, earnings management and managerial power theories are used to develop the second hypothesis relating to the expectation that CEO's at companies listed on the ALTX should enjoy relatively greater levels of compensation when controlling for company size and performance.

2.5.1 Hypothesis 1

As Company Performance for JSE and ALTX listed companies' increases, the Total compensation of the CEO of the company increases.

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \sum_i \delta_i Control\ Var_i + \rho \quad (1)$$

Where COMP = Total CEO compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value

Control Variables are made up of Total Assets, Industry of Company and the Debt/Equity Ratio

The first hypothesis is that one of the possible performance measure coefficients of α or β in Equation 1 is greater than zero with statistical significance.

2.5.2 Hypothesis 2

CEO's of ALTX listed companies in South Africa earn relatively more than CEO's of JSE Main Board listed companies when company performance and company size are controlled for.

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \varepsilon Listing + \sum_i \delta_i Control\ Var_i + \rho \qquad (2)$$

Where COMP = Total CEO compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value, Listing = Board the company is listed on.

Control Variables are made up of Total Assets, Industry of Company and the Debt/Equity Ratio

The second hypothesis is that the Listing coefficient ε is greater than zero with statistical significance in the proposed Equation 2.

The stricter listing regulations regarding corporate governance for JSE versus ALTX companies will result in JSE CEO compensation being relatively lower than that of ALTX CEO's when company performance, industry and size are controlled for.

Chapter 3. Research Methodology

3.1 Research Methodology

The research performed will be quantitative in nature. Quantitative research is based on rigid analysis of numeric data in order to obtain numeric and quantifiable results from the research (Kothari, 2004). This approach can be used to obtain results regarding the interaction of given variables and any causal relationships between them (Kothari, 2004). In general quantitative research is most appropriate when applied to a well-developed body of theory where theory can guide the research performed (Greener, 2008). There is a large body existing literature and research into the relationship between CEO compensation and Company Performance. The focus of the research is also to quantify the effect that being listed on the JSE main board versus the ALTX has on this relationship. Objective numerical data for both Company Performance and CEO compensation is also readily available (McGregor BFA, 2014). Previous recent research into the topic as well as that of agency theory has also been fundamentally quantitative in nature and it is the purpose of the report to build on this existing body of research (Murphy, 1985; Ozkan, 2011). The theory and previous research regarding company performance and executive compensation along with the agency problem is well developed. This allows specific variables and hypotheses to be developed and used which again supports the selection of quantitative methods (Creswell, 2013).

3.2 Research Design

The study will have an explanatory cross-sectional methodological approach. A cross-sectional approach is defined as an approach where data is analysed at a single point of time and for a cross-section of the entire population in order to make observations about the whole population (Greener, 2008; Saunders, Lewis, & Thornhill 2009). The research performed in this study will analyse data over a number of years while controlling for year in the analysis and is therefore deemed cross-sectional.

Explanatory research is an approach used when the relationships of well-defined variables are analysed and explained (Saunders et al., 2009). Any causality between these variables as well as analysis of which variables exhibit stronger relationships also forms part of explanatory research (Kothari, 2004). Explanatory research therefore relies on a mature theoretical base to build from so that the variables used are well defined and previously described.

The majority of research regarding company performance and executive compensation has been cross-sectional in nature (Core et al., 1999; Mehran, 1995; Murphy, 1985) where time series cross-

sectional or panel regression have been performed with variation between years excluded from analysis.

Early research focussing on company performance and executive compensation was descriptive in nature however with the maturing of the theoretical base, research has more recently become explanatory (Bradley, 2013; Core et al., 1999; Scholtz & Smit, 2012).

3.3 Population and sample

3.3.1 Population

The population for the purposes of the research is that of listed South African companies. More specifically companies listed on the JSE main board and alternate exchange will be examined.

3.3.2 Sample and sampling method

The sample design clearly defines the way in which data for the study will be selected from the entire population available before actual analysis is performed (Kothari, 2004). A census is defined as the recording and use of data from the entire population on which research is performed (Saunders et al., 2009). A census avoids the additional complications and considerations added when using a sampling technique because the entire population is surveyed. A census survey is performed of all companies that have been listed on the JSE and the ALTX for the entire five year sample period from 2009 until 2013. Only companies with performance and compensation data available for the entire five year period are used. In cases where company or compensation data is incomplete or unavailable the company is removed from the survey.

Previous research into company performance and CEO compensation has been performed recently with sample sizes varying from 39 up to 390 (Bradley, 2013; Ozkan, 2011) depending on the availability of data, the size of the index being investigated and finally the level of disclosure of CEO compensation from companies and the availability of this data. Previous research has focussed on CEO compensation and company performance over periods of approximately 5 to 7 years or when analysing the effects of a certain event periods of only 3 years or less (Bradley, 2013; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012). It is therefore proposed that approximately 40 JSE listed companies and 40 ALTX listed companies is an acceptable minimum sample size for the purposes of this research. These companies will be analysed over a five year period from 2009 to 2013. Companies will therefore need to have been listed for at least five years as well have reported accurately on their CEO's compensation over this period.

3.4 The research instrument

The data required is available using the McGregor BFA database (McGregor BFA, 2014). The database contains a collation of data gathered from company financial statements in a standard format. It has also been used in the majority of previous research done in South Africa (Bradley, 2013; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012) which ensures the comparability of the results of this paper. Values for both JSE and ALTX listed companies are available for return on equity, annual share price, total assets, industry, debt and equity directly from the McGregor BFA Database (McGregor BFA, 2014).

The only variables that require further manipulation before being analysed are annual percentage increase in share price (Share), Tobin's Q (Growth opportunities) and the return on equity (ROE). Equation 3, Equation 4 and Equation 5 show how these variables will be calculated. Total annual compensation will also need to be calculated based on the annual salary, any bonuses, performance incentives and the value of share options and share appreciation rights.

$$Share_t = \frac{Share\ Price_t - Share\ Price_{t-1}}{Share\ Price_{t-1}} \quad (3)$$

$$TobinsQ = \frac{Equity_{Market\ Value} + Liabilities_{Market\ Value}}{Equity_{Book\ Value} + Liabilities_{Book\ Value}} \quad (4)$$

$$ROE = \frac{Operating\ Profit}{Total\ Equity} \quad (5)$$

Companies will be categorised into industries based on their given category in the McGregor BFA database. The Industry categories suggested by Murphy (1999) of mining and manufacturing, financial services, utilities and other industries are adapted to the South African context by using sectors similar to those used by the JSE namely: Basic Materials, Consumer Goods and Services, Financial Services, Other Industries (McGregor BFA, 2014) as shown in Table 2.

Table 2: Industry Categories used to define companies analysed.

Industry	Sub Industries
Basic Materials	Mining, Chemicals and other Basic resources
Consumer Goods and Services	Food and Beverages, Household goods, Retailers, Media, Travel and Leisure
Financial Services	Banks, Insurance, Real Estate
Other Industries	Health Care, Technology, Oil and Gas, Industrials and Utilities

3.4.1 Cross-sectional and time series data

The dataset gathered is in the form of cross sectional time series data or panel data with company performance and compensation data gathered for each company over a period of five years. Heterogeneity in the dataset is between time periods or years in the data and therefore panel regressions are performed with fixed effects assumed between years a technique consistent with cross-sectional time series regression (Gregg et al., 2010). This technique ensures that the predicted model will not include the fixed effects that arise due to time or year (Gregg et al., 2010). Heterogeneity between companies is controlled for and represented with a combination of control variables most notably Industry dummy variables, the ALTX listing dummy variable and finally the total assets of the company controlling for company size. The fixed effect time series regression is consistent with the replacement of time or in this case year variable with four dummy variables for the five years in the sample. It is noted that this technique assumes no fixed effect differences exist between companies after the model is applied to take into account expected differences. This cross-sectional time-series approach will therefore be used in line with the majority of existing research (Griner, 1996; Murphy, 1985; Scholtz & Smit, 2012).

