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Gordon Institute of Business Science
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**CEO compensation sensitivity to performance
in the South African mining industry**

Makoanyane Theku

22318781

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

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Contact Details:
Tel: 011 800 3141
Cell: 083 472 3456
Email: thekufm@gmail.com

ABSTRACT

Orientation: The level of CEO compensation and its relationship with organisational performance has generated considerable interest worldwide. In light of compromised mining productivity as a result of the recent labour unrest in South African, some commentators have questioned the justification of certain CEO compensation in the country's mining industry.

Research purpose: The primary purpose of this study was to describe the relationship between CEO compensation and organisation performance in the South African mining industry.

Motivation for the study: A deeper understanding of the relationship would enhance knowledge when developing optimal CEO reward systems to ensure sustainability of the mining industry within the South African context.

Research design, approach and method: The research was a quantitative, archival study involving 30 mining companies over a five year period. The statistical analysis techniques used in the study included analysis of normality variance and multivariate regression.

Main findings/results: The main finding of the research was that there was a moderate to strong relationship between CEO compensation and organisational performance in the South African mining industry. However, operating expenses have progressively increased, putting performance under pressure. Furthermore, it was also found that company size plays an influential role in CEO compensation levels.

Practical/managerial implications: While the CEO compensation appears to be generally aligned with the organisational performance, the findings suggest that boards of directors should focus on structuring reward systems more optimally to mitigate managerial rent seeking in large companies and unsustainability in smaller companies.

Contribution/value-add: This study has contributed to the body of existing knowledge on executive pay for performance in the context of the South African mining industry. In addition, the study has demonstrated that the other non-performance related measures need to be considered in executive compensation design.

Keywords: CEO compensation, mining industry, South Africa, performance

DECLARATION

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

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Makoanyane Theku

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*"**Am I getting paid on a fair basis for what I'm having to deal with in this company? Must I run this company and deal with all this nonsense for nothing? I'm at work. I'm not on strike. I'm not demanding to be paid what I'm not worth.**"*

Chris Griffith, CEO: Anglo American Platinum

(Seccombe, 2014)

1.1   Background to the research problem

In recent years there has been considerable interest in the relationship between executive compensation and organisational performance worldwide. This was mainly due to the global banking crisis of 2007 to 2008, which has been partly blamed on remuneration policies in financial institutions (Shaw, 2011), (Gregg, Jewell, & Tonks, 2012), (Faulkender, Kadyrzhanova, Prabhala, & Senbet, 2010). Many papers have been written on the subject of executive remuneration policy and performance in financial institutions, with differing conclusions on the matter (Jensen & Murphy, 2010), (Gregg *et al.*, 2012), (Cao & Wang, 2013), (Zheng & Zhou, 2012). Executive compensation is vital in motivating, rewarding and retaining the most senior employees of an organisation (Bussin, 2014), (Faulkender et al., 2010), (Shaw & Zhang, 2010). Its efficiency and effectiveness are measured by sustained organisational success at the least economic costs to shareholders.

A study on the CEO pay-performance sensitivity in South African financial services companies by Shaw (2011) identified a need to expand the research beyond the financial services industry, as remuneration practices tend to vary from industry to industry. Various features of the mining industry in relation to South Africa and other developing economies in general, have made the industry an ideal candidate for the expansion of CEO pay-performance sensitivity studies. The recent instability in the mining industry, which has been linked by some commentators to the widening income inequality in the industry together with the critical role of mining in the South African economy (Molele & Letsoalo, 2012), makes comprehensive analysis of the link between CEO pay-performance sensitivity important for successful transformation of the sector in line with the mining charter. Furthermore, despite the recent loss of productivity in South African mining due to deteriorating labour relations, there are still limited studies on the South African mining industry. The level of violence that has characterised this unrest, resulting in the loss of lives has put a spotlight on the industry (Antin, 2013), and created a platform for studies that can improve societal understanding of this sector and the challenges inherent within it. In light of the compromised mining productivity as a result of labour unrest, this study sought to analyse the relationships between executive remuneration and performance in the sector. This is also necessitated by the need to ensure sustainability of the South African mining industry because of its role in the

national economic structure. A strong relationship between the two was expected despite recent developments in the industry. The study was predicted to provide better understanding of the relationship between senior management compensation and organisational performance, which could be used to optimally mitigate potential deficiencies; especially on factors that could perhaps hamper staff motivation and productivity.

Crowley (2013) stated that mining CEO salaries have been increasing at an exceedingly high rate, while dividends per share over the same period decreased significantly. The perception of the impact of executive compensation on mining industry performance is further reinforced by recent media publications, which blamed labour unrest on the widening income inequality gap between mining executives and ordinary workers (Seccombe, 2013), (van Vuuren, 2013). These reports claimed that mining wages which have been historically low relative to executive pay, and in comparison to counterparts in developed countries, may have been a contributing factor to labour unrest in the sector. While mining management have been quick to point out the undisputable link between rewards and productivity of miners as the reason why worker's demands are unjustifiable, this study seeks to provide better understanding by investigating historical relationships between the wages of the most senior managers and company performance.

The purpose of this paper is to examine the relationship between executive compensation levels and performance in South Africa, specifically in the mining industry. The findings will be helpful in establishing whether there is a link between the widening income inequality gap and performance in the South African mining industry, one of the most unequal societies in the world (Tregenna & Tsela, 2012).

The role of corporate governance as an effective oversight mechanism, entrusted with ensuring correct management activities which are in the interest of shareholders, has also been criticised. It is viewed by some as a system that excessively rewards executives regardless of their contribution outcomes, and without consequences for failure. According to Noe (2009), executive compensation structural design is an extremely challenging task as managers are generally non risk-taking wealth maximisers. He stated that the CEO's individual marginal productivity and ability to make good business decisions, as measured by the results of their decisions, are paramount in the CEO compensation design. However, many believe that an increase in executive compensation has far outweighed that of shareholder value, while others, including Crowley (2013) argued that is excessive. Saltaji (2013) suggested that the main issue

with the financial crisis is managers using their company's cash to serve their personal interests instead of in prudent investment, which diminishes the value of the company.

This paper examines the relationship between CEO compensation and organisational performance in the South African mining industry between the years 2003 and 2013. It aims to provide a better understanding of the sensitivity of mining industry performance to company executive compensation, by investigating whether there is a correlation between mining executive compensation and organisational performance.

This research report is organised in the following way: Section 2 reviews prior literature on CEO compensation and organisational performance, within the South African mining context. Section 3 discusses research questions and hypotheses. Section 4 outlines the methodology, while Section 5 covers the research results. Section 6 provides discussion of the study results in the context of the research questions, and finally, a list of references is presented in Section 7.

1.2 Problem definition

In recent years there has been considerable interest in the relationship between executive compensation and organisational performance worldwide. This interest was initially stimulated by a dramatic rise in executive compensation during the 1980s and 1990s in the United States of America (USA) (Frydman & Saks, 2010), and subsequently, due to an alleged link between executive compensation and the global financial crisis of 2007 to 2008 (Gregg *et al.*, 2012).

The debate pertaining to executive remuneration in South Africa has been dominated by the widening income inequality between executives and ordinary workers in the South African mining industry, during a challenging time in the sector. This debate was mainly stimulated by media reports on perceived pay for no performance and the alleged link between exorbitant executive compensation and instability in the sector. Questions have been raised as to whether the level of salary disparity between executives and the lowest paid workers in the mining industry was negatively impacting the company performance. This is mainly because the high income inequality is broadly seen as the catalyst for labour disputes, which usually result in the loss of production time (Steyn, 2013); (Molele & Letsoalo, 2012). This research seeks to expand the understanding of CEO compensation by examining it in the context of the South African mining industry.

1.3   Research objectives

The aim of this study is to establish a better understanding of the relationship between executive compensation (specifically the CEO) on performance in the South African mining industry. It contributes to the human resources management literature in developing countries by providing a board of directors with additional insight required in designing efficient performance enhancing remuneration policies for executives. This will be achieved by studying the correlation between CEO compensation and company performance in various South African mining companies.

1.4   Scope of the research

The scope of the research is to empirically study the relationship between firm performance and CEO remuneration in the South African mining industry. This will be achieved by gathering relevant theory on executive compensation and company performance, and conducting statistical analysis to determine whether there is a correlation.

1.5   Research motivation

Extensive research has been done on CEO remuneration and performance, mainly in the USA (Gregg *et al.*, 2012); (Ozkan, 2011). The main focus of the research relating to executive compensation worldwide was on the relationship between total compensation and organisational performance, with diverging views on whether there was a direct correlation between executive pay and firm performance. (Gregg *et al.*, 2012); (Jensen & Murphy, 1990); (Ozkan, 2011); (Tosi & Greckhamer, 2004); (Tosi, Werner, Katz, & Gomez-Mejia, 2000); (Shaw, 2011), (Shaw & Zhang, 2010); (Matolcsy & Wright, 2011). Considering the difference in market dynamics, human capital and financial resource availability between the developing and the developed world, it was deduced that there was room for further research on executive compensation in developing countries.

Shaw (2011) conducted a study on the CEO pay-performance sensitivity in the South African financial services industry, and recommended that the study needed to be expanded beyond this industry. Given the recent controversy over potential links between executive compensation and unrest in the South African mining industry, it was important to undertake research to help understand the relationship between CEO remuneration and performance in this industry.

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1.6 Summary of introduction

In summary, the relationship between CEO and organisational performance has come under scrutiny over the past decades, especially after the global financial crisis of 2007 to 2008. However, there is limited research on the relationship between executive compensation and performance in the mining industry, particularly in developing countries. Considering the key role of the mining industry in the economy of South Africa together with the recent reports on how executive compensation has outpaced performance in the sector, it was considered fitting to extend the study to the mining sector. This study will add to the currently limited academic contributions to the body of knowledge on CEO compensation in the South African mining industry.

The following chapter reviews the theory and literature on essential characteristics of the CEO compensation and organisational performance worldwide and in South Africa. The main purpose of the chapter is to provide background and different perspectives into the research problem.

2.1 Introduction

The primary purpose of this study was to gain a deeper understanding into the relationship between the performance of the South African mining industry and executive compensation, specifically for the CEO. To achieve this, relevant theory and literature on CEO compensation and measures of company performance in the South African mining industry were studied. This chapter lays out the available theory and literature relevant to the subjects, which comprises previous research and early theories associated with the research problem.

In this section, the theory which underpins the relationship between CEO compensation and organisational performance was reviewed. This entailed the development of CEO compensation theory from its inception stage to recent literature, as well as the structure and measures of executive compensation and organisational performance respectively. The role of corporate governance in ensuring effective management of the relationship between the executive and shareholders also forms an integral part of the review. The characteristics of organisational performance measures relative to CEO remuneration were then reviewed based on previous research on the subject.

2.2 Executive compensation

Executive compensation is the sum of all financial rewards and benefits granted to executives in exchange for their contribution to the company. Its main objective is to maximise shareholder value by efficiently rewarding, motivating and retaining senior management in the company (Shaw & Zhang, 2010); (Faulkender *et al.*, 2010). Topazio (2008) said executive compensation is a demonstration of how reward and business strategy can be integrated through key performance indicators (KPI) to ensure that the business attains its objectives. Shaw & Zhang (2010) stated that efficient compensation contracts link executive pay with firm performance, thus providing strong incentives for executives to operate in the best interests of the shareholder.

There are various components of executive compensation used worldwide, but the most common are the base salary, the annual bonus, insurance, pension benefits, stocks and stock options (Jensen & Murphy, 1990); (Goergen & Renneboog, 2011); (Frydman and Saks, 2010). The structure of compensation is determined by the compensation committee of the board by combining different components of the compensation at

desired magnitude, in an effort to ensure a balanced structure that protects shareholders against opportunistic actions by executives. Ozkan (2011) said executive compensation is viewed as an effective way of mitigating potential conflict of interest between shareholders and management in companies; hence it is evident that the structure of compensation is vital in integrating the diverging interests of two important stakeholders in any company.

2.2.1 Previous studies on CEO compensation and performance

Various studies on the relationship of executive compensation have been conducted worldwide, including in South Africa. Different measures of compensation and performance have been used in these studies, resulting in various assumptions, methodologies, result interpretations and findings. The USA and United Kingdom (UK) dominated the amount of research on the relationship between CEO compensation and organisational performance. The studies conducted in the USA, which were reviewed for the purpose of this study include Barber, Ghiselli, & Deale (2006); Bebchuk, Cremers, & Peyer (2011); Fahlenbrach & Stulz (2011); and Shaw & Zhang (2010). Among the studies conducted in the UK, Gregg *et al.* (2012) and Ozkan (2011) were relevant for the current work and were reviewed for the purpose of this study.

Ozkan (2011) studied the relationship between CEO pay and performance in UK non-financial firms for the period 1999 to 2005. His study used fixed pay, short term and long-term incentives as measures of executive compensation. The results showed a statistically significant positive relationship between shareholder returns and the CEO compensation. In another study that analysed the correlation between CEO compensation packages and the value, performance, and behaviour of public organisations, Bebchuk *et al.* (2011) found that CEO compensation packages were indirectly proportional to the firm value and accounting profit. Further, they also observed a positive relationship between high CEO compensation packages and the company making unfavourable acquisitions based on subsequent market performance.

Gregg, *et al.* (2012) conducted a study on the relationship between executive compensation and company performance in large financial services companies in the UK to assess its impact on the global financial crisis of 2007 to 2008. They found pay for performance in the sector could not be linked with the financial crisis, but compensation was more linked to stock performance, when good, than during a bad performance period. This is also aligned with the study on the relationship between CEO compensation and organisational performance by Shaw & Zhang (2010), which found

that CEO compensation was more sensitive to good performance than bad performance. Their study used a number of measures as independent variables, including return on equity (ROE), stock returns and the company size measured by assets. Fahlenbrach & Stulz (2011) also studied the relationship between the CEO performance structure before the global financial crisis and the performance of the organisation during the crisis. They found no evidence that organisations with better alignment of CEO interest and shareholder profit in the form of stock returns, performed better during the crisis.

Research conducted on the subject in South Africa include studies by Blair (2014); Bradley (2013); De Wet (2012); Nel (2012); Modau (2013); Resnick (2012); Shaw (2011) and van Blerck (2012). Shaw (2011) studied the relationship between the CEO compensation and performance in the South African financial services industry. This study, which used fixed pay and short-term incentives as measures of CEO compensation during the period 2005 to 2010 found that there was generally a positive relationship between company performance and CEO compensation. Another study by van Blerck (2012) analysed the alignment of the executive compensation between USA and South African banks during the period 2002 to 2011. This study tested the interrelationships between executive compensation, economic value added (EVA), ROE and growth in share price. The findings suggested a strong positive correlation between executive compensation and performance measures, as well as EVA. The study by de Wet (2012) on the relationship between executive compensation and the EVA and market value added (MVA) performance in South African listed companies also found that a positive relationship existed between executive compensation and organisational performance in all industries using ROE and return on assets (ROA) as performance measures. Modau (2013) also studied the relationship between CEO compensation and financial performance of the Top 40 Johannesburg Stock Exchange (JSE) listed companies for the period 2006 to 2012. The performance measures used in the study were market capitalisation, earnings per share (EPS), ROE, EVA and MVA. His findings were that there was a generally positive relationship between CEO compensation and performance, but the relationship has declined over time.

In contrast, Bradley (2011) studied the relationship between CEO compensation and performance in the 40 largest JSE listed companies by 2010. He observed no relationship between CEO compensation and measures of performance like ROE, ROA and EPS. Another study by Nel (2012) on the relationship between the CEO guaranteed compensation and performance in the South African retail and consumer goods sector,

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found that there was a negative relationship between CEO compensation and ROE, including its construct known as asset turnover. Further, no significant relationship was observed between executive compensation and other financial performance measures. Resnick (2012), in his study analysed the relationship between executive remuneration and company performance of the 20 largest companies listed on the JSE. The study used revenue, share price, net asset value and net profit as performance measures, while the total remuneration and its individual components were used as compensation measures. The study found that no relationship existed between organisational performance and the share price. The only performance measures that were found to be positively related to executive remuneration were revenue and net profit.

Lastly, Blair (2014) conducted a study on the relationship between the CEO compensation and the financial performance measures of the JSE listed companies in five industries. This study, conducted over the period 2008 to 2012, used the total CEO earnings, by utilising the Black Scholes methodology to determine the long-term portion of CEO compensation. The results suggested a positive and significant relationship between CEO compensation and performance in four of the five industries investigated. The study used various measures of performance including earnings before interest, tax, depreciation and amortisation (EBITDA), headline earnings per share (HEPS) and the change in share price.

2.3   CEO roles and responsibilities

The purpose of this section of the report is to outline the roles and responsibility of the CEO in accordance with the reviewed literature. The CEO position is held by the highest ranking member of the senior management team, known as the executive team in any organisation. They serve as the leader of the executive team and report directly to the board of directors. It is the CEO who is responsible for overall organisational activities by providing strategic direction and execution leadership. It is described as the best position to oversee the process involved in designing organisational goals, ensuring organisational commitment behind the chosen goal, and integrating efforts to achieve goals in a sustainable way (Andrews, 1980). The role of CEO was described as the architect of organisational purpose, organisational leader and personal leader (Andrews, 1980). Hambrick and Quigley (2014) argued that CEOs have more flexibility compared to other managers as their decisions can affect the entire company, instead of just a unit. However, the CEO's influence and effectiveness were limited by organisational constraints, including entrenched culture and institutional pressures (Hambrick & Quigley, 2014).

Organisational leadership refers to the responsibility of leading, resourcing and organising a hierarchy of teams to achieve organisational goals. Personal leadership refers to the role of effectively communicating the vision to stakeholders and leading by example in implementing the appropriate strategies to achieve organisational goals. Lastly the architect of organisational purpose refers to the CEO's responsibility for creating shareholder value by providing overall leadership in developing and executing organisational strategy. This is aligned with Rumelt's (2011) assessment, which stated that the actions of the CEO can substantially shape the fortunes of the firm. Hambrick and Quigley (2014) also argued that with their combined responsibilities in strategy formulation, strategy implementation, and leadership; there is a lot of scope for CEOs to make their mark on their firm's success or downfall. Management activities are carried out by independent directors who are perceived to be the critical component of the corporate governance process.

The CEO remuneration relative to company performance has become a subject of serious contention since to the financial crisis of 2007 to 2008 (Shaw, 2011). This increased scrutiny of executive compensation became the driving force behind some of the studies on executive pay for performance carried out during the period after the crisis (Gregg *et al.*, 2012); (Neeley & Boyd, 2010); (Faulkender *et al.*, 2010); (Fahlenbrach & Stulz, 2011). Some of the perceived problems with CEO compensation included the absolute scale, executive pay and the wages of entry level workers, fairness and its perceived susceptibility to manipulability (Harris, 2009). He also stated that some concerns about the effectiveness of CEO incentive pay appear to be valid. He said that financial misrepresentation is one of the tools used to boost CEO incentive pay resulting in long term value destruction. Jensen and Murphy (2010) argued that there was inconclusive evidence on whether the average CEO pay was excessive or not, but acknowledged that pay for performance sensitivity had increased over time. Moreover, they stated that due to the CEO's significant influence over the pay-design process, opportunities exist for them to manipulate compensation in their favour. They highlighted board independence and competence as the key areas of focus in managing the executive compensation design process.

2.3.1 Origin of executive compensation

Deeper insight into executive compensation is founded upon the principal-agent theory, which focuses on the alignment of managerial and shareholder interest. Fama and Jensen (1983) argued that the survival of organisations was dependent on the separation of ownership and control. They added that it was ideal that an agent who

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makes key decisions in the company should share in its success and failure in order to ensure organisational survival. This mechanism of cooperation between shareholders and people that manage the business on their behalf was best defined by the agency theory, which was discovered in the 1960s and early 1970s (Eisenhardt, 1989). The principal-agent literature of this theory, which is concerned with the relationship between the shareholders and management, stipulates that there will be a conflict of interest between executives and shareholders due to competing interest. To manage this problem, an organisation should adequately reward the executives proportionally to organisational performance by incurring additional cost named agency costs.

This is regarded as a balanced mechanism to minimise shareholder's risk and also rewards management appropriately for identifying and implementing decisions which are responsible for the company's success. Conversely, some including Saltaji (2013) argued that the agency theory grants managers a huge margin by allowing them to use free cash and get more benefit in return.

