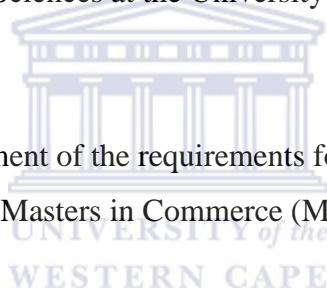


**THE RELATIONSHIP BETWEEN CEO  
COMPENSATION AND FUTURE SHARE RETURNS  
IN SOUTH AFRICA**

A dissertation presented to the  
Department of Accounting of the Faculty of Economic and  
Management Sciences at the University of the Western Cape

In fulfilment of the requirements for the degree of  
Masters in Commerce (M.Com)



By

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## DECLARATION

Except for assistance which is duly acknowledged, and references which are specifically indicated in the text and bibliography, I, Gideon Francois Steyn, declare that this research project is wholly my own work and not being in part or in its entirety submitted at any other university for degree purposes.

Gideon Francois Steyn

November 2015



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## ABSTRACT

As a result of high economic inequality, widespread discontent with excessive chief executive officer (CEO) compensation levels is acute in South Africa (SA). Some commentators argue that instead of high levels of CEO pay causing inequality, it may be part of the solution if higher levels of CEO compensation translate into better company performance, so reducing unemployment.

International studies investigating the relationship between CEO short-term cash compensation and current company performance generally report a weak or no relationship where accounting based measures of performance are used. Developments in the international literature reflect a stronger relationship when long-term incentive compensation (LIC) is included and total shareholder return (TSR) used to measure company performance. However, a concerning negative association between the highest paid CEOs in terms of excess LIC and future abnormal TSR is reported.

In contrast, SA pay-performance research is largely not reflective of the developments in the international literature, with local studies mostly finding no pay-performance relationship, except where size-related accounting measures are used. As a result of the strong correlation between CEO pay and company size reported in the international literature, and local studies not adequately controlling for company size, the accuracy of the conclusions drawn in prior studies on the pay-performance sensitivity relationship in SA are brought into question.

This study addresses the gaps in the SA literature by investigating the relationship between the size-adjusted excess CEO compensation and future abnormal TSR for the top 100 SA companies listed on the Johannesburg Stock Exchange for the period 2011 to 2013. A positive relationship is found between future abnormal TSR and short-term cash compensation, but not LIC. The levels and structure of CEO compensation in SA is also described.

**KEYWORDS:** Pay-performance sensitivity; Optimal contracting; Agency theory; Executive remuneration; Company performance; South Africa



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## **CHAPTER 1: INTRODUCTION AND OVERVIEW**

This study investigates the relationship between chief executive officer (CEO) compensation and company performance for the top 100 South African (SA) companies listed on the Johannesburg Stock Exchange (JSE) for the period 2011 to 2013. The need for such a study arises from two acute shortcomings inherent in the SA literature. Firstly, where a relationship between CEO pay and company performance is found and reported in the SA literature accounting measures, which are strongly influenced by company size, have largely been used as a proxy for company performance. As a strong positive relationship between company size and CEO pay is reported in the international literature, with international studies on pay-performance sensitivity consequently controlling for size, it is questionable whether the positive pay-performance relationships reported in the SA literature are in fact a reflection of a relationship between pay and company performance or pay and company size.

Further, SA studies largely ignore long-term incentive compensation (LIC) despite the fact that the international literature indicates that LIC is a significant component of CEO compensation and generally report a stronger relationship between company performance and LIC, than short-term cash compensation (SCC).

Thus a South African study that controls for company size, measures company performance more appropriately and includes both SCC and LIC is sorely needed. This study investigates the relationship between excess compensation calculated against peer groups based on company size and future abnormal total shareholder returns (TSR), which this study argues is the most appropriate measure of company performance.

Shareholders pay CEOs substantial packages for the purposes of attracting and retaining talented senior executives and motivating them towards improved company performance in order to increase shareholder value, in turn contributing to the economy through increased taxes and job creation. The justifiability of high CEO pay levels is a contentious issue in SA. Consequently studies on pay-

performance sensitivity are important to inform this debate. This study commences by setting out the background to the debate.

## **1.1. Background to the executive compensation debate**

### **1.1.1. High pay of executive management**

The level of compensation earned by executive managers of companies in the private sector is a contentious issue worldwide. Fuelling this debate is the increasing disparity in compensation between executives and the average worker. In the United States (U.S.) the average ratio of CEO-to-worker pay increased from 42:1 in 1980 to 373:1 in 2014 (AFL-CIO, 2015a) and in 2014 the top paid CEO earned 4 429 times the average wage of non-supervisory workers. The question arises whether this increase is justified in terms of increased company performance and returns to shareholders. Cooper, Gulen and Rau (2014) found that the companies that pay their CEOs in the top ten percent of excess pay earn negative abnormal returns of nearly -8% in the subsequent three years. This casts doubt over the economic justification for ever increasing executive compensation.

If the labour market for good leaders is a competitive environment, as suggested by Chalmers, Koh and Stapleton (2006), then companies need to compensate CEOs adequately in order to retain quality talent (Bizjak, Lemmon & Naveen, 2008). Agency theory argues that once the appropriate talent has been secured, management needs to be incentivised to act in the best interest of the shareholders of the company. It is further argued that if companies perform well, they contribute to the economy and more jobs are created.

Due to the injustice of Apartheid the South African (SA) landscape is arguably more sensitive to pay inequalities. The ruling political party (African National Congress) and its ally, the largest trade union, openly and strongly condemn the levels of CEO compensation in South Africa (COSATU, 2014). It would therefore be concerning if similar results to that of Cooper *et al.* (2014), where relatively higher paid CEOs performed worse in a subsequent period, were found locally.

Consequently a study that investigates whether higher compensation for CEOs does in fact translate into better company performance in the South African context is needed.

### 1.1.2. Pay-performance sensitivity

Pay-performance sensitivity studies investigate the relationship between CEO pay and company performance. The majority of research on the topic of executive compensation and agency theory focusses on the relationship between company performance and CEO compensation. The methodology adopted by these studies can be characterised according to three main aspects, namely: the direction of the study, measurement of compensation and measurement of company performance.

Table 1 highlights the main aspects present in pay-performance sensitivity studies, indicating the initial focus of the literature and subsequent developments. There is a trend towards including long-term incentive compensation and measuring company performance using market-related shareholder returns.

**Table 1: Differences in aspects of studies on pay-performance sensitivity**

	<b>Earlier (initial) research</b>	<b>Developments</b>
Measure of company performance	Accounting measures of company performance	Market related measures of shareholder returns
Measure of CEO compensation	Cash compensation	Total compensation (including long-term incentives)
Direction of study	Correlation between CEO compensation and company performance	CEO compensation for future company performance

International studies that find only a weak relationship between company performance and CEO pay either exclude long-term incentives from pay or use accounting ratios and figures to measure company performance (Conyon &

Leech, 1994; Girma, Thompson & Wright, 2007; Masson, 1971). Where long-term incentives such as share options and share grants are included as compensation measure, and share returns are used as performance measure, the link is much stronger (Abowd, 1990; Main, Bruce & Buck, 1996; Masson, 1971; Murphy, 1986; Stathopoulos, Espenlaub & Walker, 2005).

There are numerous studies that aim to determine the correlation between executive compensation and company performance. These studies focus on the sensitivity of CEO compensation to company performance. Since cash bonuses, share option grants and performance shares are awarded based on company performance, these studies investigate the degree to which the incentives are aligned to performance. A limitation of these studies is that they are backward looking and do not address whether the level and structure of CEO compensation is successful in motivating them to perform better in the future. There is a paucity of studies that investigate the relationship between CEO compensation and future share performance (Balafas & Florackis, 2014; Cooper *et al.*, 2014; Core, Holthausen & Larker, 1999; Murphy, 1999).

South African studies focus on cash pay and short-term incentives, as well as accounting measures of company performance, as reflected in column 2 of Table 1. No local study satisfactorily considers the further developments reflected in the international literature (this is further explained in the literature review). Therefore, a South African study that investigates the relationship between pay and future performance incorporating total compensation (and so including both the short-term component and long-term incentives) and market-related shareholder returns will clearly contribute to the development of the body of research.

In addition to the lack of studies reflecting the international developments in pay-performance sensitivity in South Africa, there is lack of summarised information available regarding total compensation of CEOs of listed companies in the country. This study is the first to address both of these issues.

## **1.2.Objectives of this study**

The first objective of this study is to analyse and describe compensation levels and pay structures for the largest 100 companies listed on the Johannesburg Stock Exchange (JSE) for 2011 to 2013.

Maximum, minimum, mean, median and standard deviation will be determined for the largest 100 companies listed on the JSE in South Africa for the period 2011 to 2013. Since the largest 100 companies listed on the JSE includes companies that vary greatly in size and industry, the compensation will be analysed per company size group and industry in order to identify characteristics that may be unique to the specific classification. The relative proportion of long-term incentives to total compensation will also be determined for each size and industry group.

The second objective of this study is to investigate and analyse the relationship between the level and structure of CEO compensation and the future total shareholder returns in South Africa.

In order to achieve this, this study first analyses the relationship between the pay components and future abnormal total shareholder returns descriptively by ranking the companies according to excess CEO compensation; that is: the difference between a CEO's compensation and the median compensation for the peer group, based on industry and/or size, of that company. The short-term (two years and one quarter) future share returns and dividends of the highest decile excess compensation are compared with the lowest decile to investigate whether the companies of the highest paid CEOs perform better than lowest paid CEOs. The remaining deciles are progressively added to investigate whether the relationship is consistent throughout the population. Secondly statistical regression analysis is performed in order to confirm whether the descriptive relationships are significant.

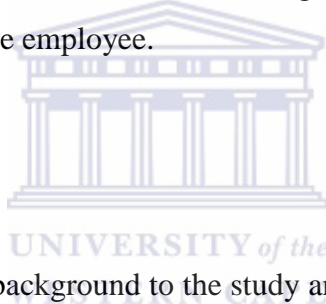
The companies are also ranked according to the proportion of long-term incentives compared to total compensation (TC) earned by the CEO, from the highest proportion LIC to TC to the lowest proportion. The short-term future



share returns and dividends of the top decile of LIC to TC ratio are compared to the lowest decile.

In addressing these two research objectives this study seeks to contribute towards the debate in South Africa regarding excessive executive compensation in two ways: first, by describing the levels and structure of compensation per size group and industry for the largest 100 companies listed on the JSE, and second, by investigating and analysing the relationship between levels and structure of CEO compensation and future shareholder returns. The approach that is followed in this study is closest to that of Cooper *et al.* (2014).

If it is found that the companies of the highest paid CEOs perform the worst in subsequent periods, as was found by Cooper *et al.* (2014), it would negatively reflect on the already contentious issue of the high pay of executives compared to the meagre pay of average employee.



### **1.3. Layout of study**

Chapter 1 discussed the background to the study and provided a brief introduction to the literature on CEO compensation. The research objectives of the study were also formulated. The study continues with a more detailed review of the literature and the formulation of specific research questions arising from the literature review in chapter 2. The methodology, limitations and scope follows thereafter in chapters 3 and 4 respectively. The results of the study for each of research objectives 1 and 2 are reported and analysed in chapter 5 and chapter 6 respectively. Finally, the contribution of the study and areas for future research are presented in chapter 7.

## **CHAPTER 2: BACKGROUND AND LITERATURE**

### **2.1.Introduction**

Shareholders of large listed companies rarely have much to do with the day to day operations of the companies. Consequently directors are appointed to manage the company on their behalf. An important question arising from the separation of the ownership and control of companies is how to motivate management (directors for the purpose of this study) to act in the best interests of shareholders. A common approach to motivate management is to award them annually for the results that have been achieved during the year. However, this approach is regularly criticised in management accounting textbooks (Drury, 2012; Horngren, Datar & Rajan, 2014; Vigario, 2007) for being short sighted. Therefore the question arises whether it is possible to reward management in such a way that they are also incentivised to create shareholder value in the longer term.

The main purpose of this study is to investigate whether paying top management more (or less) relative to peers and/or including a higher (or lower) proportion of long-term incentives in management's compensation structure translates into an increase (or decrease) in shareholder value in the future. A secondary aim is to describe levels of CEO pay and the CEO compensation structures within the different size groups and industries of the top 100 South African companies listed on the JSE.

The existing body of literature on senior executive pay reflects several main areas of interest: theories explaining managerial pay, the relationship between compensation and company performance (pay-performance sensitivity) and factors affecting this relationship.

The rest of this chapter is organised as follows: First a brief overview of the arguments and popular sentiments surrounding executive compensation is presented. This is followed by a discussion of the theories explaining executive compensation, as well as the basis on which compensation is benchmarked. The chapter continues with a review of the various models of employee compensation used internationally and the different measures of company performance used in

the pay-performance sensitivity literature. A consideration of both international and local studies in the area of executive compensation is presented thereafter. The chapter culminates in a summary of the key issues relating to pay-performance sensitivity and, consequently, the research objectives of this study investigating pay-performance sensitivity in South Africa.

## **2.2.Focus on CEO compensation**

The majority of studies on executive compensation focus on the CEO (Balafas & Florackis, 2014; Chalmers *et al.*, 2006; Cooper *et al.*, 2014; Core *et al.*, 1999; Edmans & Gabaix, 2009; Jensen & Murphy, 1990a; Jensen & Murphy, 1990b; Tosi & Gomez-Mejia, 1994) suggesting that while the principles of executive compensation applies to the role of the CEO, they are shown to be more acute in the role of CEO (Shaw, 2011).

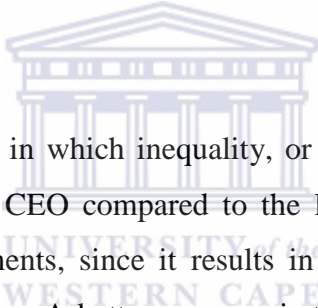
Further as the CEO is usually the top paid individual in the organisation, there is widespread interest in the CEO pay, with the popular press often reflecting the opinion that CEOs are grossly overpaid (Pickworth, 2014), disproportionate to the value that they add to the entity.

In 2014 the CEO of Discovery Communications Inc. earned \$156 077 912 in cash and incentives (AFL-CIO, 2015b). This is 4 429 times the average of production and nonsupervisory workers. The average CEO-to-worker ratio in 2014 was 373:1, up from 331 in 2013 and 42 in 1980 (AFL-CIO, 2015a). During the financial crisis of 2008, the CEOs of Wall Street firms collectively earned hundreds of millions of dollars at the expense of the indebted middleclass who could ill afford secured debt. Further the American tax payer effectively bore the cost of the Federal Reserve providing assistance to certain of these failing institutions. Such statistics and arguments are frequently reflected in the popular press (COSATU, 2014; Pickworth, 2014; Rossouw, 2015) and commonly used in political and trade union rhetoric. Even Pope St Francis – the leader of the world’s largest religious organisation – said in his first peace message of his pontificate that “...huge salaries and bonuses are symptoms of an economy based on greed

and inequality...” and called again for nations to narrow the wealth gap (PwC, 2014).

In South Africa, industrial action on the mines, as well as the emergence of the Economic Freedom Fighters (EFF) political party has fuelled the aggression towards large corporates who pay large executive salaries and bonuses, while the working class is struggling to cover their living expenses. It must however be recognised that driving this inequality in South Africa is high levels of unemployment coupled with a lack of access to quality education. In 2014 the quality of South Africa’s education ranked third from the bottom in a survey of 148 countries and last for the quality of science and mathematics education (World Economic Forum, 2014).

### **2.2.1. The pay gap**



There are different ways in which inequality, or the pay gap, can be measured. The level of pay of the CEO compared to the lowest worker is often used to support emotional arguments, since it results in the most extreme figure. It is however not representative. A better measure is the ratio between CEO pay and the average employee. A third, more scientific, measure is the Gini coefficient. Ranging from 0 (everyone is equal) to 1 (extreme inequality), the Gini coefficient appears simple to understand, but is in fact is complex to interpret as it integrates many variables, including the unemployment rate. South Africa is widely believed to be one of the most unequal countries in the world, with Gini coefficients ranging from 0.63 reported by the World Bank and 0.72 reported by Statistics SA, in comparison to 0.48 in the U.K. and 0.49 in the U.S. (PwC, 2014).

The assumption that the high Gini coefficient is due to the wide pay gap is less than sound. If the Gini coefficient is recalculated using effective unemployment levels of the U.S. (around 10% versus S.A.’s 37% in 2013) the Gini coefficient would become 0.54 (PwC, 2014). This is much closer to that of developed countries like the U.S. and the U.K., suggesting that South Africa’s high Gini coefficient is not driven only by the earning inequality between the highest and

lowest paid employees, but the inequality between the pay of the employed and the zero earnings of the unemployed (PwC, 2014). According to PwC's most recent Remuneration Report, "A recalibrated work ethic will evolve from an educated citizenry, and only then will commentators be in a position to calculate a meaningful ratio for sensible commentary" (PwC, 2014:24). They argue that the solution to the inequality problem thus lies in reducing unemployment, rather than top executives' compensation (PwC, 2014).

### **2.2.2. The demand for good CEOs**

Instead of high CEO compensation being the problem and cause of the pay inequality gap, it could be argued that it is the solution. The private sector is a significant contributor to job creation and employment opportunities. However improving company performance is a prerequisite for creating employment opportunities, and this in turn requires talented managers. The level of pay affects the quality of managers that a company can attract and consequently a pertinent question is: "Are current levels of CEO compensation high enough to attract the best and brightest individuals to careers in corporate management?" (Jensen & Murphy, 1990b:17). Jensen & Murphy (1990b) compared the compensation earned by the best lawyers and investment bankers, to that of the top CEOs and found that the former earn substantially more than the latter. Further, becoming a top paid executive can take a lifetime's investment in one company to achieve. Why would a graduate therefore decide to become a manager of a company, if they could earn significantly more in a career in law or investment banking (Jensen & Murphy, 1990b)? In the U.K. 60% of companies are worried that the lack of flexibility in recruitment policy will make it more difficult to recruit executive directors, especially from overseas (PwC, 2014).

### **2.2.3. Key issues arising from the focus on CEO compensation**

Based on the concerns in the literature as regard the level and structure of CEO compensation the key questions are:

- Rather than whether CEOs are getting paid too much, but whether the shareholders are getting what they pay for; and
- Whether certain measures of compensation are more effective in terms of motivating managerial effort and therefore translating into better company performance than others.

Addressing the above questions requires that the level and structure of CEO pay be considered relative to company performance.

## **2.3.Theories explaining managerial pay**

Research into top management pay has been ongoing for more than 85 years and comprises hundreds of studies, with the relationship between chief executive officer (CEO) compensation and company performance being the most researched topic in this area. There are, however, various theories in the literature that investigate CEO compensation and that try to explain whether shareholders get what they pay for.

### **2.3.1. Agency theory**

Agency theory considers the question of how to motivate and reward management in accordance with their contribution to increase the value of the company. The agency problem arises as a result of the managers of the company making decisions on behalf of the owners (or shareholders). This separation of control and ownership dates back to the joint-stock companies – that emerged in the sixteenth century – to exploit monopoly powers by trading as a corporate enterprise. Shareholders gained entry by purchasing shares and some were actively involved in the operations of the company. Others were “passive investors who delegated

management to paid officials directed by governors and assistants elected from amongst their ranks” (Jones & Ville, 1996:898). This separation, however, may not have been widespread until the latter part of the 19<sup>th</sup> century with management and ownership of companies vesting in the same person until around 1870 (Lambrechts (1992) cited in Hall (1998)).

Adam Smith argued that this separation of control is inefficient, since managers pursue their personal goals above that of the company, and that the situation raises prices to consumers and reduce returns to shareholders (Jones & Ville, 1996). Adam Smith is often cited from his 1776 book “*The Wealth of Nations*” as saying that economic behaviour is motivated by self-interest. Carlos and Nicholas (1996:919) disagree that the separation of control and ownership are inefficient, arguing that when there is a high frequency of transactions, “teams of salaried managers can coordinate the flow of goods and information more cheaply than the market”.

The separation of control and ownership is common to many organisations. Companies benefit from the expertise and specialisation of managers, as well as the separation of decision-making and risk-bearing. This, however, causes agency problems since the decision managers who initiate and implement the important decisions are not the major claimants and therefore do not bear a major share of the wealth effects of their decisions (Fama & Jensen, 1983). Asymmetry in information between managers and owners could also result in a possible conflict of interests (Cohen & Uliana, 1990). The agency theory emphasises that managers are self-serving and that formal mechanisms – monitoring and reward structures – are meant to align the incentives of top management with the interests of the shareholders (Fama & Jensen, 1983; Jensen & Meckling, 1976). Bebchuk, Cremers and Peyer (2011) found evidence that supports the hypothesis that a higher CEO Pay Slice (CPS) – CEOs who earn a higher proportion of the aggregate pay of the top-five highly paid executives – is associated with agency problems.

The undesirable activities of the managers can be limited by establishing appropriate incentives for the managers and by incurring monitoring costs (Jensen & Meckling, 1976).

### **2.3.2. Optimal contracting theory**

Optimal contracting theory suggests that an optimal contract should attract the right CEOs; incentivise them to exert effort and exploit growth opportunities; and reject wasteful projects while limiting the cost of doing so (Edmans & Gabaix, 2009).

Jensen and Murphy (1990a) suggested that the focus of designing an optimal contract should be linking management's expected utility to the owners' wealth, thereby creating a strong correlation between the financial benefit received by management and the profit maximisation of the shareholders.

Jensen and Murphy (1990a) suggests that, since the objective of shareholders is to increase their wealth – even though shareholder wealth is affected by many factors, including public policy, supply and demand, and actions of executives and employees of the company – it is appropriate to pay CEOs on the basis of shareholder wealth.

A positive relationship between CEO compensation and company performance would be consistent with agency theory (Barkema & Gomez-Mejia, 1998). However, optimal contracting theory suggests that the problem of appropriate CEO compensation is not just a question of how much the executive managers should be paid, but also how their compensation packages should be structured (Jensen & Murphy, 1990b). If an optimal contract does exist it is suggested that a company would want to apply it. For CEOs this relates to their compensation structure which will be considered in section 2.4.

However, agency theory and optimal contracting theory are not the only theories explaining the CEOs compensation package. Other theories, namely managerial



power and labour market theory, may also have an influence on CEO pay levels and pay structures.

### **2.3.3. Theory of managerial power**

A strong correlation between CEO compensation and company performance is often lacking in the literature, therefore other theories are put forward to explain the variety in level and structure of CEO compensation. Various authors submit the theory of managerial power as a determinant of CEO compensation.

In contrast to the optimal contract approach that has dominated research in the field of executive compensation, the theory of managerial power suggests that executives have power over their boards to influence their own compensation and extract “rents” (Bebchuk, Fried & Walker, 2002). “Rents” refers to value received by executives in excess of that which they would receive under optimal contracting, and Bebchuk *et al.* (2002) argues that managers with more power can extract greater rent.

Bebchuk and Fried (2004) found that the influence that CEOs have over the board of directors plays a role in the determination of incentives. This theory of managerial power is echoed by O’Reilly and Main (2010:676) who report that a number of studies propose that boards of directors can be “captured” by the CEO and made to serve his or her interests rather than serving the shareholders’ interests. Likewise, Cheng and Indjejikian (2009) found that CEOs have strong negotiating powers with their boards as regards to their own compensation. A U.K. study on the effect of board control and remuneration committees on management compensation found that the proportion of non-executive directors on the board, the presence of a remuneration committee and CEO duality had only a limited effect on the level of top management pay (Conyon & Peck, 1998). They did conclude, however, that top management pay and corporate performance are more aligned in companies with outsider-nominated board and remuneration committees.

If management and the owners both aim to maximise their own value there is reason to believe that the managers might not always act in the best interest of the shareholders (Jensen & Meckling, 1976). O'Reilly and Main (2010) found evidence that it is likely that CEOs and boards, whether consciously or unconsciously, may be biased in ways that affect the amounts and type of pay the CEO receives.

#### **2.3.4. Labour market theory**

Even though management might have some power over boards and how their own pay is determined, the labour market theory suggests that supply and demand play an important role. CEO compensation is viewed by this theory as the efficient outcome of a labour market in which companies optimally compete for managerial talent (Frydman & Jenter, 2010).

The labour market theory postulates that the level of CEO compensation reflects the company's demand for talented managers, and thus it aligns the interests of the manager with the shareholders (Chalmers *et al.*, 2006). A natural supply and demand is created by labour market forces which undermines most factors in determining CEO remuneration (Shaw, 2011). Himmelberg and Hubbard (2000) argued that the value of a CEO's services to the company is raised by the limited supply of suitably talented managers that are capable of running large companies. Other studies have found that companies need to re-price share options in order to retain key employees (Carter & Lynch, 2001; Chidambaran & Prabhala, 2003). The labour market theory therefore suggests that adequate compensation is a prerequisite for corporate performance.

#### **2.3.5. Benchmarking**

Bizjak *et al.* (2008) report that the practice of benchmarking the level of CEO compensation is widely spread and that it has a significant impact on CEO compensation. Their results support the view that benchmarking is a practical and

efficient mechanism to determine the market salary necessary to attract and retain valuable managerial talent as suggested by labour market theory.

Since companies typically benchmark CEO pay on peer groups based on industry and size (Albuquerque, De Franco & Verdi, 2013; Bizjak *et al.*, 2008), the industry and size of the company may have an effect on the relationship between the level of CEO compensation and the performance of the company. Faulkender and Yang (2010) also found that industry and size are important in explaining the composition of compensation peer groups. Consequently, it may be necessary to control for the industry and size of the companies in a study of the relationship between pay and performance.

While some studies explain that industry and size is used to benchmark compensation, others only mention company size. Gabaix and Landier (2006) showed that a large portion of cross-country differences in the level of CEO compensation can be explained by differences in the size of the companies. They found that in the US, both the size of the company and the size of a benchmark company in the same industry are significant predictors of CEO compensation.

There are different ways in which company size may be defined. Kaplan and Rauh (2010) used equity market value as a proxy for size, while O'Reilly and Main (2010) found that CEO compensation is strongly related to revenue as a measure of company size. Cooper *et al.* (2014) benchmarked CEO compensation on both industry and size, and reported similar results between using revenue and market capitalisation as a proxy for size.

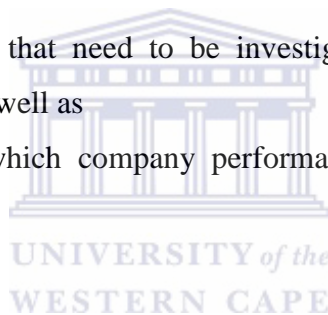
### **2.3.6. Key issues arising from the theories explaining managerial pay**

This study investigates the relationship between the level and structure of CEO compensation and future company performance. Agency theory suggests that there may be no such relationship unless the levels and structure of CEO compensation are aligned with that of shareholder wealth creation, the argument put forward by optimal contracting theory. Labour market theory would suggest a

positive relationship between the level and structure of CEO pay and future company performance as a result of more talented managers (that are more capable of directing the company) attracting larger salaries. In contrast the theory of managerial power suggests that there may be no, or only a weak, relationship between levels and structure of CEO pay and company performance. The practice of companies benchmarking CEO pay on peer groups based on industry and size may affect the relationship between the level of CEO compensation and the performance of the company.

A positive relationship between company performance and various variables comprising compensation would suggest that using those variables as incentives is effective in aligning management's interests and company performance. Before this relationship can be examined, however, consideration must first be given to:

- the components that need to be investigated as part of compensation (section 2.4); as well as
- the means by which company performance is meaningfully measured (section 2.5).



## **2.4.Compensation**

CEOs are rewarded and incentivised in various ways. According to the Chartered Institute of Personnel and Development (2015) the process of designing and implementing reward policies and practices that support and advance company (and shareholder) objectives as well as employee aspirations is called “strategic reward”. Armstrong and Brown (2006) refer to the “total reward concept” as the new approach to strategic reward. “Total reward” is classified into *transactional rewards* (also known as total remuneration, *transactional rewards* are made up of base pay, contingent pay and employee benefits) – tangible rewards emanating from the transactions between employers and employees; and *relational rewards* – intangible rewards such as learning, professional development and the work experience. The focus of this study will be on *transactional rewards* which will be referred to as compensation.

### **2.4.1. Components of CEO compensation**

CEO compensation typically consists of a short-term and a long-term component. The short-term component usually includes the base salary and annual cash bonus, plus other benefits paid for by the company. The long-term component consists mostly of performance share grants and share option grants.

The terms used to describe these compensation components varies from study to study, but all the components of total compensation (TC) can be classified under either short-term cash compensation (SCC) or long-term incentive compensation (LIC).

Shaw (2011) defines executive remuneration as all the financial benefits that a CEO and other senior executives receive, and classifies it into: fixed pay; other benefits; and short- and long-term incentives. Bognanno (2010) defines CEO compensation as the sum of base pay, bonuses, share- and option grants and benefits, while Sharma and Smith (2001) classifies compensation into three components: cash compensation (salary and bonus), other benefits (insurance, club memberships, other noncash rewards, etc.) and long-term incentives (share options and other deferred compensation). In a recent comprehensive U.S. study investigating pay for future performance, three measures of compensation were used: (i) total compensation (salary, bonus, total value of restricted shares granted, total value of share options granted, and long-term incentive pay-outs); (ii) cash compensation (salary and bonus); and (iii) incentive compensation (the difference between total- and cash compensation) (Cooper *et al.*, 2014).

The components of total compensation (TC) that emerge from a review of the literature and the annual financial statements of the top 40 JSE listed companies in South Africa can be broadly classified into short-term cash compensation (SCC) (which includes base salary, other benefits and cash bonus) and long-term incentive compensation (LIC) (which includes deferred cash bonus, share grants, share option grants and gains on shares held). This classification, presented in Table 2, includes all the components of compensation addressed in the literature, but classifies it according to the difficulty with which each component is valued.

**Table 2: Components of total compensation**

<b>Total compensation (TC)</b>	
<b>Short-term cash compensation (SCC)</b>	<b>Long-term incentive compensation (LIC)</b>
<p><u>CASH</u></p> <p>Total guaranteed pay (TGP):</p> <ul style="list-style-type: none"> <li>- Base salary</li> <li>- Other benefits</li> </ul> <p>Short-term incentive compensation (STI):</p> <ul style="list-style-type: none"> <li>- Cash bonus (CB)</li> </ul>	<p><u>CASH</u></p> <p>Deferred STI (bonus)</p> <p><u>SHARE-BASED</u> (2.4.2)</p> <p>Performance shares (2.4.2.1)</p> <p>Share options (2.4.2.2)</p> <p>Gains on shares held (2.4.2.3)</p>

The value of cash compensation is readily available since it is disclosed in the remuneration reports and poses no valuation difficulties. Other benefits include perquisites that are not paid directly to the CEO, but rather on behalf of the CEO (for example pension fund contributions and membership fees). A limitation of including long-term incentives (with the exclusion of deferred cash bonus) into pay-performance sensitivity studies is the difficulty of valuing these instruments, since the amount of compensation that will be received is uncertain at the time the compensation is awarded (Lambert, Larcker & Weigelt, 1993). Shares or options may be granted with complex vesting conditions that make it difficult to value. The International Financial Reporting Standard (IFRS) on Share-based payments (IFRS2) requires share-based compensation to be recognised in the financial statements at fair value, but is disclosed globally and not per employee. The number of share options and share grants, as well as the conditions attached to them, must however be disclosed individually per director. It is therefore possible to calculate the value of the long-term incentives, although it is highly impractical for large studies. The various types of long-term incentives are discussed in the next section, as well as the valuation thereof.