3.4.2 Logarithms of Compensation and Total Assets figures

Most previous research has used the logarithm of executive compensation and total assets figures when performing regression analysis. Using the logarithm removes the complexity of having to scale the figure and also reduces the effect that significant outliers have on the analysis (Core et al., 1999). Natural logarithm transforms are deemed suitable for compensation and total assets because both have substantially high variance and neither can ever be negative. The natural logarithms for CEO compensation as well as total assets will therefore be used to reduce the effects of significant outliers generally due to extremely large companies.

3.5 Procedure for data collection

Data will be collected from the McGregor BFA database which contains financial data for companies listed on the JSE and the ALTX in a standard format (McGregor BFA, 2014). Any data not available directly McGregor BFA will be obtained manually from the published financial statements of the companies in question. The McGregor BFA Data List Search can be used to obtain reliable values for the Total Assets, Total Shareholders' Interest (Equity), Share Price, Total Liabilities, Operating Profit and the company's industry in a collated and accessible format (McGregor BFA, 2014). The Total Remuneration (Which includes gains in the value of shares) as well as the Total Annual Compensation figure (which excludes this) are available using the McGregor BFA Director

Remuneration Search for each CEO (McGregor BFA, 2014). Compensation figures are not however available in a collated format directly and will need to be extracted manually for each company and for each year forming part of the assessment (McGregor BFA, 2014) and then collated. Total compensation is calculated individually for each year by summing the total annual compensation of the CEO (Available directly from McGregor BFA Database), the present value of the share options and share appreciation rights issued to the CEO and then subtracting any once off payments such as termination fees.

As discussed in Section 2.3.4 the share options and share appreciation rights components of CEO compensation are valued using the Black Scholes technique. Options are valued at the time that they are issued to the CEO by using the year end price of the share for the year in question. The volatility in share price for each company used in the calculation is represented using the variance in the share price over the last 60 months in line with conventional theory (Black & Scholes, 1973) and a risk free rate for South Africa of 6 % is used. Share options and share appreciation rights issued to CEO's are not collated in the standard format by McGregor BFA and are therefore obtained manually from the McGregor Director Search and then valued using the Black and Scholes technique as discussed above (McGregor BFA, 2014) for every company and year observed in the study.

The majority of listed South African companies have financial year ends on the 28th February and therefore all companies with different financial year ends will be adjusted to the 28th February using the Production Price Index for the appropriate year as published by Statistics South Africa (2014) an approach consistent with existing research (Oberholzer & Theunissen, 2012). Compensation amounts in foreign currency are converted to South African Rand using the exchange rate at the end of the year in which the compensation was received.

3.6 Data Analysis and interpretation

Mathematical Models detailed in the hypotheses of the literature review section of the report are used to construct regression equations. Time series panel regression analysis will be performed on the financial data collected from McGregor BFA for CEO compensation along with the measures of company performance and the control variables. Regression has been used as the consistent approach to comparing company performance and CEO Compensation however other recent research has suggested that Data Envelopment Analysis can also be used as a preferable approach (Oberholzer & Theunissen, 2012). Regression is selected as the method to analyse the relationship because of the large body of existing research already using the technique for similar purposes.

Cross-sectional time-series regression is deemed to be the best to process the data because it is able to explain the variation in a dependant variable in terms of several independent variables as well as

showing the size of impact each independent variable has on the dependant variable (Greener, 2008). A regression equation is also generated which can be used to judge the fairness of a CEO's compensation based on the model proposed by calculating the difference between the compensation anticipated and the actual compensation (Griner, 1996).

Cross-sectional time-series regression analysis will be performed, an approach consistent with the majority existing research on the topic (Gregg et al., 2010; Murphy, 1985) in order to find the coefficients of Equation 1 and 2 hypothesized. The industry variable will be replaced by three dummy variables for the purposes of the regression with the reference variable used being Basic Materials. Before regression is performed however, analysis will be performed to ensure that the regression is in fact valid. The descriptive statistics for CEO compensation and Company Performance for each year forming part of the analysis will also be detailed in order to discover any unexpected annual variation in mean or spread (Bradley, 2013). Autocorrelation will be tested for using the Durbin-Watson statistic, Heteroscedasticity will be measured using means of residuals, normality will be tested and finally Multicollinearity will be tested using the correlation coefficient matrix.

Cross-sectional time-series regression is first performed for JSE Listed companies and Alternate Exchange Listed companies in isolation to provide an indication of how company performance effects CEO compensation for each listing board separately. The proposed regression equation, representing the first hypothesis presented, that will be applied for the JSE Main Board and the ALTX is shown in Equation 5. The relationships found can then be contrasted with existing theory as well as compared for the two listing boards. If any issues relating to autocorrelation or multicollinearity arise between the independent variables ROE, Share or Growth separate regressions can be performed for each of these variables with the same control variables. The approach of performing separate regressions for each performance measure if required is consistent with existing research (Griner, 1996; Ozkan, 2011; Scholtz & Smit, 2012).

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \delta_1 Assets + \delta_2 Leverage + \delta_3 OTH_{Ind} + \delta_4 CON_{Ind} + \delta_5 FIN_{Ind} + \rho \quad (5)$$

Where COMP = Total CEO compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value, Assets = Total Assets, Leverage = Debt/Equity Ratio, OTH = Other Industries, CON = Consumer Related Industries, FIN = Financial Related Industries

Cross-sectional time-series regression is then performed for the entire sample of JSE Main Board and Alternate Exchange listed companies with an additional independent variable representing the listing board. The coefficient of the additional independent variable will provide an indication of the

difference in CEO compensation for ALTX and JSE Main Board companies. This difference can then be contrasted with existing theory and research regarding corporate governance, compensation and the differences in listing regulations. The proposed regression equation, informed using the second hypothesis presented is shown in Equation 6. Similarly to the initial regression performed, if any unexpected autocorrelation or multicollinearity issues are encountered separate regressions will be performed for each performance variable along with the ALTX variable and the control variables.

$$COMP = \alpha ROE + \beta Share + \gamma TobinsQ + \varepsilon ALTX + \delta_1 Assets + \delta_2 Leverage + \delta_3 OTH_{Ind} + \delta_4 CON_{Ind} + \delta_5 FIN_{Ind} + \rho \quad (6)$$

Where COMP = Total CEO compensation, ROE = Return on Equity, Share = Average Annual % Increase in Share price, TobinsQ = The Tobin's Q value, ALTX = Whether the Company is listed on the JSE Alternate Exchange, Assets = Total Assets, Leverage = Debt/Equity Ratio, OTH = Other Industries, CON = Consumer Related Industries, FIN = Financial Related Industries

The goodness of fit or R^2 statistic will also be analysed to provide an indication of how much of the variation in CEO Compensation can be explained by the models proposed above.

3.7 Limitations of the study

Several limitations apply to the research presented. The first and possibly most problematic is based on the definition of CEO compensation. CEO compensation is inherently difficult to accurately measure and objectively compare because of the vast differences that can exist in CEO payment packages (Murphy, 1999) as well as defining how to measure items such as share options. Effects of previous performance and time lags of greater than one year on CEO compensation are also neglected in the study and could result in the study missing certain relationships (Boschen & Smith, 1995). The control for industry may also not be specific enough (Murphy, 1999) leading to the neglecting of more subtle differences in sub industries. Finally the use of only accounting and market related measures for company performance while ensuring the objectivity of the research, it entirely neglects more subjective and longer term measurements of company performance, success and sustainability of the performance. Company performance used is also limited to the accounting measures of return on equity and annual change in share price to correspond with existing research. Value creation metrics in line with enlightened stakeholder theory such as Economic Value Added (Jensen, 2001) are also neglected with the study purely focusing on performance metrics. Actual measures of corporate governance and board composition are also neglected as the focus of the study is directed at corporate governance regulations rather than their application. The research is therefore limited to the assessment of company performance represented by return on equity and annual change in share price. The study also neglects the effect that a change in CEO would have in

the relationship between company performance and CEO compensation. CEO turnover and its' effects on company performance as well as CEO compensation has been the subject of existing research (Murphy & Zimmerman, 1993) and has been found to have a significant effect on company performance in the case of replacement of a poor performing CEO. The data used in this study contains a number of companies that have changed CEO over the course of the five year sample period however the effects of this are not controlled for and the study is therefore limited to considering the compensation of the person currently in the position of CEO for each year of the study.