2.3.2 Agency theory

Agency theory is a literature that addresses a contracting problem between principal and agent with competing interests (Jensen, 1983). It defines a principal-agency relationship as a contract in which one or more people employ and delegate their authority to another to manage business on their behalf (Jensen & Meckling, 1976). Eisenhardt (1989) summarised the agency theory as one that is meant to resolve problems that can occur in agency relationships. It addresses potential conflict of interest between shareholders and management, which are referred to as agency problems. This is achieved by tying the compensation of executives to company performance. It has been argued by proponents of the theory that linking executive compensation to company performance would benefit both shareholders and management through rising stock value and performance pay respectively. According to the theory, the employer is known as the principal, while the employee is known as the agent.

Jensen and Murphy (1990) said conflict of interest between shareholder and CEO was a typical case of an agency problem. According to Eisenhardt (1989), this is a problem that exists when there is a conflict between the goals of the principal and agent, and when the agent's actions are costly and difficult to verify. He said that the agency theory offers a good perspective on organisational problems requiring both the principal and agent to support one another.

According to Jensen (1983), developments since the origin of the agency theory have resulted in two almost entirely separate and valuable literatures that nominally address the same problem, namely "positive theory of agency" and "principal–agent" theory. He said the principal-agent, which forms an integral part of this report is concerned with risk sharing. This is achieved by optimally contracting the structure of their individual preferences, uncertainty and information in the operating environment. The main objective is to ensure that risk and return are shared between principal and agent, at an optimal cost to the principal.

2.3.2.1   Agency problem

Agency theory states that the conflict of different individual interests between principals and agents could lead to agency problems (Jensen & Meckling, 1976). This refers to the likelihood that managers may use their discretion to engage in activities that benefit their interests at the expense of the principal. Contracts are established to manage this potential conflict between parties with competing interest to ensure that their individual interests which are dependent on the performance of the team are aligned (Jensen & Meckling, 1976). This was based on the theory that contracts will be positive or productive for individuals with divergent interests, which is known as positive theory of agency (Jensen, 1983).

2.3.2.2   Agency costs

The sum of the costs associated with producing and managing contracts between agents and principals was defined as agency costs (Jensen, 1983); (Fama & Jensen, 1983). To ensure an efficient and sustainable business operation, agency costs are managed though a corporate governance process which acts as a control measure on behalf of the principal and a mechanism to ensure long term benefits for both principal and agent. The successful management of the agency cost is the key measure of the effectiveness of corporate governance. Saltaji (2013) said these costs to a company, intended to encourage high performance of executives, need to be monitored and minimised to prevent financial losses.

2.3.3   Optimal contracting theory

Optimal contracting theory refers to the appropriate agreement between the principal and agent that will extract the highest level of effort by the agent on behalf of the principal. This theory was based on the assumption that the contract between shareholders and CEOs are optimally designed through the corporate governance process (Schneider, 2013). It is concerned with the compensation structure that maximises

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shareholder and CEO returns, for the effort applied. Thus, the respective interests of both the CEO and shareholders will be maximised. Schneider (2013) said that the purpose of optimal contracting was not to resolve the principal–agent problem, but to effectively mitigate them.

The direct link between shareholder and CEO returns made the use of stock options in CEO contracting popular as it was perceived to be the best way to induce effort to the benefit of both agent and principal. Jensen and Murphy (2010) called stock ownership by the CEO the most powerful link between shareholder and executive wealth. The justification was that if the company does well, both the principal and agent will benefit. However, the model benefits an agent regardless of good or bad organisational performance, due to the fact that an agent gains free options in the anticipation that they will deliver results for the principle (Shaw & Zhang, 2010); (Schneider, 2013). This is more advantageous to CEOs when they are at liberty to decide when to sell their stock. On the contrary, even the increase in the stock price does not guarantee the return on investment for the principal, as they will have to first recover value lost in stocks granted to the agent.

2.3.4 Managerial power theory

Executive remuneration is regarded as a mechanism to extract maximum effort from the agent in creating shareholder value while preventing excessive rent extraction by executives. However, managers tend to be self-serving and engage in behaviour that increases agency problems rather than mitigating them. Managerial power theory suggests that the executive managers have the power to influence the level and component of their pay (Schneider, 2013). This was established by the theory using analysis of the relationship between executive compensation following the financial crises of the twenty first century. It suggested that a manager's influence on their own pay has resulted in organisational inefficiencies due to unjustifiable pay relative to the returns, resulting in a worsened agency problem.

Proponents of the managerial power theory argued that corporate governance processes were largely responsible for the emergence of this theory. They suggested that a psychological contract existed between managers and boards that together with the social forces provide incentives that negatively impact the design of efficient contracts. They said that the influence of the CEO on the appointment and pay of board members, who in turn are entrusted with the responsibility of overseeing and designing CEO compensation, created room for the abuse of power (Schneider, 2013). This executive

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influence on corporate resources created deficiencies in the structural design of executive compensation.

2.3.5 Tournament theory

In recent literature, the tournament theory was used to explain the disproportionately high CEO salaries relative to ordinary workers in the organisation. Connelly, Tihanyi, Crook, and Gangloff (2014) described it as a valuable tool in analysing behaviour when reward structures were characterised by a relative ranking system instead of absolute level of output. This theory suggested that the different levels of ranking in an organisation resemble a tournament where the total prize is shared among participants relative to their individual effort. It said that the success of the tournament is proportional to the combined effort by all participants, hence the prize is spread among the different levels to induce maximum effort. Connelly *et al.* (2014) argued that in accordance with the tournament theory, CEOs as managers at the highest level in an organisation had no incentive to maximise performance. They suggested that to induce maximum effort at this level, the winning prize should be presented as infinite.

Other applications of the tournament theory in a CEO compensation perspective explained the positive and negative impact of the concept on organisational performance. According to Connelly *et al.* (2014) and Paligorova (2011) the more optimal the compensation gap between the CEO and the management team, and between the management team and ordinary employees, the larger the incentive for performance maximisation at all levels. They suggested that the benefits of an optimally designed relative pay outweighed the benefits of pay for performance, because relative pay motivated all employees instead of one individual. Conversely, the tournament theory can negatively impact organisational performance as it may foster aggressive and competitive behaviour (Lin, Yeh, & Shih, 2013). They added that a big spread between the two adjacent remuneration levels negatively affected overall organisational performance.

2.3.6 Labour market theory

The labour market theory suggested that the CEO compensation was determined by labour market dynamics. It said that the demand and supply of talent in this labour market determined the natural CEO compensation based on market force equilibrium. Tervio (2008) argued that the level of CEO compensation was dependent on key factors, competition for available talent and the size of the organisation, while Cao and Wang (2013) said that CEO mobility is one of the key factors that determined their

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compensation. Fulmer (2009) supported this view by adding that labour market related factors contributed to the executive compensation level. He stated that his findings indicated that the compensation levels were largely influenced by competitors, and companies paid a premium to retain experienced CEOs. As a result, the compensation for a CEO in an environment where good and experienced candidates are scarce will be naturally high. Fulmer (2009) also added that this constraint is manageable through efficient investment in human capital.

2.4   Corporate governance

According to Blair (2014), there are various measures used to manage executive remuneration and general business conduct in the South African environment, in order to ensure good practices and sustainability. One of these key regulatory measures to ensure good corporate governance is the King III code on executive remuneration, which was introduced by the Institute of Directors in Southern Africa (IoDSA) in 2010 (IoDSA, 2009). The main purpose of this code is to provide the business community with minimum requirements for integrated business reporting.

Donaldson (2012) defined corporate governance as the collection of rules, policies, and institutions affecting how a firm is controlled. Saltaji (2013) said corporate governance is intended to resolve agency problems by solving issues between a board of directors and other members of a company, and ensure efficient execution of management activities. Bushman, Dai, and Wang (2010, p.1) said that "a key aspect of corporate governance is embodied in the decision rights granted to a firm's board of directors to hire, compensate, and fire the chief executive officer (CEO)". It is regarded as the most effective way through which the interests of the CEO and shareholders can be aligned by incurring additional agency costs to efficiently incentivise executives. Members of the board of directors are elected by shareholders during an annual meeting in an effort to manage agency problems and maximise the shareholder value. Good corporate governance entails professional monitoring and management of the information on company operations by a board of directors (Saltaji, 2013). They delegate most management functions and many decisions to internal agents, but retain ultimate control (Fama & Jensen, 1983). This means that the effectiveness of the board is dependent on its ability to continually monitor, review and manage the discretion of individual managers on decisions affecting the company. Adams, Hermalin, & Weisbach (2010) also concurred that the role and responsibility of a board of directors includes overseeing and monitoring senior management activities on behalf of shareholders, and assessment of executive management for appointment and dismissal. They added that in some

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companies, the board of directors are also involved in strategy formulation and executive decision making processes such as project selection.

Conversely, Tang, Crossan, & Rowe (2011) argued that vigilance of the board does not result in effectiveness. They suggested that this is dependent on the power of the board over the executive management team, which implies that powerful boards are better positioned to effectively use the tools at their disposal to influence management actions, while the influence of less powerful boards is limited. Morse, Nanda, & Seru, (2011) also argued that if the CEO is stronger than the board, they can persuade them to change the structure of performance in their favour by manipulating measures to align with the company performance outlook. This backed the view that for performance based incentive contracts to support sustained performance that maximises shareholder value, the company board of directors must be relatively stronger that the CEO.

2.5 CEO compensation

According to Jensen & Murphy (1990), the agent theory position is that compensation policy will be planned to incentivise managers to act in the best interest of the principal by increasing the shareholder value. They also added that it is appropriate to align CEO pay with the increase in shareholder wealth as this is the purpose of the business. However, many said that CEO pay has, at least in recent past, not been aligned with business performance. In some cases it has increased at a much higher rate compared to shareholder returns (Tosi *et al.*, 2000).

Matolcsy & Wright (2011) argued that equity-based compensation could be used to align the interests of shareholders and managers when monitoring of CEOs is difficult and costly. According to Zheng and Zhou (2012), there has been a significant increase in the use of stock options for executive compensation purposes over the past few decades, however this remains a very contentious issue. Jensen and Murphy (2010) described direct stock ownership by the CEO as the most powerful link between shareholder and executive wealth. They are seen as highly effective in incentivising an executive to function in the best interests of the shareholder, as the incentive to increase organisational performance is maximised while the impact of executive remuneration on shareholder value will be offset by a rising stock price (Jensen & Meckling, 1976).

Zheng and Zhou (2012) said that there is an argument that stock options are an important incentive for corporate managers and help firms retain key employees. He said there is however, a general concern that executive stock options are costly to shareholders and encourage executives to engage in opportunistic behaviour.

Conversely, Edmans & Gabaix (2009) argue that tying CEO compensation to industry performance induces the CEO to choose their firm's risk exposure optimally.

Nyberg, Fulmer, Gerhart, and Carpenter (2010) said that boards that use pay for performance to manage agency problems must have the expertise and vigilance to properly oversee executive decisions, rather than depend on alignment of incentives between the CEO and shareholders. It is therefore evident, based on the above theory that that the firm's success is not the responsibility of one specific stakeholder, but a collective responsibility of all of them.

2.5.1 Potential deficiencies in executive compensation

The proponents of the agency theory have argued that it is the best way to manage potential conflict between the principal and agent, and mitigate optimistic self-interested executives (Jensen & Meckling, 1976). Eisenhardt (1989) said the agency theory is concerned with two potential conflicts pertaining to the relationship between the principal and agent, namely the principal and agent's conflict of interest and the difference in attitudes toward risk. The literature on the subject states that a board of directors should design executive compensation in a way that incentivises managers to maximise shareholder value (Jensen & Murphy, 1990). Since managers are described as risk bearers due the impact of their decisions on the organisation (Fama, 1980), it is argued that the actions of organisational boards concerning the CEO compensation design should endeavour to incentivise them to take a certain level of risk in order to achieve the intended organisational performance outcomes (Jensen & Meckling, 1976), (Goergen & Renneboog, 2011); (Bryan & LeeSeok Hwang, 2000). This risk premium, paid mainly in form of stock options, is intended to maximise shareholder returns by influencing risk-averse managers to take risks. However, the observation by Jensen & Meckling (1976) that the behaviour of managers and workers in general is dependent on the nature of the employment contract also raises a question regarding the impact of the contract on the behaviour of agents, and whether it may unintentionally instigate opportunistic behaviour by devious managers.

Despite the need and justification for the agency theory to manage agency problems as demonstrated by proponents, the detractors have criticised CEO compensation for being too high and not being tightly linked to organisational performance. While Jensen & Murphy (2010) stated that the increase in executive compensation between 1974 and 1988 had been too low to generate significant returns for the CEO, some have argued that it is too high. Faulkender *et al.* (2010) argued that on a number of occasions the

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level of executive salary has accelerated at a much higher rate than the level of performance. They added that stock options were seen as the main contributing factor, as many self-interested executives may influence the upward movement in the stock price, in order to maximise their personal returns. Increases in executive pay relative to non-executive staff have also a received its share of attention. Faulkender *et al.* (2010) stated that it is not only the pronounced upward trend in the executive compensation that has stimulated the debate, but also its increase relative to that received by the ordinary worker.

Some have argued the risk premium which most boards of directors incorporate into the executive compensation structure, may well be one of the key sources of the deficiency in executive compensation. Jensen and Meckling (1976) noted that the CEO compensation structure may incentivise executives who are risk-neutral to taking actions that reduce firm value, resulting in increased agency costs. According to this observation, managers cost the shareholders the total agency amount associated with their compensation, regardless of whether the shareholder returns will be positive or not. Further, Jensen and Murphy (1990) found that executive pay is insensitive to shareholder returns based on their study for the period from 1974 to 1986. Various input information used in determining the appropriate level of CEO compensation have also been highlighted as deficiencies in executive pay. Jensen and Murphy (1990) argued that, while the change in shareholder wealth is the optimal measure of CEO performance, individual performance measures for a CEO should incorporate a direct measure of their actions relative to peers. They said accounting measures related to performance of organisations in the same industry or market should be adopted. Tervio (2008) noted that the difference in CEO pay is found to be mostly due to variation in firm characteristics. Bizjak, Lemmon and Nguyen (2011) added that organisations adopt compensation structures and levels similar to firms with comparable characteristics, with less regard for company size. They have noted that this has resulted in inflated executive compensation packages. They also found that the source of the problem is the conflict of interest between the parties involved in determining the peers of the organisation, which has influenced the balance of power between the board and executives as executive pay in larger organisation is higher than in smaller organisations (Tervio, 2008); (Bizjak *et al.*, 2011). This has resulted in companies benchmarking themselves against larger and more highly paid peers, which is used as a justification for higher compensation. Bizjak *et al.* (2011) concluded that the use of peer group comparison is now an important factor in CEO compensation design, but that regrettably it is biased upward.

2.5.2 CEO compensation and employee motivation

The purpose of compensation is primarily to attract the best talent, motivate employees to perform at the highest level, and the retention of these executives (Faulkender et al., 2010). However, the media attention on CEO compensation has put the pay for performance debate in the spotlight mainly due the level of compensation and associated justification. Regular reports on various private and public sector CEO compensation information in the media and company reports in accordance with King III requirements may be providing employees with information that stimulates their interest in the subject. However, Welsh, Ganegoda, Arvey, Wiley, & Budd (2012) suggested that the impact of executive compensation on employee attitudes has not been previously explored.

Neeley and Boyd (2010) also said that authors of literature on executive pay for performance barely mention the influence of CEO pay on worker morale and behaviour. Their findings suggested that, while employees in the USA are aware, and for the most part tolerant of the large gap that exists between CEO pay and that of the employees, there are limits. They concluded that when faced with layoffs or pay and benefit cuts, employees may engage in counterproductive behaviour that could be detrimental to organisational effectiveness.

According to Welsh et al. (2012), equity theory suggests a negative relationship between CEO compensation and employee attitudes if employees believe that a CEO's benefits have grown more quickly than their inputs, but would suggest a positive relationship if employees believe that the growth of CEO outputs are directly proportional to their inputs. In a study to explore the extent to which employee attitudes in the existing US workforce are impacted by executive compensation levels, Welsh *et al.* (2012) discovered that attitudes appear to be related to some measure of CEO compensation. This raises the question of whether the highly publicised salaries earned by the South African mining executive, which has been portrayed by the media as exorbitant, is somewhat to blame for mining productivity and hence performance.

2.5.3 CEO remuneration components

CEO compensation structures are designed by a board of directors as a tool to maximise shareholder returns (Noe, 2009). He commented that an optimally designed executive compensation maximises integrity at a minimal cost to the shareholders. It is for this reason that the structural design of CEO compensation is seen as an important device which is used to reward or punish CEOs for company performance. This is achieved through a variable performance sensitive pay structure or even dismissal in the case of

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poor performance (Graffin, Boivie, & Carpenter, 2013). The level and combination of remuneration components appropriate for the individual CEO is determined by the board compensation committees in an effort to align the agent and shareholder interests, and discourage unscrupulous behaviour by an executive. Saltaji (2013) said that rewarding management with shares is one of the most practical ways to align management and shareholder interest. Jayaraman and Milbourn (2012) said that recent executive compensation packages indicate board's preference for stock options instead of cash based compensation components. This is based on their observation of a dramatic increase in stock options compared to other components of CEO pay in the last three decades, making stock options one of the most important components of executive pay (Faulkender *et al.*, 2010). Jayaraman and Milbourn (2012) attributed this structural change in executive compensation packages to stock liquidity.

Gormley, Matsa, and Milbourn (2013) stated that the CEO compensation structure design process should consider the required level of risk taking necessary to deliver the desired level of performance. They noted that the main purpose of this is to influence the company performance by stimulating the executive's appetite for risk, through stock options. Bizjak *et al.* (2011) and Tervio (2008) said that external factors like company characteristics, industry and performance of competition also form a critical part of the CEO compensation design process. Primarily, a well-designed executive compensation package is viewed as an important mechanism for corporate governance (Faulkender *et al.*, 2010). It is considered an effective way of aligning shareholders returns and reward, while simultaneously counterbalancing the potential unscrupulous behaviour by the CEO to maximise their returns at the expense of shareholders.

Frydman and Saks (2010) categorised the CEO compensation structure into three distinct categories, namely short term compensation, long-term compensation and the Black–Scholes value of stock option grant. This is slightly different to the South African compensation structure according to Bussin (2014). He stated that the South African compensation structure comprises three main components; namely, total guaranteed package, short-term incentive pay and long-term incentive pay. The model presenting the structural design of CEO compensation in South Africa can be illustrated by the compensation structures shown in figure 1 below. This CEO compensation model has been adopted for the purpose of the study documented in this report.

Figure 1: Components of remuneration in South Africa (Bussin, 2014)
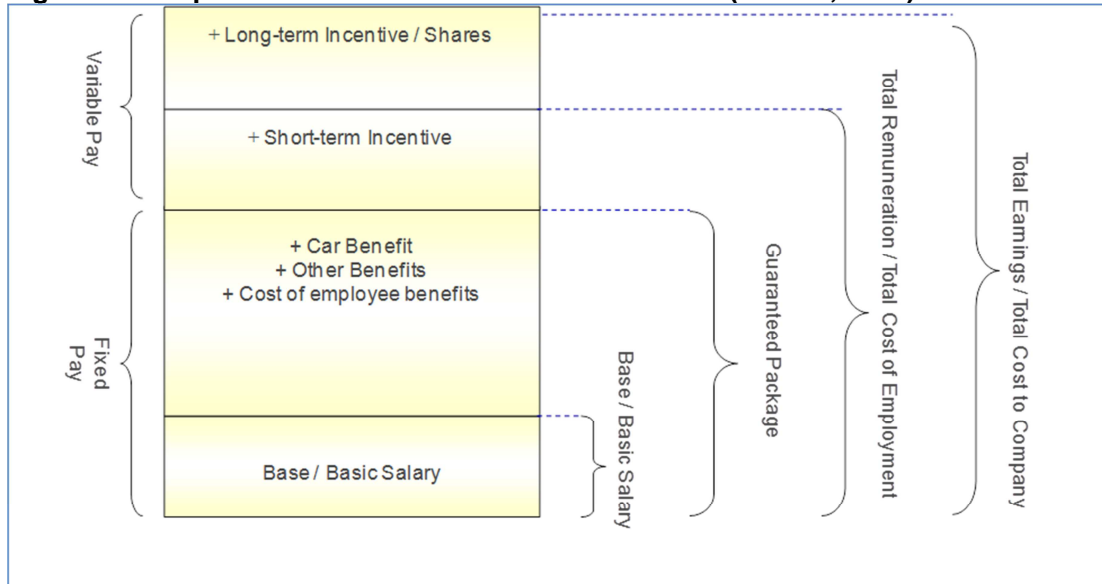
The sub-component of the CEO compensation as illustrated above can be summarised as follows according to Bussin (2014):

- Guaranteed package

The guaranteed package of employee compensation is the total amount of non-variable cost of employee to the company. It is made up of the base / basic salary, car benefit, cost of employee benefits and other benefits.