## **2.4.2. Long-term share-based incentives**

There are predominantly two types of long-term share-based incentives, namely performance shares and share options. The main distinction between the two is that performance shares are issued in full and share options only grant the right to acquire shares in the company.

### *2.4.2.1. Performance shares*

Performance shares are shares that are issued to employees under a share grant program once performance and/or other criteria have been met. No consideration is generally payable by participants (Bussin, 2011). Most share grant programs can be categorised into two main types, namely Forfeitable Share Plans (FSPs) and Conditional Share Plans (CSPs).

Under a FSP all the rights to the shares are transferred to the employee on the date of the grant. This means that the employee becomes entitled to vote, attend annual general meetings (AGMs) and receive dividends. If the performance criteria attached to the shares are not met or the employee's employment is terminated by a specified date, the shares revert back to the company (i.e. are forfeited by the employee).

When conditional shares are granted the employee does not become the owner of the shares on the grant date and thus does not receive the rights attached to the shares. Some CSPs however do allow the employee rights to receive dividends declared during the period before the shares vest, but these dividends are only received along with the transfer of the shares at the end of the performance period, and if the performance targets are reached.

Any dividends received under a FSP are taxed at the dividend tax rate of 15% in South Africa, whereas dividends received under a CSP are taxed at the employee's marginal tax rate.

### Valuation techniques

The valuation of FSPs and CSPs is the same. Since there are no quoted market prices for forfeitable or conditional shares, the fair value of these performance shares is estimated by determining the expected value of the shares granted in a given year.

The following variables are used to calculate an expected value for the share awarded during the year, taking into account the probabilities of each of the outcomes taking place:

- the time-value-of-money (TVM),
- the risk (or probability) of forfeiture, which will happen if the employee's service is terminated before the shares vest, or
- the risk (or probability) of the share never vesting due to the performance targets attached to the FSP not being reached before the expiry date.

### Valuations applied in the literature

Due to the complexity of the valuation of performance shares, as well as the limited availability of information, it is highly impractical to accurately value performance share grants in comprehensive studies.

The approach in the literature is inconsistent. Instead of attempting to value the share grants, simplifying assumptions are made as regard the value of these grants. Lambert *et al.* (1993) multiply the number of performance shares awarded by the target value (or pay-out per share if the performance criteria are met) and they value conditional shares at the share price on the grant date. Dommissie (2011) values performance shares at the average unconditional share price. Other studies mention performance shares granted, but fail to describe how these grants are valued (Bebchuk *et al.*, 2011; Cooper *et al.*, 2014).

Generally less consideration is given in the literature to the accuracy of the value of performance share grants than that of share options.



#### 2.4.2.2. Share options

Share options are instruments granted to employees that carry a right, but not the obligation, to buy a certain amount of shares in the company at a predetermined price, or “strike/offer price”. Employees must typically wait for a specified vesting period before being allowed to exercise the options. If the performance criteria are not met at a specified date, some or all of the options might not vest (Bussin, 2011).

If the company’s shares are trading at a price above that of the share option’s strike price at vesting date the options are said to be “in the money” and the option holder, or employee, may decide to exercise the option by buying the company’s shares at the strike price. If the employee wishes to cash out the value of the options, the option needs to be exercised and the underlying share needs to be sold at the market price. The difference is the intrinsic value of the option. Where the strike price is higher than the market price of the underlying share, the option is said to be “out of the money”.

The actual value received from share options depend on the company’s share price performance after the grant date, whether the employee remains with the company and the employee’s risk preference affecting his/her incentive to exercise the options (Lambert *et al.*, 1993).

#### Valuation techniques

Options are generally valued using one of two methods, namely the Black-Scholes-Merton option pricing model (Black & Scholes, 1973) and the binomial option pricing model (also referred to as the “lattice model or “binomial tree model”) (Cox, Ross & Rubinstein, 1979). These two models are also specifically mentioned in the Basis for Conclusions (BC) to IFRS2, but neither is given preference. Regardless of which method is used, the following six inputs need to be considered:

- i. current price of the underlying share
- ii. exercise price of the option

- iii. expected volatility of the price of the underlying share
- iv. expected dividend yield of the underlying share
- v. risk-free interest rate for the term of the option
- vi. expected term of the option

The binomial model is generally regarded as producing a better estimate of an option's fair value since share options may have certain features that preclude the use of the Black-Scholes-Merton formula in estimating its fair value. The binomial model can, however, be considerably more complicated than using the Black-Scholes-Merton formula (EY, 2007). By far the majority of studies reviewed in the literature (Benmelech, Kandel & Veronesi, 2010; Bizjak *et al.*, 2008; Cooper *et al.*, 2014; Jensen & Murphy, 1990a; Malmendier & Tate, 2008; Masson, 1971) use the Black-Scholes model to price employee share options.

The assumptions used as input variables should ideally be adjusted for any specific conditions for each option grant. Prior studies have, however, used blanket assumptions on all companies included in the sample, for example Jensen and Murphy (1990a) who used 5-year government securities as the risk-free rate, the dividend yield for the prior year, the past 5-year share price volatility and the number of months until expiry for the option term.

IFRS includes guidance for valuing share options. Since there is no quoted market pricing for share options awarded to employees, IFRS2 requires companies to estimate the fair value of these awards using option pricing models. The BC to IFRS2 states that no particular option pricing model is regarded as theoretically superior and that the most appropriate model for the circumstances should be used. The only requirement is that the valuation technique be consistent with generally accepted valuation methodologies for pricing financial instruments, incorporating all factors and assumptions that knowledgeable, willing parties would normally consider with respect to the relevant instrument (EY, 2007).

#### Valuations applied in the literature

The valuation of share option grants poses a major difficulty for the purpose of pay-performance sensitivity studies. Since the expected value of share options is

included in the share-based payment expense granted instead of disclosed individually per employee, the options awarded to each executive need to be calculated using a complex option pricing model. This makes the valuation thereof a very time consuming exercise for comprehensive studies.

Various different methods for determining the value of share options are used in the literature, including the Black-Scholes option pricing model (Jensen & Murphy, 1990a), the binomial valuation model (Cordeiro & Veliyath, 2003) and the Securities and Exchange Commission (SEC) method (Carpenter & Sanders, 2004). Lambert *et al.* (1993) assigned a value equal to 25% of the option's exercise price to each share option, which produces values in the same range as more sophisticated option pricing models (Lambert, Larcker & Verrecchia, 1991). Domnisse (2011) simply assign a value to share options at the average unconditional share price.

Even though research has shown that the various option-pricing methods produce highly correlated values (Carpenter & Sanders, 2004); the option pricing method that is used by the majority of studies reviewed (Bebchuk *et al.*, 2011; Bizjak *et al.*, 2008; Chalmers *et al.*, 2006; Cheng & Indjejikian, 2009; Cooper *et al.*, 2014; Jensen & Murphy, 1990a; Malmendier & Tate, 2008) is the Black-Scholes model.

While the literature is inconsistent as regard the simplifying assumptions used to value share options, it is consistent as regard the need to make use of simplifying assumptions instead of accurate share option valuation techniques.

#### *2.4.2.3. Gains on shares held*

Gains on shares held by CEOs in their own companies are not consistently viewed as part of long-term incentives. Jensen and Murphy (1990b) includes CEO shareholding as a measure of CEO wealth, but said that most CEOs hold trivial fractions of their companies' shares and ownership levels have declined over the past 50 years (Jensen & Murphy, 1990a). Main *et al.* (1996) on the other hand exclude shareholding since they feel it constitutes a personal investment and that

shareholders do not have a moral suasion to retain a substantial company shareholding and can sell out at any time. Since Cadman (2008) noted that CEOs diversify their company equity holdings after vesting, Cooper *et al.* (2014) also exclude CEO shareholding, explaining that it is difficult to measure the CEO's wealth outside the company's shareholding (once they have replaced shares in the employer company with shares of another company). Theunissen (2012) included gains on shares held as the sole component of long-term incentives in one of only two South African studies found to have included any form of long-term incentive.

#### **2.4.3. Inclusion of long-term incentives in pay-performance studies**

Numerous international studies – mostly in the U.S. (Balafas & Florackis, 2014; Bizjak *et al.*, 2008; Cooper *et al.*, 2014; Core *et al.*, 1999; Jensen & Murphy, 1990a; Jensen & Murphy, 1990b; Masson, 1971) and Australia (O'Neill & Job, 1999) – investigating the relationship between pay and performance include both short-term cash and long-term incentive compensation. Some international studies however, (Abowd, 1990; Girma *et al.*, 2007; Merhebi, Pattenden, Swan & Zhou, 2006) excluded long-term incentive compensation.

In contrast, most local South African studies (Bradley, 2011; Scholtz & Smit, 2012; Shaw, 2011), omit long-term incentives altogether due to unavailability of the expected value of share options and share grants. It is also difficult to determine the value of long-term incentives, since the future value of share options or performance shares is highly uncertain (Sharma & Smith, 2001). The only South African studies that have incorporated long-term incentives as part of compensation included only gains on shares held (Theunissen, 2012) or valued performance shares and share options at the unconditional average share price (Dommissie, 2011). The approaches used to include long-term incentives in South Africa are criticised by Main *et al.* (1996) who suggest that shares held by the CEO should be excluded since it constitutes a personal investment, and that

valuing performance shares and share options at the full share price will grossly overvalue these incentives by ignoring vesting conditions.

Given the potential significance of long-term incentives (LIC), a possibility exists that excluding LIC from an investigation into the relationship between pay and performance may give inaccurate results. Since long-term incentives are barely addressed in the local literature, there is a paucity of research into the effect long-term incentives may have on company performance in SA.

#### *2.4.3.1. Relative importance of cash- and incentive compensation*

Disagreement exists in the literature regarding the importance of including long-term incentives in pay-performance sensitivity studies. Numerous pay-performance sensitivity studies omit long-term incentives for various reasons, but the studies that do include them suggest that long-term incentives are an important component of total compensation. In contrast, Bradley (2011) argues that incentive compensation is less relevant than cash compensation to the study of the effect of CEO compensation on company performance, since a Tower Perrin study showed a decline in the U.S. in the ratio of share options to total compensation from 38% in 2004 to 23% in 2008. However, Bradley (2011) did not consider the increase in the proportion of performance share plans from 8% to 21% over the same period.

The figure therefore rather suggests a replacement of one type of long-term incentive (share options) with another type (performance share plans), instead of an overall decline in the proportion of long-term incentives to total compensation. Since a share option does not transfer a full share, but rather an option to purchase a share at a reduced price (the strike/offer price), a relatively larger amount of share options than performance shares is required to be granted in order to award the same fair value of compensation, causing an augmented dilutive effect on shareholders' positions. This might explain the shift from share options to performance shares.

Adams and Mehran (2003) provide evidence that the compensation structure of CEOs in the financial services industry in the U.S. differs from other industries and that banking companies pay a relatively larger proportion cash (fixed pay and STI) compensation than long-term incentives to CEOs. For this reason, Shaw (2011) omitted long-term incentives from his study on CEO pay-performance sensitivity in South African financial services companies<sup>1</sup>.

In contrast to the argument that long-term incentives are unimportant, Sigler (2011) cites a 2010 Salary Survey by the Economic Research Institute (ERI) that showed an increase in the proportion of incentive pay from 84% (of total pay) to 88.8% from 1997 to 2010 in the U.S. In a comprehensive study, including the S&P1500 companies from 1994 to 2011, Cooper *et al.* (2014) found that at the median level, 52% of total pay is incentive pay. In South-Africa, over the last decade or so, incentives (bonuses and share awards) increased from 38% of total compensation to nearly 67% (PwC, 2013). Cooper *et al.* (2014) also report a near perfect correlation of LIC and TC (98.6%), but with total cash pay only explaining 37.7% of total pay (Cooper *et al.*, 2014).

Therefore, even though accurate valuation of long-term incentives is not practical (as argued in section 2.4.2) it is important for pay-performance sensitivity studies in South Africa to include long-term incentive compensation for two reasons: Firstly, international studies indicate that long-term incentives make up a significant portion of total compensation. Secondly, no research in South Africa attempts to establish the relative value of the two major compensation components (short-term cash and long-term incentives) and it can thus not be ignored on the grounds that it is insignificant.

#### **2.4.4. Key issues relating to the measurement of compensation**

An assimilation of the literature suggests that a study into pay-performance sensitivity should give adequate consideration to the inclusion of both short-term

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<sup>1</sup> The results of the present study suggest otherwise (refers section 5.4.3)

cash and long-term incentives in defining the pay component. Three specific considerations arising from the literature are:

Firstly, the significance of the long-term component relative to the short-term cash component should be established. This needs to be analysed both by industry and size in order to investigate the effect of benchmarking on CEO pay levels (refer 2.3.5).

Secondly, both short-term cash compensation and long-term incentives should be included in the definition of compensation. There is merit in evaluating these relative to company performance not only in total but also separately. In order to investigate the suggestion of optimal contracting theory (refers 2.3.2) that certain compensation structures may be more effective than others in terms of incentivising greater managerial effort.

Finally, simplifying assumptions are required to be made in order to assign a value to the long-term share based incentives, for practical purposes for a study of even moderate sample size. The accuracy of the value assigned to the incentive on the basis of the simplifying assumptions should be considered. The literature is in agreement as to the acceptability of assigning a value to long-term share-based incentives on the basis of simplifying assumptions, in order to deal with the practical dilemma posed by the detail and complexity inherent in performing accurate valuations for the volume of companies included in studies of this nature. The accuracy of the simplifying assumptions is generally not tested in the literature, and presents a problem for investigation in future research.

## **2.5.Measuring company performance**

It is necessary to establish a suitable measure of company performance in order to investigate the pay-performance relationship. Various measures are used in the literature to define company performance. These measures can be classified into two broad categories, namely: accounting measures (referring to measures based on financial accounting figures reporting in the annual financial statements) and



shareholder returns (referring to value received by shareholders based on market information) (Eriksson & Lausten, 2000). These two categories of performance measures are considered in the sections that follow.

### **2.5.1. Accounting measures**

Accounting measures are verifiable and widely understood, and they are commonly used as a basis for management incentive bonuses (Murphy, 1999). Accounting measures, used as proxies for company performance in pay-performance sensitivity studies, vary from sales and profit growth (Girma *et al.*, 2007), to common accounting ratios such as return on equity (ROE) (Bradley, 2011; Shaw, 2011; Theunissen, 2012), earnings per share (EPS) (Bradley, 2011; Shaw, 2011) and return on assets (ROA) (Bradley, 2011). The use ROE is supported by Hagel, Brown and Davidson (2010) (cited in Bradley (2011)) who suggest that ROE as a performance measure remains popular, since it focuses on shareholder returns which is of primary importance to investors. It is further argued that ROE is a measure of how well the company uses debt in its capital structure to maximise shareholder returns.

#### *2.5.1.1. Shortcomings of accounting measures*

The basic problem with using accounting measures as an indication of company performance is that accounting measures do not measure shareholder value (the basic principle underpinning modern finance theory is that the value of an entity/instrument/project is the future cash flows discounted at the risk-appropriate rate (Correia, Flynn, Uliana & Wormald, 2013)). Performance, in the context of pay-performance sensitivity studies, implies a change in shareholder value (an argument supported by Bradley (2011), despite being a proponent of the use of ROE as a measure of shareholder value).

A further significant problem for pay-performance sensitivity studies is that many accounting measures (like revenue; income; profit after tax (PAT); earnings



before interest, tax, depreciation and amortisation (EBITDA); and market capitalisation) are reflective of the size of the company, rather than company performance. It is well established in the literature that company size and CEO pay are strongly related (Albuquerque *et al.*, 2013; Bizjak *et al.*, 2008), as set out in section 2.3.5. Studies that investigate the relationship between CEO pay and any of these measures are consequently investigating the relationship between CEO pay and company size, rather than company performance.

It is also well recorded in the literature that accounting measures have further specific weaknesses which would affect their reliability as a measure of company performance. Healy (1985) argues that accounting measures may be manipulated in various ways, including adjusting discretionary amounts and moving earnings between different periods. Holthausen, Larcker and Sloan (1995) found evidence suggesting that managers manipulate earnings downwards when their bonuses are at their maximum. Accounting measures can also be inconsistent from company to company by failure to adjust for differences in systemic risk, tax laws, and accounting conventions, especially across industries (Wernerfelt & Montgomery, 1988).

Despite the fact that accounting measures are commonly used as a basis for management incentivisation, a shortcoming well documented in the literature is that accounting measures encourage managers to focus on short-term profitability at the cost of long term value creation (Dechow & Sloan, 1991; Drury, 2012).

The financial accounting measures most commonly used in pay-performance sensitivity studies are ROA, ROE and EPS, and so the specific shortcomings of these warrant further consideration.

#### Return on assets (ROA)

ROA ignores leverage which affects shareholder value. Furthermore, if current assets are included, working capital policy will influence the ROA figure, and by only using non-current assets the remaining useful life and the depreciation policy might affect the relative ROA results between companies. Consequently, ROA

does not directly reflect shareholder value, and inconsistency in ROA between companies undermines comparability between companies and across industries.

Return on equity (ROE)

The ROE figure is affected by transactions that result in a change in ROE that is not reflective of the change in the wealth of shareholders. Consider the following illustration: Suppose three identical companies (Company A, Company B and Company C) achieve an ROA of 10% and the interest cost amounts to 5% of debt (taxation is ignored). Suppose Company A pays no dividend, retaining the cash for planned growth, Company B pays dividends of R25 million out of cash reserves, while Company C pays dividends of R25 million, funding the dividend payment with debt. The ROE earned by Company A, B and C would amount to 15%, 20% and 25% respectively (refer to Table 3 below).

**Table 3: An illustrative example on the effect of dividend payments on Return on Equity (ROE)**

	<b>Company A (R'000)</b>	<b>Company B (R'000)</b>	<b>Company C (R'000)</b>
Total assets	100 000	75 000	100 000
Total debt	50 000	50 000	75 000
Total equity	50 000	25 000	25 000
Profit before interest	10 000	7 500	10 000
Interest (at 5%)	(2 500)	(2 500)	(3 750)
Profit after interest	7 500	5 000	6 250
Return on assets	10%	10%	10%
Return on equity	15%	20%	25%

The above illustrates the sensitivity of ROE to changes in the accounting data with the result that the changes in ROE may not be reflective of the change in shareholder wealth (arguably, the use of ROE would overvalue Companies B and C relative to Company A, having better growth and future cash flow prospects). In addition to these specific factors affecting ROE, the issues regarding the use of ROA would be similarly applicable to ROE. It is therefore argued that ROE, or changes therein, are not suitable measures of shareholder wealth.

### Earnings per share (EPS)

EPS is calculated by dividing earnings (profits) by the number of shares in issue (Bradley, 2011). Thus, transactions involving altering the number of shares in issue will have a direct effect on EPS that is likely to be unrelated to a corresponding improvement in company performance. A share repurchase would result in an increase in EPS while a share issue will result in a decrease. Where shares are repurchased or issued at market value the wealth of shareholders would be unaffected, despite the change in EPS. If shares were overvalued at the time of the repurchase shareholder wealth of the remaining shareholders will decrease, in contrast to the implication of the increase in EPS.

The fifteen non-financial U.S. companies that reported the highest value of share repurchases in 2014, found that eleven of these companies based a portion of CEO incentives on earnings per share (Barinka, 2015). Barinka (2015) also reports that EPS is included as a performance measure in a larger proportion of the top 15 companies that repurchased the most shares versus all the Fortune 500 companies. Similarly Chivaka, Siddle, Bayne, Cairney and Shev (2009) report that the number one reason for doing a share repurchase in South Africa for the period 1999 to 2004 was to increase earnings per share. Consequently EPS cannot be used as a reliable measure of shareholder wealth for pay-performance sensitivity studies.

### Less conventional performance measures

Two less conventional measures of company performance are economic value added (EVA) (Chen & Dodd, 1997) and “Tobin’s q” (Chung & Pruitt, 1994). EVA requires a company’s cost of capital as an input variable, which is not readily available for South African companies. As a result the use of EVA is impractical. Similarly, one of the input variables of Tobin’s q is the replacement cost of the assets held by the company. This information is not disclosed in annual reports, thus rendering Tobin’s q impractical for a large sample size (Bradley, 2011).

## General

Many studies focussing on the relationship between executive compensation and company performance produced inconclusive results (Cosh, 1975; Hirschey & Pappas, 1981; Lewellen & Huntsman, 1970; McGuire, Chiu & Elbing, 1962; Meeks & Whittington, 1975). According to Coughlan and Schmidt (1985) these investigations use accounting performance measures, creating measurement errors and biased empirical results.

Due to the shortcomings of accounting ratios as a measure for company performance the trend in the pay-performance sensitivity literature is moving towards a market related measure of shareholder wealth: total shareholder return (TSR) (Abowd, 1990; Conyon & Leech, 1994; Main *et al.*, 1996; Masson, 1971; Murphy, 1986; Stathopoulos *et al.*, 2005).

### **2.5.2. Total shareholder return (TSR)**

Even though accounting measures do convey information regarding the performance of companies, they do not measure shareholder wealth creation, the main aim of shareholders.

The most direct measure of shareholder wealth is total shareholder return (TSR), defined as capital growth plus dividends. This is supported by O'Neill and Iob (1999:68) who argue that TSR is “generally regarded as the best indicator of company performance” as it combines capital growth and cash flow (dividends) to provide ultimate shareholder returns. So too, Abowd (1990) uses market performance (total shareholder return (TSR)) as well as accounting measures (economic profit) as performance measures; and he found evidence that market performance measures shows a stronger positive correlation with variable (incentive) pay than accounting measures.

Kozan and Boulanger (2004), cited in Bradley (2011), raises the concern that TSR may reflect the performance of the stock market rather than that of the company. This reflects a similar perspective adopted in management accounting education

that shares are not an effective management incentive as the share price is influenced by many factors that are outside of management's control. The effect of the general performance of the stock market can be excluded by comparing TSR between companies. Coughlan and Schmidt (1984) argue in favour of abnormal share price performance as an objective measure that is not at the discretion of management. Cooper *et al.* (2014) also used abnormal returns, calculated in excess of the average return of an industry, size and lagged return matched portfolio, to measure future performance for current pay.

#### Future performance

Since share returns are the basis of the incentive compensation of many CEOs, a positive relationship between CEO compensation and company share returns would be expected. The CEO pay level is dependent on the share price. Thus, in order to break the dependent link between performance and pay, the relationship between CEO compensation and future share returns need to be investigated.

#### Lagged-returns matched portfolios

Another effect of CEO incentive compensation being based on share returns is that CEOs with the highest level of excess pay, typically experience strong current and past share performance. Due to the tendency for over- or undervalued shares to revert back to the mean (mean reversion), the share price of companies with CEOs earning higher pay as a result of superior past and present performance would perform comparatively worse in subsequent periods than companies with weaker past performance. Cooper *et al.* (2014) use a lagged return matching approach to control for mean reversion.

#### General

Due to accounting measures of company performance being vulnerable to manipulation by management as well as being affected by factors that does not directly affect shareholder value creation, market-related measures of shareholder returns are preferred in pay-performance studies.

### **2.5.3. Key issues relating to the measurement of company performance**

A study investigating the relationship between CEO compensation and company performance should define company performance in terms of market related measures rather than accounting ratios.

The literature argues that TSR (share price movement adjusted for dividends) is the most accurate measure of shareholder wealth. However, it is necessary to exclude the effect of general stock market movements on TSR. Abnormal returns measured with reference to a suitable benchmark are argued to be the most rigorous means of achieving this.

The tendency of over- and undervalued shares to revert back to the mean value can be controlled for using lagged return matching, provided that the sample consists of sufficient number of companies.



### **2.6. Pay-performance sensitivity**

Research into the relationship between executive compensation and company performance dates back to at least the mid-1920's when William Baumol put forward the sales maximisation hypothesis. This theory argues that executive salaries appear to be far more closely correlated with the scale of operations (represented by revenue) of the company than with its profitability (McGuire *et al.*, 1962). Consequently, during the latter half of the 20<sup>th</sup> century, the study of pay-performance sensitivity has experienced a dramatic increase.

The rest of this section reviews the early international studies, later international developments, and considers the local studies in South Africa in terms of the international literature.

### **2.6.1. Early international studies (pre-2000)**

Early (pre-2000) studies investigating the relationship between CEO pay and company performance have reported inconsistent results. The majority of early pay-performance sensitivity studies originate from the United States of America (U.S.).

#### *2.6.1.1. United States of America (U.S.)*

Early studies investigate factors explaining the level of executive compensation. Roberts (1959) found that the relationship between executive compensation and sales appeared to be stronger than the relationship between compensation and profits, supporting Baumol's sales maximisation hypothesis. The number of studies investigating the link between executive pay and company performance in the U.S. started increasing in the early 1970's and largely rendered results in contradiction to Baumol's sales maximisation theory. Lewellen & Huntsman (1970) tested whether executive compensation was determined by sales, profit or share returns, for 50 "bluechip" companies from the S&P500. They found that profits and share returns were more important than sales in explaining pay levels. Masson (1971), investigating executive pay in companies in the electronics, aerospace and chemical industries, found that executive compensation was primarily related to share market performance and explicitly rejected Baumol's sales maximisation hypothesis. He further found that where the basis of compensation paralleled shareholders' interest, share returns were improved (Masson, 1971).

Later studies further investigate the influence of CEO pay level and structure on company performance, as proposed by Masson (1971). Murphy (1986) reported a positive statistical relationship between pay and performance, using total shareholder return as a measure of company performance. Four years later, in a study comparing the change in CEO wealth to the change in shareholder wealth, the relationship was still found to be positive, but falling (Jensen & Murphy, 1990a). In a further paper, they suggested that paying CEOs "better" (referring to



how pay is structured), and not just more, results in “better” company performance (measured in terms of the change in shareholder wealth). Jensen and Murphy (1990b) consider “better” pay to mean CEO shareholding (not just share options) and the threat of dismissal in the event of bad performance. They find that from 1970 through 1988, the companies included in the top decile of “best” CEO pay (based on alignment of compensation structure with shareholder wealth) achieved an average annual compound share return of 14.5%, more than one-third higher than the average return for the companies included in the bottom decile (in terms of “worst” CEO pay structure). A \$100 investment in the top decile companies (in terms of CEO pay structure) in 1970 would have grown to \$1,310 by 1988, as opposed to only \$702 for a similar investment in the ten percent of companies with the “worst” CEO pay structure (Jensen & Murphy, 1990b). Jensen and Murphy (1990b) recognise that cash based incentives are argued as being more effective than shared-based incentives in motivating management due to share based incentives being subject to non-controllable factors outside of management’s control. Yet collectively, Jensen and Murphy’s research indicated that including long-term share-based incentives (in particular the ownership of shares) in CEO pay were effective in encouraging shareholder wealth creation and found only a weak link between cash compensation and company performance. Applying optimal contract theory to their findings would suggest that long-term shares-based incentives are an optimal component of the CEO contract.

Apart from Jensen and Murphy (1990b), few of the earlier studies directly address the question of whether compensation will translate into future performance, until Abowd (1990) investigated whether the sensitivity of cash based compensation to company performance is positively related to company performance in the subsequent year. Compensation was measured as the percentage increase in total salary, as well as bonus as a percentage of base pay. He found that where there was a stronger relationship between company performance and CEO pay in the base year, companies performed better in the subsequent year. His sample included 16 000 managers from 250 large companies for the period 1981 to 1986; and he found only a weak association when employing accounting-based performance measures, but stronger evidence when using economic and market



measures. This study suggests that increasing the sensitivity of compensation to economic and market related returns may be associated with better future performance.

#### *2.6.1.2. Other international studies*

Studies in the United Kingdom (U.K.) that exclude long-term incentives from compensation found a weak positive relationship between pay and performance in large listed companies (Benito & Conyon, 1999; Conyon & Leech, 1994). Benito and Conyon (1999) found that compensation is positively related to both shareholder returns and company size, with the latter showing a stronger link.

In contrast, the first large U.K. study incorporating long-term incentives found a strong link between company performance (TSR and sales) and compensation (Main *et al.*, 1996). This study included the Black-Scholes value of share options in the compensation variable. The inputs into the Black-Scholes model were not discussed.

A stronger pay-performance relationship that is reported in the study including long-term incentives is reflective of the findings recorded in the U.S. literature.

However, in Australia, O'Neill and Iob (1999) reported an inverse relationship between compensation (including share options) and the 5-year lagged TSR, comparing current compensation to the performance over the previous five years. A longer performance term was used to eliminate short-term volatility, but this may also have been the reason for the inverse relationship: i.) the CEO might have been replaced by a new one (at high cost) due to prior bad performance, and ii.) compensation may have been based on more recent performance. O'Neill and Iob (1999) concluded that job size and complexity largely determine compensation.

### 2.6.1.3. Key findings from early studies

Two key findings emanating from the early studies in pay-performance sensitivity are that:

- Long-term incentives are more closely related with shareholder wealth creation and therefore an important component of the optimal contract; and
- A strong positive pay-performance relationship is associated with improved future performance.

### 2.6.2. More recent international studies (post-2000)

More recent studies continue to report a greater pay-performance sensitivity where long-term incentives are included in compensation and shareholder returns are used to measure company performance. The more recent literature remains consistent with earlier studies, except for findings related to the relationship between pay and future performance.



#### 2.6.2.1. Consistency with prior literature

Stathopoulos *et al.* (2005) examined the impact of extreme share performance on pay by grouping U.K. publicly listed companies into three sub-samples: extremely well- and poor performing, and neutral. They found a strong link between abnormal share returns – over the benchmark *Financial Times* All Share Index – and compensation, which included long-term incentives. Barber, Ghiselli and Deale (2006) similarly found a positive but weak correlation among CEO compensation (including long-term share-based incentives), sales, profit and share price in the U.S. restaurant industry. They report that the relationship between pay and share price is stronger for big companies, but the relationship between change in pay and change in revenue is stronger for smaller companies, suggesting that growth is an important factor.

Girma *et al.* (2007) exclude long-term incentives from compensation and use accounting-based measures of company performance and found a weak pay-performance relationship. They however report a strengthening of the relationship between company size and pay over the fifteen year period 1981 to 1996 in their U.K. study (Girma *et al.*, 2007).

Eichholtz, Kok and Otten (2008) used both accounting and market-related measures of performance, and included long-term incentive compensation to study the drivers of executive compensation in the U.K. property industry. They report that compensation is strongly linked to company size (similar to the findings of Girma *et al.* (2007)) and also to executive shareholding (Jensen & Murphy, 1990b). Eichholtz *et al.* (2008) also report that long-term incentives – but not cash pay – are explained by performance, consistent with the earlier studies of Lewellen and Huntsman (1970), and Masson (1971).



#### 2.6.2.2. *Development of the prior literature: future performance*

How performance affects compensation is well researched, but limited research exist on the reciprocal relationship of how compensation affects future performance (Murphy, 1999). Where the first study considering the relationship between executive pay and future performance investigated the relationship between pay-performance sensitivity and future company performance (Abowd, 1990), more recent studies address the question of how compensation affects future performance.