3.8 Validity and reliability

3.8.1 External Validity

External validity relates to the ability of the results of the study to be generalized for a greater population than what the research was originally intended for (Kalof, Dan, & Dietz, 2008; Kothari, 2004). In the case of this research it entails if the results regarding company performance and CEO compensation for listed South African companies can be generalized to all South African companies and if results can also reasonably be generalized to listed companies internationally as well.

The large size of listed companies as well as the transparency and regulatory requirements imposed on these companies make generalizing results to all South African companies problematic. The listing boards do however represent a reasonable portion of business in South Africa. Size and industry are also controlled for in the research further maximising external validity.

The external validity of findings related to the difference between JSE and ALTX listed companies outside of a South African context may be limited because of the specific regulations delineating the listing boards which would differ from other exchanges internationally. Due to the substantially different nature of markets in other countries as well as the corporate governance regulations that apply to listing indices in these countries the external validity of the study is limited to the South African context. The substantial differences with reference to ownership and agency theory implications make any inferences regarding private companies similarly unreasonable and further limit external validity. The external validity of the study is therefore limited to currently listed South African companies and any companies that are listed in South Africa in the future (Kalof et al., 2008).

3.8.2 Internal Validity

Internal Validity relates to ensuring that any conclusions drawn about the variation of the dependant variable caused by the independent variable are in fact valid (Kalof et al., 2008). There are a huge number of potential influences on CEO compensation (Frydman & Jenter, 2010) and therefore

ensuring complete internal validity is problematic however all possible steps will be taken in the design of this study to ensure internal validity. Internal validity is maximized by considering extraneous variables and any possible confounding along with the effects of selection bias (Kothari, 2004). Extraneous variables entail any variables that may influence the dependent variable in the study in place of the independent variable. According to previous research company size, industry and leverage have been attributed to have a significant relationship with the independent variable CEO compensation (Bradley, 2013; Jaiteh, 2011; Jensen & Murphy, 1990b) and therefore these are included as control variables to include the effects of extraneous variables in the study and ensure the internal validity. Both company performance and CEO compensation could however be affected by a number of other factors such as the economy, exchange rates or commodity prices affecting company performance. Political and media effects on CEO compensation could also have an impact on the validity of the study with comments made by the Reserve Bank governor, Gill Marcus, serving as an example of this (Fin24, 2014).

Research reveals no significant events have occurred during the sampled period of 2009 and 2013 that would greatly affect the relationship between CEO compensation and company performance. Previous studies performed over a period including the US financial crisis of 2008, included separate regressions over narrower periods around the crisis to ensure internal validity however because the research performed is performed for the period after the crisis it is deemed acceptable that this can be neglected (Jaiteh, 2011).

Selection bias based on how companies from the JSE Main Board and the Alternate Exchange are selected and the numbers thereof (based on the availability of data and the convenience sample used) could also compromise the internal validity of the study by influencing the effect that the listing board has on the compensation, performance relationship.

3.8.3 Reliability

Reliability relates to how consistently company performance and CEO compensation can be measured and consequently how repeatable the tests performed in the study are (Kothari, 2004; Saunders et al., 2009). It is noted that the choice of variables used to represent company performance and CEO compensation constructs may differ and this inconsistency is the largest threat to the reliability of results. In order to mitigate any reliability issues related to variable selection, variables were selected based on their usage in previous research. Return on Equity and Share Price appreciation was found to be the most widely used measures of company performance (Griner, 1996; Murphy, 1985; Scholtz & Smit, 2012) however, it is noted that others have used Tobin's Q and return on assets (Bradley, 2013; Ozkan, 2011). CEO compensation is represented using

the total cash compensation along with the value of share options of the CEO because it is the most widely used measure of this in previous research and has also produced similar results to other representations (Griner, 1996; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012).

While the measures used could be susceptible to accounting and financial practices that could alter their reliability it is noted that they should be largely consistent and objective because they are published by McGregor BFA (2014) and have formed the basis of existing research (Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012). Additional measures of company performance namely: ROE, Growth and Share Price Increase have also been included to provide a broader and more reliable assessment of company performance.

Environmental changes such as in the economic climate could artificially inflate share prices resulting in overstated company performance for the period, also affecting the reliability of the study. Alternate measures of company performance have therefore been included to minimize the impact of this on the results drawn from the study.

3.9 Profile of companies analysed

Table 3 shows a breakdown of the final dataset used in the research broken down by both listing and industry of the companies. The resulting dataset is made up of 30 Alternate Exchange companies and 219 JSE main board listed companies. The number of Alternate Exchange listed companies falls below the minimum sample size initially suggested however this is attributed to lack of availability of data as well as the small number of companies that have consistently been listed on the Alternate Exchange over the past five years and therefore deemed acceptable. The data includes performance and compensation figures for each company for each year in the five year sampling period from 2009 to 2013 which results in a dataset of 1245 records in total. The distribution of companies by industry is fairly balanced over the data set as shown in Table 5 with the best represented industry being Base Materials making up 30.28% of the sample and worst represented being Financial Services with 18.71%. This balance is viewed as evidence that the industry categorization selected for the analysis is appropriate. It is however noted that the industries of companies analysed are not as evenly balanced for ALTX listed companies with significantly more Consumer Related companies with 39.33%, than those in Financial Services with only 6.67%.

Table 3: Summary of company industry distribution per listing index

Table of Listing by Industry					
Listing(Listing)	**Industry(Industry)**				
	Base Material	**Consumer related**	**Financial Services**	**Other**	**Total**
ALTX	7	12	2	9	30
	2.81	4.82	0.80	3.61	12.05
	23.33	40.00	6.67	30.00	
	9.09	16.00	4.26	18.00	
JSE	70	63	45	41	219
	28.11	25.30	18.07	16.47	87.95
	31.96	28.77	20.55	18.72	
	90.91	84.00	95.74	82.00	
Total	77	75	47	50	249
	30.92	30.12	18.88	20.08	100.00

Note: The table shows a breakdown of the number of companies in the industries used in the sample. Each cell is structured as follows:

Frequency: *The number of companies*

Overall Percentage: *The percentage based on the total number of companies*

Listing Percentage: *The percentage based on the number of companies in the listing index*

Industry Percentage: *The percentage based on the total number of companies in the industry*

Chapter 4. Presentation of results

4.1 Introduction

The descriptive statistics for JSE main board and ALTX listed companies' performance and CEO compensation figures further separated by year are shown first. The descriptive statistics are provided to show the distribution of the performance and compensation figures along with an overview in differences between the figures for both the years and the listing index.

The results for Hypothesis 1 are then shown. The regression coefficients for the sample of JSE main board listed companies is displayed first followed by the regression coefficients for ALTX listed companies. The results show both the relationship between company performance and CEO compensation for companies in each listing index separately while also showing highlighting an initial differences in the relationship when contrasting the results for each of the indices.

Finally the results related to Hypothesis 2 are shown. Again the results consist of coefficients for the regression equation based on the proposed model. The results displayed are for the entire census of companies both on the JSE main board and ALTX with the difference in listing represented in this case by the ALTX listing dummy variable. The coefficient allows for the assessment of sign, magnitude and significance of the impact that being listed on the ALTX has on CEO compensation with reference to a JSE main board listed company.

For each of regression models displayed the fit of the model along with other statistical considerations and results of other statistical tests performed to ensure the validity of the model are also discussed. This includes analysis of the appropriateness of the model along with any potentially problematic results and findings.

4.2 Descriptive statistics

The descriptive statistics of the final dataset are included in Appendix A. Analysis of the means and medians of the compensation reveal skewness is present in the data gathered. This is compensated for using the logarithms of both compensation and total assets figures as detailed below. The significant difference in total assets and CEO compensation between CEO's of JSE versus ALTX listed companies is also clearly apparent due to the size difference of companies on the two listings. Also of interest is the trend present for both ALTX and JSE main board listed companies where the mean compensation of the CEO's consistently rises from 2009 to 2013. No such trend is however apparent in the mean values of the company performance figures. Discussion of this finding is beyond the scope of this research however is suggested as topic for future analysis.