- Total remuneration

Total remuneration entails the total cost of incumbent employment to the company, consisting of the guaranteed package and the components of variable pay known as short term incentives. The short term incentive component refers to the annual bonuses tied to any combination of the company performance, team performance and individual performance.

- Total earnings

The total earnings refers to the total cost to company consisting of all fixed and variable components of compensation, including costs resulting from long term incentives. The long-term incentives are the employee benefits that are applicable over a defined period, such as a share option scheme, share grant scheme, share purchase scheme and long-term cash incentive scheme.

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For the purpose of this study, only the short-term incentive component of CEO compensation will be used due to time constraints. Blair (2014) argued that using the expected long-term component of the CEO pay instead of the short term component provides more accurate results of the relationship between CEO compensation and company performance. This is because the CEO may choose to defer cashing out their benefit, which would result in the differed reporting of the transaction on the company's financial statement. While his argument is valid, the effect of using short term incentives is not expected to have significant impact on the overall findings, as the results are specific to the products of total CEO remuneration. Further, the interpretation of findings comprehends that the relationship between the CEO compensation and shareholder returns is unlikely to be excessively impacted, provided that the specific performance measures are matched with the appropriate compensation component (Nyberg *et al.*, 2010).

2.5.4 Organisational performance measure

Pay for performance is regarded as an effective mechanism to align shareholder and management goals by proportionally rewarding management for the level of effort as measured through organisational performance. While the economic theory on compensation stipulates that organisational performance should affect CEO compensation because it is the direct result of the managerial contribution, there is no specific measure of performance recommended (Murphy, 1985). Other subsequent studies on pay for performance also argued that there is no consistency in the preferred organisational performance measure (Blair, 2014); (Shaw, 2011). The previous studies on the relationship between CEO compensation and company performance indicated that results are influenced by the type of industry and performance measures analysed (Blair, 2014). He argued that the overriding principle is to ensure that all key performance measures are studied in order to limit the influence on the research results.

According to Blair (2014), the two main measures of performance in South Africa are accounting-based and market-based. Accounting-based measures comprise absolute financial performance records or ratios used to measure the performance of a company. Some argue that this measure is backward looking and may be manipulated by managers (Goergen & Renneboog, 2011). Conversely, the market-based performance measures use the equity markets performance as a measure of how well the company is doing. It is argued that it would be prudent to use shareholder return as a measure of performance (Murphy. 1985); (Goergen & Renneboog, 2011); (Ozkan, 2011) because pay for performance aligns the interests of the executives with those of the shareholder

in terms of the principal-agent theory (Gregg *et al.,* 2012). Various subsets of the accounting and market based measures of performance that are commonly used in pay for performance studies included the following:

➢ Accounting-based measures

DuPont analysis is a performance analysis method that uses gross instead of net book value of assets to determine ROE. It makes use of three distinct components, namely operating efficiency, asset turnover and financial leverage (Garrison, 2006). The DuPont components used as performance measures in this study are the ROE and asset turnover in order to minimise the effect of a correlated variable in the study, while focusing on key measures. The previous researches that used ROE as a measure of performance were; Bradley (2011); Modau (2013); Shaw & Zhang (2010); Shaw (2011) and de Wet (2012), while turnover was used as a measure of performance on the study by Nel (2012).

Absolute measure of performance refers to measures which are the evidently identifiable performance indicators without delving into the comprehensive financial results. The absolute measures of performance used in the study are turnover and EBITDA. The previous studies that used these measures include Resnick (2012) and Barber *et al.* (2006) for revenue, and Blair (2014) and Shaw (2011) for EBITDA.

HEPS is a performance measure known as a good indicator of organisational profitability by apportioning organisational profits to each of the outstanding share of common stock. This measure of performance was used in studies by Blair (2014) while Bradley (2011) and Shaw (2011) used EPS.

ROA is known as a measure of the company's profitability relative to the assets used in generating that profit (Garrison, 2006). ROA was used as a measure of performance in the studies by Bradley (2011) and de Wet (2012).

➢ Market-based measures of performance

Share performance is the measure that monitors the change in shareholder value over a defined period. The total shareholder returns (TSR) is also commonly used and refers to the total return on investment in a stock to an investor, including dividends over the investment period. Shaw and Zhang (2010) suggested that even though the stock returns are not commonly used in management contracts, they are used with earnings by compensation committees to gauge CEO performance. Other research, including studies

by Gregg *et al.* (2012) and Blair (2014) also used stock returns as a measure of company performance in executive pay.

Moreover, market capitalisation was also used to as a measure of organisational performance. It is determined as the products of the organisational share price and the number of outstanding shares (Garrison, 2006). This measure is used by investors to determine the market size of a company. Modau (2013) used market capitalisation in his study on executive compensation.

Sustainability measures like health and safety, environment, employment equity and community development are also key performance indicators in the mining industry (Department of Mineral Resources, 2010); however the inclusion of these measures is beyond the scope of this study. Only the performance matrix associated with productivity, efficiency, profit and market performance were considered for the study. The Ernst & Young (2013) survey results for the study Remuneration Governance in South Africa provided an overview of trends in remuneration related issues in South Africa over a period of two consecutive years, and was adopted as a framework to determine the key performance measures to be used for this study. Based on this report, the key short-term incentive performance indicators in the considered industries are as shown in figure 2. A similar method was also adopted by Blair (2014).

Figure 2: Short-term incentive performance indicators in South Africa
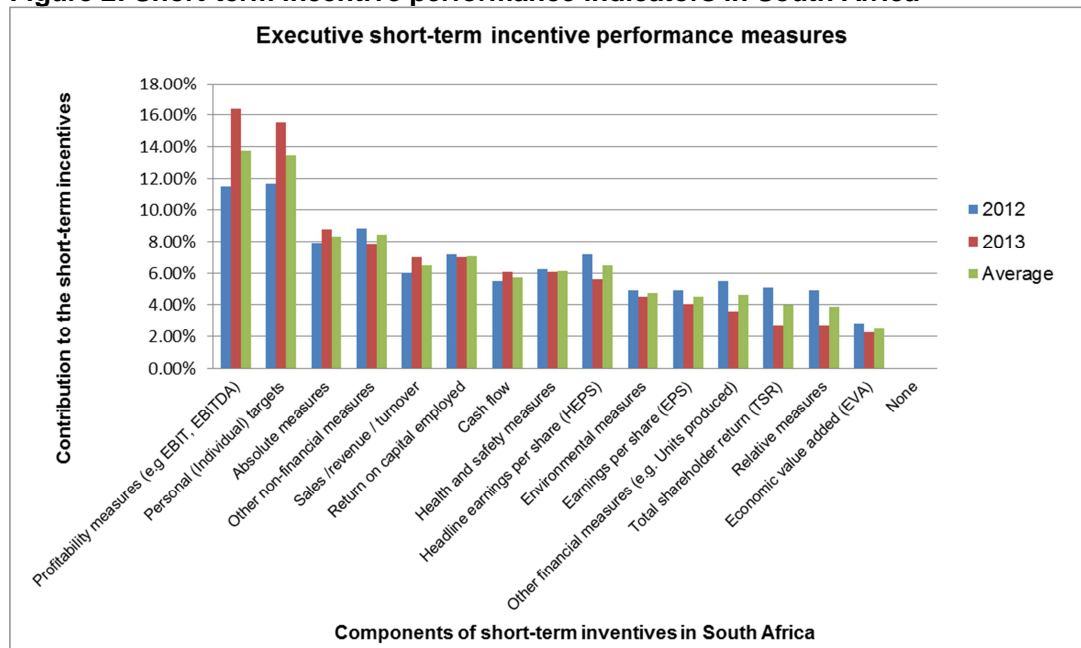
Of the performance variables included in the short-term incentive schemes for 2012 / 2013, only those measurable, recorded and having a relatively strong relationship with CEO pay were considered for the purpose of this study. These are shown in table 1:

Table 1: Performance variables tested

Subset	Parts	
DuPont components	*ROE = (profit / equity)*	*Total asset turnover = (sales / assets)*
Absolute financial performance	*EBITDA*	*Revenue*
Market performance	*Change in share price*	*Market capitalisation*
Other measures	*ROA*	*HEPS*

2.6 State of CEO compensation in the South African mining industry

South Africa made enormous progress in successfully developing a vibrant and resilient economy between the advent of democracy in 1994 and the beginning of the global economic crisis of 2008 (Bhorat, Tseng, & Stanwix, 2014). However, poverty, unemployment and inequality have remained the key challenges facing post-apartheid South Africa. Inequality, in particular seems to have progressively increased over time, with Tregenna and Tsela (2012) stated that South Africa is one of the most unequal societies in the world. They also claimed that there is consensus in the literature that the levels of inequality have worsened in South Africa since the advent of democracy in 1994.

Goergen and Renneboog (2011) identified South Africa as one of the countries with relatively high CEO compensation. They also illustrated that in the period of 10 years between 1997 and 2006, the South African CEO compensation amongst the companies with at least US $500 million in worldwide annual sales, increased at an above inflation annual rate of 9.8%. However, no link was made between this relatively high rise in the levels of CEO compensation increase and economic growth or the ordinary worker salary. While the excessive increase in CEO compensation was not limited to South Africa, and includes most European countries and the USA, it was observed that South Africa was the third highest among surveyed countries (Goergen & Renneboog, 2011). Further, the level and increase in South African CEO compensation was the highest in the developing countries among surveyed countries. On the ratio of variable pay to annual base salary expressed in percentage in the financial year 2005 / 2006, South Africa and the USA were ranked highest at 180%, which was at least 25% higher than

the next country, according the report. However, the South African CEO compensation components were the most uniformly distributed (Goergen & Renneboog, 2011).

The mining industry has played a key role in this transformation as one of the main providers of employment to many semiskilled migrant workers from rural South Africa and neighbouring countries. However, the levels of mining executive remuneration have recently come under scrutiny. According to Crowley (2013), South African fund managers overseeing almost $180 billion in assets said they are stepping up pressure on mining companies to curb executive pay as shareholder returns decline. It was reported that pay for chief executive officers at South African mining companies increased excessively in the decade to 2012, while dividends per share dropped 25% (Crowley, 2013). Further, Carte (2011) stated that South African mining and resource executives took home more pay than their cell phone and banking counterparts in 2010, while Seccombe (2013) claimed that mining executive pay is out of proportion with their company performance and recommended that a review of the way packages are structured should take place.

It was also reported that the chief executives of the top three gold and platinum mines in South Africa earned a collective remuneration totalling R140-million in 2012, leaving workers and unions indifferent to pleas of poverty by mining houses in on-going wage negotiations (van Vuuren, 2013). The same article claimed that CEO remuneration at ten of South Africa's biggest mining groups for the 2012 financial year showed that total compensation tended to increase in the opposite direction of most company's operational and financial performances, during a difficult period for the country's mining industry. The same report also indicated that labour unions said executive remuneration levels feature strongly when negotiations over worker wages take place. It was further reported that political and labour analysts have blamed the bloated executive pay packages for the growing income gap, which has reached levels unseen since the demise of apartheid (Molele & Letsoalo, 2012), (Steyn, 2013). This has been cited as one of the key reasons for the wave of illegal strike actions in the mining industry. The report went on to say that the salaries of chief executives in the mining sector have quadrupled over the past few years despite the global economic crisis and are 150 times higher than the pay of an average mineworker.

Jensen & Murphy (2010) argued that excessive compensation is not the problem, but that it is the way in which executives are compensated. They claimed that compensation of executives in the USA is independent of company performance, and it is for this reason that many executives behave like bureaucrats instead of agents that strive to maximise shareholder value. Conversely, Cao and Wang (2013) argued that

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understanding the factors that determine CEO incentive pay to company performance ratio is paramount to understanding the increase in CEO compensation. They said the two vital factors in pay to company performance ratio are CEO job mobility and organisational risk. CEO job mobility is as a result of high demand for skilled CEOs resulting in skill retention rent when the competition for resources is rife, while organisational risk refers to the structure of the risks the organisation is exposed to within its operating environment. They suggested pay for performance is dependent on the risk appetite of the agent. The more risk averse they are, the lower the pay for performance and vice versa. This implies that the pay for performance could be higher in the South Africa mining industry because of high competition for resources nationally and higher levels of risk relative to other sectors.

2.7   South African business environment context

With a Gini coefficient of more than 0.6, South Africa is one of the most unequal societies in the world. Unemployment, income inequality, together with poverty are matters of great concern in South Africa (van der Berg, 2014). The widening income inequality between ordinary workers and management is stimulating the debate on the rational for seemingly exorbitant executive pay and its relationship with company performance, especially in the South African mining industry. As the purpose of this study is to examine the relationship between the CEO compensation and organisational performance in the South African mining industry, the income inequality impact on performance is beyond the scope of this research.

The World Economic Forum ranked South Africa 113th in labour market efficiency (a drop of 18 places from 2011), 143rd place on rigid hiring and firing practices, 140th on a lack of flexibility in wage determination by companies, and last (144th out of 144 economies) on significant tensions in labour-employer relations (Schwab, 2012). It is evident, based on these results that the country has serious challenges to address in order to stand a chance of success in resolving poverty and inequality problems. Given the controversy over the potential link between executive compensation and the recent unrest in the South African mining industry, it is important to undertake research into the subject in order to learn more and identify potential solutions for the root cause of the problems.

2.8   Summary of literature review

According to the literature review, conflict of interest exists between shareholders and management, referred to as the principals and agents respectively. The literature that

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addressed these contracting problems that may occur between the principal and agent with competing interest is known as agency theory (Jensen, 1983); (Eisenhardt, 1989). This is achieved through optimal contracting theory, which is concerned with appropriately incentivising managers to eliminate managerial rent seeking behaviour. Corporate governance is the main tool used to manage these problems, resulting in additional costs. These costs incurred by shareholders to manage the agency problem are known as agency cost. These theories form the key components of the foundation for executive pay for performance.

The main purpose of an optimally designed pay for performance contract is to extract concentrated effort from managers to maximise shareholder value and prevent rent extraction. However, various factors were identified as potentially increasing agency problems rather than mitigating them. These include the power that managers have to influence their salary structural design and level, and the concept that the executive compensation is based on the relative ranking system instead of value added by the individual executive. The impact of CEO labour market dynamics is also considered to influence CEO compensation.

Various measures of CEO compensation and organisational performance are used in the reviewed literature. The CEO compensation components were mainly fixed salary, short-term and long-term incentives, while the measures of organisational performance were mainly subdivided into market and accounting based measures of performance. For the purposes of this research, the combination of fixed salary and short-term incentives were adopted as a CEO compensation measure, as well as a mixture of various market and accounting based measures commonly used in South Africa.

The South African context pertaining to executive remuneration and organisational performance, particularly in the mining industry was also reviewed. In terms of the information studied, the mining industry is experiencing labour relation challenges amid seemingly increasing executive compensation. Numerous articles have argued that there is a relationship between the levels and increase in CEO compensation, however no academic study was found to corroborate this supposed relationship in the mining industry.

The purpose of the research is limited to investigating the relationship between CEO compensation and organisational performance in the South African mining industry. Based on the information reviewed, it is anticipated that there will be a strong relationship

between measures of CEO compensation and of organisational performance. However, the outcome of this study will support or invalidate this perceived view.

Chapter three outlines the study questions that seek to resolve the research problem based on the literature reviewed in this chapter.

3.1   Introduction to research questions

The primary purpose of this study is to gain a deeper understanding into the relationship between performance in the South African mining industry and mining executive compensation, specifically the CEO. According to the literature review, compensation policies are designed to incentivise CEOs to act in the best interest of the organisation. Aligning CEO rewards with organisational performance serves as an effective measure to mitigate conflict of interest between shareholder and CEO (Jensen & Meckling, 1976). However, the literature review also highlighted that in some cases the CEO remuneration levels have grown at a rate higher than shareholder returns, or grown inversely proportional to shareholder returns.

Furthermore, in South Africa where poverty, unemployment and inequality remain key challenges, the high levels of CEO remuneration when seen in the context of salary paid to ordinary employees have been a great source of controversy. It has been perceived by the media as potentially contributing to labour unrest in the South African mining industry. This labour unrest has destabilised the industry and resulted in industrial action that have negatively affected the contribution of the mining industry to the South African GDP.

As indicated, many empirical studies on CEO pay for performance have been conducted, mainly in the financial and services industry, with diverging views on the relationship between CEO remuneration and organisational performance. Based on the theory and literature review, it appears that room exists to contribute to the literature in the context of the South African mining industry. The purpose of this section of the report is to expand on this knowledge by shifting focus to mining industry. To this end, the following research questions have been formulated:

3.2   Research questions

3.2.1   Research question one

Is there a proportional relationship between the fixed pay component of CEO compensation and measures of company performance in the South African mining industry over the period between 2009 and 2013?

3.2.2 Research question two

Is there a proportional relationship between the short-term incentive component of CEO compensation and measures of company performance in the South African mining industry over the period between 2009 and 2013?

3.2.3 Research question three

Which organisational performance measures can be used to best predict the fixed and short term components of executive compensation in the South African mining industry over the period between 2009 and 2013?

3.3 Summary of research questions

In summary, research questions one and two seek to analyse the relationship between different components of CEO remuneration and the measures of organisational performance in the South African mining industry. Finally, question three examines whether there is one predominant variable in determining the fixed and short-term incentive component of CEO remuneration in the South African mining industry. It seeks to determine the variable as well as its contribution to the structure of the considered components of CEO compensation over the period between 2009 and 2013. This was motivated by Gregg *et al.* (2012) and his observation that it appears that executives in the UK financial services industry were receiving pay based on market performance during a positive period, but changed to individual performance after the stock market crashed in 2008. The findings address the questions by analysing the strength of correlation observed between the appropriate variables.

The following chapter lays out the research methodology adopted to test the research questions raised in this chapter.

4.1   Introduction

The purpose of this chapter is to outline and justify the methodology adopted in the research. This entails defining and describing the following key concepts and tools for the analysis pertaining to the research:

- Research analysis method

- Research unit of analysis

- Research universe / population size

- Research sampling method

- Research analysis instrument

4.2   Purpose of the research

While the literature review advocated pay-for-performance as the most efficient way to align the individual interests of principal and agent, executive compensation remained the subject of contention. Despite extensive research into the subject, the relationship between executive compensation and organisational performance measures remains a complicated phenomenon. The literature shows that insight on the subject has been generally explored, but that room exists to expand the research to other industries. The purpose of this study is to extend the available knowledge on the relationship between CEO compensation and organisational performance to the mining industry, by analysing the relationship between CEO compensation and the commonly used measures of organisational performance in the South African mining industry.

4.3 Research design

This research will adopt an archival approach based on the descriptive quantitative research design. It will follow an empirical study based on the historical data and the reviewed literature to develop and support a position. The relevant numerical data pertaining to mining industry operations will be analysed statistically to investigate the relationship between the variables over the analysis period. The dependent and independent variables, namely the quantitative measures of CEO compensation and various organisational performance measures respectively. Thus, the study is quantitative in nature, because it focuses on the desktop analyses of quantities associated with the research problem instead of the qualities (Blumberg, 2008). The study will be longitudinal in order to conduct analysis of secondary time series data for CEO compensation components and organisational performance measures over the period between the year 2009 and 2013.

4.4 Population and sampling

Population is defined as the total collection of elements about which the study seeks to make some inferences (Blumberg, 2008). The population in this study was the mining organisations that were operational and listed on the JSE between the year 2009 and 2013. The adopted population definition was influenced by the need for quality and reliable mining industry statistics over the analysis period. All the JSE listed companies, including the mining industry are required to disclose director's remuneration in terms of King III; hence only the JSE listed mining companies were considered. The CEO remuneration and organisational performance data was acquired from the McGregor BFA database, which is the provider of fundamental business research data, including all JSE listed companies. The information published on the McGregor database is credible as it is based on the financial reports that are independently audited in accordance with the IFRS standard. The data for the JSE listed mining companies used in the research was also gathered from the McGregor BFA database, as well as the archived integrated organisational annual reports.

The study period was selected to incorporate various business cycles in the analysis in order to determine the relationship over time. This will minimise the effect of periodical business behaviour on the research findings. Furthermore, the time available to conduct the research also contributed to the decision regarding the period of analysis adopted. The limitation of the research scope to the mining industry was motivated by the need to align the study with the research objective of assessing the relationship between CEO

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compensation and performance in South African mining, which has recently become the subject of production constraining labour unrest.