Core *et al.* (1999) report that a 40% increase in excess compensation is associated with a cumulative loss in share returns of between -4.97% and -8.88% for holding periods between one and five years. A recent, comprehensive study by Cooper *et al.* (2014), similarly reports evidence that CEO pay is negatively related to future share returns for periods of up to three years. They found that companies, with CEOs in the top decile in terms of excess pay, earn negative abnormal returns over the subsequent three years amounting to nearly -8%. Cooper *et al.* (2014) suggest that this effect may be driven by CEO overconfidence. Similar to these

U.S. studies, Balafas and Florackis (2014) report that companies paying their CEOs at the bottom of the compensation distribution earn positive abnormal returns and outperform those at the top of the distribution.

Where a period of only one year was considered in the earlier study investigating the relationship between compensation and future performance, more recent studies have extended this investigation to a period of up to five years. Pay-performance studies also regularly include quantitative factor analysis to try and find common characteristics for inconsistencies in the pay-performance relationship, but no qualitative studies were found that try to explain these inconsistencies.

### **2.6.3. Approach to pay-performance sensitivity studies in the international literature**

The findings of more recent studies largely reflect those of the early studies in the pay-performance literature. Table 4 summarises the international pay-performance sensitivity studies into four quadrants on the basis of the variables of CEO compensation (cash- and long-term incentive compensation) as well as the measures of company performance (accounting measures and market related measures) used. The majority combines the inclusion of long-term incentives in CEO compensation with the use of market related measures of company performance (like TSR).

**Table 4: A summary of the variables used in international pay-performance sensitivity studies**

	<b>Accounting measures</b>	<b>Market-related measures</b>
<b>Cash- and long-term incentive compensation</b>	<i>Eichholtz et al. (2008)</i> <i>Jensen &amp; Murphy (1990a)</i> <i>Jensen &amp; Murphy (1990b)</i> <i>Lewellen &amp; Huntsman (1970)</i> <i>Masson (1971)</i>  Barber et al (2006)	Balafas & Florackis (2014) Barber et al. (2006) Cooper et al. (2014) Core et al. (1999) Eichholtz et al. (2008) Jensen & Murphy (1990a) Jensen & Murphy (1990b) Lewellen & Huntsman (1970) Main et al. (1996) Masson (1971) Murphy (1986) O'Neill & Iob (1999) Stathopoulos et al. (2005)
<b>Cash compensation</b>	<i>Abowd (1990)</i>  Girma et al. (2007)	Abowd (1990) Benito & Conyon (1999) Conyon & Leech (1994)

The consistency of the international literature in combining the use of long-term incentives and TSR in pay-performance sensitivity studies is evident in the above table, indicating the preference of the international literature. The level of acceptance of the use of accounting-based measures of company performance is potentially over-represented by the inclusion of the first five studies (in italics) in the first quadrant of Table 4 and the first study (in italics) in quadrant three, as accounting measures were included as a comparative to the use of TSR as a company performance measure in these studies, and weaker results reported.

#### **2.6.4. South African studies**

The literature on the link between executive pay and performance in South Africa is in its infancy. A search on Google Scholar provided very little early research on

the topic in the local context. Cohen and Uliana (1990) evaluated the effect of corporate ownership structures on employee, management and shareholder compensation for JSE listed companies and found no difference in compensation between different control structures. The study, however, only covered a single year (1987) and is thus very limited in scope. In a survey of JSE listed companies, Hall (1998) found evidence in support of the agency problem in South Africa with a substantial number of managers pursuing goals that are irreconcilable with shareholder value creation. Hall (1998) qualitatively explored the agency problem, agency cost and proposed solutions thereto in South African listed companies.

However, the pay-performance sensitivity of executive compensation has only attracted the interest of SA researchers since 2011, with a number dissertations and a handful of papers written on the subject in the last five years. A varied selection of studies has been carried out locally:

- Bradley (2011) studied the Top 40 JSE listed companies and found no correlation between short-term cash compensation and accounting measures related to company performance (ROE, ROA and EPS), nor was the relationship influenced by the industry in which the company operates.
- Shaw (2011) similarly reports no relationship between SCC and performance related accounting measures (HEPS and ROE) for the largest 30 financial services companies on the JSE. He does, however, report a strong positive relationship between SCC and accounting measures influenced by company size (EBITDA and PAT).
- Theunissen (2012) explored the ability to apply Data Envelopment Analysis (DEA) as a mathematical model to benchmark CEO compensation using similar variables as considered by pay-performance sensitivity studies as input and output variables. She found DEA to be a useful tool to identify benchmark CEOs as well as to suggest improvements for inefficient CEOs by comparing them to the benchmark group. The study used short-term cash compensation, but included gains

on shares held to represent long-term incentives, and accounting measures of company performance.

- Scholtz and Smit (2012) report a strong relationship between short-term cash compensation and total assets as well as sales (both related to company size), but a weak relationship when measuring company performance by means of EBITDA (also size related) for companies listed on the South African Alternative Exchange (AltX). A significant strong positive relationship between SCC and change in share price was reported for the period between 2003 and 2010, but this relationship was insignificant during the post-crisis period of 2008 to 2010, suggesting inconsistencies in the results.
- A study aimed at investigating the effects of race on pay-performance sensitivity found that mean compensation did not differ significantly between CEOs from previously disadvantaged groups and white CEOs, but the pay-performance relationship was stronger for former group (Barrett, 2014). Barrett (2014) also reports that short-term cash compensation correlates strongly with PAT and EBITDA (size-related), but not with ROE and change in share price (performance related).
- Theku (2014) found a moderate to strong relationship between short-term cash compensation and size-related accounting measures (revenue, EBITDA and market capitalisation) in the mining industry. Similar to prior SA studies, the relationship between SCC and performance related accounting measures (ROE, ROA and EPS) are either weak or non-existent. Similarly, no correlation between SCC and change in share price is found.
- The only study to include share options and share grants (LIC) as part of compensation is a study on whether total compensation of CEOs of the 120 top JSE listed companies could be justified by the turnover and profit (both related to company size) of the companies (Dommissie, 2011). Consistent with prior research reporting a strong relationship between company size and CEO pay, the study reports a strong positive correlation in more than 80% of the sample over a five year period.

### **2.6.5. Shortcomings of local studies relative to the international literature**

Research in the area of executive compensation in South Africa only recently started gaining popularity and numerous opportunities exist to extend the existing local literature. This section highlights some of the shortcomings of the studies that have been conducted in the area of executive compensation in the South African context.

All the studies reporting a strong positive relationship between SCC and company performance, measured performance in terms of size-related accounting measures such as sales, profit and market capitalisation (Dommissie, 2011; Barrett, 2014; Scholtz & Smit, 2012; Shaw, 2011; Theku, 2014). These studies essentially report the relationship between CEO pay and company size, rather than reflecting the sensitivity of CEO pay to company performance. This confirms the finding that company size is positively related to CEO pay which is well documented in the literature, and suggests the practice of companies benchmarking CEO compensation on the pay of peer companies of similar size occurs (Bizjak *et al.*, 2008).

Studies that investigated the relationship between SCC and accounting measures that are related to company performance (ROE, ROA and EPS) reported either an inconsistently weak relationship or no relationship at all (Barrett, 2014; Bradley, 2011; Cohen & Uliana, 1990; Shaw, 2011; Theku, 2014).

Only three studies included some form of market related measure of company performance (change in share price), but found no consistent relationship with SCC (Barrett, 2014; Scholtz & Smit, 2012; Theku, 2014). There may be several reasons for the lack of a relationship between SCC and change in share price. Firstly, dividends were not taken into account. Secondly, a period of only one year was considered. Since it arguably takes time for managerial actions to manifest in terms of company performance, performance over a period longer than one year should be considered.



Apart from Dommissie (2011) who covered the largest 120 companies listed on the JSE, all the other South African pay-performance sensitivity studies were limited to one specific industry or size group of companies (Top 40 or AltX).

Only two local studies include some measure of long-term incentives (Dommissie, 2011; Theunissen, 2012). Theunissen (2012) included gains on shares held as part of long-term incentive compensation. Some international studies do include gains on shares held, while others exclude these arguing shares held constitutes a personal investment of the CEO. Dommissie (2011) includes share grants and share options (long-term incentive compensation) at the average share price. Simplifying assumptions regarding the value of share options and share grants are widely used in the international literature, but most studies do however use a value lower than that of the share price, since it will overvalue these incentives.

Therefore, even though three studies included changes in share price as a market-related company performance measure and one study included LIC in CEO compensation, South African studies in general are not normative in terms of international studies. No South African study incorporates both long-term incentives at their expected values as a component of CEO compensation, as well as TSR as a measure of company performance.

This gap in the literature is apparent from Table 5, which presents a summary of the key variables included in the South African pay-performance sensitivity studies, being:

- CEO compensation (cash- and long-term incentive compensation);
- Accounting measures of company performance (size related and non-size related)
- Market-related measures of company performance (change in share price and total shareholder return (TSR));
- Timeframe of the study; and

- Strength and direction of the pay-performance relationship reported by the various studies where a weak and strong positive relationship are represented by “+” and “++” respectively (no relationship is indicated as “NR”).

**Table 5: A summary of the variables used in South African pay-performance sensitivity studies**

Study	Sample	Time frame (in years)	CEO pay component		Company perf. variables			
			Cash compensation (CC)	Long-term incentives (LIC)	Accounting measures		Change in share price	Total shareholder return (TSR)
					Size related	Not size related		
Dommissie (2011)	JSE Top 120	2002 – 2009	x	x <sup>1</sup>	++			
Scholtz & Smit (2012)	JSE Alternative Exchange	2003 – 2010	x		++/ +		++/ NR <sup>2</sup>	
Barrett (2014)	Sample from JSE	2004 – 2013	x		++	NR	NR <sup>2</sup>	
Theku (2014)	Mining industry	2009 – 2013	x		++	+/ NR	NR <sup>2</sup>	
Shaw (2011)	Financial services industry	2005 – 2010	x		++	+/ NR		
Bradley (2011)	JSE Top 40	2006 – 2010	x			+/ NR		
Cohen and Uliana (1990)	Industrial industry	1987	x			NR		

1. Share option grants and performance grants were valued at the average full share price

2. Volume-weighted average share price for the year

++ Strong positive relationship

+ Weak positive relationship

NR No relationship

It is clear from Table 5 that most studies in South Africa exclude long-term incentives and that none measure company performance in terms of TSR, which is increasingly becoming the norm internationally. Studies that report a positive

relationship between pay and performance define company performance in terms of size-related accounting measures and are therefore concluding on the relationship between CEO pay and company size, rather than performance. The strong correlation between the size of the company and CEO pay are consistent with the findings of the international literature.

Where accounting measures related to company performance are used, the reported relationship between pay and company performance is either weak or non-existent, and there is a lack of corroboration of inconsistent results within individual studies (where a cell contains both “NR” and “+”, the pay-performance relationship was inconsistent when using different measures of company performance). This highlights the futility of using accounting measures in investigating the relationship between CEO compensation and company performance, as well as limitation of drawing conclusions based on one measure of company performance.

Barrett (2014) determines the effect of company size on CEO pay using analysis of variance (ANOVA) and Theku (2014) acknowledges the link, but both studies fail to control for the effect of company size in CEO pay in their pay-performance regression analyses. Shaw (2011) includes the book value of assets as a dependent variable in his multivariate regression analysis in order to control for size, but reports some degree of multicollinearity, thus making it impossible to draw a clear conclusion regarding the degree to which a pay-performance relationship exists.

Since no South African study reflects the international developments of including both long-term incentives as a component of CEO pay and TSR as measure of company performance, nor adequately control for influence of size, there is a void in the SA pay-performance literature.

#### **2.6.6. Key issues relating to pay-performance sensitivity**

The literature reports a variety of findings regarding the direction and strength of the pay-performance relationship. The international studies that excluded long-

term incentives or used only accounting measures for company performance mostly report a weak relationship between pay and performance, similar to the findings of the SA studies that investigate the relationship between SCC and non-size related accounting measures of company performance. SA studies measuring company performance using size-related measures, report a strong relationship to CEO pay, which is reflective of the strong correlation between CEO pay and company size that is reported internationally. The international studies that combine the inclusion of long-term incentives with the use of TSR as the measure of company performance generally report a stronger relationship that is positively correlated. This might be as a result of LIC being more closely correlated with TC than SCC (99% compared to 38%) (Cooper *et al.*, 2014), thus if LIC are excluded, the CEO compensation will differ significantly from TC. Consequently, if SCC is not closely correlated with TC, studies that use SCC as a proxy for TC will report unreliable results. Further, any study investigating the pay-performance sensitivity relationship should control for company size.

A few international studies raise a further question regarding the existence of a causal relationship between compensation and company performance. The early literature suggests that long-term incentives as a component of compensation are an effective in improving company performance (Jensen & Murphy, 1990b). The generally strong, positive pay-performance relationship reported in later literature seems to support this suggestion. However, three studies investigating the relationship between CEO compensation and future share returns suggest the opposite (Balafas & Florackis, 2014; Cooper *et al.*, 2014; Core *et al.*, 1999) and raise the importance of considering future company performance.

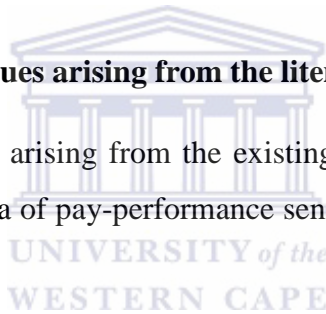
Since long-term incentives are regularly awarded on the basis of TSR, it is expected that the positive correlation between TSR and long-term incentives will result in the positive relationship between pay and performance found in the pay-performance sensitivity literature. The goal of long-term incentives, however, is to encourage long-term performance, and therefore it is important to consider future performance (in terms of TSR). There is a paucity of studies internationally, and none locally, that investigate pay relative to future performance.

Therefore, the existing literature investigating the pay-performance relationship informs future research into the relationship between CEO compensation and company performance in the following ways:

- The relationship between CEO compensation and future company performance (TSR) should be investigated, with company size controlled for;
- A negative relationship is anticipated based on the findings of previous studies internationally;
- If, however, the suggestion regarding the effectiveness of LIC as an incentive is accurate, a positive relationship should be reported, unless the relationship is affected by other factors, such as overconfidence.

## 2.7. Summary of key issues arising from the literature review

The main considerations arising from the existing body of literature that inform future research in the area of pay-performance sensitivity are presented in Table 6 below.



**Table 6: Key issues arising from the literature**

No.	Issue	Section
1.	The level and structure of CEO pay should be considered relative to company performance, instead of in isolation.	2.2.3
2.	<p>A positive pay-performance relationship would be explained by:</p> <ul style="list-style-type: none"> <li>- Effective alignment of interests (agency theory);</li> <li>- Optimal structuring of components of CEO compensation (optimal contracting theory); and</li> <li>- Labour market theory (pay for managerial talent).</li> </ul> <p>A lack of a positive relationship would be explained by:</p> <ul style="list-style-type: none"> <li>- Managerial power</li> <li>- Over-confidence</li> </ul>	<p>2.3.6/2.6.6</p> <p>2.3.6/2.6.6</p> <p>2.3.6</p> <p>2.3.6</p> <p>2.3.6/2.6.6</p>

3.	The relationship between CEO pay and company performance should be examined in terms of excess pay, so to eliminate the tendency towards similarity in pay in companies of similar size and industry sector, as suggested by benchmarking, as well as the close relationship reported between CEO pay and size-related accounting measures of company performance.	2.3.6/ 2.4.4/ 2.6.6
4.	<p>The most important distinction between compensation components is SCC and LIC, and so the relative significance of both SCC and LIC should be established</p> <p>Values can be assigned to long-term share-based incentives on the basis of simplifying assumptions. The accuracy of the result thereof should be considered.</p>	2.4.4
5.	<p>Market related measures of company performance preferable to accounting ratios. The literature argues that TSR (share price movement adjusted for dividends) is the most direct measure of shareholder wealth.</p> <p>However the effect of general stock market movements on TSR should be excluded, therefore abnormal returns on excess peer groups (industry and size) are argued to be more rigorous.</p> <p>Lagged-return matching is suggested to control for mean reversion, although this requires adequate sample sizes.</p>	2.5.3/2.6.6
6.	<p>The relationship between CEO compensation and future TSR should be considered for three reasons:</p> <ul style="list-style-type: none"> <li>- Since some component of compensation is frequently awarded on the basis of TSR, a positive relationship between TC and TSR is expected;</li> <li>- The aim of long-term incentives are to motivate CEO to perform better in future; and</li> <li>- A general paucity of studies investigating pay for future performance, and none in South Africa.</li> </ul>	2.6.6

The design and methodology to be followed in this study – which is further discussed in Chapter 3 – is informed by these key issues, as well as the research objectives and questions that follow in the next section.

## **2.8. Research objectives and questions**

### Research objective 1

The first research objective of this study is to analyse and describe compensation levels and pay structures for the largest 100 companies listed on the Johannesburg Stock Exchange (JSE) for 2011 to 2013.

The first research question to address this objective responds to the lack of information readily available regarding average levels of CEO compensation as well as the variation therein.

Research question 1: What are the maximum and average levels of, and variation in, CEO compensation, in total (TC) and per component (SCC and LIC), for the top 100 JSE listed companies overall, and how does this vary between companies of different size and in different industries?

Research questions 2 and 3 consider the findings reported in the literature of company size being a significant determinant of CEO compensation levels, as well as the practice of benchmarking of CEO pay on company size and industry being widely used internationally, with some evidence of the existence thereof reported locally (Theunissen, 2012).

Research question 2: Is company size significant in explaining the level of total compensation?

Research question 3: Is the industry sector significant in explaining the level of total compensation?

The international literature identifies the significance of long-term incentives in terms in the value thereof relative to total compensation. Further the contrast in findings between pay-performance sensitivity studies that include and exclude long-term incentives is also evident, potentially as a result of LIC being a more significant driver of TC than SCC. Research question 4 and 5 raise the question of

the relative significance of LIC in South Africa, given that the importance of these is dismissed in the local literature (Shaw, 2011).

Research question 4: What is the proportion of long-term incentive compensation (LIC) relative to total compensation (TC)?

Research question 5: Is LIC more closely correlated to TC than SCC?

Cooper *et al.* (2014) report a near perfect correlation of 98.6% between LIC and TC, but only 37.7% between SCC and TC, suggesting that LIC better explains TC than SCC. Many South African studies use SCC as a proxy for TC. If SCC is not closely correlated with TC, similar to the finding in the U.S., then any conclusion drawn regarding the relationship between SCC and company performance cannot be concluded to be true of the relationship between TC and company performance.

#### Research objective 2

The second objective of this study is to investigate and analyse the relationship between the level and structure of CEO compensation and the future total shareholder returns in South Africa.

The general experience reported in the international literature is a positive pay-performance relationship where long-term incentives are included in total compensation and TSR is used to measure company performance. This is considered the most appropriate approach internationally (refer section 2.6). The pay-performance sensitivity relationship using this combination of variables has not been tested in South Africa.

Three studies in the international literature extend the investigation of the pay-performance relationship to consider future company performance. The reason for doing so is two-fold: To exclude any possible correlation between the value assigned to the LIC and company performance (both being influenced by the current share price), and to identify any possible causal relationship between the level and structure of compensation and future company performance. In all three



cases the relationship between pay and future company performance were surprisingly found to be negative in the international literature.

Research questions 6 to 8 consider this un-researched relationship in the South African context, questioning whether a positive relationship between compensation in total and for each component (SCC and LIC) and future company performance (measured by TSR) exists. Research question 9 considers whether the pattern of the relationship between pay and future performance is consistent across three measures of compensation (TC, SCC and LIC).

Research question 6: Does a positive relationship between TC and future company performance (as measured by TSR) exist?

Research question 7: Does a positive relationship between SCC and future company performance (as measured by TSR) exist?

Research question 8: Does a positive relationship between LIC and future company performance (as measured by TSR) exist?

Research question 9: How do the pay-performance relationships based on TC, SCC and LIC respectively, compare?

A suggestion in the literature exists that LIC might be an optimal component of CEO compensation package in terms of incentivising improved future company performance. This question has also not been investigated in South Africa and this is addressed by research question 10.

Research question 10: Does an indication exist in the South African context that long-term incentives may represent an optimal component in the CEO compensation package?

All of the above research questions are un-researched in the SA context, creating a glaring void in comparison to the norm in the international literature. In addressing these research questions this study seeks to contribute towards filling the void in the SA literature and give a first glimpse of how the SA situation compares to that reported internationally.

## **CHAPTER 3: METHDOLOGY**

This study describes the level and structure of CEO compensation for the largest 100 companies listed on the JSE in South Africa for the period 2011 to 2013. The relationship between CEO compensation (in total and by component) and future company performance as measured by TSR is then investigated. The study is based primarily on data that is publicly available, but also includes data supplied by PricewaterhouseCoopers (PwC) that is subject to a confidentiality agreement (further details are provided below). Consequently, this empirical study is both descriptive and quantitative, making use of secondary data.

### **3.1.Data**

#### **3.1.1. Sample**

One of the shortcomings shared by the numerous South African studies addressing the relationship between CEO compensation and company performance are the small sample sizes. This study includes the top 100 JSE listed companies for the years 2011 – 2013. Even though some international studies include a much longer period, other studies including only three years have reported statistically significant results (Core *et al.*, 1999). The reason for limiting the sample to the top 100 (which includes large- and mid-cap companies) is the availability of the expected value of the long-term incentives for these companies as calculated and supplied by PwC. The top 100 companies represent a significant proportion of the overall market, with a combined market capitalisation of 94% of the total JSE capitalisation as at 7 May 2015 (calculated using fundamentals data downloaded from the Sharenet database). Included in the top 100 company codes on the JSE are other instruments, including exchange traded notes (ETNs) and warrants which are not operating companies managed by a CEO, and consequently were excluded from the sample. The number of companies remaining in the sample is 79 in 2011, 92 in 2012 and 92 in 2013.

The variables used to measure CEO pay and company performance in this study are defined in sections 3.1.2 and 3.1.3 respectively. The design of the study follows thereafter.

### 3.1.2. Compensation variables

The measures of CEO compensation used in this study are categorised as per the summary of the literature (presented in Table 2, section 2.4.1) and indicated in Table 7 below.

All categories of compensation identified in the literature are included in this study, except for gains on shares held, in agreement with the view of Main et al (1996) that these constitute a personal investment, not compensation.

**Table 7: Compensation variable included in this study**

<b>Total compensation (TC)</b>			
<b>Short-term cash compensation (SCC)</b>		<b>Long-term incentive compensation (LIC)</b>	
<u>CASH</u> Total guaranteed pay (TGP):	<b>This study:</b>	<u>CASH</u> Deferred STI (bonus)	<b>This study:</b>
- Base salary	Included		Included
- Other benefits	Included	<u>SHARE-BASED</u>	
Short-term incentive compensation (STI):		Performance shares	Included
- Cash bonus (CB)	Included	Share options	Included
		Gains on shares held	Excluded

The compensation data has been obtained from PwC who publishes an annual report on the practices and trends of executive remuneration (PwC, 2014). The SCC was retrieved directly from the annual financial statements by PwC. Spot-checks to the INETBFA database were performed in order to confirm the accuracy of this data.

The valuation methodology of the expected values of the long-term incentives (of the CEOs of the top 100 JSE listed companies for the three years 2011 to 2013) was discussed with PwC. The valuation methodology is generally accepted in finance theory and the assumptions are considered to be reasonable. The detail thereof cannot be fully disclosed due to the confidentiality agreement, but is further discussed in broad terms.

LIC refers to all cash- and equity settled awards that accrue to an employee based on individual and/or company performance for a period more than twelve months. Long-term incentives included in this study are classified as either performance share grants (including Forfeitable Share Plans (FSPs) and Conditional Share Plans (CSP)) or share options.

#### Performance Shares

The value of FSPs and CSPs are calculated as the number of shares granted during the financial year multiplied by the expected value of the shares. Since the exact methodology used by PwC is subject to a confidentiality agreement, the detailed calculations are not disclosed in this section. The valuation takes into account the following variables: the vesting period, the probability of vesting and the current share price.

#### Share options

The Black-Scholes-Merton model was used by PwC to price the options. The following six inputs were considered:

- i. current price of the underlying share
- ii. exercise price of the option
- iii. expected volatility of the price of the underlying share
- iv. expected dividend yield of the underlying share
- v. risk-free interest rate for the term of the option
- vi. expected term of the option

In order to review the reliability of the option values, the assumptions surrounding each input variable were discussed with the senior manager from PwC. Apart

from the first two input variables, namely the underlying share price at the grant date and the exercise price of the option – both of which are known, the following assumptions were made for each input variable used in the pricing of the share options:

- iii. expected volatility of the price of the underlying share: The historic share prices for a specific period were used to determine the share price volatility
- iv. expected dividend yield of the underlying share: The historic dividend yield for a specific period was used to determine the expected dividend yield
- v. risk-free interest rate for the term of the option: A specific government bond rate was used
- vi. expected term of the option: A specific period between the grant date and the expiry date was used as the expected term of the option

Even though the above assumptions should ideally be adjusted for specific conditions for each option grant, simplifying assumptions are widely used in the literature. The level of detail in the assumptions used in applying the Black-Scholes-Merton option pricing model in the present study arguably results in a more accurate valuation than that of numerous international studies (refer section 2.4.2.2).

In order to describe compensation levels and structures, raw pay levels were used. Compensation for 2011 and 2012 was adjusted for inflation to reflect 2013 values. The year-on-year Consumer Price Index (CPI) (StatsSA, 2015) for the financial year-end month of each company was used to adjust the compensation level of the CEO of each company. The pay for a specific year was adjusted using the CPI rate for the following year, in order to exclude the effects of inflation in comparing the results across the three years.

### **3.1.3. Performance variables**

Total shareholder return (TSR) is used to measure company performance, since it is the most direct measure of shareholder wealth, defined as capital growth plus dividends. This is supported by O'Neill and Iob (1999:68) who argue that TSR is "generally regarded as the best indicator of company performance" as it combines capital growth and cash flow (dividends), being the actual returns received by shareholders.

This study calculates TSR as  $(P_1 - P_0 + D) / P_0$  where:

- $P_1$  is the closing share price at the end of the quarter
- $P_0$  is the closing share price at the end of the previous quarter
- $D$  is the dividends declared and paid of which the last day to trade (LDT) falls within the specified quarter

Closing share prices and dividends for the top 100 JSE listed companies were downloaded from the Sharenet database for the period 2010 to 2015. The TSR for each quarter was calculated by adding the dividend to the share price appreciation for the quarter in which the LDT for the dividend fell.

For dividends disclosed in foreign currency, the relevant exchange rates were downloaded and applied on the inclusion date (LDT). Daily historical midpoint exchange rates were downloaded from Oanda.com.

## **3.2. Research design**

### **3.2.1. First research objective**

The first research objective of this study was to analyse and describe compensation levels and pay structures for the largest 100 companies listed on the Johannesburg Stock Exchange (JSE) for 2011 to 2013 in South Africa.

### 3.2.1.1. Research question 1

*What are the maximum and average levels of, and variation in, CEO compensation, in total (TC) and per component (SCC and LIC), for the top 100 JSE listed companies overall, and how does this vary between companies of different size and in different industries?*

In order to address research question 1, the maximum, minimum, mean, median and standard deviation were determined for the largest 100 companies listed on the JSE in South Africa for the period 2011 to 2013.

Bizjak *et al.* (2008) found that most companies use benchmarking to determine levels of executive compensation, with peer groups typically being based on industry and size. Since the largest 100 companies listed on the JSE includes companies that vary greatly in size and industry, compensation was further analysed per company size group and industry in order to identify characteristics that may be unique to the specific classification. The relative proportion of long-term incentives to total compensation was also determined for each size and industry group.

Gabaix and Landier (2006:1) found that “the size of large firms explains many of the patterns in CEO pay, across firms, over time, and between countries”. In developed economies such as the U.S. and the U.K. the top 100 listed companies are large peer companies of similar size. In South Africa, however, the top 100 JSE listed companies comprise a very diverse group. One quarter of the 100 largest companies report revenue that is less than 2% of the revenue reported of the largest company. It is therefore of interest to describe the maximum, average and variation in compensation of companies of different sizes.

Revenue was selected as a proxy for company size, based on consistent reports in the literature of compensation being strongly related to company size. O’Reilly and Main (2010:699) found that “CEO compensation is more strongly related to organization size, measured as revenues, than firm performance”. Bizjak *et al.* (2008) reports that most peer groups appear to be based on firms of similar size

(usually based on revenues) and Cooper *et al.* (2014) reported similar size groups when using revenue compared to market capitalisation as a proxy for size.

Revenue figures were downloaded from the standardised financial statements available in the INETBFA database. For banks and listed property companies “Turnover” and “Interest Received” (codes 051 & 055) were used as revenue and for other financial services companies such as fund managers and insurance companies “Turnover” and “Surplus Sale Investment” (codes 051 and 060) are used. For all the other companies only “Turnover” (code 051) is used, since these companies derive their main income from sales.

Where financial results were reported in foreign currency (i.e. any currency other than South African Rands - ZAR) the foreign currency revenue figure was converted to ZAR using the average midpoint exchange rate for the specific company’s financial year obtained from Oanda.com.

Four distinct size groups (based on revenue) were formed. Revenue for the top 100 companies for 2013 ranged from R8 million to R583 billion. The groups containing the largest (labelled “mega”) and smallest (labelled “small”) companies were defined as companies with revenue of more than R100 billion and less than R10 billion respectively. Further consideration was given as to how to define the “medium” and “large” groups (with reported revenue between R10 billion and R100 billion). The midpoint could be established either in terms of the absolute value of revenue (R55 billion) or in terms of the relative ratio of the highest and lowest revenue in each of the two groups (i.e. the ratio calculated as the highest revenue divided by the lowest revenue included in each group are the same, so that the relative size between the largest and smallest companies in each group is constant).

If the absolute approach was taken and revenue of R55 billion used as the midpoint, this would create the situation where the biggest company (in terms of revenue) was 5.5 times the size of the smallest company in the same group (R55 billion / R10 billion), while this ratio for the second group will only 1.8 (R100 billion / R55 billion). It cannot be argued that the smallest company in the first



group was as equal a peer to the largest company in that group, compared to group two. If the relative size approach was followed and the companies split into two groups in such a way to create two size groups that are proportionately equal in terms of the largest to smallest company in each group (in terms of revenue) the midpoint (split point) would be R31.6 billion in revenue (where  $R100 \text{ billion} / R31.6 \text{ billion} = 3.16 = R31.6 \text{ billion} / R10 \text{ billion}$ ). However, this results in a contrast that is too great in absolute terms and again it can hardly be argued that a company with revenue of R31.6 billion is a peer of a company reporting a revenue figure of R100 billion. As a compromise between the two approaches R40 billion (the nearest R10 billion increment to the average of R55 billion and R31.6 billion) was selected as the splitting point between the “medium” and “large” groups of companies. Consequently, the “medium” and “large” size groups were defined as R10 billion to R40 billion, and R40 billion to R100 billion, respectively (refer to Table 8 below).

**Table 8: Size groups (based on revenue)**

Size group	Revenue (R Billions)	Number of observations		
		2011	2012	2013
Mega	>100	8	9	11
Large	40 – 100	17	22	21
Medium	10 – 40	33	35	36
Small	< 10	21	26	24

Apart from controlling for company size, Cooper *et al.* (2014) grouped the population into 49 industry portfolios. Due to the limited sample size of this study the companies are grouped into the four distinct industry groupings used by PwC in their annual remuneration report (PwC, 2014), namely: Basic Resources (BR), Financial Services (FS), Industrials (I) and Services (S) (refer to Table 9).