4.3 Results pertaining to analysis of indexes separately

4.3.1 JSE main board listed companies

Table 4 presents the regression coefficients obtained for the proposed model in Equation 5, including confidence intervals and standardized coefficients, for JSE main board listed companies along with the fit statistics of the model.

Table 4: Results of the regression for JSE main board listed companies

JSE Main board effects on log of compensation				
	B	**95% Confidence Limits**		**β**
Intercept	3.92***	3.63	4.21	0.00
ROE	-0.06*	-0.13	0.02	-0.03
Share	0.04**	0.01	0.06	0.04
Tobin's Q	0.12***	0.10	0.14	0.39
Leverage	-0.01**	-0.03	0.00	-0.05
Assets log	0.32***	0.30	0.33	0.64
Industry				
Consumer	0.06	-0.04	0.15	0.05
Financial services	-0.44***	-0.55	-0.33	-0.41
Other	-0.09*	-0.19	0.01	-0.09
R^2		0.45		
F		109.98***		

*Note: N = 1095, B = unstandardized effect, β = standardized effect, *** = $p < 0.01$, ** $p = < 0.05$, * = $p < 0.1$, confidence intervals robust regression using the Yohai (1987) method. "Base Materials" is the reference for the "Industry" dummy variables.*

No evidence of multicollinearity was found with none of the independent variables with variance inflation figures over a value of two well below the theoretical limit of 10 at which multicollinearity may exist. Additionally the Condition index values of the independent variables all fall below 100 which adds further evidence that the model is not impacted significantly by multicollinearity (Saunders et al., 2009).

Analysis of both the standard residual plot and the studentized residual plot reveal no obvious patterns or evidence of non-linearity of the model and the linear log-log model estimated is therefore deemed appropriate. The residual plots also appear evenly distributed and the distribution

of residuals also appears normal indicating that the model appears homoscedastic (Saunders et al., 2009).

Initial regressions revealed several influential outliers with Cooks D values an order of magnitude larger than the rest of the sample. These large Cooks D values indicate outliers that have a large impact on the regression equation estimated. The outliers are also visible in the studentized residual plot falling well outside the 3 and -3 suggested limits (Saunders et al., 2009). While the logarithm transformation performed on compensation and total assets variables mitigates to a certain extent the effect of extremely large firms as outliers the effect of performance measures such as return on equity and share growth most likely result in these outliers. Removing the outlier observations in question is not deemed feasible because these extreme cases may be of value to the research in the form of extreme fluctuations on return on equity and share growth. It is therefore deemed prudent to perform a robust regression which adjusts the model to take into account the effect of outlier in order to minimize the impact of influential outliers on the accuracy of the regression (Yohai, 1987). Bootstrapping of results was also considered to mitigate the effect of outliers as well as improving the confidence intervals found however bootstrapping seemed to have a negligible effect on the results found and robust regression was therefore deemed preferable due to the significant improvement it had on the model.

The model which measures changes in compensation over time is particularly vulnerable to autocorrelation however the cross sectional time series regression technique whereby time dummy variables are added for the year of each record mitigates this. The Durbin-Watson statistic of 0.888 with significant evidence of positive autocorrelation which is expected for the time series data in use and controlled for using panel regression with fixed time effects (Gregg et al., 2010; Saunders et al., 2009).

The model estimated has an initial R^2 fit statistic of 0.54, an adjusted R^2 of 0.53 and an ANOVA F significant at 1% as shown in Table 4**.** The R^2 of the final robust regression was 0.45 which indicates that 45% of the variation in CEO compensation is explained by the model. The R^2 value obtained is considered adequate because of the complexity and number of possible influences that there could be on CEO compensation. The model is assumed to fit well when compared with existing research that found R^2 values varying from 10% up to 40% depending on the context and model in use (Bradley, 2013; Griner, 1996; Scholtz & Smit, 2012).

The control variables forming part of the regression have the largest significance as predictors of CEO compensation. As shown in Table 4, total assets is the most influential predictor of CEO Compensation (B = 0.32, *B* = 0.64, $p < .01$) with the Financial Services industry dummy variable

having a significant negative impact on CEO compensation with reference to Base Materials companies (B = -0.44, *B* = 0.41, p < .01). Growth opportunities of the firm measured using Tobin's Q have the third largest effect on Compensation (B = 0.07, *B* = 0.39, p < .01) which does provide support for Hypothesis 1. Leverage of the company serves as a negative predictor of CEO compensation (B = -0.01, *B* = -0.05, p < .05) which while still significant at a 5% level, falls below the significance of the other predictors outlined above.

With regards to Hypothesis 1, return on equity has a negative effect on CEO compensation with a significance of less than 10% contrary to Hypothesis 1. Share growth however serves as a positive predictor of CEO Compensation (B = 0.04, *B* = 0.03, p < .05) supporting Hypothesis 1 when company performance is viewed purely from an annual share price appreciation standpoint. The remaining variables related to firm characteristics have little or no impact on CEO compensation.

For JSE listed companies with company performance measured using return on equity of the company, the p-value measured is less than the assumed significance level of 0.05 and consequently the null hypothesis cannot be rejected. The data fails to support the claim that company performance when measured by return on equity has a significant effect on CEO compensation.

With company performance however measured purely from a share price growth perspective the p-value measured is below the assumed significance level of 0.05 and therefore the null hypothesis is rejected. The data supports the claim that company performance measured using share price growth has a significant effect on the expected compensation of the CEO.

4.3.2 ALTX listed companies

The regression coefficients obtained for the proposed model again shown in Equation 5, including confidence intervals and standardized coefficients, for ALTX listed companies is presented in Table 5 along with the fit statistics of the model.

Table 5: Results of the regression for JSE main board listed companies

ALTX effects on log of compensation				
	B	**95% Confidence Limits**		***B***
Intercept	6.55***	5.71	7.39	0.00
ROE	-0.05*	-0.09	0.00	-0.26
Share	-0.01	-0.02	0.01	-0.06
Tobin's Q	0.00	0.00	0.00	0.05
Leverage	-0.01	-0.02	0.00	-0.01
Assets log	0.12***	0.05	0.19	0.64
Industry				
Consumer	-0.36***	-0.57	-0.62	-0.62
Financial services	0.08	-0.29	-0.44	0.13
Other	-0.25**	-0.47	-0.04	-0.44
R^2		0.21		
F		4.03***		

*Note: N = 150, B = unstandardized effect, β = standardized effect, *** = p < 0.01, ** p = < 0.05, * = p < 0.1, confidence intervals robust regression using the Yohai (1987) method. "Base Materials" is the reference for the "Industry" dummy variables.*

Collinearity diagnostics performed found no variables with a condition index greater than the threshold of 100 which indicates that no major multicollinearity issues exist in the model once time series effects are controlled for. Variance inflation figures also fall below the limit of 10 adding further support to the above assumption regarding no multicollinearity (Saunders et al., 2009).

No unexpected patterns appear in the Residual plots and the residuals appear normally distributed which indicates that no non-linearity issues exist and underlines the appropriateness of the log-log model. The Durbin-Watson test result is 1.14, again with a significant evidence of positive autocorrelation which is attributed to the time series nature of the data used and is controlled for with the time fixed effect panel regression technique (Gregg et al., 2010; Saunders et al., 2009).

The dataset once again contains several influential outliers which are again attributed to companies with extreme performance figures for single years. Robust regression is again performed in order to mitigate the effect of outliers on the model. Once again bootstrapping yielded negligible improvements to the model in comparison to robust regression.

The R^2 fit statistic of the final robust regression is 0.21 which is slightly lower than fit statistics reported for JSE main board listed companies above. The R^2 of the initial regression was 0.25 with an adjusted R^2 of 0.19. The difference between the two fit statistics is attributed to additional controls variables which do not improve the accuracy of the model in the case of ALTX specific companies. The R^2 is fairly consistent with past research into the topic with fit statistics varying from 10% up to 40% depending on the context (Bradley, 2013; Griner, 1996; Scholtz & Smit, 2012).