4.5 Unit of analysis

This section of the report provides the units of measure that are used in the research. Blumberg (2008) defined units of analysis as the description of the objects used in the research as well as the level at which the research is performed. The units for CEO compensation and organisational performance, as used in the research are shown below.

4.5.1 CEO compensation variables

The components of CEO compensation used in the study are:

- The guaranteed total package made up of basic salary and fixed benefits

- The short-term incentive component of CEO compensation

Long-term incentives, which are commonly paid in stocks, were omitted from the study.

4.5.2 Mining organisational performance variables

The two main measures of organisational performance were used, namely accounting and market measures. The accounting measures of performance are backward looking as they are based on the balance sheet and income statement, while the market measures of performance are forward looking as they are based on the company share price. However, both measures were used to broaden understanding of the relationship between the commonly used performance measures in general and CEO remuneration. The variables of organisational performance used in the research are categorised as follows:

➢ Accounting-based measures of company performance category

- Return on equity (ROE), which is made up of profit margin, total asset turnover and equity multiplier

- Earnings before interest, tax, depreciation and amortisation (EBITDA)

- Headline earnings per share (HEPS)

➢ Market-based measure of performance

- Change in share price

- Market capitalisation

4.6   Sampling technique

The sample selection starts with all mining firms listed on the JSE, as per the population in Section 3. A time series data, which entails that the variables used in the analysis will be collected within the population. A purposive sampling technique was adopted by hand-picking JSE listed mining companies with all the required measurement variables published and archived in the McGregor BFA database. This is because it is expected that the sample of JSE listed mining companies, which has all the relevant data for the study period, conforms to similar criterion and characteristics as all the JSE listed mining companies.

Table 1 shows the sample of companies used in the study.

Table 2: Sample of JSE listed mining companies used in the study

African Rainbow Minerals LTD	Infrasors Holdings LTD
Anglo American Platinum LTD	Keaton Energy LTD
Anglo American PLC	Lonmin PLC
Anglo Gold Ashanti LTD	Merafe Resources LTD
Aquarius Platinum LTD	Northam Platinum LTD
Assore LTD	Pan African Resources PLC
Bauba Platinum LTD	Rangold & Exploration LTD
BHP Billiton PLC LTD	Rockwell Diamonds INC
Buildmax LTD	Sable Metals and Minerals LTD
Coal of Africa LTD	Sentula Mining LTD
Drdgold LTD	South African Coal Mining LTD
Exxaro Resources PLC	Tawana Holdings LTD
Gold Fields LTD	Trans Hex Group LTD
Harmony Gold LTD	Wescoal Holdings LTD
Impala Platinum LTD	Wesizwe Platinum LTD

Of the 45 mining companies, which were listed at the time of acquiring the data, the following companies were excluded for inadequate data on the McGregor BFA database or not listed on the JSE for the entire study period:

Table 3: JSE listed mining companies not included in the study

Atlatsa Resources CORP	Hwange Colliery LTD
Buffalo Coal CORP	Royal Bafokeng Platinum LTD
Delrand Resources LTD	Tharisa LTD
Eastern Platinum LTD	Waterberg Coal LTD
Firestone Energy LTD	Sibanye Gold LTD
Glencore PLC	Resource Generation LTD
Petmin LTD	Goliath Gold LTD
Village Main Reef LTD	

4.7 Measurement / analysis instruments

Microsoft Excel and IBM SPSS Statistics version 22 software packages were used for data and statistical analysis purposes. Both software packages were fully licensed through Gordon Institute of Business (GIBS), University of Pretoria at the time of conducting the study.

4.8 Data gathering and analysis approach

This research was limited to mining companies listed on the JSE. It was conducted using various data elements contained in the organisational financial statements, director's reports and JSE performance archives. This information was sourced from the McGregor BFA database for secondary quantitative time series data and was preferred because of the quality and reliability of its data.

Once the relevant data was sourced, it was sorted in accordance with the research design requirements using Microsoft Excel. This was followed by quantitative statistical analysis to examine whether there was a relationship between the variables within the collected data. To achieve this, the regression analysis of the organisational performance and executive compensation structure data units was conducted.

4.9 Potential research limitations

The following potential limitations have been identified so far in this research:

- This study was limited to JSE listed companies because of the availability of audited financial reports in line with the King III report on corporate governance;

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hence the findings may not be valid for non-listed companies as they may not be subscribing to the King III corporate governance principles.

- Limitations of this study also included the inability to show a causal relationship.

- The study excluded the long term stock options data due to the research time constraints and related data accessibility challenges. Since this information was described by Ozkan (2011) as potentially the most performance-sensitive component of compensation, the validity of study results may be limited where the compensation structure differs from the sampled data.

- Since the company performance is a product of good vision and leadership to ensure successful execution, its performance is not only dependent on CEO compensation. Employee attitude together with the leadership style of the entire management team can impact performance; hence the findings of the study are not conclusive on causality as it was beyond the scope of this research.

4.10 Summary of research methodology

In summary, the research methodology used was a deductive approach based on descriptive quantitative research design. It was longitudinal in order to conduct analysis of secondary time series data over the study period. The population for the study was the mining organisations that were operational and listed on the JSE between the years 2009 and 2013. A purposive sampling technique was adopted by hand-picking JSE listed mining companies that met the prescribed conditions.

All data used in the research was acquired from the McGregor BFA database, which is the credible provider of fundamental business research data, including all JSE listed companies.

The research methodology outlined in this section underpins the subsequent process to test and analyse the relationship between CEO compensation and organisational performance in the South African mining industry. The next chapter presents the results of conducted studies.

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CHAPTER 5: RESULTS

5.1 Introduction

The main objective of the research was to examine the relationship between measures of CEO compensation and organisational performance in the South African mining industry. Based on the literature review, a strong relationship between the two was expected. To analyse this relationship, statistical analysis of the data concerning sampled companies was conducted.

This chapter presents the results of the study, which was conducted in accordance with the prescribed research methodology outlined in Chapter 4. Its main purpose is to describe the data used in the research through descriptive statistics and present regression analysis results associated with all the research questions outlined in Chapter 3.

5.2 Descriptive statistics

5.2.1 Description of the sample

In total, 30 mining sector companies that were listed on the JSE formed part of the tested sample. All the research input data associated with the sample was obtained from the McGregor BFA database in the form of captured records and organisational reports. Where the highest ranking member of the executive management was termed Managing Director (MD) instead of the CEO, the MD compensation information was utilised. Of the sampled companies, most had more than one CEO for the entire analysis period. Only 36.7% of the highest ranking executive managers retained their positions throughout the analysis period. The remaining 63.3% represent the CEO turnover among the sampled group, resulting in two or more highest ranking executive managers in charge over the analysis period. The sample was made up of 30 companies, while the period of analysis was five years representing five items for each measure of analysis. Thus, 150 cases were studied.

Various currencies were used by the sampled companies for either executive compensation or annual financial reporting. The South African Rand (ZAR) was the predominant currency, with the American Dollar (USD), British Pound (GBP) Canadian Dollar (CAD) and Australian Dollar (AUD) also represented in the sampled data. For the

purpose of standardising the units of analysis, the currencies for all tested compensation components and performance measures were noted in ZAR. This was achieved by converting all the currencies to ZAR using the average exchange rates between 2007 and 2013, since the seven year period is considered to minimise the short term exchange rate volatility (Modau, 2013). The ZAR exchange rate to USD,GBP, CAD and AUD for the period between 2007 and 2013 (Historical Exchange Rates, n.d.) is shown graphically in figure 3 below.

Figure 3: Graphical representation of 2007 – 2013 ZAR to USD, GBP, CAD and AUD exchange rates
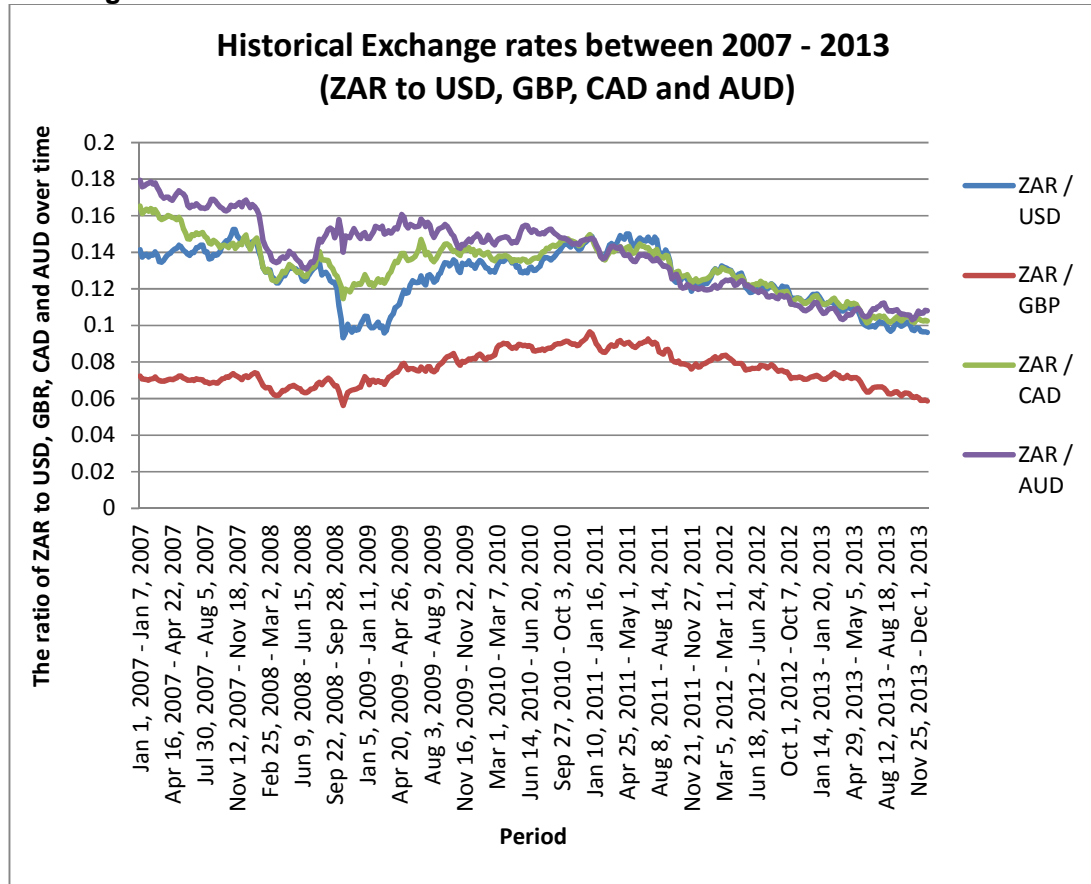
The calculated average exchange rate for the seven year period between 2007 and 2013 together with the minimum and maximum exchange rates were shown in the table below.

Table 4: Average historical exchange rates

Exchange rates	ZAR / USD	ZAR / GBP	ZAR / CAD	ZAR / AUD
Period average	0.1264	0.0759	0.1319	0.1389
Period high	0.1541	0.0973	0.1686	0.1816
Period low	0.0871	0.0537	0.1001	0.1026

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5.2.2 Measures of CEO compensation

The measures of CEO compensation adopted by the study are fixed pay and short term incentive. These individual measures of CEO compensation for sampled organisations standardised to the ZAR are graphically illustrated below. The fixed pay component is presented in figure 4.

Figure 4: Fixed pay component of CEO compensation
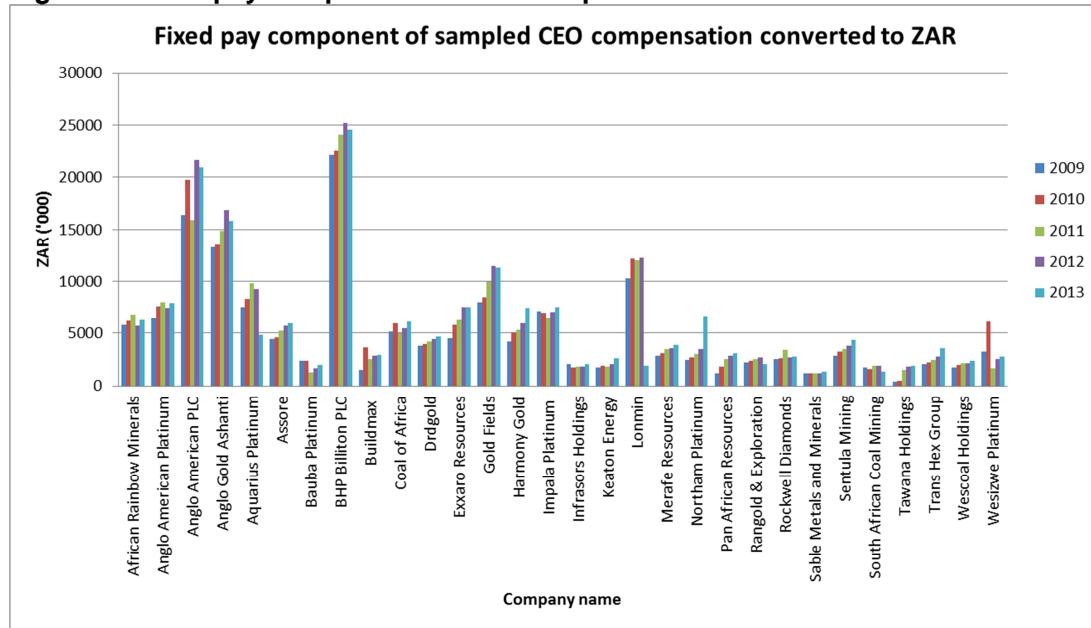
It was observed that the fixed pay component of the CEO compensation per company was generally stable over the analysis period. In contrast, the short term component of the CEO compensation over the same period was volatile as shown in figure 5. This demonstrates an expected link between the performance dependant short-term incentives, while the fixed pay remained constant irrespective of the organisational performance.

Figure 5: Short-term incentive pay component of CEO compensation
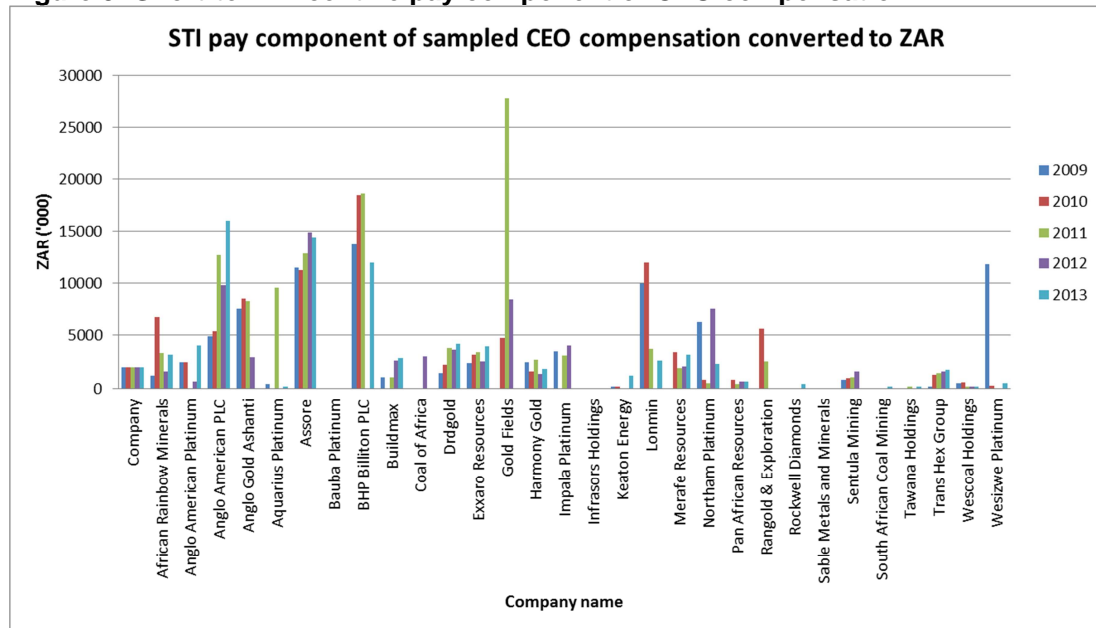
The descriptive statistics for each of the measures of CEO compensation utilised in the study are discussed individually in the following subsections.

5.2.2.1   Fixed pay component of CEO compensation

The summarised table of numerical descriptive statistics for the fixed pay measures of executive compensation for the sampled group between 2009 and 2013 are shown in table 5.

Table 5: Numerical descriptive statistics – fixed pay ('000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	5049.0	3077.5	4907.4	374.0	22176.0
2010	5671.0	3809.0	5266.6	454.0	22587.0
2011	5702.2	3494.0	5282.6	1200.0	24106.0
2012	6204.0	3674.5	5958.1	1200.0	25237.0
2013	5952.6	4143.0	5595.3	1332.0	24549.0

The data shows that the fixed pay component of executive compensation increased at a mean average rate of 4.4%, from R5,049,000 to R5,953,000 during the period of analysis. This translates to a compound increase of 4.2% per year over the same period. While the increase in the fixed component of executive pay between 2009 and 2010 was the highest within the study period at a mean average 12.3%. The increase in

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subsequent years was miniscule, while a negative growth was experience in 2013 against an average inflation rate of 8.62% over the study period.

The mean and median for the fixed pay measure of CEO compensation tabulated above are illustrated graphically in table 6. It is evident from the graph that the rate of increase in the mean and median remains constants throughout the period of analysis.

Figure 6: Graphical representation of descriptive statistics – fixed pay
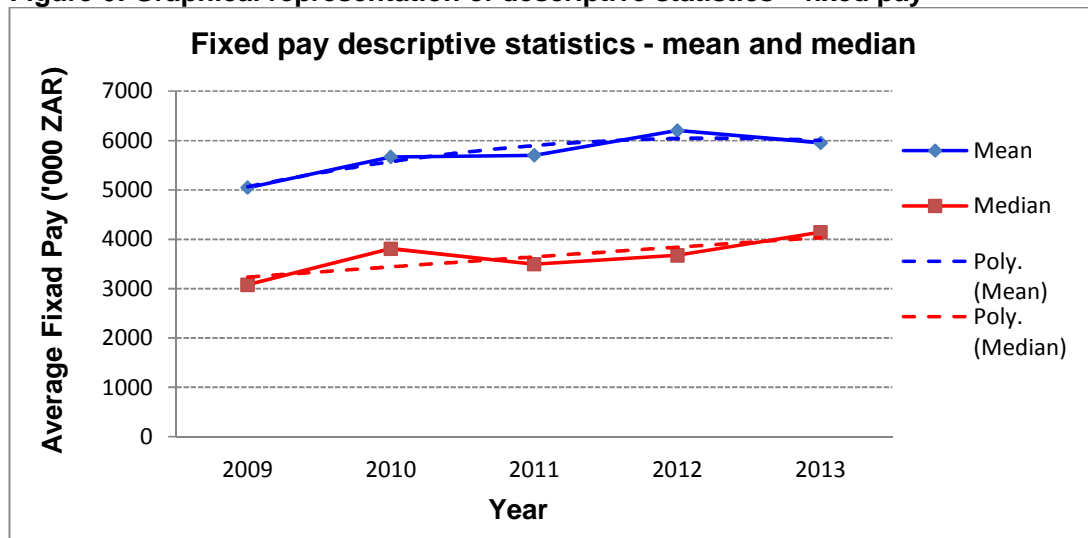
Based on the analysis of fixed pay information for sampled mining companies over the study period, it appears that the rate of change in fixed pay has not been as high as reported in the media. However, the miniscule increase observed was off a higher base relative to general workers in South Africa.

5.2.2.2   Short-term incentive component of CEO compensation

The summarised table of descriptive statistics for the short term incentive measures of executive compensation are shown in table 6 below.

Table 6: Numerical descriptive statistics – STI pay ('000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	2738.9	639.0	4118.0	0.0	13710.0
2010	3014.1	864.0	4471.0	0.0	18441.0
2011	3964.2	1243.0	6462.5	0.0	27719.0
2012	2302.8	985.5	3540.6	0.0	14894.0
2013	2526.0	553.0	4223.0	0.0	16047.0

The data shows that the short term incentive component of executive compensation remained volatile throughout the study period. The upward trend in the CEO short term compensation for sampled mining companies was recorded until the peak was reached in 2011. However, the downward trend was observed since the peak of 2011 to 2013. The mean and median for the data tabulated above is illustrated graphically in figure 7.