**Table 9: Industry groups**

Industry	Number of observations		
	2011	2012	2013
Basic Resources (BR)	21	21	20
Financial Services (FS)	20	27	23
Industrials (I)	11	12	13
Services (S)	27	32	36

These industries represent the most fundamental categories of companies in South Africa. Financial services includes listed property companies, while manufacturing companies are included with industrials. Services encompasses all other industries, including retail, healthcare and telecommunication.

### *3.2.1.2. Research question 2*

*Is company size significant in explaining the level of total compensation?*

In order to address research question 2 the following null hypothesis was set:

*Hypothesis 1 ( $H_1$ ):* The distributions of the level of CEO total compensation of companies in four different size groups (based on revenue) are the same.

In order to test hypothesis 1 a two-sample t-test assuming unequal variances was performed on the total compensation between each pair of the four size groups previously identified. A scatter graph of the data shows that the distributions of the observations are such that it allows for a t-test, however, due to the large amount of variation in the sample, a Mann-Whitney U test for non-parametric data was also performed for corroborative purposes.

### *3.2.1.3. Research question 3*

*Is the industry sector significant in explaining the level of total compensation?*

In order to address research question 3 the following null hypothesis was set:

*Hypothesis 2 ( $H_2$ ):* The distributions of the level of CEO total compensation of companies in four industry sectors are the same.

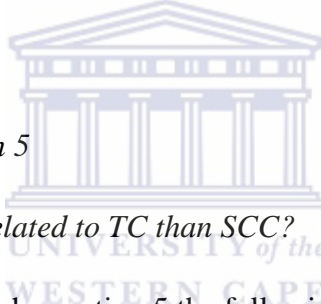
In order to test hypothesis 2 a two-sample t-test assuming unequal variances, as well as a Mann-Whitney U-test (again for corroborative purposes) test was

performed on the total compensation between each pair of the four industry groups previously identified.

#### *3.2.1.4. Research question 4*

*What is the proportion of long-term incentive compensation (LIC) relative to total compensation (TC)?*

In order to address research question 4, the proportion of LIC to TC was calculated for the largest 100 companies listed on the JSE in South Africa for the period 2011 to 2013 overall, and per size/industry group. This proportion was calculated by dividing the total LIC by the total TC, as well as dividing the median LIC by the median TC, overall and for each size/industry group.



#### *3.2.1.5. Research question 5*

*Is LIC more closely correlated to TC than SCC?*

In order to address research question 5 the following hypothesis was set:

*Hypothesis 3 (H<sub>3</sub>):* The correlation between LIC and TC is stronger than the correlation between SCC and TC.

In order to test hypothesis 3 the correlation between the components of compensation was determined.

### **3.2.2. Second research objective**

The second research objective of this study was to investigate and analyse the relationship between the level and structure of CEO compensation and the future total shareholder returns in South Africa. The approach followed to achieve this objective is closest to that of Cooper *et al.* (2014).

### 3.2.2.1. Research question 6

*Does a positive relationship between TC and future company performance (as measured by TSR) exist?*

The relationship between TC and TSR was investigated in terms of excess TC and abnormal TSR. It was necessary to use excess compensation – that is, the absolute pay less the median of pay of the peer group – rather than the absolute value of compensation in order to control for the effect of benchmarking on compensation. Abnormal TSR was used in order to eliminate the effect of general share market movements, calculated as the TSR of each company less the benchmark of the equally weighted (EW) TSR of the top 100 JSE listed companies. In order to address research question 6, the following hypothesis was set:

*Hypothesis 4 (H<sub>4</sub>):* A positive relationship between excess total compensation (TC) and abnormal future total shareholder return (TSR) exists.

The approach taken to test hypothesis 4 was to firstly analyse the situation descriptively in order to establish the apparent relationship between excess TC and abnormal TSR. This relationship was then tested statistically in order to confirm or reject the hypothesis.

#### Descriptive analysis of the relationship between excess total compensation and abnormal total shareholder return

The approach taken in the descriptive analysis was to first compare the abnormal returns of the extreme cases of excess pay, since the distinction would be clearest when contrasting the situations of companies with highest and lowest excess pay relative to peers, given the obvious existence of other factors affecting abnormal returns. In order to do this, companies were ranked on excess TC and decile portfolios were formed. The abnormal TSR of the top and bottom deciles of excess pay were compared. This is consistent with the approach taken by Cooper *et al.* (2014) who also primarily focused on the extremes, giving only limited consideration to the remaining deciles.

In order to investigate whether the relationship between excess compensation and abnormal returns was consistent across the remaining deciles, with abnormal returns declining as excess pay diminished, the remaining deciles were taken into consideration. The groupings were progressively broadened to include the next highest/lowest decile and the average abnormal returns for the larger groups were calculated. This process was repeated until the entire sample was split into two groups, being the top and the bottom half. A steadily decreasing abnormal return across groupings from highest to lowest decile would indicate a consistently positive relationship between excess TC and abnormal TSR.

The abnormal future TSR for nine quarters was calculated for the top and bottom decile portfolio of excess total compensation. Excess compensation was calculated as the absolute compensation of a CEO less the median compensation for the peer group (based on size/industry groupings as previously described in section 3.2.1) to which the CEO's company belongs. The return holding period is limited to nine quarters due to the availability of compensation data. Even though the incentivisation effect of compensation on company performance may take several years to manifest, international studies on the pay for future company performance relationship have reported significant results for holding periods as short as one year (Cooper *et al.*, 2014; Core *et al.*, 1999).

The abnormal TSR in excess of the benchmark (JSE top 100 equally-weighted index) was calculated for each company in the top and bottom deciles of excess compensation. Abnormal TSR was calculated for a period of nine quarters after the portfolio formation date. This period was limited by the availability of compensation data for the years 2011 to 2013.

Decile portfolios were formed at the start of the calendar year in which the CEO compensation was reported. The companies' actual financial years were disregarded for simplicity of the calculation. This simplification is supported by the findings of Cooper *et al.* (2014) that a similar relationship between pay and future performance exists regardless of forming portfolios on calendar year ends or financial year ends. Portfolios were created at the start of the calendar year, since it is argued that a CEO will be aware of how his/her compensation package

is structured at the start of the year and any incentivisation effect would commence immediately. The equally weighted abnormal TSR for the companies in the top and bottom deciles of excess compensation were then calculated. Equal weighting eliminates the disproportionate effect that large companies may have on portfolio returns.

In order to investigate whether the relationship appears to be consistent when testing the relationship in different ways, three alternative measures of future returns, as well as one alternative measure of excess pay was tested, as follows:

- Equally weighting the abnormal returns does not show the effect that the size of the pay package may have on the relationship between pay and future performance. In order to investigate the effect of the level of pay on the relationship the abnormal TSR of the top and bottom decile of excess total compensation was weighted using the square-root of pay. This alternative weighting provides a sense of the importance of pay levels on returns within the decile groups. The square-root of pay, rather than the actual pay level was used, since the resultant effect of pay on the weighting is less pronounced and the results are comparable to that of Cooper *et al.* (2014) as the same approach is followed.
- Due to the variability in share returns, the relationship may be skewed by the effect of extreme cases. The median abnormal TSR was calculated for the top and bottom deciles of excess compensation in order to eliminate the effect of outliers. Portfolios were formed at the start of the calendar year.
- The financial years of the top 100 JSE listed companies in South Africa end in seven different months, as opposed to only two in the U.S. Calculating abnormal returns from the start of the company specific calendar years is more accurate, since it matches the pay period with the TSR period. Equally-weighted abnormal TSR was calculated, but portfolios were formed at the start of the financial year in order to eliminate the effect of lag between the calendar year end and the financial year end. The abnormal return was calculated as the TSR of the company

in excess of the equally weighted TSR of the JSE top 100 index for the same time period for each company.

- As a result of the small sample size and the high variability in total compensation, calculating excess pay using different cut-off points between size groups may affect the relationship between pay and future performance. In order to eliminate the effect of different size groupings, TC was regressed on company revenue and the resultant residual plots of each observation were used as excess pay. Excess pay calculated in this manner is referred to as “residual pay” for the remainder of this study, to distinguish this approach from the primary method determining excess pay used in this study. Abnormal returns were equally-weighted and portfolios formed on calendar years.

A summary of the various descriptive analyses performed and the sections in which the results can be found is presented in Table 10 below.

**Table 10: Summary of various descriptive analyses (TC)**

Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.1.1.1
Square-root of pay	Calendar	Absolute vs. median per size group	6.1.1.2
Median	Calendar	Absolute vs. median per size group	6.1.1.3
Equal	Financial	Absolute vs. median per size group	6.1.1.4
Equal	Calendar	Residual vs. predicted	6.1.1.5

Testing of the statistical significance of the relationship between excess total compensation and abnormal total shareholder return

In order to test the statistical significance of the relationships that appear to exist in the descriptive analysis, the Pearson’s correlation coefficient was calculated to measure the linear correlation between the excess total compensation (in terms of the median per size group) and the abnormal TSR for each year. A scatter graph of the data shows that the distributions of the observations are such that it allows for the Pearson’s correlation. Due to the large variation in TC in the population, the Spearman’s rank correlation coefficient for non-parametric data, which is

more robust against outliers, is also calculated for corroborative purposes. The abnormal returns were calculated from the start of the financial year to which the total compensation relates, in order to better match the compensation and return periods.

As a result of the small sample size, the Pearson’s correlation coefficient and the Spearman’s rank correlation coefficient between excess TC and abnormal TSR were also calculated by defining excess TC as the residual plots, relative to the predicted TC, when regressing TC on revenue. A summary of the statistical tests performed is presented in Table 11 below.

**Table 11: Summary of various statistical tests (TC)**

Test	Abnormal total shareholder return	Excess total compensation	Results
Correlation	Year-end	Basis for determining excess	Section
Pearson	Financial	Absolute vs. median per size group	6.1.2.1
Spearman	Financial	Absolute vs. median per size group	6.1.2.1
Pearson	Financial	Residual vs. predicted	6.1.2.2
Spearman	Financial	Residual vs. predicted	6.1.2.2

#### 3.2.2.2. Research question 7

*Does a positive relationship between SCC and future company performance (as measured by TSR) exist?*

In order to address research question 7, the following hypothesis was set:

*Hypothesis 5 (H<sub>5</sub>):* A positive relationship between excess short-term cash compensation (SCC) and abnormal future total shareholder return (TSR) exists.

In order to confirm hypothesis 5 a similar approach was followed to that which were carried out to confirm hypothesis 4, except abnormal future TSR for nine quarters were calculated for the top and bottom decile portfolios of excess short-term cash compensation (SCC). The relationship between pay and future performance was descriptively analysed, before being statistically tested.



Descriptive analysis of the relationship between excess total compensation and abnormal total shareholder return

Abnormal TSR was equally weighted and portfolios formed on calendar years. Since the square-root of pay weighting of abnormal TSR and forming portfolios at the start of financial year did not change the descriptive relationship between excess TC and abnormal TSR dramatically, as well as the latter alternative being extremely time consuming, these two alternatives were not re-performed for SCC. Median abnormal returns were however tested again for SCC since the graph narrowed slightly for two quarters when median abnormal TSR were calculated for TC (refer to 6.1.1.3). Furthermore, as a result of the small sample size, median returns remain important to eliminate the potential influence of extreme cases.

The relationship between residual SCC and equally weighted abnormal TSR was investigated through regression analysis in order to eliminate the effect of changes in size groupings on the ranking of excess SCC.

A summary of the various descriptive analyses performed, as well as the location of the findings, are presented in Table 12 below.

**Table 12: Summary of various descriptive analyses (SCC)**

Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.2.1.1
Median	Calendar	Absolute vs. median per size group	6.2.1.2
Equal	Calendar	Residual vs. predicted	6.2.1.3

Testing of the statistical significance of the relationship between excess total compensation and abnormal total shareholder return

In order to test the statistical significance of the relationship between excess- and residual SCC and abnormal TSR, the Pearson’s correlation coefficient and the Spearman’s rank correlation coefficient were calculated (refer to Table 13 below).

**Table 13: Summary of various statistical tests (SCC)**

Test	Abnormal total shareholder return	Excess total compensation	Results
Correlation	Year-end	Basis for determining excess	Section
Pearson	Financial	Absolute vs. median per size group	6.2.2.1
Spearman	Financial	Absolute vs. median per size group	6.2.2.1
Pearson	Financial	Residual vs. predicted	6.2.2.2
Spearman	Financial	Residual vs. predicted	6.2.2.2

3.2.2.3. Research question 8

*Does a positive relationship between LIC and future company performance (as measured by TSR) exist?*

In order to address research question 8 the following hypothesis was set:

*Hypothesis 6 (H<sub>6</sub>):* A positive relationship between excess long-term incentive compensation (LIC) and abnormal future total shareholder return (TSR) exists.

In order to confirm hypothesis 6 a similar approach was followed to that which were carried out to confirm hypothesis 5, except abnormal future TSR for nine quarters was calculated for the top and bottom decile portfolios of excess- and residual long-term incentive compensation (LIC). The relationship between excess (and residual) LIC and abnormal TSR was first analysed descriptively. The Pearson’s correlation coefficient and the Spearman’s rank correlation coefficient were then calculated between excess- and residual LIC and abnormal TSR to test the statistical significance of the relationship. A summary of the various descriptive analyses and statistical tests performed is presented in Panels A and B respectively of Table 14 on the next page.

**Table 14: Summary of various descriptive analyses and statistical tests (LIC)**

**Panel A: Descriptive analyses**

Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.3.1.1
Median	Calendar	Absolute vs. median per size group	6.3.1.2
Equal	Calendar	Residual vs. predicted	6.3.1.3

**Panel B: Statistical tests**

Test	Abnormal total shareholder return	Excess total compensation	Results
Correlation	Year-end	Basis for determining excess	Section
Pearson	Financial	Absolute vs. median per size group	6.3.2.1
Spearman	Financial	Absolute vs. median per size group	6.3.2.1
Pearson	Financial	Residual vs. predicted	6.3.2.2
Spearman	Financial	Residual vs. predicted	6.3.2.2

*3.2.2.4. Research question 9*

*How do the pay-performance relationships based on TC, SCC and LIC respectively, compare?*

In order to address research question 9 the results of research questions 6, 7 and 8 were compared to determine whether the companies in the top deciles of excess compensation consistently earn higher or lower abnormal TSR than the bottom deciles. The remaining deciles between the extremes were also analysed to compare the consistency of the relationships between the different components of compensation and the abnormal TSR. International studies have followed a similar approach where the remaining deciles were either examined individually (Cooper *et al.*, 2014) or cumulatively (Balafas & Florackis, 2014).

### 3.2.2.5. Research question 10

*Does an indication exist in the South African context that long-term incentives may represent an optimal component in the CEO compensation package?*

In order to address research question 10 the following hypothesis was set:

*Hypothesis 7 (H<sub>7</sub>):* The companies with CEOs in the top decile of the relative proportion of LIC to TC, earn higher equally weighted future abnormal TSR than the companies of the CEOs in the bottom decile, when forming portfolios at the start of the calendar year.

In order to confirm hypothesis 7 the proportion of long-term incentive compensation (LIC) to total compensation (TC) was calculated for all the companies. The sample was then sorted in order of the highest to the lowest proportion of LIC to TC.

The equally-weighted abnormal TSR for nine quarters, after forming portfolios at the start of the calendar year, was calculated for each company in the top and bottom deciles of relative LIC to TC nine quarters. The bottom decile will include all the companies that do not pay any LIC. Since companies that award LIC may differ from companies that do not pay any form of LIC, the relationship was recalculated by excluding the companies not paying any LIC from the sample in order to confirm the results, or investigate whether they changed.

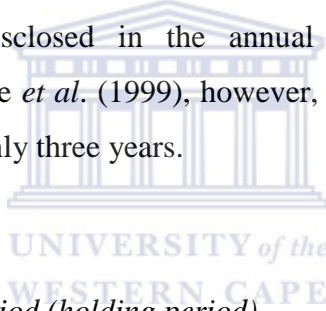
## CHAPTER 4: LIMITATIONS AND SCOPE

### 4.1.Limitations

#### 4.1.1. Limited time frame

##### *4.1.1.1.Compensation data limited to three years*

This study only covers a three year period. International studies generally include a longer period, with Cooper *et al.* (2014) covering 18 years. The expected value of long-term incentives (namely: share options and performance share grants) were obtained from PwC, since these are not disclosed in the annual financial statements. These values were only calculated by PwC for the three years from 2011 to 2013. In order to extend the period of the study the expected values of share options and performance share grants would have to be calculated using the detailed information disclosed in the annual financial statements, a time consuming exercise. Core *et al.* (1999), however, report a significant relationship for a sample including only three years.



##### *4.1.1.2.Future return period (holding period)*

One of the main aims of this study is to investigate the relationship between CEO compensation and future share returns. Since the value effect of a CEO's actions will only be seen after some time, company performance is defined as TSR using a buy-and-hold strategy. Cooper *et al.* (2014) measured abnormal TSR over one-year and three-year holding periods, while Core *et al.* (1999) included a five-year holding period as well. Due to the limited availability of long-term incentive compensation, the longest holding period possible was used, namely nine quarters. This is considered enough time to give a first glimpse into a possible relationship, since international studies report significant relationship for holding periods as short as one year (Cooper *et al.*, 2014; Core *et al.*, 1999).

#### **4.1.2. Top 100 JSE listed companies**

This study is limited to the largest 100 companies listed on the JSE and therefore only includes large- and medium capitalisation listed companies. Companies with a small market capitalisation are excluded due to the unavailability of the expected values of long-term incentives for these companies. Previous pay-performance sensitivity studies in South Africa were limited to a single industry (Shaw, 2011; Theku, 2014) or to only large capitalisation companies (Bradley, 2011), therefore, despite the limitation to the top 100 companies, this study contributes to the literature by extending the population size. Furthermore, the largest 100 companies represents 94% of the total JSE capitalisation as at 7 May 2015 (calculated using fundamentals data downloaded from the Sharenet database).

#### **4.1.3. Valuation of long-term incentives**

The assumptions used to calculate the Black-Scholes-Merton value of the share options and the expected value of the performance share grants were not tailored to each company. Due to time constraints and for the purpose of being consistent, blanket assumptions were used for each company for the input variables of the expected value of long-term incentives. The approach taken in this study to value long-term incentives is arguably still more accurate than the approach taken in the literature generally. Prior research has shown that various option-pricing methods produce highly correlated values and therefore should not affect the results of the pay-performance relationship (Carpenter & Sanders, 2004).

#### **4.1.4. Industry groupings**

The sample was classified into the four major industry groupings in order to test for the effect of benchmarking. A more detailed classification of companies into specific close industries may provide different results. There are however too few companies in the sample. Furthermore, some industries only have one close peer.

#### **4.1.5. Mean reversion**

Companies that are overvalued tend to underperform relative to companies that are undervalued. As a result of this tendency of share prices to revert back to the mean, it may therefore be necessary to control for mean reversion. Due to the small sample size and limited time frame of this study, it is not practical to divide the benchmark portfolio into smaller benchmark groups. Mean reversion could affect the returns of companies, which should be born in mind when interpreting the results.

### **4.2.Scope**

#### **4.2.1. Labour market theory**

The labour market theory postulates that the level of CEO compensation reflects the company's demand for talented managers, and thus it aligns the interests of the manager with the shareholders (Chalmers *et al.*, 2006). It could be assumed that more talented managers will perform better, hence a positive relationship between the level of CEO compensation and company performance may provide support for the labour market theory. An investigation of the labour market theory is outside the scope of this study.

#### **4.2.2. Managerial power theory**

The theory of managerial power suggests that executives have power over their boards to influence their own compensation and extract value in excess of that which they would receive under optimal contracting (Bebchuk *et al.*, 2002). Furthermore, it was found that the influence that CEOs have over the over the board of directors plays a role in the determination of incentives (Bebchuk & Fried, 2004). Consequently, an inverse relationship between the level (and proportion of LIC to TC) of CEO compensation and company performance may

be support for the theory of managerial power. Investigating this theory is outside the scope of this study.

#### **4.2.3. Other variables affecting compensation**

In order to control for the effect of benchmarking on the level of CEO compensation, excess compensation is used to investigate the relationship between CEO compensation and future share returns. There are however other factors (such as CEO age, CEO tenure, ownership structure, and the composition of the compensation committee) that may have an effect on the level and structure of CEO compensation (Daily, Johnson, Ellstrand & Dalton, 1998; David, Kochhar & Levitas, 1998). This study is limited to an investigation of the effect of the level and structure of CEO compensation on future share returns.

#### **4.2.4. Measures of company performance**

Accounting measures may induce managers to focus on short-term profitability at the cost of long-term value creation (Dechow & Sloan, 1991) and may be affected by factors that do not influence company performance (Wernerfelt & Montgomery, 1988). Consequently it is suggested that market related measures provide a better measure for shareholder value. This is confirmed by O'Neill and Job (1999) confirm that total shareholder return (TSR) – namely: capital growth and dividends – is the best indicator of company performance to provide ultimate shareholder returns. This study is limited to the relationship between the level and structure of CEO compensation and company performance, as measured by future TSR and does not investigate the relationship relative to accounting measures of company performance to compare the results.



#### **4.2.5. Benchmark portfolio creation**

Cooper *et al.* (2014), the most similar study to this, created benchmark portfolios by grouping the companies into 49 distinct industries. Each industry group was then broken down into two size groups based on December revenue figures. Since CEOs with the highest level of excess pay also typically experience strong current and past share performance, they used a lagged return matching approach to control for possible lower future returns due to mean reversion from the high returns associated with high pay. Due to the limited number of companies in the sample, the equally weighted return of the top 100 companies listed on the JSE was used as the benchmark.



## **CHAPTER 5: DESCRIPTION OF CEO COMPENSATION**

### **5.1.Introduction**

The first research objective of this study is to analyse and describe compensation levels and pay structures for the largest 100 companies listed on the Johannesburg Stock Exchange (JSE) for 2011 to 2013, a larger sample that covers a broader range of company sizes and industries than other studies.

This first research objective is addressed by the rest of this chapter, which is structured as follows: The level and structure of CEO compensation is described overall for the top 100 JSE listed companies, as well as by company size and industry groupings. Thereafter the relative significance of the short-term cash and long-term incentive components is considered.

### **5.2.Description of level and structure of CEO compensation**

This section describes the levels and structure of CEO compensation in addressing the first research question that was set.

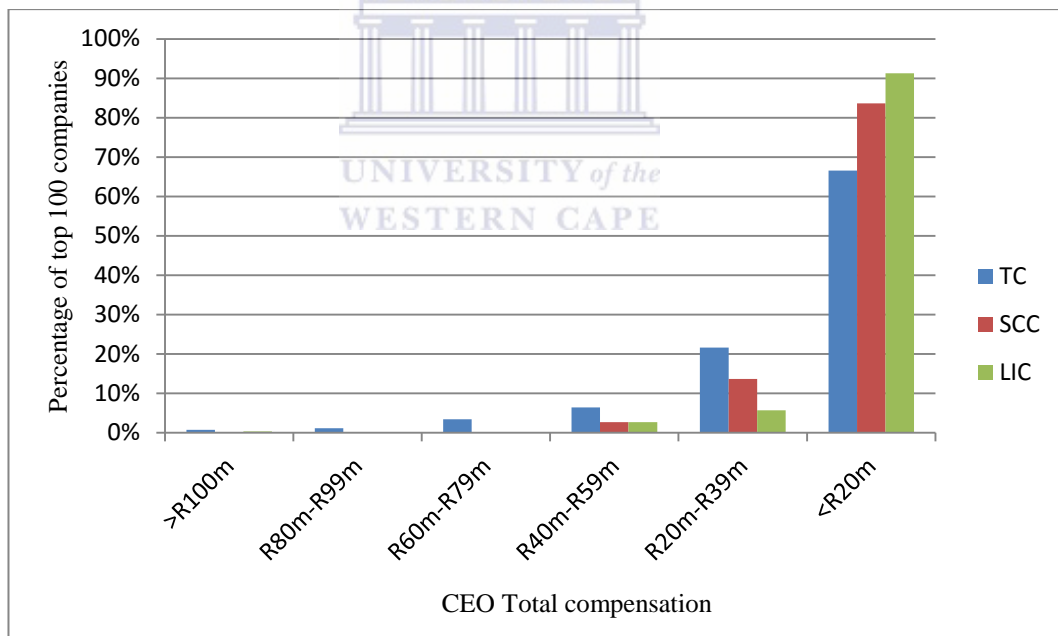
Research question 1: What are the maximum and average levels of, and variation in, CEO compensation, in total (TC) and per component (SCC and LIC), for the top 100 JSE listed companies overall, and how does this vary between companies of different size and in different industries?

The description of CEO compensation for the top 100 companies overall is presented in section 5.2.1 below, and the descriptions of CEO compensation for companies of different sizes, and in different industries are presented in sections 5.2.2 and 5.2.3 respectively.

### 5.2.1. Overall

The level of total CEO compensation (TC) varies greatly amongst the largest 100 companies, ranging from a maximum annual TC of R137 million to a minimum annual TC of R1.4 million being paid to CEOs across the three year period. This excludes one CEO who did not earn any compensation at all over the three year period. This range might support the impression that CEOs in South Africa earn excessive pay packages; however, the majority of CEOs' TC is skewed towards to bottom, as is evident from Figure 1. The mean total compensation for the period was R20.5 million per year and nearly two thirds of CEOs in the largest 100 listed companies in South Africa earned less than the mean total compensation. This is further highlighted by the median annual TC of R14.7 million being below the mean.

**Figure 1: Percentage of companies per CEO total compensation bracket**



The high level of variation in TC is reflected in the standard deviation of R18.9 million. Table 15 reports descriptive statistics on inflation adjusted levels of CEO compensation and its components (short-term cash compensation (SCC) and long-term incentive compensation (LIC)) for the pooled population over 2011 to 2013. The SCC component is broken down further into total guaranteed package and annual cash bonus.

**Table 15: Descriptive statistics on compensation components for the JSE Top 100 companies**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	7 824	4 912	12 737	7 757	20 494
Median	6 039	3 843	10 348	3 479	14 709
Std. dev. (P)	6 546	4 966	9 146	13 058	18 882
Std. dev. (S)	6 559	4 976	9 164	13 082	18 918
Maximum	50 001	27 230	52 842	130 454	136 713
Minimum	1 128	-	1 431	-	1 431
% of sum	38%	24%	62%	38%	100%
% at median			72%	28%	100%

The maximum cash compensation granted to any CEO during the three years from 2011 to 2013 was R53 million, whereas the maximum long-term incentive compensation was two and a half times higher at R130 million. Although maximum SCC was smaller than maximum LIC, the difference between the two is not as extreme as in the U.S., where the maximum LIC was nearly six times that of the maximum SCC (Cooper *et al.*, 2014). Similar to the U.S., the standard deviation in South Africa showed less variation in cash compensation than LIC, although the difference in variation between SCC and LIC is smaller locally. The standard deviation of cash compensation in SA is nearly 70% of that of incentive compensation, while the same relationship is only one fifth in the U.S. (Cooper *et al.*, 2014).

The median short-term cash compensation and long-term incentive compensation were R10.3 million and R3.5 million respectively, in contrast to \$1 million and \$1.4 million respectively in the U.S. (Cooper *et al.*, 2014). It is clear from the above results that in South Africa, cash compensation makes up a relatively larger portion of total pay than in the U.S. Out of the 263 observations (over the three year period 2011 to 2013), 70 pay packages (nearly 27%) did not include any long-term incentive compensation as part of overall compensation and 91% of CEOs earned LIC less than R20 million (refer Figure 1) suggesting a small proportion of CEOs earn a large portion of their wealth in the form of LIC.

### 5.2.2. Description by company size group

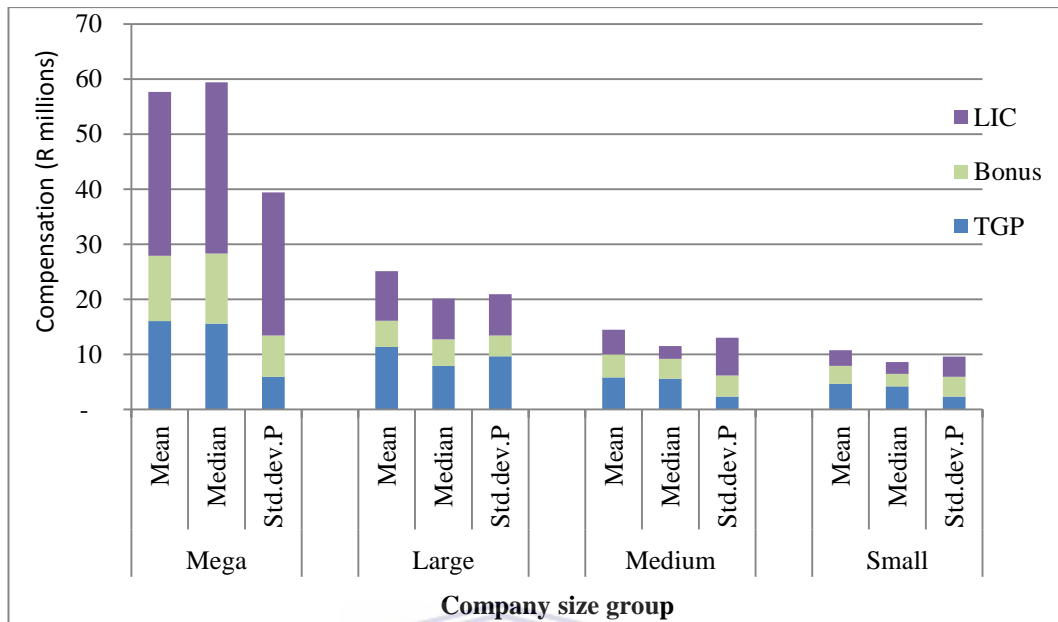
The previous section provided an overview of compensation levels and structures for the top 100 companies listed on the JSE overall. In order to address the second part of research question 1 (refer section 2.8), this section divides the top 100 companies into four distinct size groups, based on revenue, and analyses the compensation levels and structures for each size group.

Since it is common practice for companies to benchmark pay on size and/or industry (Bizjak *et al.*, 2008) and O'Reilly and Main (2010) found that CEO compensation is strongly related to company size as measured by revenue, research questions 2 and 3 are also addressed by testing two null hypotheses (*Hypothesis 1* and *Hypothesis 2*) to establish whether company size (based on revenue) and/or industry sector are determinants of CEO compensation levels.

Revenue of the top 100 companies ranges from R7 million to R583 billion. These companies were split into four groups on the basis of revenue and are referred to as “mega” (revenue more than R100 billion), “large” (revenue from R40 billion and R100 billion), “medium” (revenue from R10 billion to R40 billion) and “small” (revenue less than R10 billion).

The mean, median and standard deviation of the various components – short-term cash compensation (divided into total guaranteed pay (TGP) and cash bonus (CB)) and long-term incentive compensation (LIC) – of compensation per company size are presented in Figure 2. It is clear that the mean, median and standard deviation increase as the company size increases, supporting the sales maximisation hypothesis, as well as the argument that companies benchmark on size.