Table 5 shows the coefficients of the estimated regression model. Clearly from the table presented the company performance measures perform worse as predictors of CEO compensation for ALTX listed companies. Again total assets of the company is the largest positive predictor of compensation (B = 0.12, *B* = 0.28, p < .01). Two of the industry dummy variables are significant predictors of compensation however in this case Consumer (B = -0.36, *B* = -0.62, p < .01) and Other Industries (B = -0.25, *B* = -0.44, p < .05) differ significantly from the Base Materials reference.

Similarly to JSE listed companies return on equity serves as a negative predictor of CEO compensation however this result is not significant at below 0.05 (B = -0.04, *B* = -0.05, p < .10) and fails to reject the null of Hypothesis 1.

For the sample of ALTX listed companies when measuring company performance purely using share price growth the p-value measured falls above the assumed significance of 0.05 and also fails to reject the null of Hypothesis 1. Share price growth therefore does not serve as a significant predictor of CEO compensation for ALTX listed companies.

4.4 Results pertaining to analysis of indexes together

The regression coefficients obtained for the final model shown in Equation 6, including confidence intervals and standardized coefficients, for JSE main board and ALTX listed companies is presented in Table 6 along with the fit statistics of the model.

Table 6: Results of the regression for both JSE main board and ALTX listed companies

Listing effects on log of compensation				
	B	**95% Confidence Limits**		***B***
Intercept	4.08***	3.80	4.36	0.00
Listing				
ALTX	-0.12**	-0.23	0.00	-0.11
ROE	-0.10*	-0.15	-0.05	-0.12
Share	0.01	-0.01	0.02	0.01
Tobin's Q	0.13***	0.11	0.14	1.14
Leverage	-0.02***	-0.03	-0.01	-0.10
Assets log	0.30***	0.29	0.32	0.67
Industry				
Consumer	0.03	-0.08	0.09	0.01
Financial services	-0.39***	-0.49	-0.28	-0.36
Other	-0.03	-0.13	0.06	-0.03
R^2		0.65		
F		110.00***		

*Note: N = 1245, B = unstandardized effect, β = standardized effect, *** = p < 0.01, ** p = < 0.05, * = p < 0.1, confidence intervals robust regression using the Rousseeuw and Yohai (1984) method. "Base Materials" is the reference for the "Industry" dummy variables and ""JSE main board" is the reference for the "Listing" dummy variables.*

Multicollinearity tests on the regression of the full sample of companies reveal no evidence of multicollinearity with Condition Index values falling well below the theoretical limit of 100 and Variance Inflation Figures well below the limit of 10.

Both the studentized residual plot and the residual plot reveal no clear patterns and the distribution of the residuals also appear normally distributed which supports the linear log-log model proposed as well as indicating that no adverse effects of homoscedasticity are present.

Once again a number of influential outliers exist in the data indicated by Cooks D values substantially larger than the rest of the sample as well as the absolute value of studentized residual figures above the limit of three for certain observations. Iterative testing of various techniques such as outlier

removal, bootstrapping and robust regression revealed that again robust regression provided the best model. Robust regression is also consistent with the analysis performed in Hypothesis 1.

Results of the initial regression performed indicate an R^2 fit statistic of 0.53 along with an adjusted R^2 of 0.52 which shows that the number of independent variables used in the model improve its accuracy rather than diluting it. The robust regression performed achieved a R^2 fit statistic of 0.65 as shown in Table 6. The R^2 is deemed adequate for the model due to the complexity of CEO compensation and the number of the factors that could play a role in its calculation as well as comparisons with existing research.

Six of the independent variables of the proposed model exhibit some level of significance. Total assets of the company once again has the most significant impact on CEO compensation (B = 0.30, *B* = 0.67, p < .01) a relationship which is further amplified by the fact that the logarithm of total assets is used in the model. Tobin's Q also serves as a strong predictor of CEO compensation with the model presented (B = 0.13, *B* = 1.11, p < .01). The Leverage of the company has a negative relationship with CEO compensation (B = -0.02, *B* = -0.10, p < .01). With regards to the industry dummy variables used, CEO's of Financial Services companies (B = -0.39, *B* = -0.36, p < .01) are compensated significantly less than the reference industry of Basic Materials. Return on equity serves as a negative predictor of CEO compensation (B = -0.10, *B* = -0.12, p < .1) similarly to the results found for JSE and ALTX listed companies separately.

The variable of particular interest and specifically related to Hypothesis 2 is that of Listing represented using the ALTX dummy variable. The coefficient of the ALTX dummy variable indicates that CEO's of ALTX listed companies are compensated relatively less than their JSE counterparts (B =-0.12, *B* = -0.11, p < .05) after controlling for performance, company size, growth opportunities and industry in the proposed model. It is noted that this finding has a significance level of below 5% and therefore indicates that the null of Hypothesis 2 can be rejected and that listing index does in fact have a significant effect on CEO compensation in South Africa as proposed in Hypothesis 2. It is however noted that a positive coefficient was expected for the ALTX variable however a negative coefficient was in fact found.

4.5 Summary of the results

Robust regressions were performed for all three of the models proposed due to the number of outliers in the dataset, which while not large as a percentage of the entire sample, had an influential impact on the models. Robust regression was deemed preferable to removal of the outliers because it was deemed important to retain the entire dataset and not entirely discard the effect of

companies with extreme results in specific years. It also yielded a more acceptable model than when bootstrapping was used.

The fit achieved of the three models was deemed adequate with the best fit achieved being that of the final model with the entire sample with an R^2 statistic of 0.65. An R^2 of 0.47 was achieved for the sample of JSE Main Board listed companies while the fit of the sample of ALTX listed companies was substantially worse than the other models with an R^2 statistic of 0.24. The adjusted R^2 was 0.19 which also indicates that the number of independent variables in the model did not improve the accuracy of the model proposed for ALTX listed companies which is contrary to the results found for the entire sample and JSE main board listed companies where the adjusted R^2 values were fairly similar to the original R^2.

With regards to Hypothesis 1, return on equity for both JSE Main board and ALTX company samples exhibited an insignificant relationship with CEO compensation and in both cases the coefficient was negative which indicates that as the return on equity of a company falls, the compensation of the CEO can be expected to increase. This contradicts Hypothesis 1 which anticipated that improved company performance (In this case represented by return on equity) would result in higher pay for the CEO.

If company performance is measured purely based on growth in share price, the JSE main board listed companies sample provided support for Hypothesis 2 with annual share price growth exhibiting a significant positive relationship with CEO compensation. In the case of ALTX listed companies however no significant result was found for annual share price growth and CEO compensation which contradicts Hypothesis 1.

For both ALTX and JSE main board listed companies, the variable with the largest effect as a predictor of CEO compensation was that of Total Assets which indicates that CEO's at larger companies can expect to enjoy higher compensation than those at smaller companies on either index.

Testing of Hypothesis 2 involved the introduction of a listing dummy variable and the assessment of the entire sample including companies from both indexes. The p-value measured for the ALTX dummy variable falls below the assumed significance of 0.05 and the null hypothesis can be rejected. The results found that if all other variables are kept constant, A CEO at an ALTX listed company can expect to be compensated 12% less than a CEO at an identical company listed on the JSE main board. The data supports the claim that CEO's at ALTX listed companies earn relatively less

compensation than those at JSE listed companies when controlling for a number of different company variables.

Other results regarding the full sample include a significant positive relationship between Total Assets and CEO compensation. Once again Total Assets also acts as the most influential predictor of CEO compensation. Leverage, return on equity and Tobin's Q also all have a significant effect on CEO compensation.

Chapter 5. Discussion of the results

5.1 Introduction

The research performed was broken down into two sections. Results will first be discussed regarding Hypothesis 1 for JSE main board and ALTX listed companies in isolation. In particular agency theory and the influence that company performance has on CEO compensation will be examined. The results found for each sample will then be contrasted for the two indexes and any differences highlighted. The results found for Hypothesis 2 will then be discussed with reference also made to the results found regarding Hypothesis 1. The discussion around Hypothesis 2 will centre on the listing dummy variable introduced that represents the difference in CEO compensation between the indexes not explained by the initial model presented in Hypothesis 1.