Figure 7: Graphical representation of descriptive statistics – STI
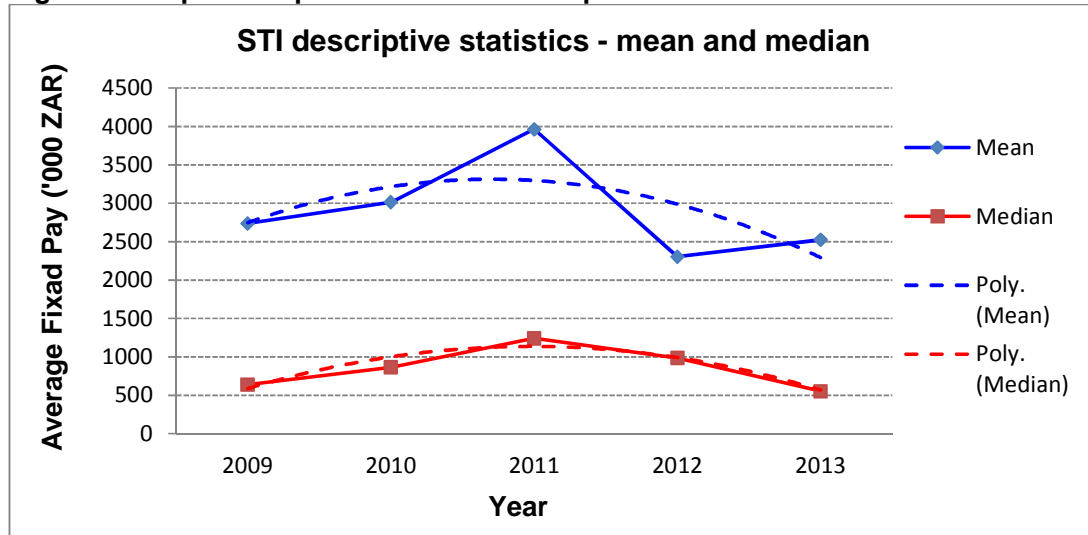
While the fixed pay component of executive compensation is guaranteed regardless of company performance, the short term incentive component is variable depending on the contracted measures of company performance. This suggests that the short-term incentive is the most performance aligned measure of the two components of CEO compensation considered in the research; hence the most important in understanding the relationship between CEO compensation and performance. The volatile nature of the short-term components of CEO compensation relative to fixed pay, as observed in figure 6 relative to figure 7 was considered to be indicative of the company performance during the study period.

5.2.2.3   Summary of measures of CEO remuneration

The descriptive statistics for measures of CEO remuneration showed that the fixed pay component increased steadily over a period of five years from 2009 to 2013. The average increase was 4.4% per year. Conversely, the short-term incentive increased steeply from 2009 to 2011, before reducing to levels lower than recorded in 2009. It was observed that the peak period for the short-term incentive component of executive compensation was recorded a year before the peak of the crisis that resulted in the death

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of 34 mineworkers who were participating in an unprotected and violent strike in Marikana (Antin, 2013).

It was anticipated that organisational performance is closely linked with the short-term incentive as opposed to the fixed component of executive compensation. The detailed analysis of the relationship is discussed in Chapter 6.

5.2.3 Measures of company performance

The organisational measures of performance adopted for the purpose of this research are as follows:

- Return on equity (ROE)

- Return on assets (ROA)

- Asset turnover

- Revenue (Rev.)

- Earnings before interest, tax, depreciation, and amortisation (EBITDA)

- Headline earnings per share (HEPS)

- Change in share price (ΔSP)

- Market capitalisation (MC)

The descriptive statistics for each measure of organisational performance are tabulated in the subsections below. The results show that both the market and accounting based measures of performance for sampled companies have generally reduced over the analysis period of the five years between 2009 and 2013.

The descriptive statistics for the each of the adopted measures of performance for the study are discussed individually in the following subsections.

5.2.3.1   Return on equity (ROE)

The numerical descriptive statistics for the ROE for the analysis period of the five years between 2009 and 2013 are shown in table 7 below. The table shows that a negative ROE equity was reported for at least one of the sampled companies for each of the five

years within the study period. The biggest standard deviation was recorded in 2011, suggesting that the widest dispersion of ROE data from its mean was recorded in 2011.

Table 7: Numerical descriptive statistics - ROE

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	78.0	10.8	261.5	-70.2	1359.6
2010	34.4	20.1	96.1	-142.6	424.1
2011	164.0	21.8	914.7	-384.1	4981.2
2012	16.9	12.1	77.4	-219.3	237.5
2013	-80.0	4.1	293.8	-1540.8	115.4

Figure 8 depicts the mean and median average ROE for all sampled organisations over the analysis period of the five years between 2009 and 2013. The data shows that an increased mean average of ROE was recorded in one of the four study periods producing negative growth. However the median ROE has remained relatively constant throughout the period. The negative ROE suggests that, on average, sampled companies made a net loss with the money invested in the company by shareholders.

Figure 8: Graphical representation of descriptive statistics – ROE
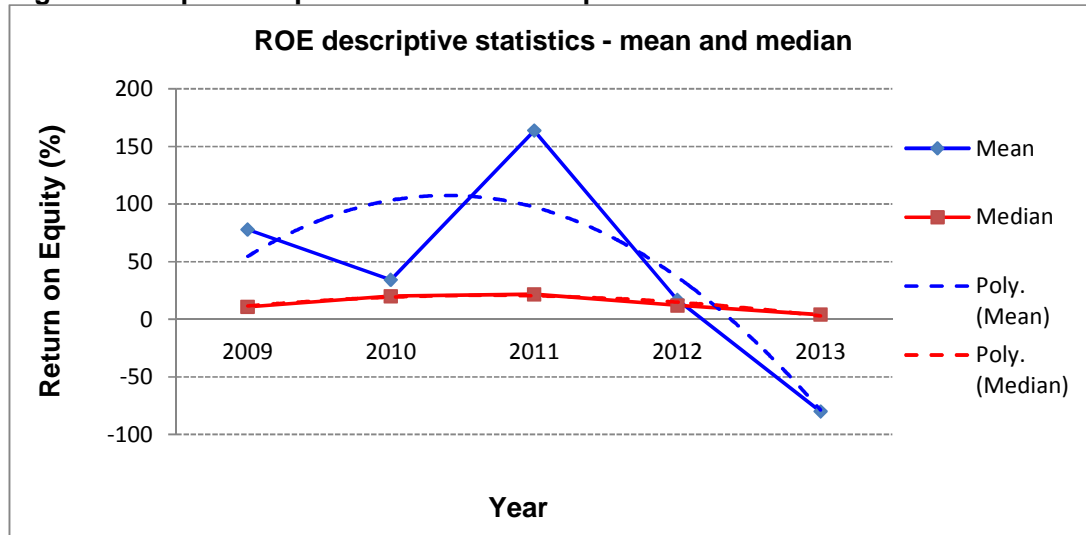
5.2.3.2   Return on assets (ROA)

The numerical descriptive statistics for the ROA for the analysis period of the five years between 2009 and 2013 are shown in table 8 below. The negative ROA was also reported for at least one of the sampled companies for each of the five years within the

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study period. This negative ROA suggests that the companies were not efficiently utilising their assets as negative earnings were reported on average against the total company assets. Contrary to the ROE, the mean ROA was lower than median ROA throughout the study period.

Table 8: Numerical descriptive statistics - ROA

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	-0.4	4.4	34.5	-113.3	71.3
2010	8.6	8.8	38.1	-112.6	130.0
2011	-13.7	8.6	75.2	-311.7	59.7
2012	3.8	5.6	31.2	-94.0	62.8
2013	-21.8	4.0	69.4	-271.0	47.4

Figure 9 depicts the average ROA for all sampled organisations over the analysis period of the five years between 2009 and 2013. Similar to ROE, the mean ROA decreased from 4.39 in 2009 to 4.02 in 2013. Both the mean and median ROA were trending downward at the end of the study period.

Figure 9: Graphical representation of descriptive statistics – ROA
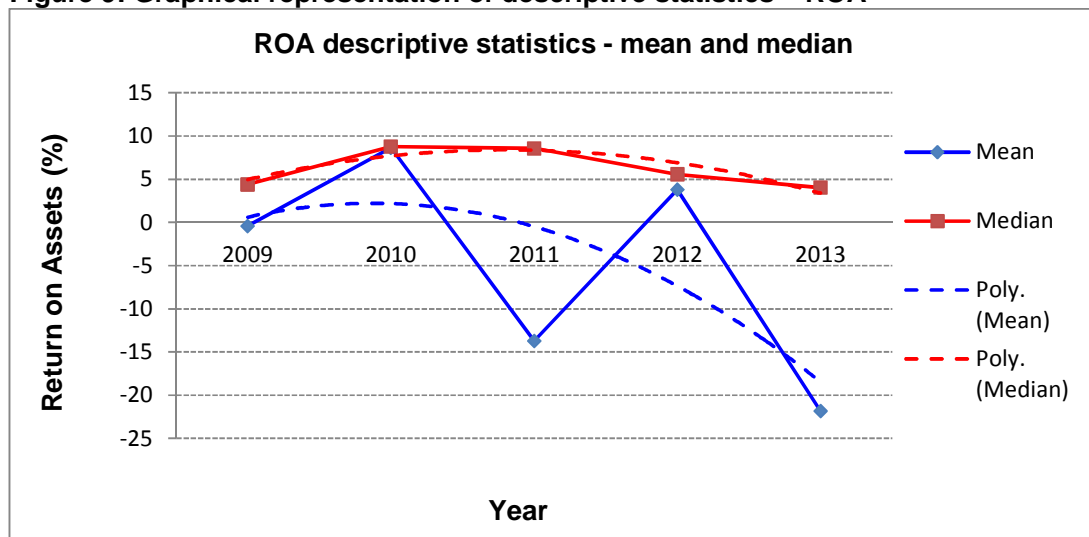
5.2.3.3 Asset turnover

The numerical descriptive statistics for the asset turnover for the analysis period of the five years between 2009 and 2013 are shown in table 9 below.

Table 9: Numerical descriptive statistics – asset turnover

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	0.74	0.62	0.68	0.00	3.19
2010	0.70	0.65	0.60	0.00	2.55
2011	0.84	0.72	0.70	0.00	3.34
2012	0.87	0.72	0.70	0.00	3.26
2013	0.85	0.65	0.76	0.00	3.42

Figure 10 depicts the mean and median averages of asset turnover for sampled companies over the five year period from 2009 to 2013. It was observed from the graph that the mean and median of asset turnover for sampled companies have steadily increased at a low rate over the study period.

Figure 10: Graphical representation of descriptive statistics – asset turnover
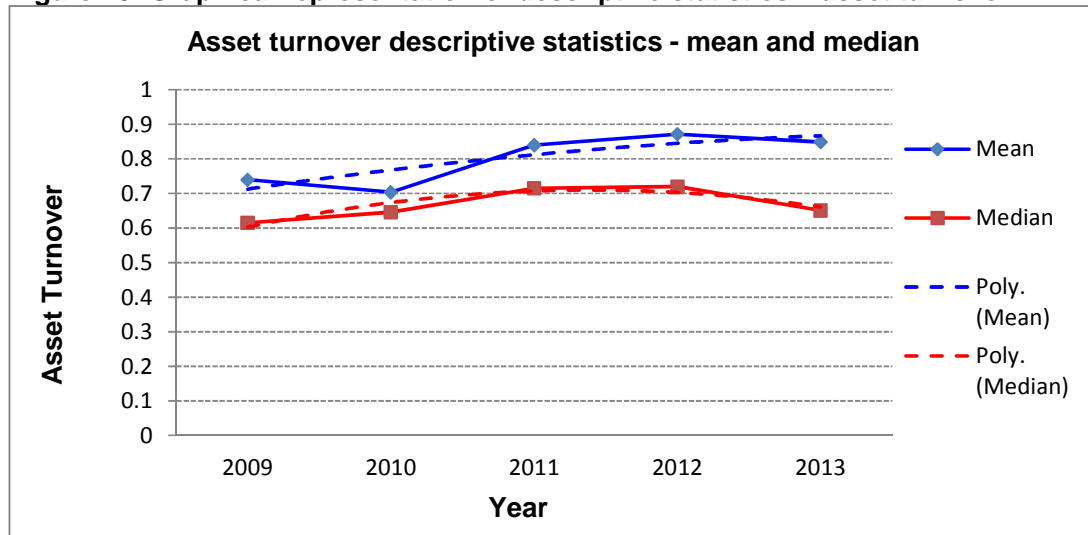
5.2.3.4   Revenue

The numerical descriptive statistics for total revenue generated by sampled companies over the analysis period of the five years between 2009 and 2013 are shown in table 10 below. On average, the revenue for sample companies has increased over the analysis period, with the reduction in revenue only recorded in one of the four business cycles studied.

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Table 10: Numerical descriptive statistics – revenue ('000 000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	177058.7	1983.6	690073.7	0.0	3577039.6
2010	172971.1	2368.5	637494.2	0.0	3169291.4
2011	207749.0	2496.0	780919.2	0.0	3974911.6
2012	227547.9	2773.1	871031.8	0.0	4475909.8
2013	251493.7	2791.0	919472.9	0.0	4616160.9

Figure 11 graphically depicts the mean and median of revenue generated by sampled companies over the five year period from 2009 to 2013. It was observed from the graph that the means of revenue generated for sampled companies have progressively increased since 2010 within the study period, while the median has remained steady. Further, there is a big difference between the median and the mean of the revenue generated, which indicates that most of the revenue used in the study was generated by a small number of companies within the sampled group.

Figure 11: Graphical representation of descriptive statistics – revenue
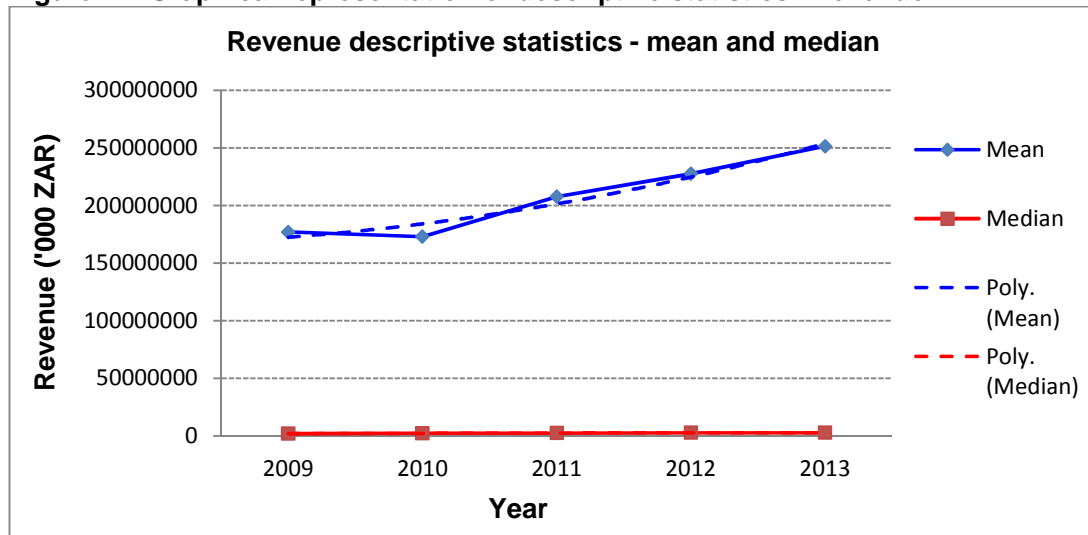
5.2.3.5   Earnings before interest, tax, depreciation, and amortisation (EBITDA)

The numerical descriptive statistics for EBITDA generated by sampled companies over the analysis period of five years between 2009 and 2013 are shown in table 11 below. Based on the statistical analysis of the data for sampled companies, the mean and

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median averages of EBITDA increased steadily from 2009 to 2011, before declining in 2012 and 2013.

Table 11: Numerical descriptive statistics – EBITDA ('000 000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	9043.4	41.6	26803.3	-1321.2	136281.6
2010	13221.7	632.6	40854.9	-25.8	206471.5
2011	17279.8	373.7	56564.3	-992.1	299936.7
2012	13548.6	284.3	48427.5	-1684.0	262903.5
2013	13167.0	257.8	41621.6	-921.2	223117.1

Figure 12 depicts the trend for EBIDA over the analysis period. The diagram indicates that EBITDA mean has increased from 2009 to 2011, before declining in the subsequent two years within the period of study. The median of EBITDA followed a similar trend, but its magnitude was significantly lower than the mean. This indicates that the contribution of companies to the total EBITDA data used in the analysis is heavily skewed towards a few companies within the sampled group. Further, the declining EBITDA in 2012 and 2013 while the revenue is increasing indicates that the companies' expenses have increased over the period.

Figure 12: Graphical representation of descriptive statistics – EBITDA
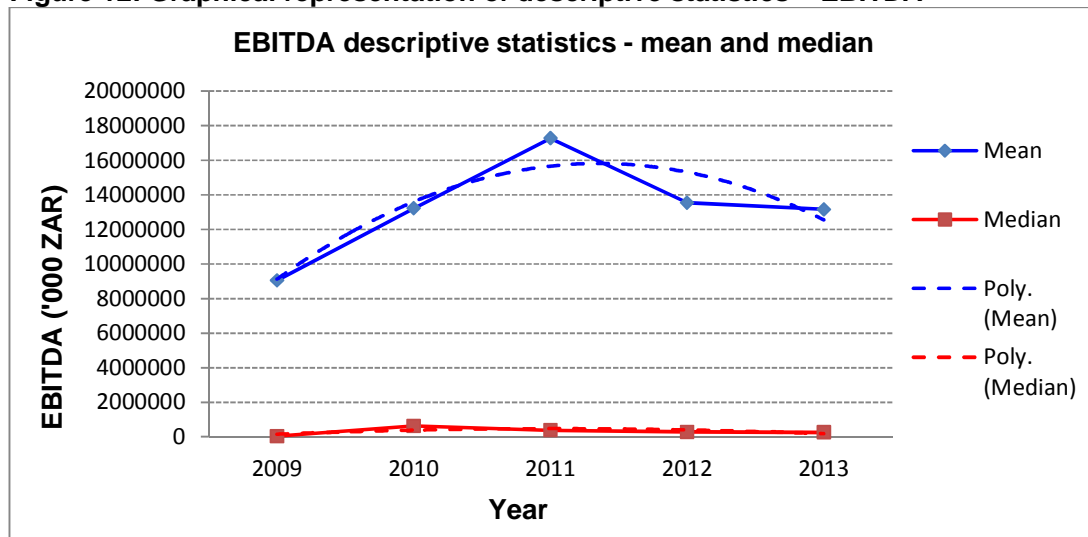
5.2.3.6   Headline earnings per share (HEPS)

The numerical descriptive statistics for HEPS for sampled companies over the analysis period of the five years between 2009 and 2013 are shown in table 12 below. The

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minimum HEPS recorded for each of the years of study is negative, indicating that the real returns for at least one company during each of the years of analysis was negative.

Table 12: Numerical descriptive statistics – HEPS ('000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	3589.3	15.0	19053.6	-1880.0	104412.4
2010	2014.5	14.5	8598.9	-159.8	47331.3
2011	1301.4	16.0	3766.6	-45.6	20394.2
2012	1223.3	23.5	4858.9	-562.0	26679.3
2013	1080.9	20.4	4725.4	-356.0	25951.5

Figure 13 graphically depicts HEPS for sampled companies over the period between 2008 and 2013. The trend observed indicates that the mean average HEPS for sampled companies has progressively declined over the study period. The lowest mean of the HEPS within the analysis period was recorded in 2013 while the highest was in 2009.