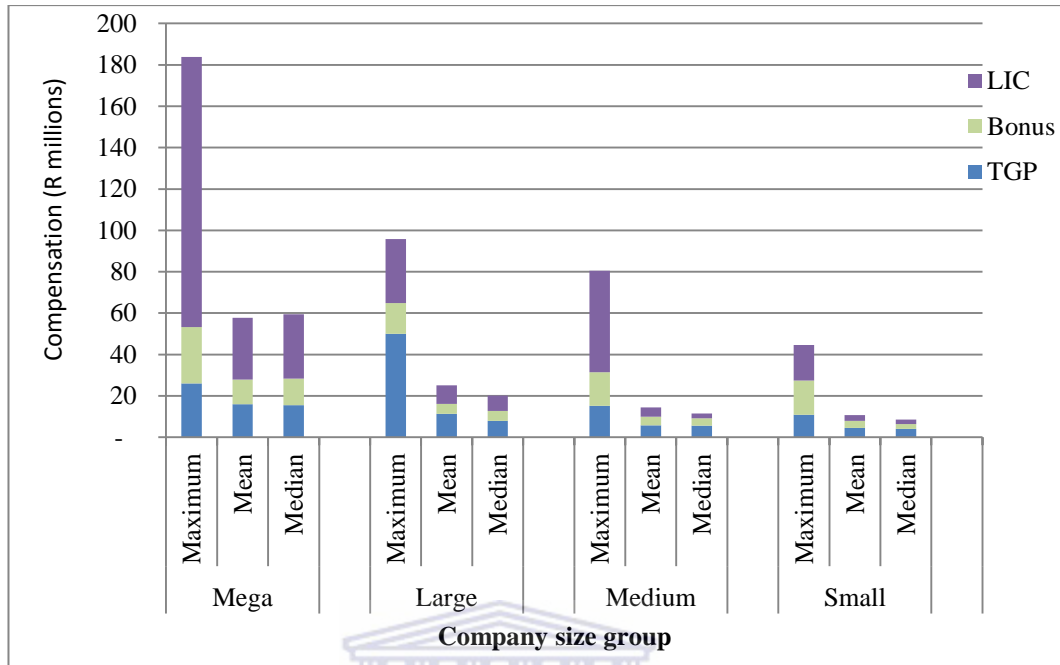
**Figure 2: Mean, median and standard deviation of the components of compensation per company size group**



The proportion of long-term incentive compensation is larger for bigger companies, but the mean long-term incentives are skewed towards to lower end of the scale as a result of 27% of the companies in the population not paying any form of long-term incentives.

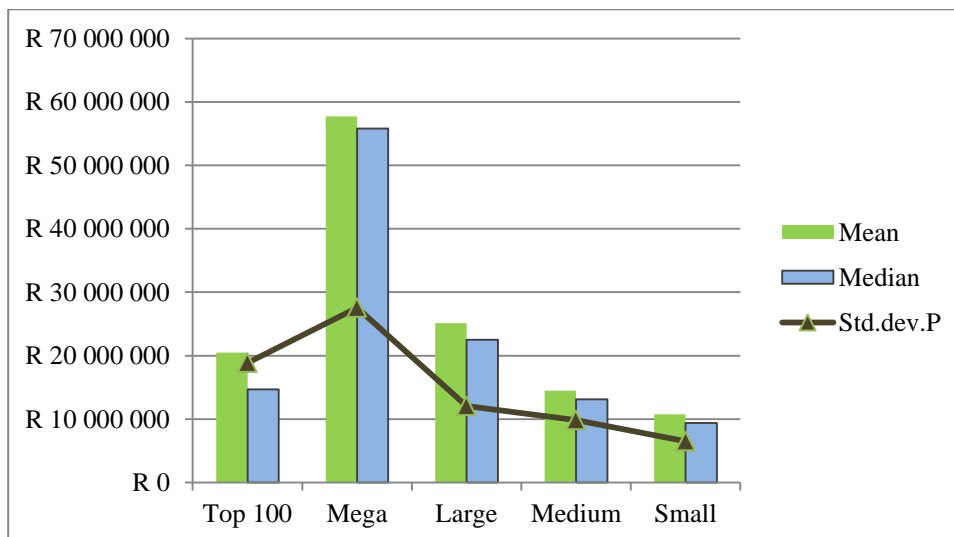
It is clear from Figure 2 above that the mean, median and standard deviation increase in line with an increase in the size grouping. A similar trend is shown for the maximum total compensation (refer Figure 3 on the next page). It is however interesting to note that the highest annual TGP of R50 million is reported in the “large” size grouping and not in the “mega” size grouping, where the highest annual TGP was R26 million, nearly half. Similarly, the absolute value of the highest annual LIC in the “medium” grouping (R49 million) is more than that reported in the next biggest group of “large” companies (R31 million). This is reflective of the extent of the variation in pay that exists.

**Figure 3: Maximum, mean and median of the components of compensation per company size group**



It is not only total compensation overall that is skewed toward the lower end of the scale, but within size groups as well. Figure 4 shows that the median total compensation is consistently lower than the mean total compensation when companies are divided into size groups. This skewness is as a result of a small number of very large total compensation packages.

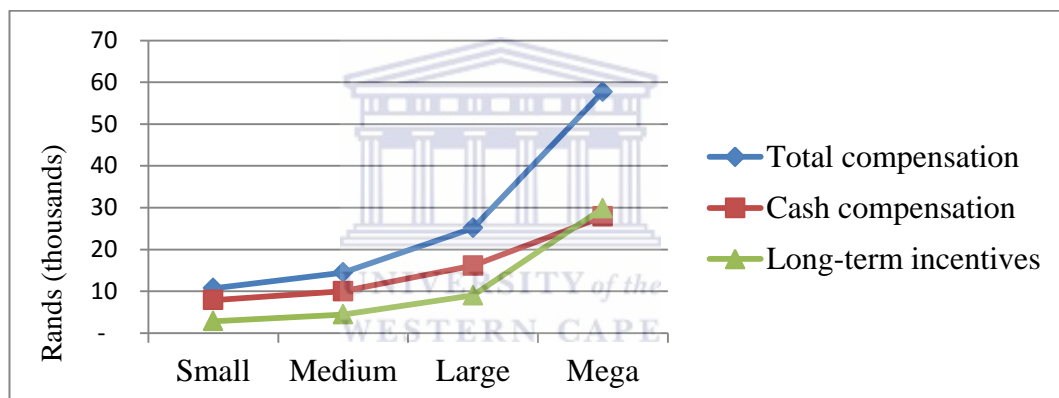
**Figure 4: Mean, median and standard deviation of total compensation per size group**



From Figure 4 it is clear that the standard deviations are lower than the means and the medians for each size grouping due to the close relationship between company size (in terms of revenue) and total CEO compensation levels. This provides further support for the sales maximisation hypothesis, as well as for benchmarking on company size.

Figure 5 clearly depicts the relationship between the mean of each component of compensation and the revenue of the company. Furthermore, LIC forms a significant part of total compensation, especially in larger companies, as is evident from the mean LIC of R29.8 million exceeding the mean SCC of R27.8 million for “mega” companies.

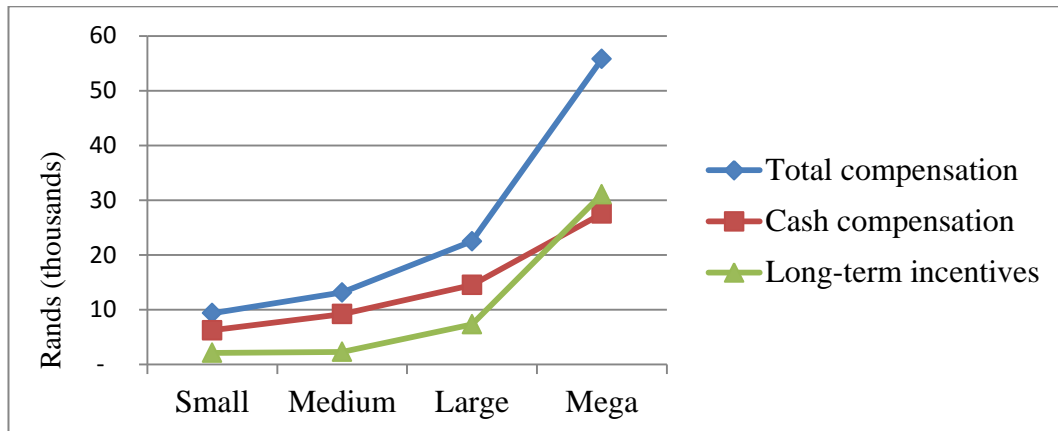
**Figure 5: Mean compensation per size group**



The relative importance of LIC for mega companies is even more pronounced when looking at the median compensation components. Figure 6 on the next page shows that “large” companies pay median LIC of close to 50% of median SCC, but very large (“mega”) companies pay median LIC in excess of median SCC (R31.3 million and R27.6 million respectively).



**Figure 6: Median compensation per size group**



The maximum, minimum, mean, median and standard deviation of each component of compensation for each of the four size groupings are presented in Tables 39 to 42 in APPENDIX B.

### 5.2.3. Description by industry

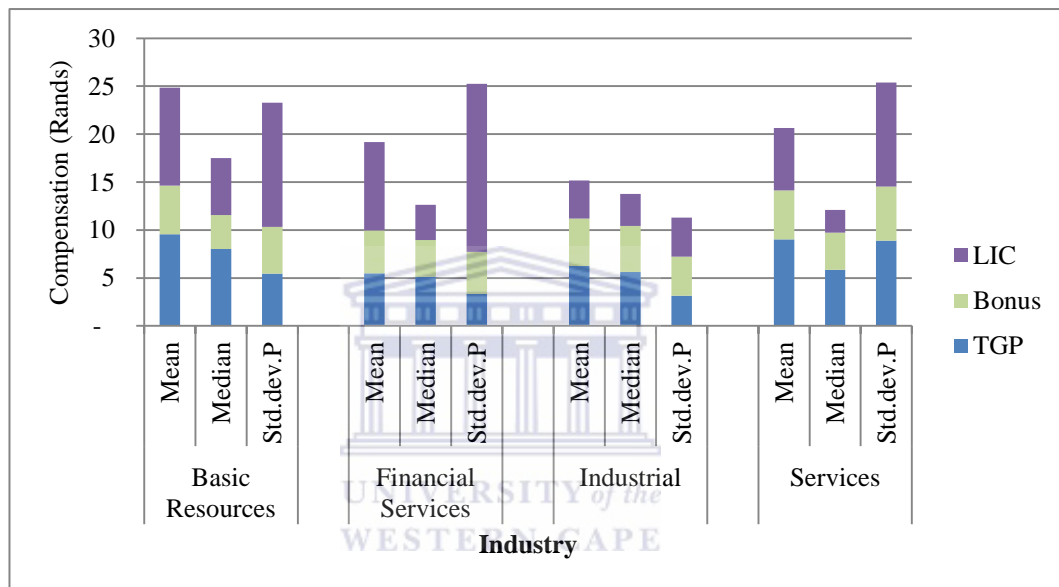
It is clear that CEOs of larger companies generally earn more than CEOs of smaller companies, but apart from size, there is an indication in the literature that companies also benchmark according to the industry within which the company trades (Albuquerque *et al.*, 2013; Bizjak *et al.*, 2008).

The companies in the sample population were grouped into four distinct industry classifications, being:

- i. Basic Resources (BR) which includes mining, steel, oil & gas, and paper companies;
- ii. Financial Services (FS) which is made up of banks, insurance companies, real estate and investment funds;
- iii. Industrials (I) which includes logistics, manufacturing, construction; and
- iv. Services (S) which is made up of all the companies that do not fall within the first three industries, including: retail, telecommunications, travel & leisure, healthcare, media and consumer goods.

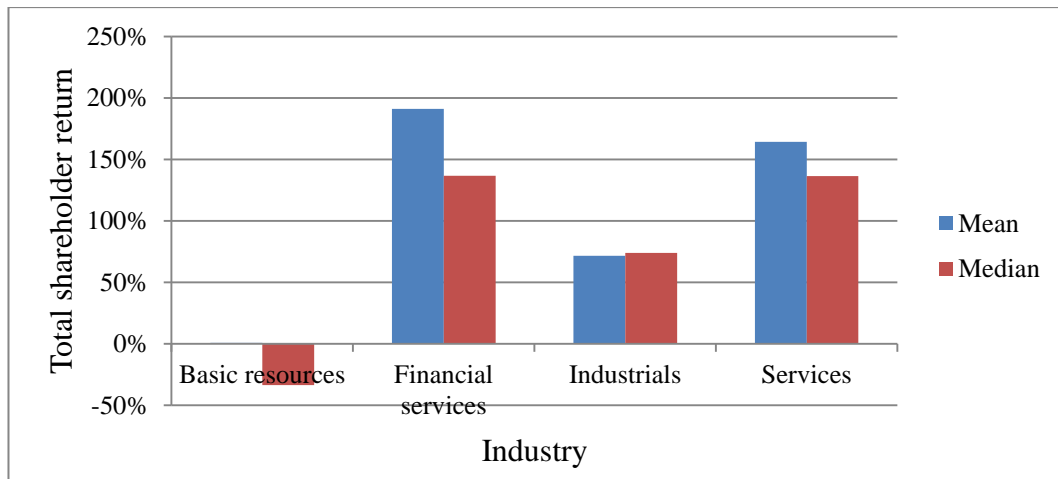
Figure 7 presents the mean, median and standard deviation of the various components – short-term cash compensation (total guaranteed pay (TGP) and cash bonus) and long-term incentives (LIC) – of compensation per industry. In contrast to the different size groups in section 5.2.2 the means, medians and standard deviations do not show a marked difference between industries, with a few exceptions and other matters of interest.

**Figure 7: Mean, median and standard deviation of the components of compensation per industry**



As a result of the end of the commodity boom and the resultant decline in the prices of basic resources, companies in the mining sector of the basic resources industry have severely underperformed companies in the other three main industry groupings. This is evident from Figure 8 on the next page that reports a nearly 0% mean return in the resources industry, with a median negative return of -34%.

**Figure 8: Total shareholder return per industry for the period January 2011 to April 2015**



#### Mean and median pay for basic resources

The mean and median compensation for basic resources companies stand out as being higher than the other industry groupings. The highest mean and median TGP (R9.6 million and R8 million respectively) are also reported in the BR industry, with the next highest mean and median TGP earned in the Services industry (R9 million and R5.9 million respectively). The high pay in basic resources companies may be reflection of the size of the companies rather than the industry, since the three biggest companies (in terms of revenue) in 2013 were included in the basic resources industry grouping.

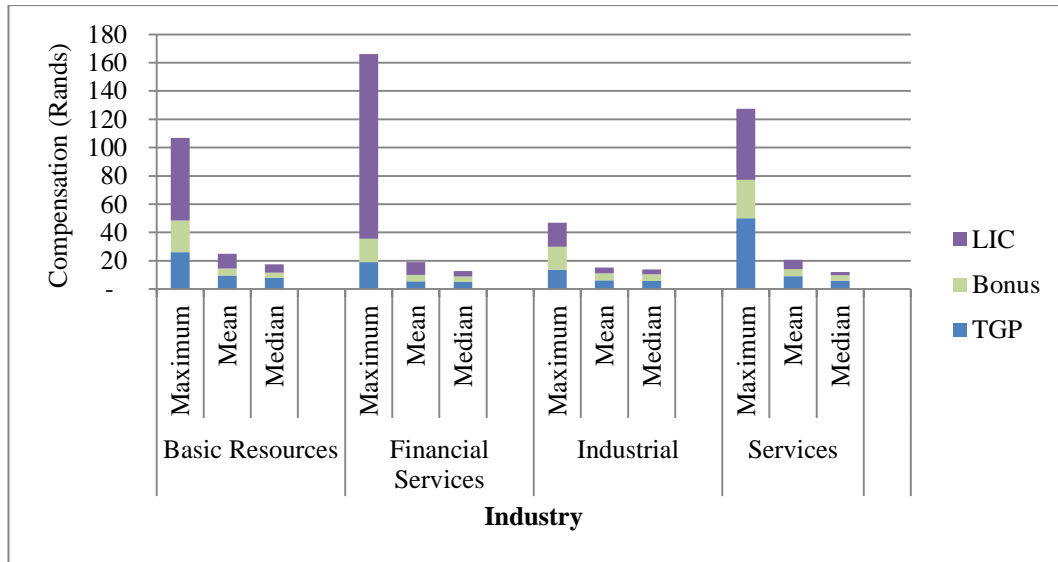
#### Returns of mining companies

The total shareholder returns of mining companies in the basic resources industry are mostly negative, despite paying relatively large pay packages. Descriptively, therefore, there seems to be no relationship between CEO pay and company performance in the basic resources industry.

#### Maximum

The maximum total compensation relative to the mean and median is presented in Figure 9 for each industry grouping. The CEO earning the highest annual LIC was in the financial services (valued at R130 million), while the highest annual TGP and CB were earned by a CEO from the services industry.

**Figure 9: Maximum, mean and median of the components of compensation per industry**



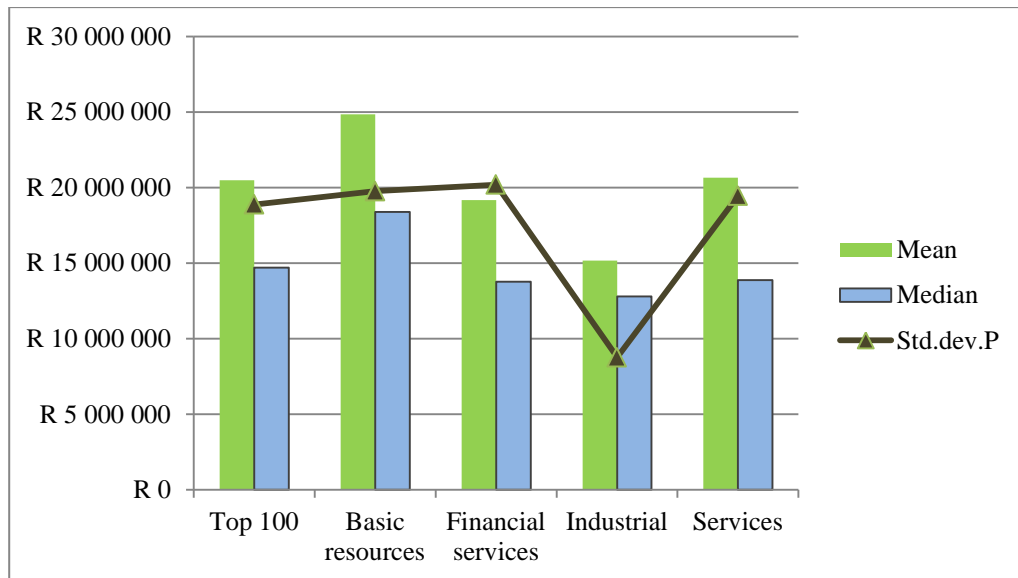
Skewness

Figure 9 above also highlights the skewness of pay components when reported by industry. The only industry with a maximum total compensation does not exceed 250% of the mean total compensation is in the industrial grouping.

Variation in compensation

The variation in total compensation is similar across industries (refer Figure 10 on the next page) except for industrials that shows a noticeably lower standard deviation. Even though each industry grouping contains a similar distribution in terms of company size, the companies in the industrial grouping are a much tighter group in terms of specific industry (mostly manufacturing). The services grouping, however, includes telecommunications, healthcare, retailers and technology; and the financial services grouping is made up of banks, insurance companies and real estate. Another reason for the lower standard deviation in the industrial grouping is the lower proportion of LIC, the component that is subject to more variation.

**Figure 10: Mean, median and standard deviation of total compensation per industry**



### Benchmarking

Visually the effect of size on benchmarking appears to be more pronounced than that of industry (refer Figure 4). It cannot, however, be concluded that benchmarking does not take place on the basis of industry, but if it does it is likely to be on the basis of a more detailed grouping (closer peers) than the four major industry groupings used in this study. Each of the four industry groupings contains a wide range of different companies. It is however not meaningful to analyse companies at a more detailed level, due to the limited number of companies in each specific industry (one only in some cases).

### Long-term incentive compensation (LIC)

Mean LICs are similar across industries, except for industrial where the mean is notably lower. It is only in the financial services industry where the mean LIC comes close to the mean SCC (R9.2 million and R10 million respectively). In all three the other industries, mean LIC is well below mean SCC (refer Figure 11 on the next page).

**Figure 11: Mean compensation per industry group**

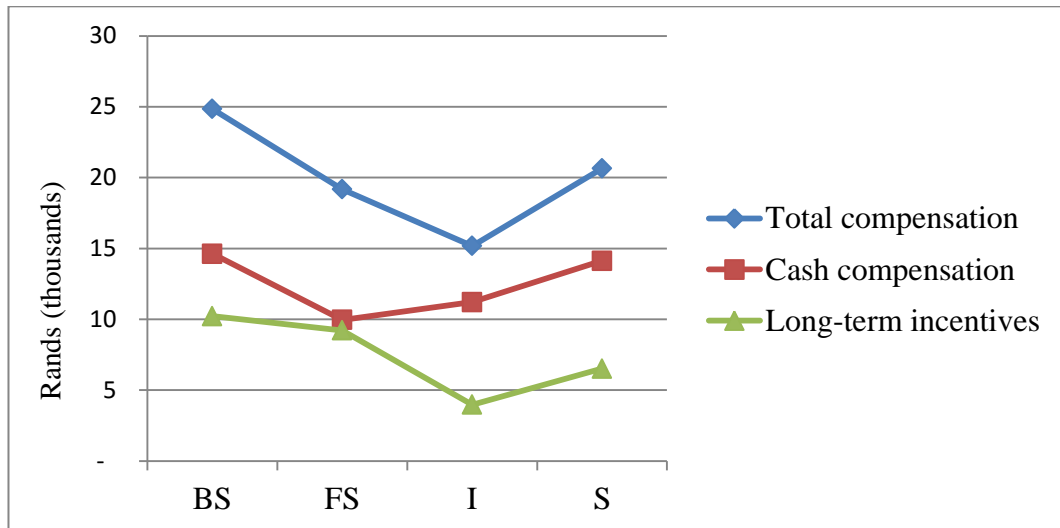
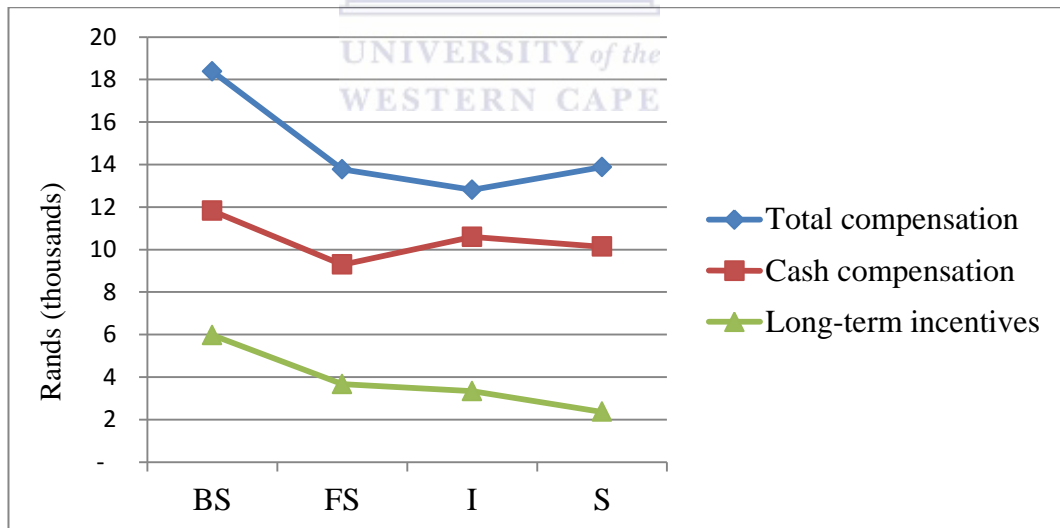


Figure 12 below, however, reports that median LIC is consistently significantly lower than SCC in all four industries, mainly as a result of all four industries containing companies that do not pay any form of LIC.

**Figure 12: Median compensation per industry group**



The maximum, minimum, mean, median and standard deviation of each component of compensation for each of the four industry groupings are presented in Tables 43 to 46 in APPENDIX C.

### **5.3. Significance of long-term incentives relative to total compensation**

From the mean and median total compensation per size group described in section 5.2.2 above it seems clear that there is a big difference in the level of total compensation between the different size groups. However, even though the total compensation levels and the structure of the compensation packages vary amongst industry groups, the pattern is not as clear as with the size groups.

This section statistically investigates whether CEO compensation is determined by company size and/or the industry in which the company operates in order to address research questions 2 and 3.

Research question 2: Is company size significant in explaining the level of total compensation?

Research question 3: Is the industry sector significant in explaining the level of total compensation?

A null hypothesis was set for each of these research questions. The hypothesis and the findings for research question 2 and 3 are presented in sections 5.3.1 and 5.3.2 respectively.

#### **5.3.1. Difference in total compensation between size groups**

The following null hypothesis was set in order to address research question 2:

*Hypothesis 1 ( $H_1$ ):* The distributions of the level of CEO total compensation of companies in four different size groups (based on revenue) are the same.

The results of a two-sample t-test show a statistically significant difference in pay between the four size-groups (at the 5% confidence level), as reported in Table 16 on the next page, and the null hypothesis is therefore rejected (refer Table 20 at the end of the chapter). This supports the findings of previous studies that found

that CEO compensation is strongly related to company size as measured by revenue (Bizjak *et al.*, 2008; O'Reilly & Main, 2010).

**Table 16: Size groups: Results of Two-sample t-test assuming unequal variances and Mann-Whitney U-Test**

Size groups	Two sample t-test			Mann-Whitney U-test		
	Mega ( <i>p</i> -value)	Large ( <i>p</i> -value)	Medium ( <i>p</i> -value)	Mega ( <i>p</i> -value)	Large ( <i>p</i> -value)	Medium ( <i>p</i> -value)
Large	0.009*			0.002*		
Medium	0.004*	0.034*		<0.001*	<0.001*	
Small	0.002*	<0.001*	0.016*	<0.001*	<0.001*	0.135

\* Significant at the 5% confidence level

The Mann-Whitney U-Test corroborates the results of the t-test.

### 5.3.2. Difference in total compensation between industry groups

The following null hypothesis was set in order to address research question 3:

*Hypothesis 2 (H<sub>2</sub>):* The distributions of the level of CEO total compensation of companies in four industry sectors are the same.

The results of a two-sample t-test (see Table 17) report no significant difference in pay between the four main industry groupings at the 5% confidence level. This is confirmed by the Mann-Whitney U-Test, and Null hypothesis 2 is therefore accepted (refer Table 20 at the end of the chapter).

**Table 17: Industry groups: Results of Two-sample t-test assuming unequal variances and Mann-Whitney U-test**

Industry	Two sample t-test			Mann-Whitney U-test		
	BR ( <i>p</i> -value)	FS ( <i>p</i> -value)	I ( <i>p</i> -value)	BR ( <i>p</i> -value)	FS ( <i>p</i> -value)	I ( <i>p</i> -value)
Fin. services (FS)	0.893			0.221		
Industrials (I)	0.055	0.201		0.141	0.348	
Services (S)	0.465	0.672	0.163	0.137	0.351	0.982

\* Significant at the 5% confidence level

It is calculated that size, and not the major industry in which the company operates, is significant in explaining the level of CEO total compensation. This



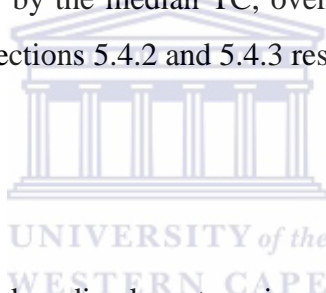
supports the findings reported in the literature (Gabaix & Landier, 2006; O'Reilly & Main, 2010) and (inadvertently) in five SA studies that used size-related accounting measures of company performance.

#### **5.4. Proportion of long-term incentive compensation**

This section considers the relative importance of LIC and SCC as expressed in research question 4.

Research question 4: What is the proportion of long-term incentive compensation (LIC) relative to total compensation (TC)?

This proportion is calculated by dividing the total LIC by the total TC, as well as dividing the median LIC by the median TC, overall (section 5.4.1) and for each size/industry grouping (sections 5.4.2 and 5.4.3 respectively)

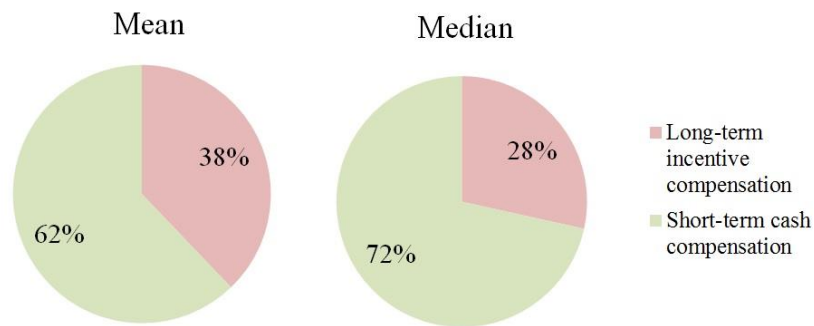


##### **5.4.1. Overall**

Even though the mean and median long-term incentive compensation (LIC) is less than that of short-term cash compensation (SCC) locally, the relative proportions of LIC to total compensation (TC) are not insignificant. The median LIC of R3.5 million is less than half of the mean (R7.8 million) due to 27% of companies not awarding any long-term incentives over the three year period 2011 to 2013.

When considering the pay of all the companies cumulatively, total compensation comprises of 62% SCC (salary, benefits and bonus) and 38% LIC. The total guaranteed package and cash bonus make up 38% and 24% of TC respectively. At the median level of all observations, 72% is SCC and 28% is LIC (refer to Figure 13 on the next page). Even though the relative proportion of LIC to TC in South Africa is smaller compared to the U.S., where Cooper *et al.* (2014) reported a 48/52 split between cash and incentive compensation respectively at the median level, the proportion of LIC to TC is large enough not to be ignored.

**Figure 13: Proportion of long-term incentive compensation and short-term cash compensation**

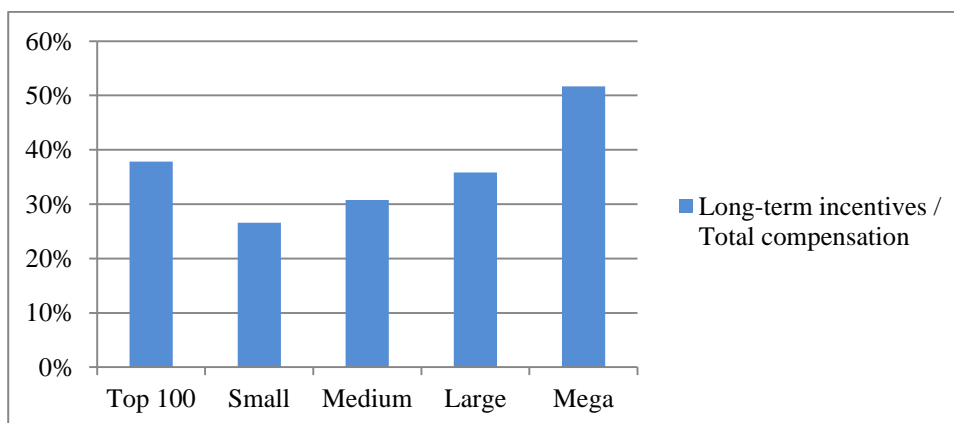


**5.4.2. Compensation structure per size group**

The median short-term cash compensation for small- and medium sized companies (R6.3 million and R9.2 million respectively) was three to four times as much as the median incentive compensation (R2.1 million and R2.3 million respectively), with large companies paying roughly twice as much cash compensation as incentive compensation (R14.5 million and R7.4 million respectively). Only the group of mega-sized companies reported higher median long-term incentive compensation (LIC) than short-term cash compensation (SCC) (R31.1 million and R27.6 million respectively).