5.2 Discussion of separate regressions based on listing index

Company performance measured as return on equity did not prove to be a significant positive predictor of CEO compensation at either JSE main board or ALTX listed companies. This contradicts existing research in the USA conducted by Griner (1996) however other research performed in the South African context also failed to find a significant relationship between return on equity and CEO compensation (Oberholzer & Theunissen, 2012). Bradley (2013) did however find a significant relationship between return on assets and CEO compensation for JSE listed companies however the coefficient found was negative similar to the results found in this study. The lack of relationship between performance and compensation could be first attributed to the incorrect selection of a company performance measure or secondly that there is a delay in the effect of a change in return on equity on the compensation of the CEO. It could also however be attributed to an agency problem at both ALTX and JSE listed companies where the compensation of CEO's is unrelated to the performance of the business. It is also possible that South African companies may have larger emphasis on value creation and compensate CEO's in line with enlightened stakeholder theory by using measures such as Economic Value Added (Jensen, 2001).

Company performance when measured using annual share price growth was found to be a significant predictor of CEO compensation with a 1% increase in share price growth for the year resulting in a 3% increase in estimated CEO Compensation for JSE listed companies only. No significance regarding company performance as annual share price growth was however found for ALTX listed companies. This could be attributed to CEO remuneration schemes that are closely linked to the share price for JSE main board listed companies. Schemes such as these may be less prevalent for ALTX listed companies due to the lower liquidity of shares on the index. The result for JSE listed companies contrasts findings by Ozkan (2011) where no significant relationship was found between

annual share price growth and CEO compensation. The difference could however be attributed to differences in economic climate or country specific factors (Research by Ozkan (2011) focussed on UK listed companies in 2007) which could clearly effect share price growth. It is also noted however that annual change in share price is sensitive to the environment in which the firm operates and this could explain the relationship between growth in share price and CEO compensation whereby when markets are more positive CEO's may be compensated more while they may be compensated less when markets are negative. Research by Jensen et al. (2004) also indicates that the maximisation of market value of a firm does not always represent a maximisation of value created by the firm which may indicate that even though a relationship between share growth and compensation was found, CEO's may still not be incentivized to maximise the creation of value by the firm. An additional measure of value creation such as Economic Value Added (EVA) could also be considered in future studies to assess the level of value created by a firm and how CEO compensation depends on this in line with enlightened stakeholder theory (Jensen, 2001).

Tobin's Q has been used in previous research as both a measure of company performance (Mehran, 1995) as well as a measure of growth opportunities of a company (Ozkan, 2011) because it measures the perceived market value of the company versus the book value of the company. For JSE main board listed companies an increase in Tobin's Q is associated with an increase in expected CEO compensation however no such relationship was found for ALTX listed companies. The finding for JSE main board listed companies falls in-line with those of Smith Jr and Watts (1992) as well as theoretical underpinnings in that CEO's are compensated more at companies with greater growth opportunities. Of particular interest is also that Smith Jr and Watts (1992) propose that at companies with greater growth opportunities, manager's compensation is generally more closely linked to the growth in firm value or the realization of growth opportunities. This could further explain the significant relationship between annual share price growth and CEO compensation found for JSE main board listed companies. It is however alarming that ALTX listed companies do not exhibit a relationship between growth opportunities and company performance given that ALTX listed companies are generally smaller and more growth focussed. It could however again be attributed to the low liquidity of ALTX share which could influence the market value of the company.

The findings for both ALTX and JSE main board listed companies that the size of a company has a large effect on expected CEO compensation corresponds well with both theory as well as past research. The results found indicate that a 10% increase in firm size results in 3.2% larger compensation for the CEO in JSE listed companies while for ALTX listed companies a 10% increase in firm size results in a 1.2% increase in CEO compensation. Theoretically it is proposed that larger companies are able to pay more and therefore are able to attract more talented managers who in

turn require or expect larger compensation (Baker et al., 1988; Jensen & Murphy, 1990a). Past research, transcending both geographical and time context, has also found a significant positive relationship between company size measured using total assets and CEO compensation (Griner, 1996; Oberholzer & Theunissen, 2012; Scholtz & Smit, 2012; Smith Jr & Watts, 1992) which corresponds well with the findings of this paper. Research by Baker et al. (1988) found a similar relationship between firm size and compensation and speculate that this dependence could lead to inefficiencies in the business as CEO's are driven to increase the size of the firm without considering the actual of creation of value for the company.

The effect of industry on CEO compensation differs between JSE main board and ALTX listed companies. Of particular interest is that CEO's at Financial Services companies can expect to earn 41% less than CEO's at Basic materials companies. For ALTX listed companies CEO's of companies in Consumer and Other Industries are also paid significantly less than those in Basic Materials. The difference between the listings could however attributed to differences in the makeup of the companies in the samples. The statistic regarding Basic materials CEO's being paid more than CEO's in other industries is still however particularly damning when considered in the context of labour unrest and questions about overpaid executives in the mining industry in South Africa (PricewaterhouseCoopers, 2010).

Of the remaining control variables, the relationship between financial leverage of a company and the CEO's compensation once again differs between JSE main board and ALTX listed companies. CEO's at companies on the JSE main board carrying less debt relative to equity enjoy higher compensation than those with higher debt to equity ratios. This relationship does not hold however for ALTX listed companies. The finding for JSE main board listed companies corresponds with previous research by Smith Jr and Watts (1992) which associates the phenomenon once again with growth opportunities and companies with greater growth opportunities being less likely to carry debt.

5.2.2 Managerial and board implications

For both ALTX and JSE main board listed companies, company size has the largest impact on CEO compensation. It is debatable whether it is a case of larger companies being able to afford better managerial talent with managerial talent requiring more pay or simply that the company can afford to pay more and therefore does. This leads to the far more nefarious consideration that it could be due to the more room for CEO's to extract larger compensation at these larger companies.

Smith Jr and Watts (1992) posit that start-up's and smaller companies compensate managers more based on company growth opportunities rather than actual performance because the performance has not yet been realized. It is therefore particularly startling that CEO's at ALTX listed companies

which are generally smaller and younger than JSE main board companies, are not compensated at all based on growth opportunities (JSE, 2012). Boards of ALTX companies should therefore consider revising CEO compensation contracts in order to better include growth opportunities as a means of assessment. It is however noted that because of the low liquidity of shares on the ALTX, share price related measures, such as Tobin's Q, may not be entirely suitable for ALTX listed companies.

5.3 Discussion of full sample regression including listing

The discussion regarding Hypothesis 2 primarily centres on the results relating to the dummy variable ALTX which represents the effect that the index on which a company is listed has on the CEO's predicted compensation. While the model also includes a number of other independent variables with significant effects on CEO compensation, these are discussed in more detail in the discussion of Hypothesis 1 results. A number of interesting findings are however apparent when considering the model presented using the entire sample of companies. As the return on equity of a company increases the expected CEO compensation decreases. This could be attributed to the decrease in profit due to an increase in salary expenses due to the CEO's larger salary. No relationship between annual share price growth and CEO compensation was found for the entire sample of companies which could be evidence of agency problems over the two indexes. Also of note is that CEO's of Financial Services companies once again earn substantially less (62%) than their peers which while it falls in-line with existing research (Gregg et al., 2010) could be considered worrying in a South African context due to the "pay gap" in the Base Materials sector (PricewaterhouseCoopers, 2010).