Figure 13: Graphical representation of descriptive statistics – HEPS
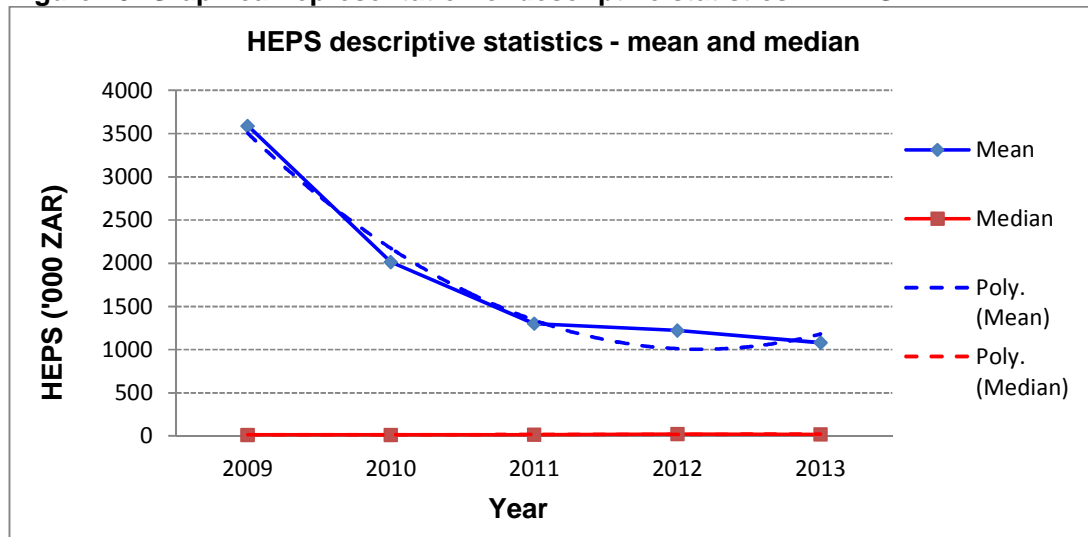
5.2.3.7   Change in share price

The numerical descriptive statistics for the change in share price for sampled companies over the analysis period of five years between 2009 and 2013 are shown in Table 13 below. The mean and median of the change in share price remain relatively aligned, which implies that it was evenly distributed among the sampled companies, except in

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2013 where the mean was positive and the median negative resulting in the biggest difference across the five years of study.

Table 13: Numerical descriptive statistics – change in share price

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	20.1	14.1	52.3	-58.2	133.2
2010	2.3	4.1	33.3	-77.3	100.0
2011	-14.3	-21.7	28.8	-65.1	62.3
2012	-12.4	-13.1	35.0	-69.8	94.0
2013	0.6	-10.1	66.4	-87.9	231.9

The means of the change in share price for sampled companies over the analysis period of five years between 2009 and 2013 are graphically represented in figure 14 below. The change in share price was at its peak in 2009, with positive growth also experienced in the following year. However, a steep decline in the change in share price followed, resulting in two consecutive years of negative growth, before recovering slightly in 2013.

Figure 14: Graphical representation of descriptive statistics – change in share price
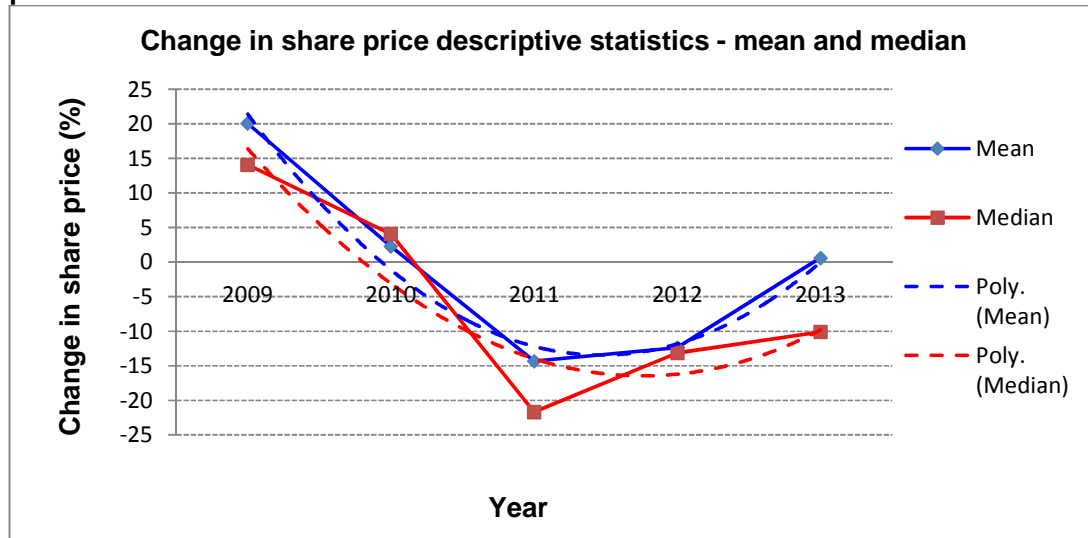
5.2.3.8   Market capitalisation

The numerical descriptive statistics of the market capitalisation for sampled companies over the analysis period of five years between 2009 and 2013 are shown in table 14

below. The mean average is much higher than its median, which indicates that the minority of sampled companies contribute the majority of total market capitalisation.

Table 14: Numerical descriptive statistics – market capitalisation ('000 000)

Year	Mean	Median	Std. Deviation	Minimum	Maximum
2009	56110.7	2675.9	123931.4	16.2	528775.7
2010	61392.5	3013.2	135768.5	38.0	590439.4
2011	53217.4	2521.2	115894.6	30.4	500508.3
2012	54578.4	2152.8	129600.8	67.9	625667.4
2013	49594.3	1743.3	136073.2	31.7	691889.1

Figure 15 graphically depicts the market capitalisation for sampled mining companies for the period of five years between 2009 and 3013. The trends over the analysis period demonstrate a slight decrease in the average market capitalisation over the study period. The positive trends in the trajectory were recorded during 2009 to 2010 and 2011 to 2012, while the rest of the period demonstrated a decline in market capitalisation.

Figure 15: Graphical representation of descriptive statistics – market capitalisation
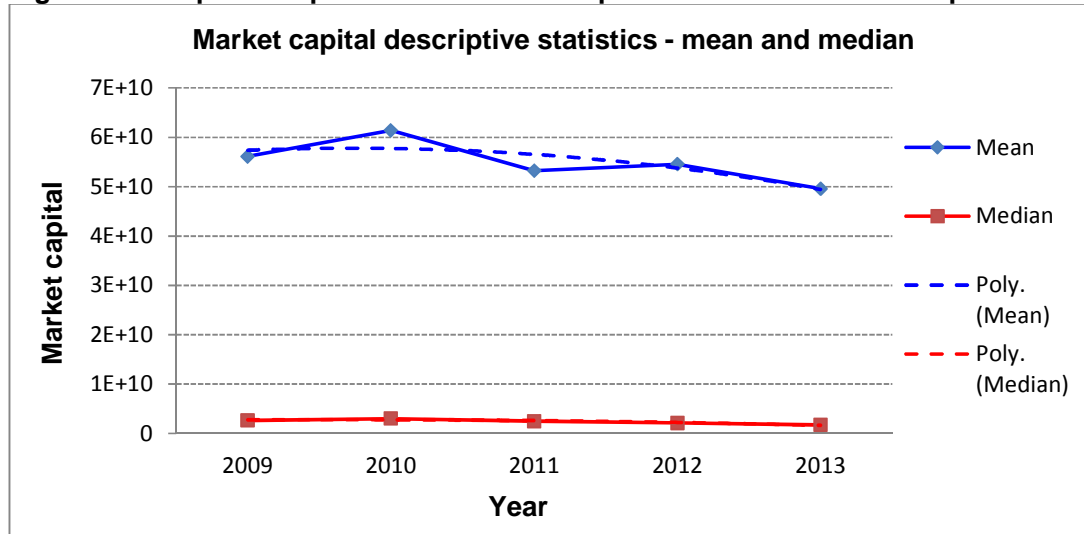
5.2.3.9   Summary of measures of company performance

The descriptive statistics for measures of organisational performance show that the performance of the sampled group of mining companies has been mixed for accounting based measures, while the market based measures have generally been declining over

the study period. However, it appears that the market based performance of sampled companies was recovering by the end of the analysis period in 2013, while the majority of accounting based performance measures were declining, with the exception of the revenue generated.

The high level analysis suggests that the accounting measures of performance, except EBITDA were less affected by the South African mining labour crisis of 2012 compared to the market based measures of performance. EBITDA reduced relative to revenue generated, which indicates that the expenses excluding interest, tax, depreciation and amortisation increased significantly in 2012 and 2013. This resulted in HEPS remaining stable throughout the period between 2012 and 2013. The extent of the relationship between each measure is further investigated in the following sections.

5.3   Normality test

The purpose of the test is to determine whether the data is normally distributed or not, in order to select the most appropriate test for the differences between the averages of groups in the data. The Shapiro Wilk test was used to test for normality. This test was selected because each group size has less than 50 observations, as the comparison test is conducted between the years (Shapiro & Francia, 1972). To test for normality, the following hypotheses were tested:

- H_0 = The data is normally distributed
- H_1 = The data is not normally distributed

The P value of 0.05, which represents 5% level of significance was accepted, which suggests that the results of the tests are interpreted as follows:

- P-value < 0.05, reject the H_0, then the data is not normally distributed
- P-value ≥ 0.05, accept the H_0, then the data is normally distributed

As shown in ANNEXURE A, all the data was not normally distributed in all the years of study except for the change in share price in 2009, 2010, 2011 and 2012 where a P-value of 0.309, 0.157, 0.108 and 0.131 respectively were obtained.

The two sets of tests for differences that were considered are parametric and non-parametric. The parametric test is suitable for normally distributed data, while the non-parametric test is used for the data that is not normally distributed (Pallant, 2013). Since all but four of the 50 cases compared were not normally distributed, it was decided to use the non-parametric test for comparison. The decision to select this test was

influenced by the smaller group sizes and high number of outliers, which is associated with a non-normally distributed data set.

5.4   Test for comparison

The type of non-parametric test adopted for comparison between the years on each of the variables was the Kruskal-Wallis test. Since there was no missing data for the sampled group of companies, the number of observations in each year remained 30 throughout the test. Contrary to the parametric test, the non-parametric test uses the mean ranking instead of the mean for comparison purposes (Pallant, 2013). This mitigates the impact of outliers on the test results. The following hypotheses were taken to test for normality:

- H_0 = There is no difference between groups / years
- H_1 = There is a difference between groups / years

Similarly, the P value of 0.05, which represents 5% level of significance was accepted, which suggests that the results of the tests are interpreted as follows:

- P-value < 0.05, reject the H_0, then there is a difference between groups / years
- P-value ≥ 0.05, accept the H_0, then there is no difference between groups / years

The summary of the Kruskal-Wallis test statistics is shown below in table 15, while the detailed results of the statistics of the Kruskal-Wallis test are laid out in ANNEXURE B**:**.

Table 15: Kruskal-Wallis test statistics results

Measure	Chi-Square	df	Asymp. Sig. (P-Value)
CEO fixed pay	1.302	4	.861
CEO STI	.990	4	.911
ROE	5.200	4	.267
ROA	2.953	4	.566
AT	1.286	4	.864
ΔSP	10.470	4	.033
MC	.267	4	.992
Rev.	.431	4	.980
EBITDA	2.307	4	.680
HEPS	1.685	4	.793

Based on the above results, there is no difference between the averages of the performance and CEO compensation measures for the tested groups over the analysis period except the change share price where a P-value of 0.033 was obtained. These

results indicate that the average of the groups used in the statistical analysis remain similar, with the exception of the change in share price.

Since the difference between the groups was identified for the change in share price measure, it was decided to further investigate where in the data the difference is located. To test for the location of the difference between the groups for the change in share price measure, the Post-Hoc tests were conducted. To minimise the probability of biased results, the test was made more onerous by using Bonferroni adjustment / correction to adjust the level of significance lower. The applied adjustment entailed testing each p-value against a significance level of $0.05 / 5 = 0.01$; hence the interpretation of the results was based on the following:

- P-value < 0.01, reject the H_0, then there is a difference between the years for the change in share price measure
- P-value ≥ 0.01, accept the H_0, then there is no difference between the years for the change in share price measure

The Mann-Whitney test was used to test for the difference between the years for the change in share price measure, and the results were as follows:

Table 16: Mann-Whitney test results – change in share price

Measure & Tests Pair	Year	N	Mean	Std. Deviation	Mean Rank	Z	Asymp. Sig. (2-tailed)
ChSharePrice Pair 1	2009	30	20.07	52.323	32.73	-0.991	0.322
	2010	30	2.27	33.338	28.27		
ChSharePrice Pair 2	2009	30	20.07	52.323	36.13	-2.499	0.012
	2011	30	-14.33	28.762	24.87		
ChSharePrice Pair 3	2009	30	20.07	52.323	35.93	-2.41	0.016
	2012	30	-12.38	35.005	25.07		
ChSharePrice Pair 4	2009	30	20.07	52.323	34.43	-1.745	0.081
	2013	30	0.6	66.399	26.57		
ChSharePrice Pair 5	2010	30	2.27	33.338	35.78	-2.343	0.019
	2011	30	-14.33	28.762	25.22		
ChSharePrice Pair 6	2010	30	2.27	33.338	34.33	-1.7	0.089
	2012	30	-12.38	35.005	26.67		
ChSharePrice Pair 7	2010	30	2.27	33.338	32.5	-0.887	0.375
	2013	30	0.6	66.399	28.5		
ChSharePrice Pair 8	2011	30	-14.33	28.762	29.38	-0.495	0.62
	2012	30	-12.38	35.005	31.62		
ChSharePrice Pair 9	2011	30	-14.33	28.762	28.93	-0.695	0.487
	2013	30	0.6	66.399	32.07		
ChSharePrice Pair 10	2012	30	-12.38	35.005	29.27	-0.547	0.584
	2013	30	0.6	66.399	31.73		

Based on the above results, all the P-Values are greater than 0.01; hence there is no statistically significant difference between the years for the change in share price measure.

Since the change in share price represents the change in shareholder value in the form of stock returns, the change in the average mean shown in Table 16 remains significant. Further, the higher spread around the mean together with the smaller sample size influences the results; hence it cannot be conclusively concluded that there is no difference between the means although it is supported by statistical analysis. This is also supported by the significance that is marginally higher than the correlation coefficient threshold for pair 2, pair 3 and pair 5. While the statistical results based on the input data indicate that there is no statistically significant difference between the years for the change in share price measure, other studies using another data sample may arrive at a different conclusion.

The remainder of Chapter 5 focuses on publishing the results specific to research questions raised in Chapter 3. The correlation results were analysed using the following guidelines for the interpretation of correlation coefficient in order to determine its strength: weak relationship; r = 0.10 to 0.29, moderate relationship; r = 0.30 to 0.49 and strong relationship; r = 50 to 1 (Pallant, 2013).

5.5   Results for research question one

The objective of research question one was to test whether there is a significant relationship between the fixed pay component of CEO compensation and various measures of company performance in the South African mining industry over the period between 2009 to 2013. The CEO remuneration measure was used as the dependent variable while the company performance measures were the independent variable throughout the analysis.

5.5.1   Multivariate regression analysis: fixed pay and organisational performance

The process adopted involved identifying independent variables that are correlating with the dependant variable, followed by linear regression analysis to determine the best predictors of the dependant variable. The measures of organisational performance used in the analysis were ROE, ROA, asset turnover, revenue, EBITDA, HEPS, market capitalisation and the change in share price. Pearson product-moment correlation co-efficient was used to analyse the strength of the relationship between the fixed pay component of correlated CEO compensation and measures of organisational

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performance. The results were mixed, with correlation observed for certain measures of organisational performance and none observed for others. Detailed results of the regression analysis presenting the correlation coefficients over the period of analysis are shown below.

The following hypotheses were taken to test for correlation:

- H_0 = There is no correlation between the variables
- H_1 = There is a significant correlation between the variables

The p-value of 0.05, which represents a 5% level of significance was accepted, resulting in the following interpretation of the results:

- P-value < 0.05, reject the H_0, there is correlation
- P-value ≥ 0.05, accept the H_0, then there is no correlation

Using the criteria above to analyse the correlation results shown in Table 17, it was observed that the independent variables correlating with the fixed compensation component of CEO compensation are ROA, market capitalisation, revenue and EBITDA.

Table 17: Fixed pay and organisational performance correlation

Analysis method	Independent variables	CEO FP	ROE	ROA	AT	Δ SP	MC	Rev.	EBITDA	HEPS
Sig. (1-tailed)	CEO FP		.287	.004	.393	.448	.000	.000	.000	.383
	ROE	.287		.084	.468	.201	.453	.494	.481	.426
	ROA	**.004**	.084		.002	.063	.018	.094	.027	.006
	AT	.393	.468	.002		.002	.380	.391	.475	.058
	Δ SP	.448	.201	.063	.002		.131	.254	.224	.056
	MC	**.000**	.453	.018	.380	.131		.000	.000	.395
	Rev.	**.000**	.494	.094	.391	.254	.000		.000	.423
	EBITDA	**.000**	.481	.027	.475	.224	.000	.000		.049
	HEPS	.383	.426	.006	.058	.056	.395	.423	.049	
Pearson Correlation	CEO FP	1	-.046	.219	-.022	-.011	.866	.784	.750	.025
	ROE	-.046	1	.113	.007	.069	-.010	-.001	.004	.015
	ROA	**.219**	.113	1	.232	.126	.172	.108	.157	.204
	AT	-.022	.007	.232	1	.228	-.025	-.023	.005	.129
	Δ SP	-.011	.069	.126	.228	1	.092	.055	.063	.131
	MC	**.866**	-.010	.172	-.025	.092	1	.928	.879	.022
	Rev.	**.784**	-.001	.108	-.023	.055	.928	1	.939	.016
	EBITDA	**.750**	.004	.157	.005	.063	.879	.939	1	.135
	HEPS	.025	.015	.204	.129	.131	.022	.016	.135	1

Based on the aforementioned interpretation of the correlation coefficient, a strong correlation exists between the fixed component of CEO compensation and the following

organisational performance measures: market capitalisation, revenue and EBITDA. Furthermore, a weak correlation exists between the fixed component of CEO compensation and ROA. In contrast, there was no statistically significant correlation between fixed pay and ROE, asset turnover, HEPS and the change in share price. The summary of the results are found below in Table 18.

Table 18: Fixed pay and organisational performance results interpretation summary

Dependant variable	Independent variables	Relationship
Fixed pay component of CEO compensation	Return on equity	No relationship
	Return on assets	**Weak relationship**
	Asset turnover	No relationship
	Change in share price	No relationship
	Market capitalisation	**Strong relationship**
	Revenue	**Strong relationship**
	Earnings before interest, tax, depreciation and amortisation	**Strong relationship**
	Headline earnings per share	No relationship

The negative correlation coefficient was obtained between the dependant and some independent variables namely ROE, asset turnover and the change in share price. This suggests an inversely proportional relationship between these independent variables and the fixed pay component of CEO compensation, albeit insignificant.

5.6 Results for research question two

The objective of research question two was to test whether there is a statistically significant correlation between the short-term incentive component of CEO compensation and various measures of company performance in the South African mining industry over the period between 2009 and 2013. A significantly strong relationship between CEO compensation and measures of company performance was expected in accordance with the executive pay for performance literature.

5.6.1 Multivariate regression analysis: STI and organisational performance

Similarly, the independent variables that were correlating with the dependant variable were identified, followed by linear regression analysis to determine the best predictors of the dependant variable. The measures of organisational performance used remained the

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same, namely ROE, ROA, asset turnover, revenue, EBITDA, HEPS, market capitalisation and the change in share price. Pearson product-moment correlation co-efficient was used to analyse the strength of the relationship between the short-term components of CEO compensation and measures of organisational performance.

The results of the statistical analysis were based on the following hypotheses:

- H_0 = There is no correlation between the variables
- H_1 = There is a significant correlation between the variables

The p-value of 0.05, which represents a significance level of 5% was accepted, resulting in the following interpretation of the results:

- P-value < 0.05, reject the H_0, there is correlation
- P-value ≥ 0.05, accept the H_0, then there is no correlation

Using the criteria above to analyse the correlation results shown in

Table **19**, it was observed that the independent variables correlating with the short-term component of CEO compensation are ROA, market capitalisation, revenue and EBITDA.