Figure 14 clearly shows the relationship between company size and the proportion of long-term incentive compensation to total compensation.

**Figure 14: Proportion of long-term incentives to total compensation per size group**



A large proportion of the companies in the mega size group are dual listed multinational companies, thus reflecting the higher incentive component that was found by Cooper *et al.* (2014) in the U.S. Mega companies in total reported 48% cash compensation followed by large-, medium- and then small companies (64%, 69% and 73% respectively).

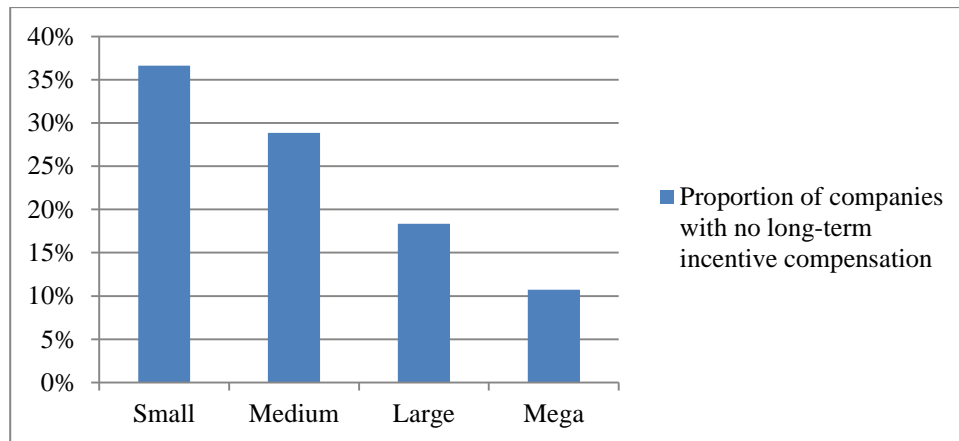
Out of the 71 companies in the small size group, 12 CEOs (17%) did not earn any cash bonus and 26 (37%) did not receive any long-term incentives as part of their compensation. Table 18 below presents the number and percentage of companies that did not pay incentives (cash bonus and long-term incentive compensation). It is noticeable that the number of companies not paying LIC increase with a decrease in company size.

**Table 18: Companies with no cash bonus or long-term incentive compensation per size group**

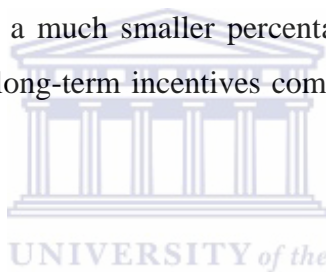
Company size grouping	N	No cash bonus		No long-term incentive compensation	
		Number of companies	Percentage of companies	Number of companies	Percentage of companies
Small	71	12	17%	26	37%
Medium	104	16	15%	30	29%
Large	60	14	23%	11	18%
Mega	28	5	18%	3	11%

Figure 15 on the next page clearly depicts how long-term incentives make up a smaller proportion of total compensation in smaller companies relative to larger companies.

**Figure 15: Proportion of companies with no long-term incentive compensation per size group**



It is interesting to note that a relatively larger percentage of CEOs in the large- and mega size-groups did not earn cash bonuses, than in the small- and medium size-groups. Conversely, a much smaller percentage of the CEOs in the former two groups received no long-term incentives compared to the CEOs of the latter two groups.



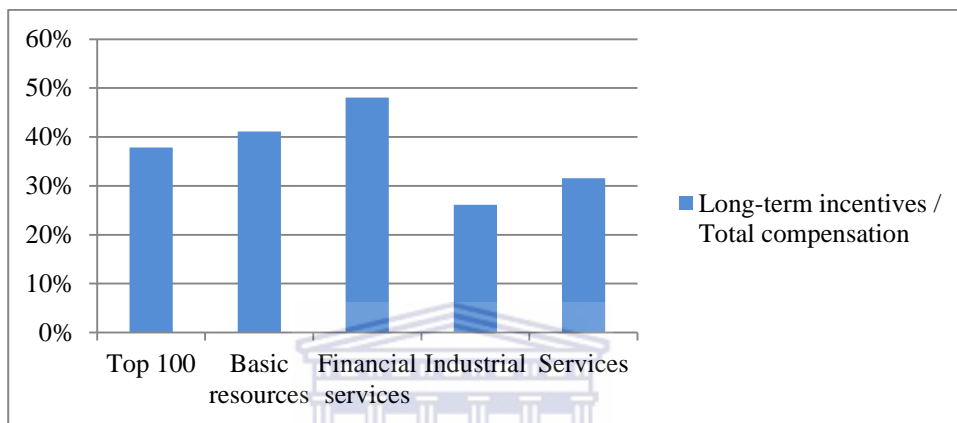
#### **5.4.3. Compensation structure by industry**

Proportions of incentive pay to total compensation vary greatly by industry (see Figure 16 on the next page), with a near equal split in the financial services industry (with 48% in the form of long-term incentive compensation) to 26% of total compensation in the industrial sector making up long-term incentives. Basic resources and other services (including retail, consumer goods, health care, telecommunications and media) also have reasonably low levels of long-term incentive compensation (41% and 32% respectively).

Shaw (2011), in a study investigating the pay-performance relationship in the financial services industry in SA, excluded LIC from CEO compensation on the basis of Adams and Mehran's (2003) findings that banking companies in the U.S. rely less on LIC in their CEO compensation packages. Shaw (2011), however, assumed this applies to companies other than banks (insurers and fund managers) in South Africa. These assumptions have not been investigated locally prior to this

study. It is interesting to note that the financial services industry grouping – which includes banks, insurers, fund managers and real estate – pays the highest proportion of long-term incentives to total compensation of any industry grouping, as well as the highest maximum annual long-term incentive compensation (R130 million – refer Figure 9 earlier).

**Figure 16: Proportion of long-term incentives to total compensation per industry group**



### 5.5. Correlation of components of compensation

This section determines the correlation between the different components of compensation in order to address research question 5.

Research question 5: Is LIC more closely correlated to TC than SCC?

In order to address research question 5 the following hypothesis was set:

*Hypothesis 3 (H<sub>3</sub>):* The correlation between LIC and TC is stronger than the correlation between SCC and TC.

The correlation is calculated between the different components of CEO compensation: Total compensation, short-term cash compensation (SCC), and long-term incentive compensation. The different components of SCC (total guaranteed package and cash bonuses) are also included.

The variation in total compensation is driven by both incentive and cash compensation, being positively correlated to all aspect of compensation (refer Table 19 below). It is interesting to note that short-term cash compensation comprises a larger proportion of total pay overall and at the median level. Despite this the long-term incentive compensation is more closely correlated to total pay than short-term cash compensation.

**Table 19: Correlations between components of raw compensation**

	<b>TC</b>	<b>SCC</b>	<b>LIC</b>	<b>TGP</b>	<b>CB</b>
Total compensation ( <b>TC</b> )	1.000				
Short-term cash compensation ( <b>SCC</b> )	0.781	1.000			
Long-term incentive compensation ( <b>LIC</b> )	0.899	0.429	1.000		
Total guarantee package ( <b>TGP</b> )	0.673	0.851	0.377	1.000	
Short-term cash bonus ( <b>CB</b> )	0.551	0.721	0.292	0.248	1.000

Consequently hypothesis 3 is accepted (see Table 20).

Even though both the correlation between total guaranteed package (TGP) and short-term cash compensation (SCC), and the correlation between short-term cash bonuses (CB) and SCC seem to suggest a close relationship (85% and 72% respectively), TGP seems to play a more significant role in driving SCC. This is supported by the overall median and maximum TGP (R6 million and R50 million respectively) compared to the overall median and maximum CB (R3.8 million and R27 million respectively).

Our findings suggest relatively close relationships between both short-term cash compensation (SCC) and total compensation (TC), as well as long-term incentive compensation (LIC) and TC. Furthermore, there is a close relationship between total short-term cash compensation, and both total guaranteed pay (salaries and benefits) and bonuses. This is inconsistent with results from the U.S. where total incentive pay showed a near perfect correlation of 98.6% with total pay, but total cash pay only explaining 37.7% of total pay (Cooper *et al.*, 2014). As for the components of cash pay, a U.S. study reported a 98.5% correlation between

bonuses and total cash pay, but only 49.8% between salary and total cash compensation.

It appears as if cash compensation plays a relatively more important role in determining total pay in South Africa than the U.S., as does the guaranteed cash portion of the total cash pay. The strong correlation between SCC and TC (78.1%) may suggest that using short-term cash compensation as a proxy for total compensation (as most prior SA studies have done) is not entirely inappropriate.

### 5.6. Conclusion to research objective 1

In this chapter the maximum and average levels of, and variation in, CEO compensation, in total (TC) and per component (SCC and LIC), for the top 100 JSE listed companies overall were described. The variation between companies of different size and in different industries was also described (Research question 1). A two-sample t-test assuming unequal variances confirmed that company size is significant in explaining the level of total compensation, whereas the major company industry is not (Research questions 2 and 3). The proportion of long-term incentive compensation (LIC) relative to total compensation (TC) was established (Research question 4), as well as whether LIC is more closely correlated to TC than SCC (Research question 5).

The results of the hypotheses tested in order to address research objective 1 is summarised in Table 20 below.

**Table 20: Results of Chapter 5: Description of CEO compensation**

No.	Hypothesis	Result
H <sub>1</sub>	The distributions of the level of CEO total compensation of companies in four different size groups (based on revenue) are the same.	Reject
H <sub>2</sub>	The distributions of the level of CEO total compensation of companies in four industry sectors are the same.	Accept
H <sub>3</sub>	The correlation between LIC and TC is stronger than the correlation between SCC and TC.	Accept

## **CHAPTER 6: ANALYSIS OF THE RELATIONSHIP BETWEEN PAY AND FUTURE PERFORMANCE**

Prior international studies on the relationship between CEO pay and future company performance report negative abnormal returns for the highest paid executives (Balafas & Florackis, 2014; Cooper *et al.*, 2014; Core *et al.*, 1999). The results suggest that managerial compensation components such as long-term incentives – meant to align the interests of management with shareholder value – do not necessarily translate into higher future shareholder returns.

This chapter reports on this relationship in South Africa in addressing the second research objective of this study, to investigate and analyse the relationship between the level and structure of CEO compensation and the future total shareholder returns in South Africa. This relationship is based on excess compensation, which is loosely described as the difference between the total and average CEO compensation. Since a close relationship between pay and company size is found to exist in South Africa (refer section 5.3.1), excess compensation was more specifically defined as the excess of total compensation over the median compensation per peer group based on size as determined in Chapter 5.

This chapter is structured as follows. Firstly the relationship between excess CEO compensation levels (in total and by component) and future TSR is analysed. Thereafter the relationship between CEO compensation structure and future TSR is investigated.

### **6.1.The relationship between total compensation (TC) and future total shareholder return (TSR)**

This section analyses the relationship between TC and future company performance in addressing the sixth research question that was set.

Research question 6: Does a positive relationship between TC and future company performance (as measured by TSR) exist?



In order to address research question 6 the following hypothesis was set:

*Hypothesis 4 (H<sub>4</sub>):* A positive relationship between excess total compensation (TC) and abnormal future total shareholder return (TSR) exists.

In order to investigate hypothesis 4 the relationship was first analysed descriptively in order to establish the apparent relationship between excess TC and abnormal TSR using different methods. This relationship was then tested statistically in order to confirm or reject the hypothesis.

#### **6.1.1. Descriptive analysis**

The relationship between excess TC and abnormal TSR are investigated in different ways in order to establish whether the methodology followed has an effect on the direction of the relationship. First the abnormal returns of the top and bottom deciles are weighted equally, and secondly weighted on the basis of the square-root of pay. Thirdly, the median abnormal returns are investigated in order to eliminate the effect of outliers. For simplicity, all portfolios are formed on calendar years. One test is, however, repeated forming the portfolios on financial years in order to investigate whether the relationship is affected by the portfolio formation date. Finally, portfolios are formed by ranking companies according to residual pay, as opposed to excess pay over the median of the peer group, to investigate whether the results are affected by the company size peer groupings.

The various descriptive analyses are presented in sections 6.1.1.1 to 6.1.1.5 as detailed in Table 21 on the next page.

**Table 21: Summary of various descriptive analyses (TC)**

Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.1.1.1
Square-root of pay	Calendar	Absolute vs. median per size group	6.1.1.2
Median	Calendar	Absolute vs. median per size group	6.1.1.3
Equal	Financial	Absolute vs. median per size group	6.1.1.4
Equal	Calendar	Residual vs. predicted	6.1.1.5

*6.1.1.1. Weighting of abnormal TSR: Equal*

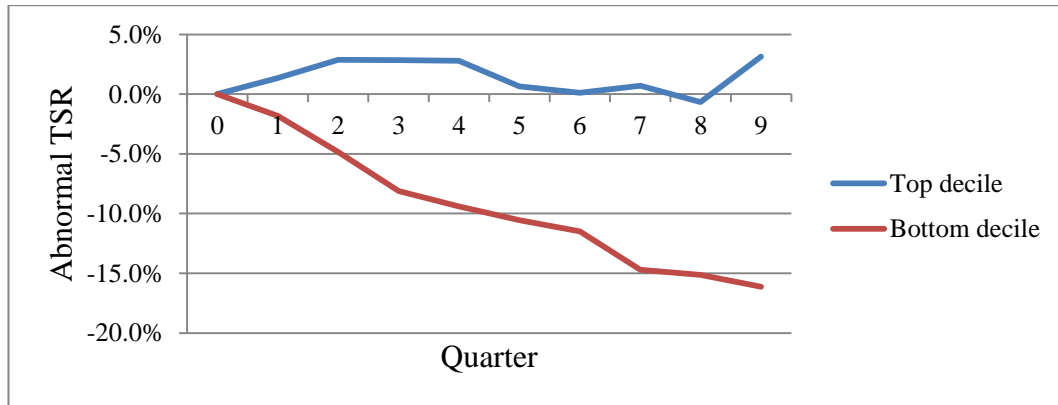
In order to investigate this relationship companies were first ranked on the basis of excess total compensation (as defined by total compensation less median total compensation per peer group based on company size, as described in the previous chapter), and divided into deciles. Abnormal TSR was calculated from the start of the calendar year to which the excess CEO compensation related, defined as the excess TSR over the equally weighted (EW) TSR of the top 100 JSE listed companies.

The abnormal TSR of the top and bottom deciles were calculated on the basis of equal weightings of abnormal TSR for each company. In the year after the companies are classified into the highest and lowest excess compensation deciles respectively (column titled “Quarter (+4)”), companies in the highest total compensation decile earn positive abnormal return of 2.8%. In contrast, the companies in the lowest compensation decile earn negative abnormal returns of -9.4%. The performance worsens more significantly over time for the lowest decile, while the abnormal returns in the highest decile remain positive but reduce. In the nine quarters after the classification period, companies in the high compensation decile earn positive abnormal returns of 3.2%, while the companies in the lowest compensation decile earn negative abnormal return of -16.1%.

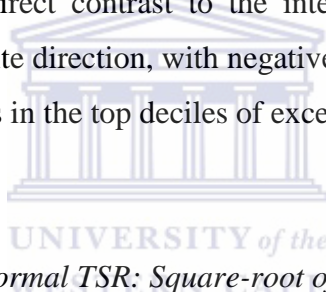
Figure 17 reflects the cumulative quarterly abnormal TSR earned by the top and bottom decile of excess CEO compensation. The graph shows a widening gap between the abnormal TSR of the top and bottom deciles, with a small positive

cumulative abnormal return for the top decile and increasingly negative abnormal TSR for the bottom decile.

**Figure 17: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of excess total compensation**



This description is in direct contrast to the international studies that report a relationship in the opposite direction, with negative abnormal returns being earned by companies with CEOs in the top deciles of excess compensation.

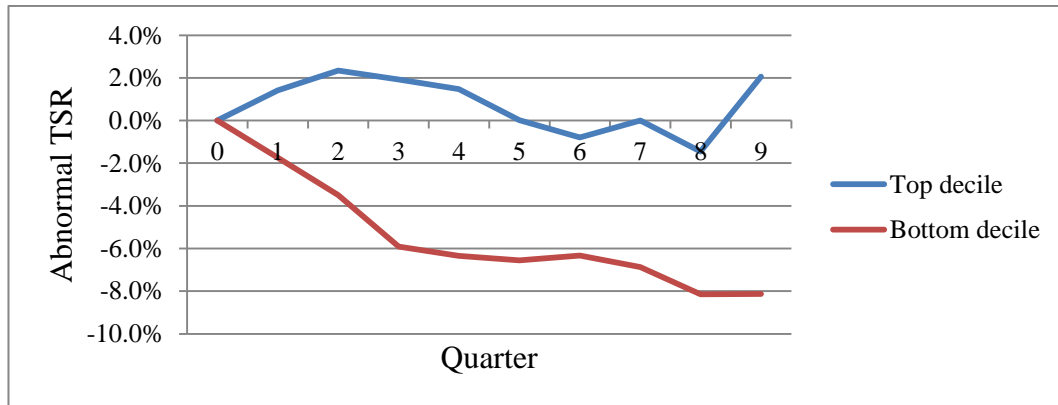


#### 6.1.1.2. Weighting of abnormal TSR: Square-root of pay

In order to test whether the relationship is augmented by the absolute level of total compensation, abnormal TSR was recalculated weighting the returns using the square root of pay. This places more emphasis on proportionately higher CEO pay packages.

Even though the square-root of pay (SRoP)-weighted abnormal portfolio returns are less pronounced, the relationship remains positive (see Figure 18 on the next page).

**Figure 18: Square-root of pay weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of excess total compensation**



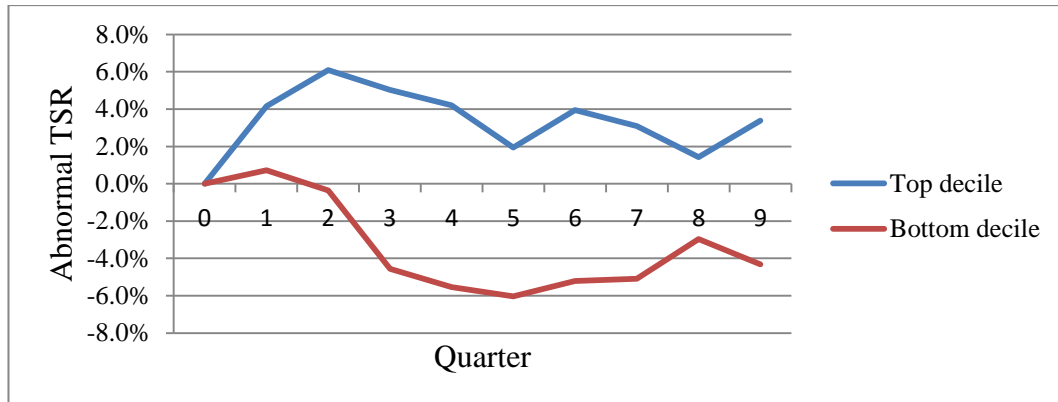
The less pronounced returns suggest that the incentivisation effect is weaker for the CEOs earning the highest excess compensation (refer Table 22). This is in contrast to Cooper *et al.* (2014) who found stronger results using this alternative weighting method.



#### 6.1.1.3. Weighting of abnormal TSR: Median of the

In order to test whether the results were driven by outliers the relationship was also investigated on the basis of median abnormal returns. Median abnormal returns for the highest compensation decile were found to be 4.2% and 3.4% for the first four and nine quarters respectively, and companies in the lowest compensation decile earn -5.5% (first year) and -4.3% (first nine quarters), therefor resulting in a similar pattern than the average returns (refer Figure 19 on the next page).

**Figure 19: Median abnormal returns earned by companies with CEOs in the top and bottom deciles of excess total compensation**



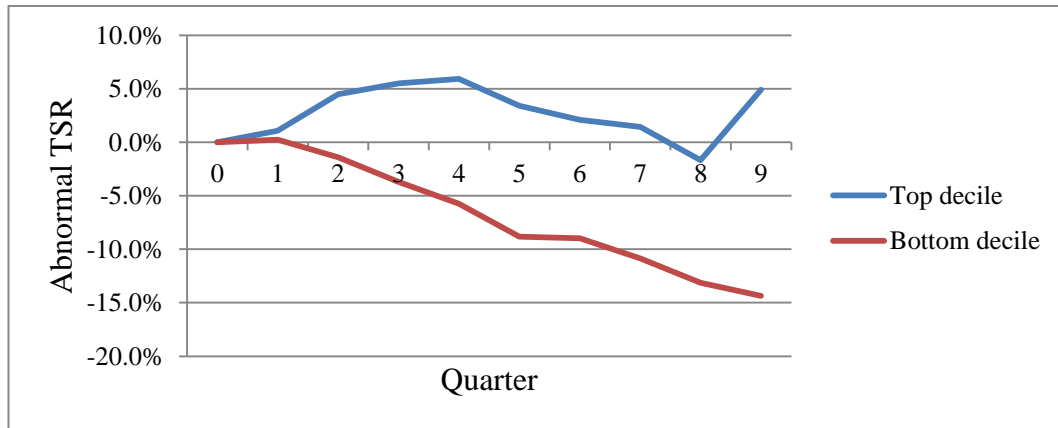
The results are not driven by outliers, consistent with Cooper et al (2014), even though outliers may augment the extent of the abnormal returns.

#### 6.1.1.4. Year-end: Financial

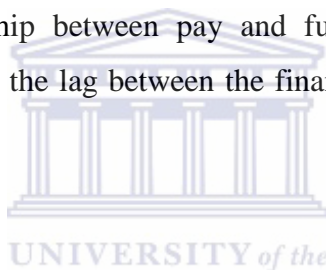
In order to investigate whether forming portfolios at the start of the calendar, rather than the companies' specific financial years, has an effect on the relationship between excess pay and future company performance, the portfolios were formed at the start of the financial year of each company and the abnormal returns for each quarter calculated relative to the benchmark for the same time period for each company. The use of financial years instead of calendar years better matches the return periods with the compensation periods and is therefore more accurate.

The top decile remain associated with positive abnormal returns and the bottom decile remain associated with negative abnormal returns (refer Figure 20 on the next page). The highest compensation decile companies earn an EW abnormal return 5.9% in the first year, slightly contracting to 4.9% for the full nine quarters. Similar to Cooper *et al.* (2014) the direction of the relationship between TC and abnormal future TSR does not change when forming on dates other than calendar year ends.

**Figure 20: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of excess total compensation (portfolios formed on financial year-end)**



The companies in the lowest decile, however, report negative abnormal returns of -5.7% with performance worsening over time to -14.4% after nine quarters. The pattern of the relationship between pay and future company performance is therefore not affected by the lag between the financial year end and the calendar year end.

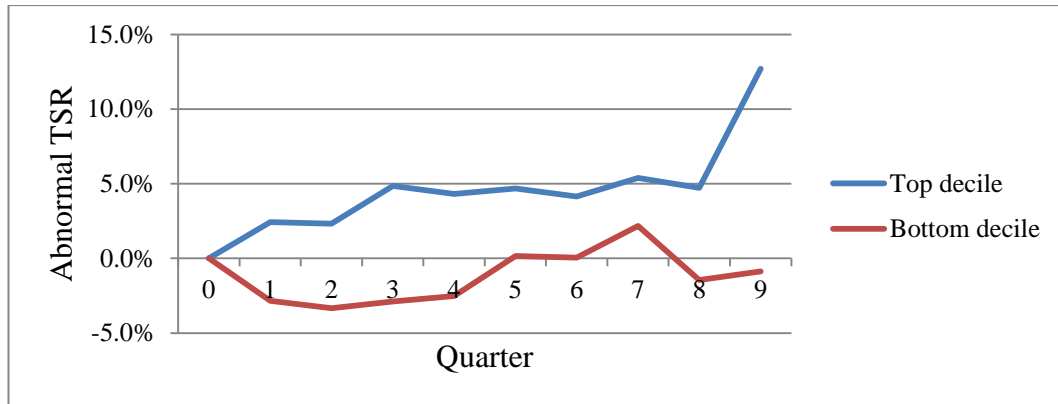


#### *6.1.1.5. Basis for determining excess pay: Residual*

In order to test whether the relationship between TC and future performance is generally unaffected by the methodology used, the company peer size groupings were disregarded and the companies ranked according to residual TC to form decile portfolios.

The top decile remains associated with positive and increasing abnormal returns, while the bottom decile initially showed negative abnormal returns for one year, which diminished over time (refer Figure 21 on the next page). The highest compensation decile companies earn an EW abnormal return of 4.3% in the first year, increasing to 12.7% for the full nine quarters. The EW abnormal return of the bottom decile is -2.5% after one year, but end up only slightly negative after the full nine quarters (-0.9%).

**Figure 21: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of residual total compensation**



Even though the companies in the top decile outperform the companies in the bottom decile, both deciles' abnormal return lines have moved upwards. This shift in returns is explained by the movement of companies between deciles when ranking companies differently to form portfolios. The largest mega-sized company for instance, moved from the top decile to the bottom when sorting on excess- and residual TC respectively, thus indicating that the methodology may have the potential to affect the results, especially where a weak relationship is found. The statistical analysis will show whether the apparent change is significant or not.

*6.1.1.6. Conclusion to descriptive analysis*

Panels A and B of Table 22 report cumulative abnormal returns for one year (Quarter +4) and two years and one quarter (Quarter +9) after the portfolio formation date for the companies with CEOs in the top and bottom deciles of excess total compensation.

**Table 22: Abnormal return calculated against Top100 JSE Listed companies****Panel A: Highest excess compensation decile (Total Compensation)**

<b>Return weighting</b>	<b>Compensation</b>	<b>Portfolio formation</b>	<b>N</b>	<b>Quarter (+4)</b>	<b>Quarter (+9)</b>
Equal	Excess	Calendar year	26	2.8%	3.2%
Square-root of pay	Excess	Calendar year	26	1.5%	2.1%
Median	Excess	Calendar year	26	4.2%	3.4%
Equal	Excess	Financial year	26	5.9%	4.9%
Equal	Residual	Calendar year	26	4.3%	12.7%

**Panel B: Lowest excess compensation decile (Total Compensation)**

<b>Return weighting</b>	<b>Compensation</b>	<b>Portfolio formation</b>	<b>N</b>	<b>Quarter (+4)</b>	<b>Quarter (+9)</b>
Equal	Excess	Calendar year	27	-9.4%	-16.1%
Square-root of pay	Excess	Calendar year	27	-6.3%	-8.1%
Median	Excess	Calendar year	27	-5.5%	-4.3%
Equal	Excess	Financial year	27	-5.7%	-14.4%
Equal	Residual	Calendar year	27	-2.5%	-0.9%

The companies with the highest paid CEOs (in terms of excess total compensation) consistently outperform the lowest paid CEOs regardless of whether equally-weighted or square-root of pay weighted average abnormal returns are used. Forming the portfolios at the start of the calendar- or financial year returns similar results. Median abnormal returns show less pronounced abnormal returns (a narrower gap between the top and bottom deciles of excess TC), but the direction of the results remain the same. A similar relationship is reported when sorting companies on residual TC in order to form portfolios, even though the abnormal returns are more positive at both extremes.

Additional deciles tested

Since the results reported on above are based on only top and bottom deciles, the extremes of excess total compensation, and contrast against the international literature, the relationship between excess pay and abnormal future TSR was also



tested for the remaining deciles to investigate whether the relationship remained constant for the remaining deciles. The portfolios were formed at the start of each calendar year and the abnormal returns were equally-weighted.

The positive relationship between higher excess TC and future abnormal TSR was found to persist for the top half of the deciles, but weakened after the top three deciles. Table 23 below reports cumulative abnormal returns for one year (Quarter +4) and two years and one quarter (Quarter +9) after portfolio formation date for the companies in the top and bottom deciles of excess total compensation, as well as the top and bottom two, three, four and five deciles respectively. All extended portfolios in the bottom half consistently reported negative abnormal TSR.

**Table 23: Abnormal total shareholder return (TSR) cumulative decile trends (Portfolios sorted on excess total compensation)**

Portfolio	Equally weighted abnormal TSR		Median abnormal TSR	
	Q(+4)	Q(+9)	Q(+4)	Q(+9)
Top 10%	2.8%	3.2%	4.2%	3.4%
Top 20%	3.6%	10.4%	3.1%	14.1%
Top 30%	4.2%	8.3%	4.6%	12.7%
Top 40%	-0.2%	0.7%	2.2%	6.2%
Top 50%	0.5%	1.0%	1.6%	4.7%
Bottom 50%	-2.8%	-7.3%	-3.7%	-10.1%
Bottom 40%	-3.0%	-6.0%	-1.2%	-3.5%
Bottom 30%	-2.3%	-5.9%	1.0%	-2.3%
Bottom 20%	-5.9%	-11.0%	-2.8%	-3.8%
Bottom 10%	-9.4%	-16.1%	-5.5%	-4.3%

If a positive relationship exists between excess TC and abnormal TSR, a trend – from highest to lowest abnormal TSR – would be expected if the deciles are ranked in terms of excess TC. Certain deciles, however, stand out as starkly inconsistent suggesting that the relationship is not linear. The second and third deciles outperform the top deciles regardless of how the relationship is tested.

This may be a limited reflection of the overconfidence phenomenon reported by Cooper *et al.* (2014). The declining positive abnormal returns fall sharply when the fourth decile is included in the cumulative abnormal returns (from 4.2% to -0.2%) and recovers somewhat when added the fifth decile, before sharply declining again in decile six. A detailed review of the data shows a high concentration of extremely poor performing mining companies in decile four and six.

Even though the positive relationship between excess TC and future abnormal TSR weakens closer to the average, overall the companies paying in the top half of excess TC seem to outperform those in the bottom half. This is in contrast to Cooper *et al.* (2014) who found a non-linear relationship with no relation in the bottom deciles, and a negative relationship in the top three deciles of excess pay.



### **6.1.2. Statistical analysis**

In order to test the statistical significance of the relationship that appears to exist in the descriptive analysis in the previous section, the correlation between excess TC and abnormal TSR, as well as the correlation between residual TC and abnormal TSR, is calculated.

#### *6.1.2.1. Correlation between excess total compensation and abnormal total shareholder return*

The Pearson's correlation coefficient and the Spearman's rank correlation coefficient are reported in Table 24, with statistically significant correlations (at the 5% confidence level) depicted in bold in the highlighted cells.