As detailed above the data reveals that CEO's of ALTX listed companies earn 12 % less than CEO's of JSE main board listed companies after controlling for company size, growth opportunities, performance, leverage and industry. The model accounts for 65 % of variation in CEO compensation and it is therefore noted that the remaining variation could be due to other influential factors on compensation not controlled for in the model. It is however assumed that even with the effect of these uncontrolled for factors, being listed on the ALTX still has a significant impact on expected CEO compensation. The significant difference in compensation found for CEO's of ALTX listed companies versus JSE mainboard listed companies could be attributed to the corporate governance regulation differences between the listings (JSE, 2014a). The negative relationship between expected compensation and being listed on the ALTX contradicts the initial hypothesis that the additional corporate governance regulations that JSE main board companies are subject to (Even though it may only be in a comply or explain capacity) would result in greater oversight over the CEO's compensation, a reduction in the agency problems and consequently lower compensation. The findings also contradict previous research which while not directly related to differences in indexes

but are rather related to notable differences in the corporate governance regulations of the indexes namely CEO duality, board compensation and the presence of a remuneration committee. Core et al. (1999) found that the presence of CEO duality at a company was significantly associated with an increase in expected CEO compensation for companies listed in the USA. It is however noted that similar research by Conyon (1997) for UK listed companies did not find a significant effect of CEO duality on CEO compensation.

With regards to board independence Core et al. (1999) found that as the percentage of executive members of the board increased, the expected CEO compensation decreased which supports the results found in this study if the JSE main board regulations are assumed to be entirely binding. Research by Basu et al. (2007) performed on data from Japanese companies revealed that the presence of at least one independent director resulted in a decrease in expected CEO compensation which lends support to the original hypothesis and differs from the results presented.

The differences between the findings presented and those of past research can be explained by a number of factors. First JSE main board regulations are enforced in a comply of explain manner and a number of companies do in fact infringe on the good governance regulations particularly CEO duality (Mangena & Chamisa, 2008). ALTX companies may also follow good governance practices even though they are not obligated to, based on being listed on the ALTX. The above factors make direct comparisons with existing research into corporate governance practices and compensation unfeasible however it does provide a useful starting point with which to contrast the effectiveness of the regulations. The difference could also however be explained by the greater exposure and prestige associated with the JSE main board which could attract more talented individuals to the position of CEO that require larger compensation.

ALTX listed companies are also required to have a designated advisor or DA overseeing the companies compliance with JSE regulations (JSE, 2012). The presence of a dedicated auditor of the governance of the company may in fact be more effective than more stringent regulations which could explain the decrease in expected CEO compensation associated with a company's listing on the ALTX. The greater expected compensation of main board CEO's may be an indication of the presence of agency problems (Core et al., 1999) and CEO's to some extent exploiting their position to increase the amount of compensation they receive regardless of the company performance.

Another noteworthy discrepancy between listing regulations is that of the requirement of the presence of a remuneration committee (JSE, 2012, 2014c). JSE main board listed companies are required to appoint a committee to oversee and audit the remuneration of employees of the company including the CEO. Research in the UK by Conyon and Peck (1998) found that the

introduction of a remuneration committee in the last 10 years was associated with a drop in CEO compensation which again lends support to the hypothesis presented that CEO's of JSE main board listed companies should be compensated relatively less than ALTX CEO's. The findings presented may however differ from the previous research due to geographical context, the specific role of the committee and finally whether JSE main board listed companies actually comply fully with the committee requirements. It is noted that the role of designated advisor for ALTX listed firms may perform a similar or even stronger role than that of an internal committee.

5.3.2 Managerial and board implications

Boards of JSE main board companies should consider why ALTX listed companies pay their CEO's relatively less than JSE listed companies. While it may be due to greater prestige and exposure of the main board attracting more talented candidates it should still be considered whether the presence of an independent designated advisor overseeing the governance practices acts to discourage CEO's from potential rent seeking behaviour and therefore reducing any possible agency problems and with it the compensation received by the CEO. The results also indicate that further investigation may be required into the effectiveness of the corporate governance regulations applied to JSE main board listed companies by the JSE. The efficacy of the application of regulations in a comply or explain fashion may also be questionable and a stricter stance by the JSE may be required to minimize agency problems at listed companies.

5.4 Conclusion

Regarding the first hypothesis, CEO's of JSE main board companies were found to be compensated to an extent based on company performance when measured using the percentage growth in share price. For ALTX listed company CEO's however, no significant relationship was found between compensation and any of the company performance measures proposed. This discrepancy could indicate an agency problem for ALTX listed companies because the incentives of CEO's may not be aligned with the performance of the company. Results related to the second hypothesis however, which measured the difference in CEO compensation due to index on which the company is listed after controlling for the variables used in the model proposed for the first hypothesis, indicate that ALTX CEO's are paid less than their JSE mainboard counter parts.

In summary the research results presented show that while CEO's of ALTX listed companies are paid relatively less than JSE main board CEO's, the compensation of CEO's of JSE main board companies is better explained and associated with company performance than compensation of ALTX CEO's. Another concern highlighted is that no relationship was found between growth opportunities and CEO compensation for ALTX listed companies. This is particularly concerning because past research

and theory generally dictate that CEO's of smaller and rapidly growing companies (A condition which ALTX listed companies appear to satisfy) should be measured on growth opportunities created for the company (Smith Jr & Watts, 1992).

Chapter 6. Conclusions & recommendations

6.1 Introduction

The conclusions of the study are presented along with recommendations to the stakeholders identified earlier in the report based on the conclusions presented. The conclusions and recommendations are based on the results found in conjunction with the theoretical underpinnings of the study discussed in the literature review. Finally suggestions for further research into the topic that became apparent throughout the research process are presented.

6.2 Conclusions of the study

The study found that for listed companies in South Africa the index on which they are listed has a significant effect on the amount the CEO is compensated in relationship with the performance of the company. The compensation of ALTX CEO's was found to not be influenced by the way the company performed in the same year while for JSE main board CEO's, the annual growth of the share price of the company had a significant impact on compensation. Analysis of the absolute difference between compensation of CEO's on the indexes after controlling for expected differences (Such as size and performance) using the model formulated during the first part of the analysis, revealed that ALTX CEO's were compensated 12% less than JSE main board CEO's.

The issue may not be excessive compensation but rather how and why CEO's are compensated. ALTX CEO's may earn relatively less than JSE Main Board CEO's but the finding that ALTX CEO's compensation has no significant relationship with any of the company performance measures may still be a problem. This lack of noticeable effect of company performance on CEO compensation may indicate agency problems in ALTX listed companies whereby the interests of the CEO diverge from the interests of the company (Murphy, 1985) because of misaligned remuneration policies. The study presented also highlights the well-documented contrast in opinions on executive compensation: First is the academic view that suggests that of paramount importance is ensuring that compensation is well aligned with company performance in order to minimize agency problems (Eisenhardt, 1989) regardless of how much executives earn. This point of view posits that no matter how much a CEO is compensated, it is not a problem so long as the compensation is justified in the improved performance of the company. The second is that of outside observers that measure compensation absolutely regardless of performance of the company. With widening inequality, labour instability, "pay gap" and growing questions about excessive executive compensation (PricewaterhouseCoopers, 2010) the second group have become more and more vocal in South Africa. These groups also highlight CEO income relative to the average employee salary at a company to highlight inequality and fundamental unfairness in remuneration policy (Preston, 2014). This

study therefore concludes that while at face value it may appear that JSE main board CEO's are compensated excessively (Because ALTX CEO's are compensated relatively less than JSE main board CEO's), agency problems may in fact be worse at ALTX firms because there appears to be less alignment with CEO compensation and company performance and therefore less justification of high CEO compensation figures.

It is also questionable whether the relationship for JSE main board listed companies CEO's compensation and annual share price growth represents enough of a link between company performance and CEO compensation in order to align the objectives of the CEO with that of the company. The relationship between return on equity as well as growth opportunities should also play a role in the determination of CEO compensation. This is particularly alarming considering research in the USA that found a significant relationship between company performance measured by return on equity which may indicate that the alignment of executive remuneration and company performance in South Africa may fall behind that of the USA (Griner, 1996).

6.3 Recommendations

Recommendations are made particularly to boards of companies currently listed, or that will list in future, in South Africa and their shareholders regarding the way CEO's are compensated and how agency problems may be mitigated based on differences found between being listed on the ALTX and the JSE main board.