Table 19: STI and organisational performance correlation

Analysis method	Independent variables	CEO STI	ROE	ROA	AT	Δ SP	MC	Rev.	EBITDA	HEPS
Sig. (1-tailed)	CEO_STI		.409	.000	.162	.050	.000	.000	.000	.000
	ROE	.409		.084	.468	.201	.453	.494	.481	.426
	ROA	**.000**	.084		.002	.063	.018	.094	.027	.006
	AT	.162	.468	.002		.002	.380	.391	.475	.058
	Δ SP	.050	.201	.063	.002		.131	.254	.224	.056
	MC	**.000**	.453	.018	.380	.131		.000	.000	.395
	Rev.	**.000**	.494	.094	.391	.254	.000		.000	.423
	EBITDA	**.000**	.481	.027	.475	.224	.000	.000		.049
	HEPS	**.000**	.426	.006	.058	.056	.395	.423	.049	
Pearson Correlation	CEO_STI	1	.019	.294	.081	.135	.518	.468	.506	.339
	ROE	.019	1	.113	.007	.069	-.010	-.001	.004	.015
	ROA	**.294**	.113	1	.232	.126	.172	.108	.157	.204
	AT	.081	.007	.232	1	.228	-.025	-.023	.005	.129
	Δ SP	**.135**	.069	.126	.228	1	.092	.055	.063	.131
	MC	**.518**	-.010	.172	-.025	.092	1	.928	.879	.022
	Rev.	**.468**	-.001	.108	-.023	.055	.928	1	.939	.016
	EBITDA	**.506**	.004	.157	.005	.063	.879	.939	1	.135
	HEPS	**.339**	.015	.204	.129	.131	.022	.016	.135	1

Based on the correlation coefficient interpretation guideline, the results of the relationship analysis between the short-term component and various measures of compensation can be summarised as follows:

Table 20: STI and organisational performance results interpretation summary

Dependant variable	Independent variables	Relationship
Short-term component of CEO compensation	Return on equity	No relationship
	Return on assets	**Weak relationship**
	Asset turnover	No relationship
	Change in share price	**Weak relationship**
	Market capitalisation	**Strong relationship**
	Revenue	**Moderate relationship**
	Earnings before interest, tax, depreciation and amortisation	**Strong relationship**
	Headline earnings per share	**Moderate relationship**

Evidently, a strong correlation exists between the short-term component of CEO compensation and the two measures for organisational performance, namely market capitalisation and EBITDA. The short-term component of CEO compensation is moderate, correlating with revenue return and EBITDA. Furthermore, there is a weak correlation between the short-term component of CEO compensation and the change in share price and the ROA. Lastly, there was no statistically significant correlation between the short-term component of CEO compensation and the last two measures of performance, namely ROE and asset turnover. The correlation coefficient between the dependant and the independent variable was universally positive, which depicts a positive relationship.

5.7 Results for research question three

Research question three sought to determine the organisational performance measures that can be used to best predict the fixed and short term components of executive compensation in the South African mining industry over the period between 2009 and 2013. The objective of this research question was to investigate whether there are some measures of performance that are paramount in the structural design of the CEO compensation. Moreover, these dominant drivers of compensation design were further analysed to assess their individual contribution, in order to determine whether a specific

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component can explain the CEO compensation in the South African mining industry over the analysis period. It was expected that different measures of performance would be the strongest drivers for each component of CEO compensation, since the two components are intended for uniquely different goals.

5.7.1 Multivariate regression analysis: fixed pay

The Multicollinearity test, which is concerned with mitigating the effects of correlation between independent variables, was conducted on performance measures that are correlated with the fixed pay component of CEO compensation. Multicollinearity refers to the high correlation between the independent variables which may impact the results (Pallant, 2013). Based on Multicollinearity test results, revenue was removed from further analysis because its collinearity statistics exceeded the limit of ten for variance inflation factor (VIF) and had the lowest tolerance (Pallant, 2013). In addition, the outliers were identified using histogram of data residuals, and they were also excluded from the analysis. These outliers were cases 19, 20 and 38.

The results showing the initial and final collinearity statistics after the changes were implemented are shown below in Table 21. Further, the Durbin-Watson score of 0.648 was obtained from the results, which indicates that the data was positively autocorrelated. However, this was aligned with expectations because the data for each of the sampled organisations over the period of five years will bear some resemblance.

Table 21: Collinearity test statistics: fixed pay

Model		Initial collinearity statistics		Final collinearity statistics	
		Tolerance	VIF	Tolerance	VIF
Multicollinearity test (fixed pay)	(Constant)				
	ROA	.928	1.077	.973	1.027
	MC	.133	7.514	.190	5.250
	Rev.	.069	14.528		
	EBITDA	.116	8.639	.191	5.229

Finally, the Cochrane-Orcutt method, which is suitable for regression analysis of the data containing positive autocorrelation was implemented (Pagan, 1974). The Cochrane-Orcutt method results that were obtained after five analysis iterations are shown below. Table 22 shows the model fit summary for the Cochrane-Orcutt statistical analysis.

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Table 22: Model fit summary – fixed pay

Model fit summary				
R	**R square**	**Adjusted R square**	**Std. Error of the sstimate**	**Durbin-Watson**
.832	.693	.684	1783.794	2.049

The coefficient of determination, also known as R squared is the measure of the model prediction accuracy. The R squared for the current study is 0.693, which suggests that 69.3% of the variations in fixed pay are explained by the independent variables in the model. Further, the iterative analysis process of the Cochrane-Orcutt method reduced the Durbin-Watson to 2.049 against the target level of 2, which suggests that the autocorrelation problem was significantly minimised after five iterations. The results of the analysis of variance (ANOVA) associated with the model are also tabled below.

Table 23: ANOVA – fixed pay

ANOVA			
	Sum of squares	**Df**	**Mean square**
Regression	1011999048.926	3	337333016.309
Residual	448651037.984	141	3181922.255

Table 24 shows the regression coefficients for the model. The following criteria were used to interpret the results:

- H_0 = Independent variable not significant in determining fixed pay
- H_1 = Independent variable significant in determining fixed pay

Table 24: Regression coefficients – fixed pay

Regression coefficients					
	Unstandardized coefficients		**Standardized coefficients**		
Variables	**B**	**Std. Error**	**Beta**	**t**	**Sig**
ROA	.685	2.799	.012	.245	.807
MC	3.067E-08	.000	.758	7.997	.000
EBITDA	1.081E-05	.000	.082	.859	.392
(Constant)	3708.487	511.106		7.256	.000

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The p-value of 0.05, which represents a significance level of 5% was accepted, resulting in the following interpretation of the results:

- P-value < 0.05, reject the H_0, the independent variable significant in determining fixed pay
- P-value ≥ 0.05, accept the H_0, the independent variable not significant in determining fixed pay

Based on the above, it was found that market capitalisation and the constant are the most dominant predictors of the fixed pay component of CEO compensation. The constant refers to the minimum fixed pay for the least paid CEO within the industry over the analysis period.

5.7.2 Multivariate regression analysis: STI

The assumptions and process used to determine the significance of the relationship between organisational performance measures and CEO compensation in the mining industry over the analysis period were similar to the process outlined above in Section 5.7.1 for fixed compensation. Multicollinearity test was conducted on performance measures that are correlated with the short-term component of CEO compensation. Similarly, revenue was excluded from further analysis based on the results of the test as the collinearity statistics exceeded the limit of ten for VIF and had the lowest tolerance (Pallant, 2013). The outliers, which were identified as cases 26, 38, 39 and 63 were subsequently exempted from further analysis.

Table 25**:** shows the initial and final collinearity statistics after the changes were implemented. The Durbin-Watson score of 1.516 was obtained from the results, which indicate that the data was positively autocorrelated. However, the level of auto-correlation was lower than in the case of fixed pay, as it was closer to the target score of 2.

Table 25: Collinearity test statistics: STI

Model		Initial collinearity statistics		Final collinearity statistics	
		Tolerance	**VIF**	**Tolerance**	**VIF**
Multicollinearity test (STI)	(Constant)				
	ROA	.904	1.106	.933	1.071
	MC	.133	7.521	.178	5.623
	Rev.	.065	15.299		
	EBITDA	.103	9.679	.173	5.777
	HEPS	.855	1.170	.855	1.170

Similarly, the Cochrane-Orcutt regression analysis was conducted. The results of the model fit summary for Cochrane-Orcutt statistical analysis after five analysis iterations were as shown in Table 26 below.

Table 26: Model fit summary – STI

Model fit summary				
R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
.697	.486	.468	2559.036	1.969

The R squared for the current study is 0.486, significantly lower than the R squared recorded for fixed pay studies above.The final Durbin-Watson in the model was 1.969, which was closer to the target value of 2. Anova studies are also shown below in Table 27, followed by the regression coefficient results in Table 28.

Table 27: ANOVA - STI

ANOVA			
Analysis	Sum of squares	df	Mean square
Regression	861667889.547	4	215416972.387
Residual	910264488.598	139	6548665.386

Table 28: Regression coefficients – STI

Variables	Unstandardized coefficients		Standardized coefficients	t	Sig
	B	Std. error	Beta		
ROA	8.911	4.325	.129	2.060	.041
MC	1.281E-08	.000	.346	2.467	.015
EBITDA	2.456E-05	.000	.182	1.282	.202
HEPS	.265	.048	.354	5.498	.000
(Constant)	1509.322	317.527		4.753	.000

Using a similar regression coefficient results interpretation process, it was found that headline earnings per share was the most dominant predictor of the short-term incentive component of CEO compensation. The constant in the model indicates that statistically CEOs for the sampled group of organisations received short-term incentives within the analysis period.

5.8   Summary of results

The descriptive statistics for measures of CEO compensation appears to show that the fixed pay component of CEO compensation was generally stable, with sub 5% increase on average per annum. Conversely, the short-term component of CEO compensation was volatile during the same period, indicating that it was not guaranteed for sampled CEOs throughout the analysis period.

The descriptive statistics for measures of organisational performance indicate that the performance based measures were mainly volatile during the analysis period, except asset turnover. It is deduced that the asset heaviness nature of the mining industry may be stabilising the asset turnover measure, as it is a common denominator in the companies throughout the analysis period. The operating expenses appear to have progressively increased, putting bottom line performance under pressure. Further, there is a significant difference in the size of the sampled companies, resulting in large standard deviations, particularly for performance measures that are linked to the company size, namely market capitalisation, revenue and EBITDA. The means that these variables are also vastly different from the median, which appears to indicate that a minority of sampled companies contribute the majority to the total data.

The results of research question one suggest that market capitalisation, revenue and EBITDA are strongly related to the fixed component of CEO compensation. Conversely, there was no statistically significant correlation observed between fixed pay and ROE, asset turnover, HEPS and the change in share price. The results of research question two suggest a strong positive relationship between the short-term component of CEO compensation and the two measures for organisational performance, namely market capitalisation and EBITDA, a moderate relationship with revenue return and EBITDA and a weak relationship with the change in share price and the ROA. Conversely, the ROE and asset turnover were found to have no relationship with the short-term component of CEO compensation. Lastly, the results of research question three suggest that market capitalisation and the constant were the most dominant predictors of the fixed pay component of CEO compensation, while headline earnings per share was the most dominant predictor of the short-term incentive component of CEO compensation in the mining industry over the analysis period.

The following chapter provides a comprehensive discussion of the results in the context of the literature review and research questions.

6.1   Introduction

The main objective of the research was to examine the relationship between CEO compensation and organisational performance in the South African mining industry. The previous chapter presented the assumptions and results of the study. It also provided a high level analysis of the observed relationships between the variables based on descriptive and regression statistical analysis results.

This chapter provides an in-depth discussion of the research results within the context of the literature review and research questions discussed in Chapters 2 and 3 respectively. The main objective is to examine alignment between the results presented in Chapter 5 against the results of prior studies on related topics in order to highlight key similarities and differences for the purpose of literature expansion.

6.2   Discussion of research question one

Research question one focused on analysing the relationship between the fixed pay component of CEO compensation and various measures of organisational performance in the South African mining industry. The bivariate regression analysis was used to test for correlation. This subsection presents a discussion of the key findings pertaining to research question one.

6.2.1   Measures of organisational performance

The measures of organisational performance which were used in the research were ROE, ROA, asset turnover, change in share price, market capitalisation, revenue, EBITDA and HEPS. The results pertaining to the relationship between the fixed pay component of CEO compensation and individual performance measures were as discussed below.

6.2.1.1   ROE

There is no statistically significant relationship observed between ROE and the fixed pay component of CEO compensation. This is in line with earlier findings by Bradley (2013) who also found no statistically significant relationship between CEO compensation of the JSE Top 40 and ROE. In contrast, Shaw (2011) found a weak relationship between ROE

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and the three measures of CEO performance he considered, namely fixed pay, short-term incentives and total remuneration in South Africa. In addition, De Wet (2012) found a positive relationship between CEO compensation and ROE in all industries, although his study used the total CEO remuneration, instead of fixed pay as the dependant variable.

Further, the negative correlation coefficient between ROE and fixed pay suggests that the relationship between the two variables is negatively inclined, albeit statistically insignificant.

6.2.1.2   ROE

The results of the study indicate a statistically weak relationship between ROA and the fixed pay component of CEO compensation. De Wet (2012) also found a positive relationship between CEO compensation and ROA in all industries, but his study used the total CEO remuneration, instead of fixed pay as the dependant variable. Conversely, the study by Bradley (2013) found no statistically significant relationship between CEO compensation of the JSE Top 40 and ROA.

6.2.1.3   Asset turnover

The asset turnover was found to have no relationship with the fixed pay component of CEO compensation. This differs with the study by Nel (2012) on the relationship between the CEO's guaranteed cost to company and performance in the South African retail and consumer goods sector, which found a negative relationship between CEO's guaranteed cost to company and asset turnover.

6.2.1.4   Change in share price

The relationship between the fixed component of CEO compensation and the change in share price is not statistically significant. These results differ from the findings of the studies by van Blerck (2012) and Blair (2014) which found a statistically significant correlation between share price and CEO compensation. However, the difference between the studies is that Shaw (2011) and van Blerck (2012) used the total remuneration while Blair (2014) also included the long-term component of CEO compensation.

The results are aligned with expectations, as the change in share price is dependent on various internal and external factors, which are not considered in determining the fixed pay component of CEO compensation.

6.2.1.5   Market capitalisation

Organisational market capitalisation, which is the measure of the company size based on market share price and number of the company's outstanding shares, was shown to have a strong relationship with the fixed pay component of CEO compensation. These results were aligned with prior expectation of a stronger relationship between fixed pay and market capitalisation, as a proportional link was expected between the level of executive management responsibility and fixed compensation. The results concur with a prior study by Modau, (2013), which suggested a direct relationship between fixed compensation and market capitalisation.

6.2.1.6   Revenue

Similarly, the revenue generated by an organisation was shown to have a strong relationship with the fixed pay component of CEO compensation. It was also found that the income was directly proportional to the size of the company, as bigger companies generally generate more revenue than small companies. It therefore appears that the relationship between revenue and fixed pay was influenced by the company size. The results are also aligned with the study by Barber *et al.* (2006), which suggested that there was a positive relationship between CEO compensation and revenue. They added that the correlation may be positively influenced by the prioritisation of market share growth and revenue by companies in the restaurant segment of the hospitality industry.

In contrast, Gregg *et al.* (2012) found no relationship between CEO compensation and the change in real sales in large UK companies in the financial services industry. From these differing observations, it appears that the main contributing factor was the size of the company. The more similar the size of companies included in the sample of the analyses, the smaller the relationship between CEO compensation and organisational performance.

6.2.1.7   EBITDA

Similarly, a statistically significant relationship was observed between EBITDA and the fixed pay component of CEO compensation. The results suggest that an increase in EBITDA was likely to result in the rise in CEO fixed pay. Since EBITDA is an income statement item determined for revenue, it was expected that the two items would be proportional and share the same relationship with fixed pay. The results of the study concerning EBITDA are aligned with the study by Blair (2014), which suggested a

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positive relationship between performance and EBITDA in the majority of studied industries.

6.2.1.8   HEPS

The results indicated no relationship between HEPS and the fixed pay component of CEO compensation. In his study, Shaw (2011) suggested a generally weak relationship between the fixed component of CEO compensation and HEPS, with a moderate relationship only observed in the first and third years of the six years of his study. In contrast, Bradley (2013) found no statistically significant relationship between CEO compensation and EPS. However, Blair (2014) suggested a positive relationship between HEPS and the long-term incentive component of CEO compensation.

6.2.2   Summary of discussion: results of question one

In summary, the results for research question one suggest a significantly positive correlation between the fixed pay component of CEO compensation and four out of eight measures of organisational performance used in the study. No significant negative correlation was observed between fixed pay and any of the organisational performance measures used in the study, but no relationship was observed in the remaining four measures of executive compensation.

The measures of organisational compensation which display a positive relationship with the fixed component of CEO compensation are ROA, market capitalisation, revenue and EBITDA. The universal characteristics of these measures of compensation are that they all linked with either revenue or the company size, which then share a positive relationship. Since high revenue is mainly a sub-product of large companies, the results appear to indicate that the fixed pay component was mainly dependant on the company size.

6.3   Discussion of research question two

Research question two sought to analyse the relationship between the short-term component of CEO compensation and various measures of organisational performance in the South African mining industry. The bivariate regression analysis was also used to test for correlation. This subsection presents a discussion of the key findings pertaining to research question two.

6.3.1 Measures of organisational performance

All measures of organisational performance, which were used in the previous study to analyse the relationship between the fixed pay component of CEO compensation and organisational performance measures, were again used as independent variables in this study. These were ROE, ROA, asset turnover, change in share price, market capitalisation, revenue, EBITDA and HEPS. The results pertaining to the relationship between the short-term component of CEO compensation and individual performance measures were as discussed below.

6.3.1.1   ROE

Based on the analysis results, there was no statistically significant relationship between ROE and the short-term component of CEO compensation. These results are in line with those obtained on the relationship between ROE and the fixed component of CEO compensation, which means that ROE is not related to the two measures of compensation used in the study. Consequently, total remuneration, which is made up of both fixed pay and short term components, is also not related to organisational performance. These findings are consistent with Bradley (2013) who found no statistically significant relationship between CEO compensation of the JSE Top 40 and ROE.

However, they differ from De Wet (2012) who found a positive relationship between CEO compensation and ROE in all industries, although his study used the total CEO remuneration. In contrast, Nel (2012a) found a negative relationship between ROE and executive compensation.

6.3.1.2   ROA

Similar to the fixed pay component of CEO compensation outcomes, the results for the short-term component of CEO compensation also indicate a weak positive relationship with ROA. De Wet (2012) also found a positive relationship between total CEO compensation and ROA in all industries, while Bradley (2013) found no relationship between the two variables.

6.3.1.3   Asset turnover

The asset turnover was also found to have no relationship with the short-term component of CEO compensation. These results differed from the study done by Nel (2012) on the relationship between the CEO's guaranteed cost to company and performance in the

South African retail and consumer goods sector, which found a negative relationship between the two.

6.3.1.4   Change in share price

There was a weak statistically significant relationship between the short-term component of CEO compensation and the change in share price. These results are aligned with the findings of the studies by Blair (2014) and van Blerck (2012) that found a statistically significant correlation between share price and CEO compensation. Blair (2014) and van Blerck (2012) used total remuneration while Ozkan (2011) used the long-term incentive component of CEO compensation.

However, these results differ from Resnick (2012) who found no relationship between share price and CEO short-term compensation. Shaw & Zhang (2010) also found no evidence that CEO cash compensation is proportional to stock returns, particularly during periods of poor stock performance.

6.3.1.5   Market capitalisation

Based on the analysis, a strong statistically significant relationship between the short-term component of CEO compensation and organisational market capitalisation was observed. Consequently, a strong relationship also exists between total remuneration and market capitalisation, as the total remuneration is made up of the two variables that were found to have a strong relationship with market capitalisation, namely the fixed and short-term incentives (Bussin, 2014).

The results support a prior study by Modau, (2013), which suggested a direct relationship between fixed compensation and market capitalisation. Gregg *et al.* (2012) also found that there is a relationship between compensation for executive directors and the size of the organisation.

6.3.1.6   Revenue

Similar to the study by Resnick (2012) where fixed pay was used as a measure of compensation, the revenue generated was found to have a statistically strong relationship with the short-term component of CEO compensation. Furthermore, it appears that a strong relationship also exists between total remuneration and revenue, because total remuneration is a product of both the fixed and short-term components of compensation (Bussin, 2014).

The results are similar to a study carried out by Barber *et al.* (2006) which suggested that there is a positive relationship between CEO compensation and revenue.

6.3.1.7   EBITDA

There was a statistically significant relationship observed between EBITDA and the short-term pay component of CEO compensation. It appears that the strong relationship between EBITDA and revenue makes their individual interaction with CEO compensation identical. The results are also in line with the analysis of the fixed pay component of CEO compensation and EBITDA, which implies that the CEO total remuneration pay is positively correlated with EBITDA. This was deduced from the design of the total remuneration, which is defined as the product of the fixed pay and short term incentives.

6.3.1.8   HEPS

Contrary to the results obtained when fixed pay was used as a measure of compensation, it appears that there is a moderate relationship between HEPS and the short-term pay component of CEO compensation. Shaw's (2011) study suggested a generally weak relationship between the short-term component of CEO compensation and HEPS, with a moderate relationship only observed in the first two of the six years of his study. As discussed in section 6.2.1.8, the studies by Bradley (2013) and Blair (2014) produced diverging findings on the relationship between HEPS and CEO compensation. This could be influenced by the difference in the component of CEO compensation in the two studies, namely guaranteed compensation for Bradley (2013) and total compensation for Blair (2014).