**Table 24: Pearson's correlation coefficient and Spearman's rank correlation coefficient for excess TC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	R	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
Q1	-0.00	0.99	0.04	0.72	-0.05	0.64	0.03	0.81	<b>0.26</b>	<b>0.01</b>	0.19	0.08
Q2	0.02	0.83	0.07	0.53	-0.06	0.55	-0.03	0.78	<b>0.27</b>	<b>&lt;0.01</b>	0.21	0.05
Q3	0.06	0.62	0.16	0.17	-0.02	0.86	0.06	0.55	<b>0.28</b>	<b>&lt;0.01</b>	0.16	0.12
Q4	0.09	0.44	0.13	0.24	-0.00	0.98	0.12	0.26	<b>0.25</b>	<b>0.02</b>	0.12	0.24
Q5	0.11	0.32	0.16	0.15	0.04	0.71	0.13	0.20	<b>0.24</b>	<b>0.02</b>	0.16	0.13
Q6	0.10	0.41	0.10	0.41	0.06	0.54	0.15	0.15	0.21	0.05	0.13	0.20
Q7	0.12	0.31	0.15	0.18	0.09	0.41	0.17	0.12	0.19	0.07	0.12	0.25
Q8	0.13	0.25	0.19	0.11	0.06	0.57	0.12	0.25	0.15	0.15	0.10	0.34
Q9	0.16	0.16	0.20	0.08	0.09	0.40	0.15	0.15	0.15	0.16	0.09	0.38

The Pearson's correlation coefficient for normally distributed samples reports a statistically significant, though weak, positive correlation between excess TC and abnormal. No correlation is reported in 2011 and 2012 using this test. As a result of the large variation in compensation and returns in the sample, the Spearman's rank correlation coefficient was also calculated for robustness against outliers. No correlation between excess TC and abnormal TSR is reporting using this alternative test. The inconsistent results the different years, as well as between the two tests, indicate that any positive relationship between excess TC and abnormal TSR is very weak.

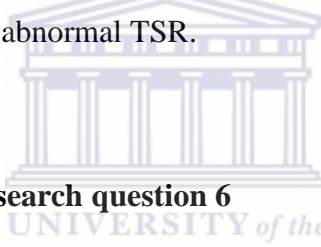
#### *6.1.2.2. Correlation between residual total compensation and abnormal total shareholder return*

In order to test whether different methods of calculating excess TC alter the results, the correlations between residual TC and abnormal TSR is also calculated. The Pearson's correlation coefficient and the Spearman's rank correlation coefficient are reported in Table 25 with statistically significant correlations (at the 5% confidence level) depicted in bold in the highlighted cells.

**Table 25: Pearson's correlation coefficient and Spearman's rank correlation coefficient for residual TC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
Q1	0.04	0.70	0.10	0.39	-0.03	0.77	0.01	0.92	0.16	0.12	0.08	0.46
Q2	0.04	0.75	0.07	0.55	0.01	0.92	0.01	0.91	0.16	0.12	0.10	0.34
Q3	0.09	0.46	0.16	0.15	0.08	0.47	0.11	0.29	<b>0.21</b>	<b>0.04</b>	0.13	0.21
Q4	0.12	0.30	0.13	0.26	0.07	0.51	0.15	0.15	<b>0.22</b>	<b>0.04</b>	0.11	0.29
Q5	0.15	0.19	0.19	0.10	0.09	0.40	0.16	0.12	<b>0.23</b>	<b>0.03</b>	0.16	0.14
Q6	0.15	0.20	0.14	0.22	0.09	0.41	0.17	0.11	<b>0.23</b>	<b>0.03</b>	0.16	0.12
Q7	0.17	0.14	0.19	0.10	0.12	0.25	0.21	0.05	<b>0.23</b>	<b>0.03</b>	0.17	0.11
Q8	0.18	0.13	0.21	0.06	0.13	0.22	0.19	0.07	0.18	0.08	0.13	0.23
Q9	0.20	0.09	0.22	0.06	0.14	0.18	<b>0.21</b>	<b>0.04</b>	0.16	0.12	0.10	0.32

Similar to the excess TC correlations, only a few quarters in 2013 (as well as the ninth quarter of 2012) report a significant, albeit weak positive relationship between residual TC and abnormal TSR.



### 6.1.3. Conclusion to research question 6

Despite the statistically significant positive relationship reflected for five quarters in 2013 calculating the Pearson's correlation, no statistically significant relationship is reported for the majority of the 27 quarter period. It is telling that the tougher Spearman's correlation reflects a statistically significant relationship for only one quarter. Descriptively there appears to be a relationship, but not statistically. Hypothesis 4 is therefore rejected (refer Table 37 at the end of this chapter).

These findings indicate that the situation in South Africa appears to be different to the international situation that report diminishing cumulative abnormal returns for the highest excess pay (Balafas & Florackis, 2014; Cooper *et al.*, 2014; Core *et al.*, 1999); and the results of this study do not support the suggestion that paying CEOs more leads to value destroying behaviour.

The sporadic evidence of a statistically significant relationship between excess TC and abnormal TSR may be a result of a complete lack of a relationship between

one of the components of TC and abnormal TSR, as suggested in the international literature that generally finds no (or a weak at best) relationship between short-term cash compensation and company performance, and a strong relationship when long-term incentives are considered. The relationship between each of these two components of TC and future company performance is now considered.

## **6.2.The relationship between short-term compensation (SCC) and future total shareholder return (TSR)**

The relationship between SCC and future company performance is analysed in this section which addresses research question 7.

Research question 7: Does a positive relationship between SCC and future company performance (as measured by TSR) exist?

It is necessary to investigate the relationship between SCC and future abnormal TSR separately for three reasons. Firstly, international pay-performance studies report a weak or non-existent relationship between pay and future performance when excluding LIC from compensation. Secondly, it was established in Chapter 5 that SCC makes up a more significant portion of TC in South Africa than internationally. Lastly, since local pay-performance sensitivity studies use SCC as a proxy for TC, it is important to know whether the relationship between SCC and future performance is consistent with the relationship between TC and future performance.

In order to address research question 7 the following hypothesis was set:

*Hypothesis 5 (H<sub>5</sub>):* A positive relationship between excess short-term cash compensation (SCC) and abnormal future total shareholder return (TSR) exists.

In order to test hypothesis 5 the relationship was analysed descriptively in order to establish the apparent relationship between excess SCC and abnormal TSR using different methods. This relationship was then tested statistically in order to confirm or reject the hypothesis.

### 6.2.1. Descriptive analysis

Since very similar results for the relationship between excess TC and EW abnormal future TSR were found using square-root of pay weightings and company financial year-ends in the previous section (6.1), the relationships between SCC and future company performance were not tested on these two bases. As a result of the small number of companies in each decile, however, the potential effect of outliers remains important. Consequently, the SCC-performance relationship is retested using median abnormal returns. The relationship was also described in terms of residual short-term cash compensation due to the small sample size and large variation within peer groups based on company size.

In order to investigate this relationship companies were ranked on the basis of excess short-term cash compensation (as defined by short-term cash compensation less median short-term cash compensation per peer group based on company size, as described in the previous chapter), as well as residual short-term cash compensation (as defined by the difference between the actual SCC and the predicted SCC), and divided into deciles.

The various descriptive analyses are presented in sections 6.2.1.1 to 6.2.1.3 as detailed in Table 26 below.

**Table 26: Summary of various descriptive analyses (SCC)**

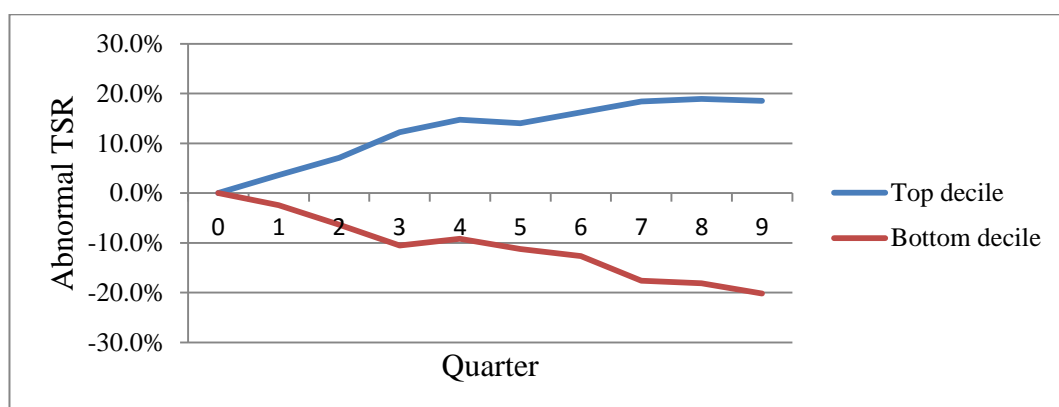
Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.2.1.1
Median	Calendar	Absolute vs. median per size group	6.2.1.2
Equal	Calendar	Residual vs. predicted	6.2.1.3

### 6.2.1.1. Weighting of abnormal TSR: Equal

In order to investigate this relationship the abnormal TSR of the top and bottom deciles were calculated on the basis of equal weightings of abnormal TSR for each company. Abnormal TSR was calculated from the start of the calendar year to which the excess CEO compensation relates, defined as the excess TSR over the equally weighted TSR of the top 100 JSE listed companies.

The relationship was found to be qualitatively similar the relationship between excess total compensation and future abnormal TSR, reported in section 6.1. The companies with the highest paid CEOs in terms of excess SCC earn positive abnormal future TSR, but the abnormal returns are more pronounced using SCC instead of TC (see Figure 22 below). In the first year after sorting on cash compensation, for the Quarter (+4) window, the companies in the highest decile of excess SCC earn abnormal TSR of 14.7%, which increase to 18.5% at the end of nine quarters. The companies in the lowest cash compensation decile earn negative abnormal returns of -9.2% in the first year, worsening to -20.2% after two years and one quarter.

**Figure 22: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of excess short-term cash compensation**



Furthermore, the positive abnormal returns improve over time while the negative abnormal return keeps on worsening, unlike the relationship between total compensation and future TSR in section 6.1, where the abnormal return of the

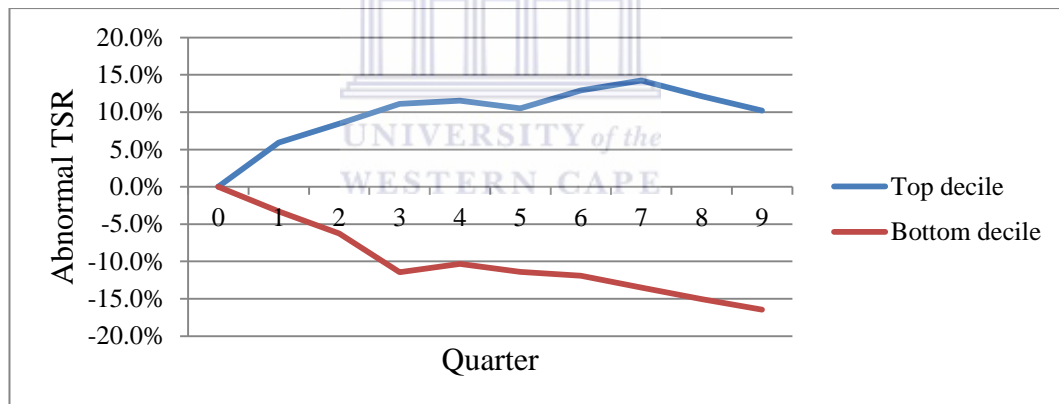
highest decile reverts back to zero after two years. This may be an indication that SCC is more effective than TC in incentivising CEOs as regards future performance, or it may be as a result of talent attraction.

#### 6.2.1.2. Weighting of abnormal TSR: Median

In order to test whether the results were driven by outliers, the relationship between SCC and abnormal future TSR was also investigated on the basis of median abnormal returns.

A similar pattern is reported using median returns, again suggesting that the results are not driven by outliers (refer Figure 23).

**Figure 23: Median abnormal returns earned by companies with CEOs in the top and bottom deciles of excess short-term cash compensation**



Median abnormal returns for the lowest cash compensation companies are -10.3 (Q+4) and -16.5% (Q+9), suggesting outliers did not cause the clear divergence between the top and the bottom cash compensation deciles.

In order to investigate whether there is an indication that the effect of SCC on future abnormal return is caused by the cash bonus component, the percentages of cash bonus and TGP were calculated for the top and bottom deciles companies of excess SCC. In the top decile the cash bonus comprised 36% of SCC (close to the average of 39% for the population overall), while for the cash bonus amounted to only 9% of SCC for the companies in the bottom decile. Since this indicated that a



relationship might exist between the cash bonus and future abnormal TSR, the relationship between the two was tested. Surprisingly the gap between the abnormal TSR of the companies in the top and bottom deciles of excess cash bonus was narrower than the gap depicted in Figure 22 with companies in the top decile earning cumulative abnormal TSR of 9.2% by the ninth quarter (less than half of that reflected in Figure 22). Similarly the negative abnormal TSR of companies in the bottom decile in terms of excess cash bonus was only -12.1% by the ninth quarter, also notably less than the -20.2% reflected in Figure 22.

Therefore the TGP was similarly investigated and again the relationship between the abnormal TSR for companies in the top and bottom deciles of excess TGP was narrower than that reflected in Figure 22, with positive abnormal returns amounting to only 2% by the ninth quarter, and small negative abnormal returns being reflected in the first year. The negative cumulative abnormal TSR of the bottom decile companies amounted to -7.9% by the end of the ninth quarter. The distinction in abnormal TSR is more pronounced relative to the excess total SCC than to either the cash bonus or TGP component thereof.

When sorting on the relative proportion of cash bonus to total SCC, the top decile (paying the largest proportion of SCC as a cash bonus) earns a positive cumulative abnormal return of 19.2% at the end of the ninth quarter, compared to negative abnormal returns of -8.8% over the same period for the companies who pay no CB.

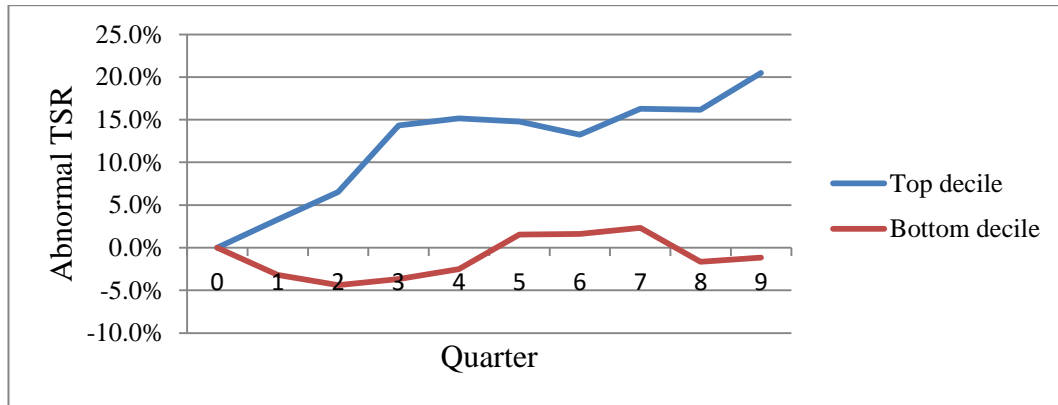
#### *6.2.1.3. Basis for determining excess pay: Residual*

In order to test whether the relationship between SCC and future performance remains consistent regardless of the company size groupings used as peers to benchmark SCC, companies were ranked according to residual SCC to form decile portfolios.

The top decile remains associated with positive and increasing abnormal returns (20.5% after nine quarters), while the bottom decile initially shows negative

abnormal returns, that disappear for a few quarters to end slightly negative (-1.2%) at the end of quarter nine (refers Figure 24).

**Figure 24: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of residual short-term cash compensation**



When comparing the equally-weighted abnormal return graph using excess SCC to form portfolios (Figure 22) with the same graph using residual SCC (Figure 24) it is clear that there was significant variation in the companies included in the top, and especially the bottom, decile portfolios. The trend of the top decile in terms of excess/residual SCC outperforming the bottom decile, however, persists.

#### 6.2.1.4. Conclusion to descriptive analysis

The relationship between excess SCC and future company performance is important due to the proportional significance of SCC to TC for South African companies. The results suggest that excess SCC is more closely related to improved company performance in the future than excess TC. It is also noted that improved future performance is associated with the payment of cash bonuses, however, it is clear that the greatest distinction between positive and negative abnormal TSR is related to the extent of the total SCC paid relative to peers. This finding could be explained by labour market theory which suggests that a premium is paid to attract and retain top talent, which in turn produces top results.

In chapter 5 it was noted that South African companies pay a relatively higher proportion of a CEOs TC as SCC (62%, refer 5.4.1) than the average in the U.S.

(48%) (Cooper *et al.*, 2014). The pronounced relationship between excess SCC and future abnormal TSR supports a higher SCC component of TC in South Africa.

Panels A and B of Table 27 below report cumulative abnormal returns for one year (Quarter +4) and two years and one quarter (Quarter +9) after portfolio formation date for the companies in the top and bottom deciles of excess short-term cash compensation.

**Table 27: Abnormal return calculated against Top100 JSE Listed companies sorted on Short-term Cash Compensation**

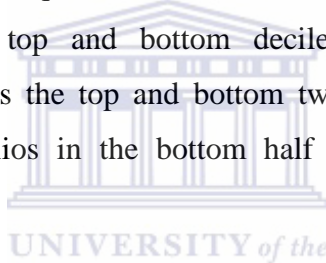
<b>Panel A: Highest excess short-term cash compensation decile</b>					
<b>Return weighting</b>	<b>Compensation</b>	<b>Portfolio formation</b>	<b>N</b>	<b>Quarter (+4)</b>	<b>Quarter (+9)</b>
Equal	Excess	Calendar year	26	14.7%	18.5%
Median	Excess	Calendar year	26	11.6%	10.2%
Equal	Residual	Calendar year	26	15.1%	20.5%
<b>Panel B: Lowest excess short-term cash compensation decile</b>					
<b>Return weighting</b>		<b>Portfolio formation</b>	<b>N</b>	<b>Quarter (+4)</b>	<b>Quarter (+9)</b>
Equal	Excess	Calendar year	27	-9.2%	-20.2%
Median	Excess	Calendar year	27	-10.3%	-16.5%
Equal	Residual	Calendar year	27	-2.5%	-1.2%

International studies that exclude long-term incentive compensation generally report a weak or no relationship between pay and company performance. The strong positive relationship between SCC and future company performance found in this study, together with the strong correlation (78.1%) between SCC and TC reported in section 5.5, however, supports the positive relationships reported in earlier South African studies where long-term incentive compensation was excluded. This underscores the legitimacy of investigations into pay-performance sensitivity in SA that are based only on SCC.

Additional deciles tested

Since the results reported on above are based on only top and bottom deciles, the extremes of excess short-term cash compensation, and contrast against the international literature, the relationship between excess pay and abnormal future TSR was also tested for the remaining deciles to investigate if the relationship remained constant throughout the population. The portfolios were formed at the start of each calendar year and the equally-weighted abnormal returns, as well as the median abnormal returns were calculated.

The positive relationship between higher excess SCC and future abnormal TSR was found to persist for the top half of the deciles, but weakened towards the 5<sup>th</sup> decile. Table 28 below reports cumulative abnormal returns for one year (Quarter +4) and two years and one quarter (Quarter +9) after portfolio formation date for the companies in the top and bottom deciles of excess short-term cash compensation, as well as the top and bottom two, three, four and five deciles respectively. All portfolios in the bottom half consistently reported negative abnormal TSR.



**Table 28: Abnormal total shareholder return (TSR) cumulative decile trends (Portfolios sorted on excess short-term cash compensation)**

Portfolio	Equally weighted abnormal TSR		Median abnormal TSR	
	Q(+4)	Q(+9)	Q(+4)	Q(+9)
Top 10%	14.7%	18.5%	11.6%	10.2%
Top 20%	9.1%	8.8%	7.8%	12.0%
Top 30%	7.0%	8.3%	7.3%	11.2%
Top 40%	3.2%	4.9%	3.8%	8.1%
Top 50%	1.1%	0.2%	2.0%	3.9%
Bottom 50%	-3.4%	-5.2%	-3.4%	-4.7%
Bottom 40%	-3.4%	-5.6%	-4.3%	-5.4%
Bottom 30%	-3.7%	-5.5%	-4.5%	-7.4%
Bottom 20%	-5.8%	-7.7%	-5.2%	-6.3%
Bottom 10%	-9.2%	-20.2%	-10.3%	-16.5%

The deciles appear to be more consistently ordered than TC from high to low abnormal returns, with a steady trend of declining TSR from the top to the bottom deciles, regardless of using the equally-weighted average or median TSR. The relationship between excess SCC pay and abnormal TSR are therefore more consistent than the relationship between excess TC and abnormal TSR. The abnormal returns in the middle deciles show much less variation, opening up at the extremes. This may imply that in order for companies to perform significantly better (or worse) than the benchmark, the CEOs need to be paid significantly more (or less) than their peers, which surprisingly suggests a strong relationship between SCC and future company performance.

### **6.2.2. Statistical analysis**

There appears to be a much stronger positive relationship between excess SCC and future TSR than excess TC. In order to test whether this relationship is statistically significant, the correlation between excess SCC (as well as residual SCC) and abnormal TSR is determined.

#### *6.2.2.1. Correlation between excess short-term cash compensation and abnormal total shareholder return*

The Pearson's correlation coefficient and the Spearman's rank correlation coefficient are reported in Table 29 on the next page, with statistically significant correlations (at the 5% confidence level) depicted in bold. The Pearson's correlation reports a statistically significant relationship between excess SCC and abnormal TSR for the later quarters of 2012 and most of 2013. The Spearman's correlation, which is more robust against outliers, reports a statistically significant relationship between excess SCC and abnormal TSR for all three years.

**Table 29: Pearson's correlation coefficient and Spearman's rank correlation coefficient for excess SCC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
<b>Q1</b>	0.09	0.44	0.10	0.41	0.09	0.40	0.06	0.55	<b>0.22</b>	<b>0.04</b>	<b>0.25</b>	<b>0.02</b>
<b>Q2</b>	0.06	0.58	0.12	0.31	0.06	0.57	0.01	0.94	<b>0.30</b>	<b>&lt;0.01</b>	<b>0.30</b>	<b>&lt;0.01</b>
<b>Q3</b>	0.19	0.10	0.21	0.07	0.10	0.36	0.13	0.20	<b>0.31</b>	<b>&lt;0.01</b>	<b>0.32</b>	<b>&lt;0.01</b>
<b>Q4</b>	0.20	0.08	0.19	0.10	0.14	0.19	0.18	0.09	<b>0.31</b>	<b>&lt;0.01</b>	<b>0.30</b>	<b>&lt;0.01</b>
<b>Q5</b>	0.18	0.11	0.17	0.15	0.18	0.09	<b>0.23</b>	<b>0.03</b>	<b>0.30</b>	<b>&lt;0.01</b>	<b>0.31</b>	<b>&lt;0.01</b>
<b>Q6</b>	0.15	0.19	0.12	0.29	<b>0.23</b>	<b>0.03</b>	<b>0.24</b>	<b>0.02</b>	<b>0.28</b>	<b>&lt;0.01</b>	<b>0.25</b>	<b>0.02</b>
<b>Q7</b>	0.18	0.12	0.20	0.08	<b>0.23</b>	<b>0.03</b>	<b>0.27</b>	<b>&lt;0.01</b>	<b>0.25</b>	<b>0.02</b>	<b>0.24</b>	<b>0.02</b>
<b>Q8</b>	0.18	0.11	0.21	0.07	<b>0.22</b>	<b>0.03</b>	<b>0.24</b>	<b>0.02</b>	0.19	0.07	0.18	0.09
<b>Q9</b>	0.22	0.05	<b>0.25</b>	<b>0.03</b>	<b>0.23</b>	<b>0.02</b>	<b>0.25</b>	<b>0.02</b>	0.16	0.12	0.14	0.18

It is therefore clear that the positive relationship between excess SCC and abnormal future TSR that was reported descriptively in section 6.2.1 is not only stronger than the positive relationship between excess TC and abnormal TSR (refers section 6.1.1), but statistically significant.

There is, however, only one statistically significant quarter in 2011 when calculating the Spearman's correlation, compared to seven quarters in 2013 regardless of the test. This inconsistency between years reflects the inconsistency of the findings in the literature, suggesting that the time frame or period covered by the research is a factor that influences the results.

The question is raised of whether a change in company performance could be detectable in only nine quarters. A longer term view is important since it may take five years or more to affect change in company performance.

The underlying data was scrutinised to investigate the reason for the difference in correlations. The average excess SCC decreased by 11% from 2011 to 2012, before increasing by 29% in 2013. The cumulative quarterly abnormal returns generally increased during the quarters where a statistically significant relationship was reported, while decreasing where this relationship was insignificant, being most of 2011 and the first half of 2012.

6.2.2.2. *Correlation between residual short-term cash compensation and abnormal total shareholder return*

In order to test whether different methods of calculating excess TC alter the results, the correlation between residual TC and abnormal TSR was also determined. The Pearson's correlation coefficient and the Spearman's rank correlation coefficient are reported in Table 30, with statistically significant correlations (at the 5% confidence level) depicted in bold. The Pearson's correlation reports a statistically significant positive relationship between residual SCC and abnormal TSR for just under half of the quarters in 2012 and 2013, but only the ninth quarter in 2011, while the more robust Spearman's correlation reports an even stronger significant positive relationship for more than half of all the quarters across all three years.

**Table 30: Pearson's correlation coefficient and Spearman's rank correlation coefficient for residual SCC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
Q1	0.15	0.19	0.22	0.06	0.10	0.34	0.05	0.63	0.10	0.32	0.14	0.18
Q2	0.08	0.47	0.16	0.17	0.10	0.34	0.04	0.68	0.16	0.12	0.21	0.05
Q3	0.20	0.08	<b>0.25</b>	<b>0.03</b>	0.16	0.14	0.16	0.13	0.21	0.05	<b>0.22</b>	<b>0.03</b>
Q4	0.20	0.08	0.22	0.05	0.18	0.09	0.19	0.07	<b>0.23</b>	<b>0.03</b>	0.20	0.06
Q5	0.22	0.06	<b>0.23</b>	<b>0.04</b>	0.20	0.06	<b>0.22</b>	<b>0.03</b>	<b>0.25</b>	<b>0.02</b>	<b>0.25</b>	<b>0.02</b>
Q6	0.19	0.10	0.18	0.11	<b>0.23</b>	<b>0.03</b>	<b>0.24</b>	<b>0.02</b>	<b>0.25</b>	<b>0.02</b>	<b>0.24</b>	<b>0.02</b>
Q7	0.21	0.06	<b>0.26</b>	<b>0.02</b>	<b>0.24</b>	<b>0.02</b>	<b>0.28</b>	<0.01	<b>0.24</b>	<b>0.02</b>	<b>0.23</b>	<b>0.03</b>
Q8	0.20	0.07	<b>0.25</b>	<b>0.03</b>	<b>0.25</b>	<b>0.02</b>	<b>0.26</b>	<b>0.01</b>	0.18	0.08	0.17	0.10
Q9	<b>0.23</b>	<b>0.04</b>	<b>0.27</b>	<b>0.02</b>	<b>0.25</b>	<b>0.02</b>	<b>0.28</b>	<0.01	0.14	0.17	0.12	0.25

Different results are found when comparing the two tests, but there is an overlap in terms of the time period. This suggests that when correlations are weak – which is to be expected when investigating CEO pay and company performance, due to the large number of factors influencing compensation and share returns – the results appear to be sensitive to the type of test used. Therefore, when dealing with weak correlations it is advisable to perform corroborative statistical tests. This is equally valid for small sample sizes and distributions that contain large variation.

The results of the statistical analysis suggest that at least during some quarters, sometimes as much as seven consecutive quarters, the relationship between excess (and residual) SCC and abnormal TSR is statistically significant. The correlation varies between 22% and 32% and a positive relationship exists, but is considered to be weak.

### **6.2.3. Conclusion to research question 7**

The positive relationship between excess SCC and abnormal TSR descriptively appears to be stronger than the relationship between excess TC and abnormal TSR. This positive relationship in terms of SCC is statistically significant, though weak, thus Hypothesis 5 is accepted (refers Table 37 at the end of this chapter).

## **6.3. The relationship between long-term incentive compensation (LIC) and future total shareholder return (TSR)**

This section analyses the relationship between LIC and future company performance in addressing the eighth research question that was set.

Research question 8: Does a positive relationship between LIC and future company performance (as measured by TSR) exist?

It is necessary to investigate the relationship between LIC and future abnormal TSR separately, since LIC is excluded from prior South African studies and so getting a first glimpse of the relationship in SA is of interest. Internationally a strong relationship between CEO pay and company performance is reported and Cooper *et al.* (2014), investigating the relationship between pay and future company performance, found stronger results for LIC than any other component of compensation.



In order to address research question 8 the following hypothesis was set:

*Hypothesis 6 (H<sub>6</sub>):* A positive relationship between excess long-term incentive compensation (LIC) and abnormal future total shareholder return (TSR) exists.

In order to test hypothesis 6 the relationship was first analysed descriptively using a similar approach to that was used in section 6.2.1, after which it was tested for statistical significance in order to accept or reject the hypothesis.

### 6.3.1. Descriptive analysis

In order to investigate this relationship companies were first ranked on the basis of excess long-term compensation (LIC) (as defined by actual LIC less median LIC per peer group based on company size, as described in the previous chapter), divided into decile portfolios and the equally-weighted abnormal TSR calculated for each portfolio. The median abnormal TSR for each portfolio was then calculated in order to test for the effect of outliers. Lastly, excess LIC was calculated in terms of residual long-term incentive compensation (as defined by the difference between the actual LIC and the predicted LIC) and the equally-weighted abnormal TSR calculated for each decile portfolio.

The various descriptive analyses are presented in sections 6.3.1.1 to 6.3.1.3 as detailed in Table 31 below.

**Table 31: Summary of various descriptive analyses and statistical tests (LIC)**

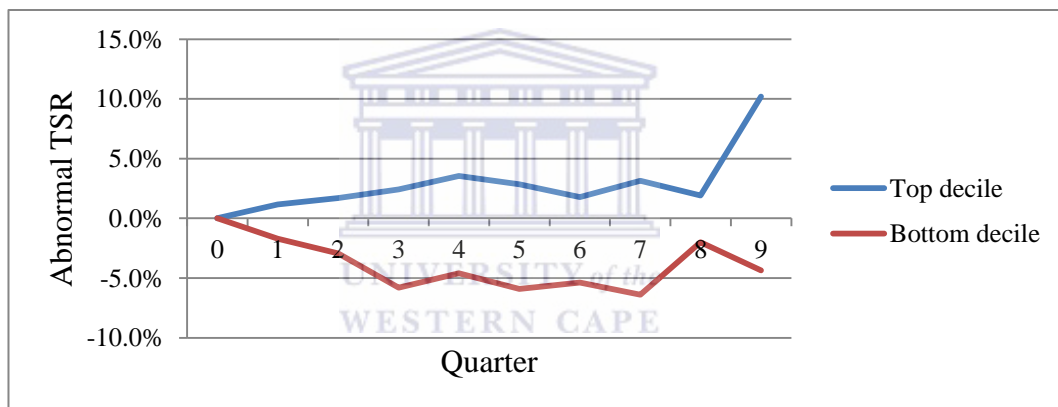
Abnormal total shareholder return		Excess total compensation	Results
Weighting	Year-end	Basis for determining excess	Section
Equal	Calendar	Absolute vs. median per size group	6.3.1.1
Median	Calendar	Absolute vs. median per size group	6.3.1.2
Equal	Calendar	Residual vs. predicted	6.3.1.3

### 6.3.1.1. Weighting of abnormal TSR: Equal

The abnormal TSR of the top and bottom deciles was calculated on the basis of equal weightings of abnormal TSR for each company. Abnormal TSR was calculated from the start of the calendar year to which the excess LIC relates, defined as the excess TSR over the equally weighted TSR of the top 100 JSE listed companies.

From Figure 25 it is evident that the abnormal returns of the top and bottom deciles of incentive compensation follow a similar general trend than when using total compensation or short-term cash compensation.