The first recommendation resulting from analysis related to the first hypothesis is that boards and shareholders of ALTX companies should consider ways to better align CEO's compensation with company performance. Company performance measurement could take the form of annual share growth however it is noted that due to low liquidity of shares on the index this may not be feasible. Other measures such as return on equity could instead be used. Included in this should be evaluation of how CEO's can also incentivised based on the growth opportunities of the company which past research reveals is a generally accepted practice for smaller companies (Smith Jr & Watts, 1992). Evaluation based on growth opportunities could also encourage more forward thinking and long term behaviour by CEO's which could prove beneficial to ALTX listed companies.

The second recommendation is that designated advisors could be made compulsory for main board listed companies, to ensure better compliance with governance regulations which could eliminate the difference in CEO compensation between the indexes and the agency problems that may be associated with the difference. Designated advisors ensure a company's compliance with listing regulations and could be used to improve compliance rates of companies listed on the JSE main board. As part of this, the King III regulations, notably remuneration committees, CEO Duality and

board independence, and their application to JSE main board listed companies should also be reconsidered as a means with which to address agency problems. The comply or explain nature of these regulations could also be reconsidered in order to make compliance more common and possibly minimise agency problems. A harder stance on how these regulations are applied such as fines may therefore be required to encourage companies to comply with good governance regulations rather than simply providing explanations for non-compliance.

The third recommendation is that boards should consider improving the link between company performance and CEO compensation across both indexes. Remuneration committees should annually review the performance of the company when determining the compensation of the CEO to ensure that the incentives of CEO's and the company's performance are better aligned. Measures such as return on equity and Tobin's Q could be used during this process in order to provide objective judgment of the company's performance.

The final recommendation is that JSE main board companies' boards could consider recruiting high talent CEO's from ALTX listed companies. The CEO's at ALTX listed company are not only paid relatively less but are also not measured based on company performance, so high talent individuals at high performing companies could be recruited without the high expected compensation that would usually be associated with a CEO of a high performance main board listed company .

6.4 Suggestions for further research

Future research could assess the actual level of compliance of ALTX and JSE Main board listed companies with the comply or explain corporate governance regulations of the indexes. This could be extended to also include the impact on the relationship with CEO compensation and company performance that compliance with regulations has.

During the research process it became apparent that other executives and directors at firms are in some cases compensated similarly or even in excess of the amount received by the CEO. Further research could therefore include compensation figures for the entire board of directors when assessing the relationship with company performance. The compensation of these executives should of course also be aligned to company performance.

Further research could also focus on the effect that performance has on compensation over a period of time by lagging performance figures in order to assess the effect that past performance has on compensation. This could be used in conjunction with long term incentive schemes in order to measure how well incentivized CEO's are remunerated based on long term performance.

The models formulated in this study could also be used to assess which CEO's are overpaid or underpaid based on their actual compensation and the compensation predicted by the models. Future performance figures could be used in conjunction with the model in order to assess how much the CEO should be compensated in relation to the market (Jensen, 2001). This technique could reveal companies that overcompensate their CEO relative to the market as well as CEO's that are significantly underpaid and is consistent with past research in to the topic (Griner, 1996). In conjunction with this additional measures of company performance could be used in the models proposed and in particular that of Economic Value Added (EVA) in order to better apply the research towards enlightened stakeholder theory (Jensen, 2001).

Further investigation into CEO compensation based on company industry and in particular how CEO's of Basic materials are paid significantly more than their counterparts in financial services and other industries is required. This would be particularly appropriate in a South African context because of the "pay gap" that exists in industries that require large amounts of unskilled labour.

Further investigation could also be performed into other possible explanations for the difference in JSE main board and ALTX CEO compensation. The research could analyse the difference in factors such as tenure, experience and qualifications for CEO's between the two indexes. The variation of compensation of CEO's over time in conjunction with an assessment of company performance would also be particularly useful regarding whether agency problems have increased or decreased over a sample period.

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Appendix A: Descriptive Statistics

Table A1: Descriptive Statistics for JSE Main Board listed companies over five year period

Year	Variable	N	Mean	Median	Std Dev	25th Pctl	75th Pctl	Min	Max
2009	Compensation	219	6809.70	3951.00	8211.90	2165.00	8624.44	90.00	65306.02
	ROE	219	0.11	0.12	0.38	0.04	0.22	-4.08	1.28
	Share	219	-0.14	-0.13	0.41	-0.48	0.13	-1.00	1.73
	TobinsQ	219	1.60	1.10	2.10	0.85	1.46	0.00	18.65
2010	Compensation	219	7822.92	4331.00	10438.65	2266.00	9235.75	101.00	94232.30
	ROE	219	0.14	0.13	0.37	0.05	0.20	-1.61	4.25
	Share	219	0.26	0.19	0.48	0.00	0.41	-1.00	4.00
	TobinsQ	219	1.79	1.18	2.51	0.86	1.64	0.14	19.46
2011	Compensation	219	9873.78	5129.45	16438.47	2783.00	10619.14	156.00	173333.73
	ROE	219	0.09	0.12	0.39	0.04	0.20	-4.42	1.08
	Share	219	0.25	0.09	1.26	-0.08	0.26	-1.00	14.32
	TobinsQ	219	1.75	1.16	2.69	0.89	1.66	0.01	29.58
2012	Compensation	219	10300.56	5485.00	17208.99	3287.00	9809.00	220.00	150474.92
	ROE	219	0.14	0.12	0.79	0.04	0.19	-4.61	9.55
	Share	219	0.32	0.09	1.66	-0.11	0.35	-1.00	18.61
	TobinsQ	219	1.96	1.16	3.83	0.91	1.70	0.10	40.15
2013	Compensation	219	12076.77	6052.00	20181.53	3291.00	11913.00	260.00	167656.02
	ROE	219	-0.00	0.11	0.93	0.03	0.19	-12.17	1.07
	Share	219	0.32	0.09	1.70	-0.11	0.34	-1.00	18.09
	TobinsQ	219	2.15	1.20	5.21	0.90	1.84	0.09	68.88

Table A2: Descriptive Statistics for Alternate Exchange listed companies over five year period

Year	Variable	N	Mean	Median	Std Dev	25th Pctl	75th Pctl	Min	Max
2009	Compensation	30	1828.88	1516.50	1196.07	1207.00	2033.00	694.00	6718.00
	ROE	30	-0.11	0.06	0.57	-0.12	0.16	-2.32	0.51
	Share	30	-0.34	-0.41	0.47	-0.65	-0.15	-0.85	1.64
	TobinsQ	30	2.07	0.96	3.67	0.81	1.33	0.25	17.57
2010	Compensation	30	1808.96	1658.00	897.35	1221.00	2092.61	615.00	4376.00
	ROE	30	-0.55	0.00	2.37	-0.34	0.11	-12.95	0.31
	Share	30	-0.12	-0.10	0.40	-0.38	0.10	-0.87	0.91
	TobinsQ	30	2.23	0.95	4.58	0.74	1.32	0.51	24.49
2011	Compensation	30	2314.65	1886.00	2265.46	1431.00	2078.00	422.00	13066.68
	ROE	30	-0.03	-0.07	0.90	-0.20	0.12	-1.80	4.11
	Share	30	1.15	-0.15	6.97	-0.25	0.17	-1.00	38.00
	TobinsQ	30	1.87	0.98	3.63	0.76	1.33	0.03	20.14
2012	Compensation	30	2326.80	1979.50	1141.89	1687.00	3031.00	438.00	5153.00
	ROE	30	0.59	0.01	7.03	-0.18	0.16	-17.04	33.77
	Share	30	1.20	0.06	5.88	-0.38	0.31	-0.79	32.00
	TobinsQ	30	5.11	1.05	18.82	0.87	1.41	0.58	104.10
2013	Compensation	30	2606.93	2013.50	1420.28	1602.00	3561.00	540.00	5898.00
	ROE	30	-0.38	0.00	1.13	-0.38	0.09	-4.00	2.18
	Share	30	0.73	-0.11	4.42	-0.38	0.21	-0.92	24.00
	TobinsQ	30	11.96	1.09	56.25	0.81	1.45	0.60	309.52