6.3.2   Summary of discussion: results of question two

In summary, the results for research question two suggest a significant positive correlation between the short-term component of CEO compensation and six out of eight measures of organisational performance used in the study. The measures of organisational compensation which display a positive relationship with the short-term component of CEO compensation are ROA, market capitalisation, revenue, EBITDA, change in share price and HEPS. The two organisational performance variables that were not identified when the fixed pay was used as a measure of compensation are the change in share price and HEPS. The observed positive relationship between short-term component and the change in share price was weak, while a moderate positive relationship was observed between the short-term component and HEPS.

Once more no significant relationship was observed between the CEO compensation component and the ROE and asset turnover. Further, no negative relationship was observed between the short-term component of CEO compensation and various measures of organisational performance considered.

6.4   Discussion of research question three

Research question three sought to identify the organisational performance measures that can be used to best predict the fixed and short-term components of executive compensation in the South African mining industry over the period between 2009 and 2013. This was achieved by using regression statistical analysis to determine the organisational performance measures that are the main determinants for each component of compensation as well as the degree of contribution.

The results for research question one and the research equation were used as the main input for the analysis of research question three. Accordingly, all the organisational performance variables that appeared to have a positive correlation with each measure of CEO compensation was further analysed to determine the highest contributor and the associated degree of contribution of the relevant compensation measure. It was expected that the variables that appeared to demonstrate the strongest correlation with the measures of compensation would be the main contributors to the associated compensation measure.

This subsection discusses the results pertaining to research question three as outlined in section 3.

6.4.1   Discussion of results: determinants of fixed pay

This part of research question three analysed the individual relationships between the fixed pay component of CEO compensation and correlating measures of organisational performance. The results give an insight into the structural design of the fixed pay component of CEO compensation within the analysis period by examining the degree of contribution by each compensation measure.

The findings outlined in the previous chapter indicated that the biggest contribution to the fixed pay component of CEO compensation was attributed to market capitalisation. This is aligned with the study by (Modau, 2013) that a strong relationship exists between market capitalisation and fixed pay, although he did not investigate the contribution of market capitalisation to fixed pay component of CEO compensation. This appears to

suggest that the company size, instead of organisational performance determined the level of fixed pay for a sampled group of companies within the analysis period. Further, owing to its characteristic as the main component of the guaranteed CEO compensation, all CEOs received fixed compensation for each year of the analysis period. This resulted in a constant becoming one of the key determinants of the fixed pay. It can therefore be inferred, based on the results, that while the market capitalisation contributed greatly in determining the level of the fixed pay component of CEO compensation in mining organisations, the constant is the second most accurate predictor.

On the other hand, the impact of ROA and EBITDA in explaining the level of the fixed pay component of CEO compensation was insignificant compared to the other two factors, although they were both positively correlating with fixed pay. This appears to indicate that, while these financial performance measures were aligned with the fixed CEO compensation in South Africa mining industry during the analysis period, they played an insignificant role in predicting the level of fixed CEO compensation.

6.4.2   Discussion of results: determinants of short-term incentives

This part of research question three sought to identify the measure of organisational performance that served as the main determinant of the short-term component of the CEO compensation. Since the short-term incentives are intended to reward for performance in the short term, it was expected that a performance measure would be the main determinant of the short-term incentive component of the CEO compensation. The obtained results give an insight into the structural design of the short-term component of CEO compensation within the analysis period by examining the degree of contribution by each compensation measure.

The findings suggest that HEPS was the most dominant predictor of the short-term incentive component of CEO compensation. This indicates that, of the performance measures used in the study, HEPS appeared to be the main determinant of the short-term component of CEO compensation. Since HEPS is regarded as an indicator of the health of the business, the results suggest that maintaining or improving the financial health of the company was critical during the period of analysis. As a result, managing directors that improved the financial health of their companies within the period of analysis benefited the most from the short-term incentive component of CEO compensation.

Further, the second highest contributor to the short-term component of CEO compensation was the constant. This indicates that statistically, CEOs for the sampled group of organisations received short-term incentives within the analysis period; however the level was dependant on other levers, including positively correlated performance measures. The contribution of the rest of the performance measures, which played a lower role relative to HEPS were market capitalisation, ROA and EBITDA in that particular order. However, the contribution to short-term incentive CEO compensation was relatively well distributed among all the performance measures resulting in a significant contribution by the positively related performance measures in determining the short-term component of CEO compensation.

6.4.3   Summary of discussion: research question three results

Market capitalisation was identified as the performance measure that had the strongest correlation with the fixed component of the CEO performance and also the main contributor that can be used in explaining the structure of the fixed CEO compensation. On the other hand, HEPS was identified as the key determining factor for the short-term compensation accounting for the strongest correlation with that component of the CEO compensation, followed by the constant. While the degree of contribution to the short-term measure of CEO compensation was fairly distributed among all by positively correlated organisation performance measures, the degree of contribution to the fixed pay component of CEO compensation was attributed mainly to the market size of the company and the constant.

6.5 Summary of discussion of results

This chapter documented the discussion of the research results relative to the context of the research questions and literature review. The discussion focused on presenting depth insight into each of these results relative to the research questions, by supporting observations with the relevant literature.

The findings appear to suggest that there was a significant positive relationship between CEO compensation components and various organisational performance measures. The fixed pay component of CEO compensation appear to be directly proportional to the half of the performance measures used, while the short-term measure of performance was proportional to two thirds of the measures. While some of the organisational measures have shown no relationship with CEO compensation, none was found to have a significant negative relationship. It can therefore be inferred that there is no basis to claim

an inverse proportional relationship between organisational performance and CEO compensation, while the opposite can be supported by the results. Furthermore, the study results also appear to indicate that the company size plays a key role in determining CEO compensation. This finding supports Tervio (2008) who observed a strong link between executive compensation and company size, but in differed from Bizjak *et al.* (2011) who argued that the firm characteristics are the most dominant factor compared to company size.

Since the total remuneration was made up of fixed pay and short-term incentives, it can be inferred that the market size of the company played a key role in determining the total remuneration as it was the predominant determinant of fixed pay and the third highest determinant of short-term compensation. The degree of contribution on total remuneration by all the performance measures used in the study was not determined as it was beyond the scope of this research.

Chapter 7 highlights the main findings of the research based on the discussion presented in this chapter, and also outlines recommendations for business consideration as well future studies on the subject.

7.1 Introduction

This chapter highlights the main findings of the research in accordance with the research results discussion in Chapter 6. It also presents recommendations concerning the implications to stakeholders and business, as well as for future research consideration.

7.2 Research findings

7.2.1 Key research finding summary

The following conclusions were made with respect to the research findings:

- The CEO compensation in the South African mining industry was positively linked with the company performance measures, as each of the individual CEO compensation measures showed a moderate to strong positive relationship with the majority of performance measures considered. The fixed-pay measure of compensation strongly correlated to the market capitalisation, revenue and EBITDA, while the short-term compensation strongly correlated with market capitalisation and EBITDA. A moderate relationship was only observed for the short-term CEO compensation with revenue and HEPS. Lastly, a weak relationship was observed between the fixed pay component of CEO compensation and ROA, and also between the short-term component of CEO compensation with ROA and share price. No significantly negative relationship was observed between the two compensation measures and any of the organisational performance measures considered in the research.

- The biggest contributor to the fixed pay component of CEO compensation was market capitalisation, while earnings per share was the biggest contributor to the short-term compensation. Further, the company size was found to have an influential impact on both the fixed pay and the short-term components of CEO compensation.

- Lastly, it appears that the operating expenses excluding interest, tax, depreciation and amortisation across the industry increased in 2012 and 2013. Although the main driving force behind the increase was not investigated, the adjustment of employee's wages subsequent to industrial action was believed to have played a role.

7.2.1 Research findings in the context of the research motivation

Sentiments in the reviewed media articles, which criticised executive compensation levels with respect to the alignment with stock performance, appeared to be somewhat unfounded. The results indicate that there is no relationship between the change in stock price and the fixed pay component of CEO compensation, while a weak relationship was observed with respect to the short-term compensation. Since the performance may be affected by other external factors including a period of good performance throughout the market and sector (Gregg *et al.*, 2012), it seems prudent that the fixed pay compensation may not be linked to stock performance. On the other hand, the alignment of the stock performance with CEO performance was mainly achieved through long-term stock options, which did not form part of the research. The appearance of the weak, but positive relationship between stock performance and the short-term component of CEO compensation indicated that stock performance played a minor role compared to other measures of performance in the short-term compensation characteristic. Since the bulk of the CEO pay was made up of the long-term incentive compensation (Blair, 2014), the sentiments on the alignment of stock performance and CEO compensation could not be conclusively supported or rejected based on the results. However, it can be deduced that there was no negative relationship between stock performance and the total CEO remuneration, as there was a weak positive relationship between the short term compensation component and stock performance and none between stock performance and fixed pay component. Further, there could be other contributing performance measures agreed between executive management and the board, which are neither financial nor stock performance in nature.

On the other hand, the findings appear to refute sentiments that the executive compensation in the mining industry was not linked to financial performance. Of all the organisational performance measures analysed, only the ROE and asset turnover were found to have no relationship with at least one of the components of CEO compensation, while none displayed a negative relationship. This also appears to indicate that the components of the DuPont analysis method are not generally used to determine both fixed and short-term components of compensation, which makes up the total remuneration. This observation is aligned with Nel (2012) who found no relationship between financial performance measures used in the DuPont and the fixed component of CEO compensation.

The performance measures associated with the company size, namely market capitalisation, EBITDA, revenue and the ROA appeared to dominate with respect to

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frequency and the strength of the relationship with each of the two CEO compensation measures used in the study. This appears to indicate that the company size played a key role in determining the level of the fixed pay and short-term components of CEO compensation, resulting in CEO compensation levels that were in favour of large companies in the South African mining sector. Proponents for the alignment between pay and responsibility may argue that the characteristics depict an optimal design for CEO compensation. However, the same argument is valid when made by detractors, that the level of responsibility associated with sustainably running and growing a smaller company was bigger considering resource constraints and disruption by competitors, especially in a price taking industry where volumes produced represent competitive edge. The key is for compensation committees to find the balance to ensure optimal compensation based on the individual characteristics of each company.

While there was no evidence from this study to accurately evaluate the comments by Mr Chris Griffith on the justification of CEO salary level (Seccombe, 2014), his comments were ill advised, badly-timed and inappropriate. This was because the mining industry had just witnessed unprecedented instability, which had resulted in the death of numerous striking mine workers and policemen a year earlier. Moreover, the comments were insensitive considering that the situation in the mining environment was still delicate, as there were on-going negotiations at the time. The comments could have been interpreted as a demonstration of management's arrogance towards employee's demands, and potentially exacerbating the situation. Thankfully, he speedily apologised and retracted the comments.

7.3 Stakeholder recommendations

The following were identified as the key recommendations for stakeholders in the South African mining industry based on the research findings:

- The alignment of CEO compensation should be considered, with appropriate measures of compensation for the mining industry like productivity and safety investigated. Based on literature reviewed, one of the key responsibilities of the executive management is to take the lead in designing and implementing a strategic direction for the business. This involves getting every member of the team committed to one business goal. It is therefore the executive management's

responsibility to minimise lost time by motivating all employees to perform at the highest level in pursuit of the common goal.

- Based on the results, the company size is potentially the key focal point, as it plays an important role in the level of compensation and short term incentives. Thus, the boards of large companies need to prevent rent seeking behaviour by managing the overall performance measurement contribution of processes that are significantly influenced by the firm size. On the other hand, the boards of smaller companies also need to design innovative compensation contracts that incorporate the effects of the strong relationship between the company size and total remuneration, and simultaneously mitigate non-value adding upward biased compensation.

- Since CEOs are rent seeking agents who are concerned with maximising their return at minimal effort (Noe, 2009), the findings suggest that smaller companies could be subjected to high turnover at a senior management level, further hampering their ability to implement organisational strategic objectives. This potential leadership and intellectual capacity drain at smaller companies, which was not further investigated in this research, could result in continual executive training by smaller companies for the benefit of the larger companies. To mitigate this challenge, smaller companies could consider locking their prospective managing directors into long term contracts, with restrictive clauses on the termination of service.

- While CEO compensation and organisational performance appear to be positively related, the results may not hold for all organisations included in the sector. It is therefore recommended that the company boards consider regularly reviewing the CEO compensation structure with an objective to maximise performance within a particular contracting period taking the prevailing and forecasted environmental factors into consideration. Pay for performance sensitivity should be implemented to reward good and punish bad performance. Moreover, developing a robust model that uses real time data from databases like McGregor to design CEO compensation and also forecasts the likely outcome based on the strategies implemented relative to competition, should be considered.

7.4 Suggestions for future research

This study contributed to the literature of the relationship between organisational performance and CEO remuneration in the South African mining industry, specifically fixed pay and short-term compensation. However, due to the wide scope of the study area as well as the time constraints, a number of key related study limitations and opportunities to further expand the literature were identified. Thus, it is recommended that future studies into executive pay for performance literature should consider the following for further research:

- This study was limited to JSE listed companies because of data availability and time constraints. The need exists to expand the mining CEO pay for performance studies beyond the borders of South Africa. This is because findings concerning the South African environment may not necessarily be the same in similar other countries because of the differences in the human capital requirements, culture and the country's history. These prospective studies would assist in understanding the relationship between mining CEO compensation and performance in countries that are at different developmental levels and geographic regions. The combined findings will equip business with the relevant tools to appropriately design optimal compensation contracts in accordance the relevant business dynamics.

- The study excluded the long term stock options data due to the research time constraints and related data accessibility challenges, resulting in only two components of CEO compensation measures being considered, namely the fixed pay and short-term incentives component of CEO compensation. It is recommended that future studies incorporating the long-term incentives component of CEO compensation, should be considered.

- Limitations of the study also included the inability to show a causal relationship. It is recommended that a study investigating the cause of the observed relationships between CEO compensation and organisational performance measures as well as the influential contribution of the company size on the CEO compensation structure should be considered.

- The study did not include sustainability measures like health and safety, environment, employment equity and community development which form an integral part of mining industry strategic objectives in South Africa. It is

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recommended that future studies could also be expanded to incorporate these performance measures as well as other key measures of organisational performance that might not be included in the current study.

- Lastly, the study focus was on examining the relationship between the CEO compensation and organisational performance in the South African mining industry. Future studies could consider investigating the relationship between the executive compensation in the South African mining industry and the deteriorating labour relations, resulting in unprotected violent strikes and instability.

7.5 Concluding remarks

Executive pay for compensation is a key mechanism to ensure that agents are optimally incentivised to maximise the principal's value. It is an important tool that can assist the business to grow if efficiently designed, and potentially destroy shareholder wealth if inefficiently designed. To balance the need for long term business sustainability, sustainable growth in the short in real term and optimal CEO compensation levels, a holistic design approach that serves as the driving force behind organisational goals is vital.

The result of the study appears to indicate that CEO compensation in the South African mining industry is aligned with organisational performance. However, operating expenses have progressively increased, putting performance under pressure. Furthermore, the influence of the size of the company on the CEO compensation level has emerged as a potentially contentious issue. While the results appear to indicate that there is a moderate to strong relationship between CEO pay and performance, the level of CEO compensation relative to the ordinary worker remains a critical challenge for the sector. The historically low wages widely associated with low productivity levels are regarded as the source of the challenging labour relations environment that is prevailing in the sector. To improve the situation, an open and authentic dialogue by all involved stakeholders will be required in the interest of the long term sustainability of the sector. Policy, together with mutual respect between management and labour movements will serve as a key feature to underpin the road to recovery of the mining sector.

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ANNEXURE A: Shapiro-Wilk test comprehensive results

Year		Shapiro-Wilk Test Results		
		Statistic	Degrees of freedom (df)	Significance (Sig. / P-value)
CEO_FixPay	2009	.758	30	.000
	2010	.775	30	.000
	2011	.776	30	.000
	2012	.746	30	.000
	2013	.731	30	.000
CEO_STI	2009	.708	30	.000
	2010	.723	30	.000
	2011	.663	30	.000
	2012	.694	30	.000
	2013	.629	30	.000
ReturnEquity	2009	.402	30	.000
	2010	.734	30	.000
	2011	.249	30	.000
	2012	.893	30	.006
	2013	.445	30	.000
ReturnTotAss	2009	.788	30	.000
	2010	.850	30	.001
	2011	.577	30	.000
	2012	.905	30	.011
	2013	.709	30	.000
AssetTurnover	2009	.860	30	.001
	2010	.914	30	.019
	2011	.879	30	.003
	2012	.895	30	.006
	2013	.870	30	.002
ChSharePrice	2009	.960	30	.309
	2010	.949	30	.157
	2011	.943	30	.108
	2012	.946	30	.131
	2013	.864	30	.001
MarketCapital	2009	.511	30	.000
	2010	.511	30	.000
	2011	.518	30	.000
	2012	.472	30	.000
	2013	.403	30	.000
Revenue	2009	.280	30	.000
	2010	.298	30	.000
	2011	.291	30	.000
	2012	.286	30	.000
	2013	.303	30	.000
EBITDA	2009	.393	30	.000
	2010	.360	30	.000
	2011	.341	30	.000
	2012	.308	30	.000
	2013	.351	30	.000
HEPS	2009	.204	30	.000
	2010	.238	30	.000
	2011	.372	30	.000
	2012	.277	30	.000
	2013	.248	30	.000

ANNEXURE B: Kruskal-Wallis test results

Item	Year	N	Mean	Std. Deviation	Mean Rank	Median
CEO_FixPay	2009	30	5049	4907	68	3078
	2010	30	5671	5267	76	3809
	2011	30	5702	5283	75	3494
	2012	30	6204	5958	79	3675
	2013	30	5953	5595	79	4143
	Total	150	5716	5354		
CEO_STI	2009	30	2739	4118	73	639
	2010	30	3014	4471	77	864
	2011	30	3964	6462	81	1243
	2012	30	2303	3541	71	986
	2013	30	2526	4223	75	553
	Total	150	2909	4644		
ReturnEquity	2009	30	78.0	261.5	76	10.8
	2010	30	34.4	96.1	83	20.1
	2011	30	164.0	914.7	80	21.8
	2012	30	16.9	77.4	78	12.1
	2013	30	-80.0	293.8	60	4.1
	Total	150	42.7	449.8		
ReturnTotAss	2009	30	-0.4	34.5	72	4.4
	2010	30	8.6	38.1	85	8.8
	2011	30	-13.7	75.2	76	8.6
	2012	30	3.8	31.2	78	5.6
	2013	30	-21.8	69.4	67	4.0
	Total	150	-4.7	53.6		
AssetTurnover	2009	30	0.7	0.7	71	0.6
	2010	30	0.7	0.6	70	0.6
	2011	30	0.8	0.7	79	0.7
	2012	30	0.9	0.7	80	0.7
	2013	30	0.8	0.8	77	0.7
	Total	150	0.8	0.7		
ChSharePrice	2009	30	20.1	52.3	93	14.1
	2010	30	2.3	33.3	84	4.1
	2011	30	-14.3	28.8	62	-21.7
	2012	30	-12.4	35.0	66	-13.1
	2013	30	0.6	66.4	72	-10.1
	Total	150	-0.8	46.5		
MarketCapital	2009	30	56110709747	123931367341	76	2680000000
	2010	30	61392474798	135768467924	78	3010000000
	2011	30	53217387080	115894606728	76	2520000000
	2012	30	54578439340	129600822149	74	2150000000
	2013	30	49594268159	136073203914	73	1740000000
	Total	150	54978655825	126803276768		
Revenue	2009	30	177058665	690073720	72	1983629
	2010	30	172971126	637494168	74	2368521
	2011	30	207748969	780919198	77	2496037
	2012	30	227547909	871031775	77	2773124
	2013	30	251493704	919472925	78	2791005
	Total	150	207364075	776906575		
EBITDA	2009	30	9043359	26803275	70	41602
	2010	30	13221698	40854881	85	632576
	2011	30	17279843	56564310	77	373733
	2012	30	13548588	48427463	73	284320
	2013	30	13167000	41621645	72	257767
	Total	150	13252098	43449847		
HEPS	2009	30	3589.3	19053.6	71	15.0
	2010	30	2014.5	8598.9	80	14.5
	2011	30	1301.4	3766.6	80	16.0
	2012	30	1223.3	4858.9	78	23.5
	2013	30	1080.9	4725.4	69	20.4
	Total	150	1841.9	9880.6		