**Figure 25: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of excess long-term incentive compensation**



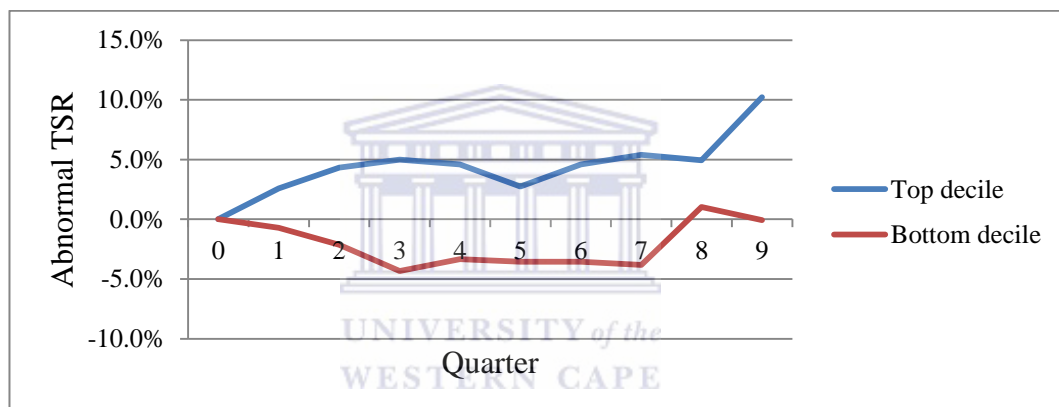
The companies with CEOs earnings the highest excess long-term incentive pay earn abnormal returns of 3.6% in the first year, which improve to 10.2% over the subsequent five quarters. The CEOs in the lowest excess LIC decile earned a negative return of -4.6% in the first year.

### 6.3.1.2. Weighting of abnormal TSR: Median

The relationship between LIC and abnormal future TSR was again investigated on the basis of median abnormal returns, in order to investigate the influence of outliers.

A similar pattern is reported using median returns. The negative abnormal TSR of the bottom decile disappeared, while the positive abnormal TSR of the top decile remain largely unchanged, suggesting that only the bottom decile is affected by outliers (refer Figure 26).

**Figure 26: Abnormal returns (median) earned by companies with CEOs in the top and bottom deciles of excess long-term incentive compensation**



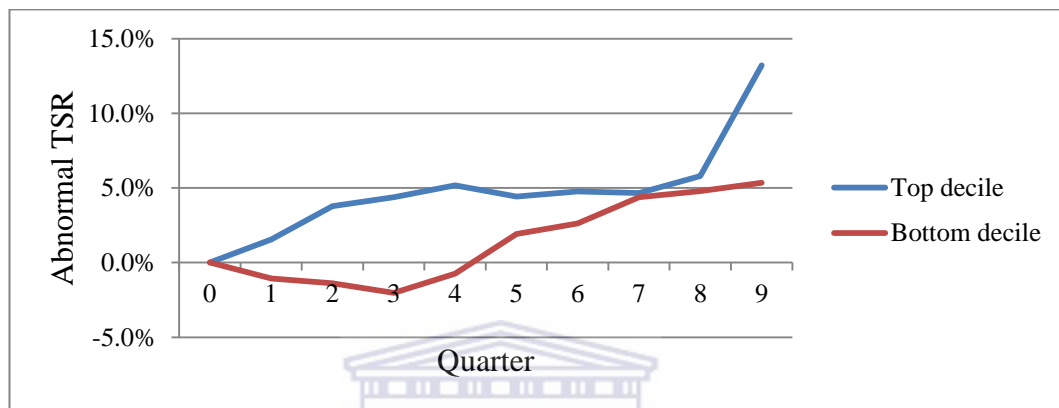
The small negative abnormal returns of the bottom decile of excess LIC that disappear after two years is consistent with the findings of Cooper *et al.* (2014). The top decile of excess LIC, however, moves in the opposite direction from the U.S. study, where the top 10% of companies in terms of LIC is associated with negative abnormal returns of up -9.38% after three years.

### 6.3.1.3. Basis for determining excess pay: Residual

In order to test whether the relationship between LIC and future performance remain consistent regardless of the company size groupings used as peers to benchmark LIC, companies were ranked according to residual TC to form decile portfolios.

The top decile remains associated with higher positive and increasing abnormal returns (13.2% after nine quarters), while the bottom decile reports negative cumulative abnormal TSR only for the first year, after which it turns positive to end on 5.3% after the full nine quarters (refers Figure 27).

**Figure 27: Equally-weighted abnormal returns earned by companies with CEOs in the top and bottom deciles of residual long-term incentive compensation**



The graphical relationship between LIC and abnormal TSR changes when excess compensation is calculated in different ways, suggesting that the apparent relationship is less clear than for TC and SCC, and in fact there may be little to no distinction.

#### 6.3.1.4. Conclusion to descriptive analysis

The graphs depicting the relationship between excess/residual LIC and abnormal TSR when reporting only the extreme deciles suggest a weaker relationship between LIC and future company performance. Caution should, however, be taken when only comparing the top and bottom deciles, since there may be greater variation in the rest of the sample. It was therefore necessary to investigate the remaining eight deciles in further detail.

Additional deciles tested

Similar to sections 6.1 and 6.2 the remaining eight deciles were also considered and no consistent relationship is visible across the remaining deciles (refer Table 32 below).

**Table 32: Abnormal total shareholder return (TSR) cumulative decile trends (Portfolios sorted on excess long-term incentive compensation):**

Portfolio	Equally weighted abnormal TSR		Median abnormal TSR	
	Q(+4)	Q(+9)	Q(+4)	Q(+9)
Top 10%	3.6%	10.2%	4.6%	10.2%
Top 20%	2.9%	3.8%	4.6%	4.6%
Top 30%	-0.1%	-1.8%	2.5%	-0.1%
Top 40%	-3.0%	-4.5%	-0.6%	-3.7%
Top 50%	-3.3%	-5.7%	-1.4%	-4.9%
Bottom 50%	1.1%	-0.6%	2.7%	2.2%
Bottom 40%	0.6%	-1.6%	2.9%	2.0%
Bottom 30%	-1.5%	-7.2%	1.9%	-1.4%
Bottom 20%	-5.6%	-11.7%	-1.9%	-5.8%
Bottom 10%	-4.6%	-4.4%	-3.3%	-0.1%

Even though the top decile in terms of excess LIC earned higher abnormal TSR than the bottom decile, there is clearly not a consistent trend in the relationship. The conclusion can therefore not be drawn that paying more LIC compared to peer companies consistently result in improved future performance.

There is no consistent relationship between decreasing excess LIC and decreasing abnormal TSR, as is evident from the jumbled abnormal TSRs reported in Table 32 above. There is a very sudden drop in cumulative abnormal TSR at the third decile, while the return of the second to last decile is significantly lower than the last decile.

There could be several reasons for this lack of a clear trend:

- The first possible reason could be that, as a result of mega companies paying such large LIC relative to the other size groups, the mega companies paying positive excess LIC would be in high deciles while the mega companies paying lower LIC than their peers (negative excess LIC) would be in lower deciles. This is in comparison to the medium and small companies that have much lower median LIC, where any excess LIC paid by these smaller companies (whether positive or negative) would be much less than the excess paid by the mega companies, and thus would be concentrated in the middle deciles. This would result in a small or medium company paying no LIC (with a small negative excess LIC of less than R2.1 million or R2.3 million respectively) being ranked in a higher decile than a mega company paying a large LIC that is less than the median of R31 million for their peer group.

This prompts the questions that surely it is better to pay something rather than nothing in terms of incentivising future performance? To test whether this was the reason for the jumbled results, the companies paying no LIC were removed from the sample and the test re-performed. The same results were however found with the deciles remaining as jumbled.

Given the suggestion of labour market theory, which postulates that companies paying more to attract better talent, which produces better results, portfolios were formed on the basis of the absolute values of the LIC, as opposed to the excess LIC. A closer relationship between abnormal TSR and total LIC was found than with excess LIC, but the deciles were still (though less severely) jumbled.

- The second reason for the lack of a clear trend is the negative returns earned by the resource companies in the mining sector that still paid large LIC. This resulted in a concentration of the mining companies in certain of the higher deciles, having a strong negative influence on the abnormal TSR of those deciles (refer to the top 40% and top 50% in Table 32).

- A third reason for the jumbled results, could be that unlike the SCC package of CEOs that remain relatively constant from year to year, the LIC component varies notably within the same company from year to year. For example, 30% of companies (for which three years' data were available) were found to pay no LIC in one year, but make a large LIC payment in another. The company that paid the highest LIC for sample as a whole (in the financial services (FS) industry, refer 5.2.3) in one year, paid no LIC in the following year. This lumpiness in LIC payments would result in these companies being included in very high deciles in the years that they paid LIC and lower deciles in the years they didn't. To illustrate this, the FS company in question was included in the top decile of excess LIC in 2011 and the bottom decile in 2012. Therefore it cannot be concluded that companies in the low deciles are not incentivised in terms of future performance, as the CEOs might have been awarded large LIC in previous years, and so in fact are incentivised as regard future performance. To control for the lumpiness of LIC payments the average inflation adjusted LIC for the three year period was calculated and the portfolios reformed on this basis. The results, however, were no more consistent than originally found, with the top two deciles showing strong positive abnormal TSR, while the rest of the deciles remaining jumbled.

#### Conclusion on descriptive relationship

The abnormal TSRs of the top and bottom deciles show that the top decile of excess LIC consistently outperforms the bottom decile. The gap does, however, narrow when using median abnormal TSR and other than the top two deciles the remaining deciles appear jumbled and no clear relationship between LIC and abnormal TSR for these deciles is evident. When using residual LIC to form portfolios the gap between the top and bottom deciles is severely diminished.

The major mathematical reasons that obscure a relationship between LIC and abnormal TSR were eliminated as being reasons for the lack of a clear

relationship that was found outside of the top two deciles. This, together with the stronger relationship that was found between the absolute values of LIC and future performance, suggests that other than for the extreme cases, excess LIC relative to the peer group does not appear particularly effective in incentivising future performance. These results find no support in South Africa for the suggestion in the international literature that LIC is an optimal component of the CEO's pay package, except where LIC is very large relative to the peer group. This brings into question the effectiveness of LIC as a mechanism to incentivise future performance and potentially supports the argument that LIC is merely an unjustified inflation of the CEO's pay package.

It has been noted in the literature review that in the international literature a trend exists of a shift from share options to performance shares. This study doesn't differentiate between these two types of LIC. Options may have a significantly lower value, which might affect the ranking based on excess LIC.

The superior performance of the top two deciles of excess LIC does, however, stand out. This may be explained by the high proportion of "mega"-sized companies that pay higher LIC in those deciles, supporting labour market theory which suggests that larger companies can afford the best talent, which is capable of outperforming their peers.

### **6.3.2. Statistical analysis**

This relationship between excess LIC and future TSR appears much weaker than that of excess TC and SCC. In order to test whether this relationship is statistically significant, the correlation between excess LIC (as well as residual LIC) and abnormal TSR was calculated.



6.3.2.1. Correlation between excess long-term incentive compensation and abnormal total shareholder return

From the results of the Pearson's correlation coefficient and the Spearman's rank correlation coefficient are reported in Table 33 below, it is clear that there is no correlation between excess LIC and abnormal TSR.

**Table 33: Pearson's correlation coefficient and Spearman's rank correlation coefficient for excess LIC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
Q1	-0.05	0.68	-0.05	0.68	-0.15	0.16	-0.11	0.28	0.13	0.20	0.08	0.46
Q2	-0.00	1.00	0.00	1.00	-0.15	0.16	-0.11	0.30	0.09	0.40	0.04	0.73
Q3	-0.02	0.90	-0.02	0.87	-0.11	0.28	-0.05	0.64	0.09	0.39	0.04	0.72
Q4	0.02	0.86	-0.04	0.70	-0.13	0.23	-0.04	0.68	0.08	0.47	0.01	0.94
Q5	0.04	0.75	-0.04	0.72	-0.10	0.33	-0.04	0.67	0.09	0.39	0.06	0.59
Q6	0.04	0.74	-0.08	0.47	-0.11	0.28	-0.05	0.62	0.09	0.41	0.08	0.46
Q7	0.05	0.68	-0.05	0.66	-0.08	0.45	-0.03	0.78	0.11	0.29	0.09	0.40
Q8	0.06	0.58	-0.04	0.75	-0.12	0.27	-0.08	0.46	0.10	0.34	0.09	0.40
Q9	0.08	0.50	-0.03	0.83	-0.08	0.43	-0.04	0.68	0.10	0.36	0.11	0.29

In contrast to the correlation between excess SCC and future performance, there is no statistically significant relationship between excess LIC and abnormal TSR, as expected based on the lack of a steady decline in the cumulative abnormal TSR from highest to lowest deciles presented in Table 32. This is in stark contrast to the U.S. experience where the pay-performance relationship is generally stronger when including LIC. It also contradicts the findings of Cooper *et al.* (2014) who report a statistically significant negative relationship between excess LIC and abnormal TSR for the top three deciles as a result of CEO overconfidence.

6.3.2.2. Correlation between residual long-term incentive compensation and abnormal total shareholder return

In order to test whether the calculation of excess LIC affected the relationship, the Pearson's and Spearman's correlations are recalculated using residual LIC instead of excess LIC. The results of these correlations, reported in Table 34 below, confirm that there is no statistically significant relationship between LIC and future company performance, for the three year period.

**Table 34: Pearson's correlation coefficient and Spearman's rank correlation coefficient for residual LIC and abnormal TSR**

Quarter	2011 n = 79				2012 n = 92				2013 n = 92			
	Pearson		Spearman		Pearson		Spearman		Pearson		Spearman	
	r	p-val.	$\rho$	p-val.	R	p-val.	$\rho$	p-val.	r	p-val.	$\rho$	p-val.
Q1	-0.02	0.84	-0.02	0.87	-0.14	0.19	-0.07	0.51	0.16	0.13	0.09	0.40
Q2	-0.00	1.00	-0.05	0.64	-0.07	0.49	-0.01	0.92	0.10	0.36	0.02	0.82
Q3	-0.00	0.98	-0.05	0.68	-0.02	0.86	0.02	0.83	0.13	0.23	0.06	0.59
Q4	0.04	0.76	-0.07	0.53	-0.05	0.64	0.00	0.98	0.11	0.31	0.03	0.80
Q5	0.06	0.60	-0.02	0.85	-0.04	0.74	0.01	0.90	0.11	0.28	0.07	0.50
Q6	0.07	0.52	-0.03	0.77	-0.07	0.53	-0.02	0.86	0.11	0.30	0.09	0.39
Q7	0.08	0.46	-0.00	0.98	-0.02	0.82	0.01	0.94	0.12	0.26	0.08	0.45
Q8	0.09	0.41	0.00	0.99	-0.02	0.87	-0.02	0.87	0.11	0.30	0.08	0.46
Q9	0.10	0.38	0.01	0.92	0.00	1.00	0.01	0.92	0.12	0.27	0.10	0.33

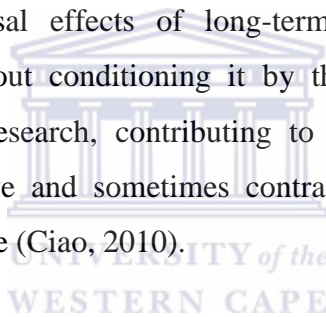
**6.3.3. Conclusion to research question 8**

Even though the top decile in terms of excess LIC outperforms the bottom decile, the abnormal TSRs of the remaining deciles are jumbled and the statistical tests indicate that there is no relationship between excess LIC and abnormal TSR. Thus, Hypothesis 6 is rejected (refer to Table 37 at the end of the chapter).

These results are largely corroborative of those of Cooper *et al.* (2014), who similarly found a lack of a relationship between LIC and company performance, (other than for companies paying in the top deciles of excess compensation, where a negative relationship exists). These results however are in contradiction to those

of other international studies who find that CEO LIC is negatively associated with future company performance (Balafas & Florackis, 2014; Cooper *et al.*, 2014).

This presents a disturbing picture: LIC is intended by corporates to provide incentivisation regarding long-term performance and represents substantial amounts of cash. If LIC is a generally ineffective (or negatively effective) form of incentivisation, or only sporadically effective (as the broad distributions, non-linear relationship and lack of statistical significance suggest), then the question must be asked – why? It is beyond the ability of quantitative empirical research to answer this question and it is suggested that qualitative research into the question of why LIC schemes may lack effectiveness (or even be detrimental to company performance, as Cooper *et al.* (2014) suggest) is required. The interpretive approach intrinsic in qualitative research would be helpful in allowing the reality of the causal effects of long-term incentive schemes to show themselves freely, without conditioning it by the parameters set in place by quantitative empirical research, contributing to generate new knowledge that explains the inconclusive and sometimes contradictory results reported in the body of existing literature (Ciao, 2010).



#### **6.4. Similarity of the pay-performance relationship between different components of CEO compensation**

This section considers whether the relationship between compensation and future company performance can be similarly described when using different measures of compensation. This is reflected in research question 9.

Research question 9: How do the pay-performance relationships based on TC, SCC and LIC respectively, compare?

In order to address research question 9 the cumulative abnormal return graphs presented in sections 6.1 to 6.3 were compared to determine whether the relationships between excess compensation – whether it be TC, SCC or LIC – and future performance are described similarly.

Even though the descriptive analysis consistently indicated that the companies in the top decile of excess compensation, regardless of whether TC, SCC or LIC was used as a measure of compensation, earn higher future short-term abnormal shareholder returns (whether equally-weighted or median) for up to nine quarters, than the companies included in the bottom decile, analysis of the remaining deciles indicated that this does not represent a consistent relationship across the various deciles.

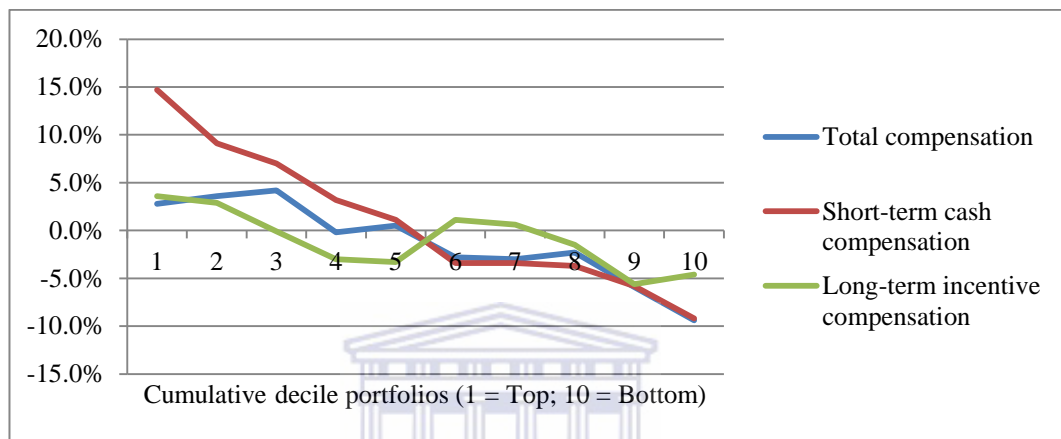
A consideration of the trends across deciles indicates a more consistent and direct relationship between excess SCC and abnormal TSR, than excess TC and abnormal TSR. Further, it showed that no consistency in relationship between excess LIC and abnormal TSR exists beyond the extreme deciles. This is clear from the trends (or lack thereof) in abnormal TSR reported in Table 35 below for the top and bottom deciles, as well as the cumulative abnormal TSR when systematically adding the remaining deciles. Cumulative abnormal returns notably contradictory to the trend are highlighted in red below.

**Table 35: Equally-weighted abnormal returns of cumulative decile portfolios formed on excess TC, SCC and LIC**

Portfolio	Quarter (+4)			Portfolio	Quarter (+9)		
	Total comp.	Short-term cash comp.	Long-term incentive comp.		Total comp.	Short-term cash comp.	Long-term incentive comp.
Top 10%	2.8%	14.7%	3.6%	Top 10%	3.2%	18.5%	10.2%
Top 20%	3.6%	9.1%	2.9%	Top 20%	10.4%	8.8%	3.8%
Top 30%	4.2%	7.0%	-0.1%	Top 30%	8.3%	8.3%	-1.8%
Top 40%	-0.2%	3.2%	-3.0%	Top 40%	0.7%	4.9%	-4.5%
Top 50%	0.5%	1.1%	-3.3%	Top 50%	1.0%	0.2%	-5.7%
Bottom 50%	-2.8%	-3.4%	1.1%	Bottom 50%	-7.3%	-5.2%	-0.6%
Bottom 40%	-3.0%	-3.4%	0.6%	Bottom 40%	-6.0%	-5.6%	-1.6%
Bottom 30%	-2.3%	-3.7%	-1.5%	Bottom 30%	-5.9%	-5.5%	-7.2%
Bottom 20%	-5.9%	-5.8%	-5.6%	Bottom 20%	-11.0%	-7.7%	-11.7%
Bottom 10%	-9.4%	-9.2%	-4.6%	Bottom 10%	-16.1%	-20.2%	-4.4%

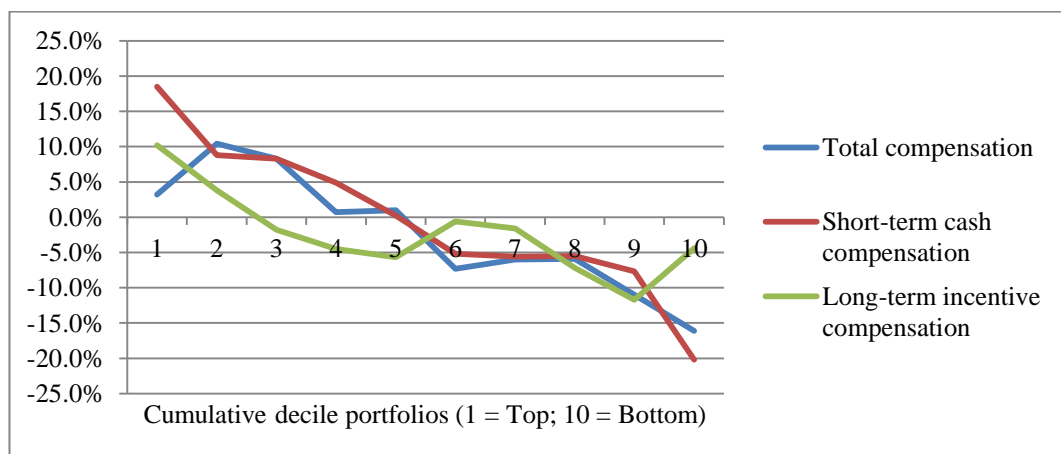
The cumulative abnormal returns after one year (at the end of quarter 4) for each portfolio in Table 35 above are graphically represented in Figure 28 below, showing a much clearer downward trend from the top decile in terms of excess SCC to the bottom decile, than for the corresponding deciles in terms of excess LIC.

**Figure 28: Abnormal returns for cumulative decile portfolios after four quarters**



This stronger trend in the cumulative abnormal returns for portfolios formed on the basis of excess SCC, than those formed on the basis of excess LIC, persist at the end of the ninth quarter (refer Figure 29).

**Figure 29: Abnormal returns for cumulative decile portfolios after nine quarters**



A suggestion in the literature exists that LIC might be an optimal component of the CEO compensation package in terms of incentivising improved future

company performance (Jensen & Murphy, 1990b). However, Cooper *et al.* (2014) found the opposite, that negative abnormal TSR was associated with higher excess LIC in the top three deciles, and more so for this component of compensation than any other. CEO overconfidence was put forward as a possible reason for this phenomenon. They found no linear relationship between pay and future performance in the remaining deciles. Contrary to the findings of Cooper *et al.* (2014), the descriptive analysis indicates that in the SA context LIC is positively associated with relatively better abnormal TSR in the top deciles of excess LIC, but this is not so pronounced as the positive relationship between excess SCC and abnormal TSR. However, the statistical analysis shows that no linear relationship between excess LIC and abnormal TSR exists.

In contrast to the lack of a relationship between excess LIC and abnormal future TSR, both descriptive and statistical analysis show a positive relationship between excess SCC and abnormal TSR. This suggests that in the SA context SCC is a more optimal component of TC than LIC in terms of CEO incentivisation. This question is further investigated in section 6.5 which follows, investigating whether the relative values of the two components comprising the structure of the CEO compensation package is of influence in the pay-performance sensitivity relationship.

#### **6.5. The relationship between the compensation structure (LIC versus TC) and future total shareholder return (TSR)**

This section analyses the relationship between the CEO compensation structure and future company performance in addressing research question 10 that was set.

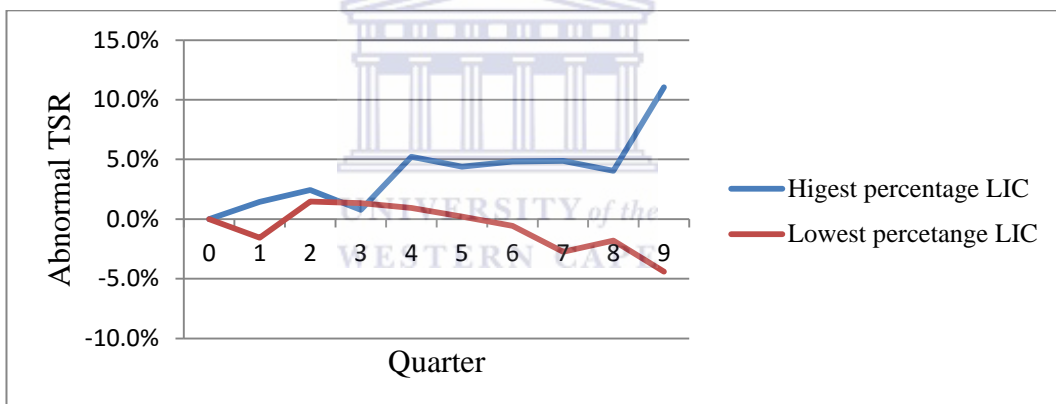
Research question 10: Does an indication exist in the South African context that long-term incentives may represent an optimal component in the CEO compensation package?

In order to address research question 10 the following hypothesis was set:

*Hypothesis 7 (H<sub>7</sub>):* The companies with CEOs in the top decile of the relative proportion of LIC to TC, earn higher equally weighted future abnormal TSR than the companies of the CEOs in the bottom decile, when forming portfolios at the start of the calendar year.

From the pattern of future abnormal TSR in Figure 30 below, it is clear that pay packages that consist of a larger proportion LIC relative to TC results in higher future abnormal TSR than compensation packages consisting of short-term cash compensation only.

**Figure 30: Abnormal returns (equally-weighted) earned by companies with CEOs in the top and bottom deciles of long-term incentive compensation as a percentage of total compensation (including companies paying no LIC)**



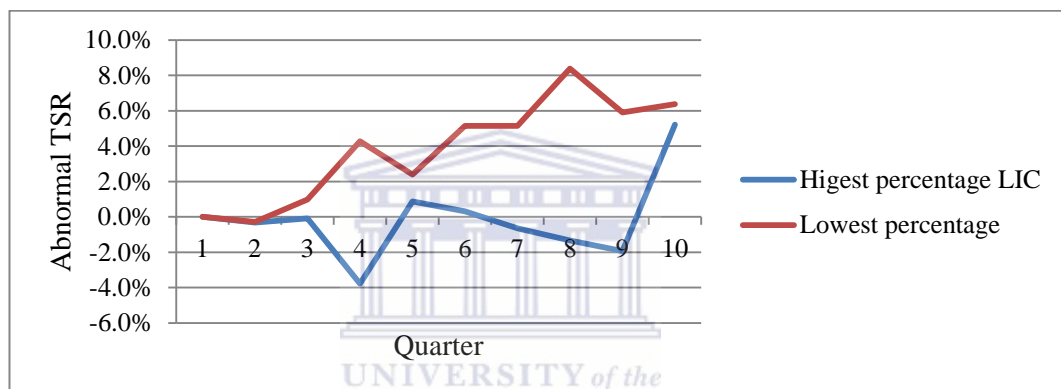
The top decile sorted on the LIC to TC ratio includes companies whose CEOs earn between 54% and 95% of their total compensation by means of long-term incentives. The bottom “decile” is not a true decile in that it includes all companies that compensated their CEOs by means of 100% cash pay.

Companies whose CEOs earn a relatively larger proportion of their overall compensation by means of long-term incentives outperform CEOs earning only cash compensation in the first year, with abnormal returns of 5.2% compared to 0.9%. Over time the CEOs earning higher LIC continue to outperform their peers with an abnormal TSR of 11.0% after nine quarters. The CEOs earning only cash

pay perform significantly worse, earning a negative abnormal TSR of -4.4% after nine quarters (refer to Table 36 on the next page).

Since companies that do not pay any long-term incentive compensation may differ from companies that do, the relationship in Figure 30 was recalculated by removing the companies that did not pay any LIC from the sample. This resulted in the bottom decile of companies ranked on the proportion of LIC to TC outperforming the top decile (refer Figure 31 below).

**Figure 31: Abnormal returns (equally-weighted) earned by companies with CEOs in the top and bottom deciles of long-term incentive compensation as a percentage of total compensation (excluding companies paying no LIC)**



Since there is no relationship between LIC and abnormal TSR, it is no surprise that the abnormal TSR lines of the top and bottom deciles swap around when recalculating the relationship between LIC and abnormal TSR in a different way. The cumulative abnormal TSR at the end of four and nine quarters is presented, in Table 36 on the next page, for the sample including companies that pay zero LIC, as well as the sample excluding those companies.

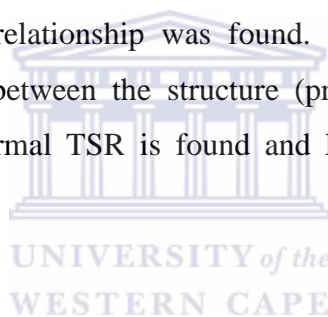


**Table 36: Abnormal returns (equally weighted) calculated against Top100 JSE Listed companies for top and bottom deciles sorted on incentive to total pay ratio (calendar year portfolio formation)**

Portfolio based on ratio of long-term incentive compensation to total compensation: (LIC : TC)	Companies paying no LIC included			Companies paying no LIC excluded		
	N	Quarter (+4)	Quarter (+9)	N	Quarter (+4)	Quarter (+9)
Top decile	26	5.2%	11.0%	20	0.9%	5.2%
Bottom decile	69	0.9% *	-4.4% *	19	2.4%	6.4%

\* Due to the large number of companies that do not award long-term incentives, more than one decile contained companies with a 100% cash component. The bottom “decile” includes all companies that paid 0% LIC (2011: N = 23, 2012: N = 25 and 2013: N = 21)

The Pearson’s correlation between the ratio of LIC to TC and the abnormal returns was calculated for all nine quarters for the period 2011 to 2013 and no statistically significant relationship was found. Thus, regardless of how it is tested, no relationship between the structure (proportion LIC to TC) of CEO compensation and abnormal TSR is found and Hypothesis 7 is rejected (refer Table 37 in section 6.6).



## 6.6. Conclusion to research objective 2

Of the four positive relationships hypothesised regarding compensation and future company returns (as set out in Table 37 on the next page), Hypotheses 6 and 7 regarding the existence of a positive relationship between future abnormal TSR and LIC, and the structure of CEO compensation, are rejected on the basis of a complete lack of a descriptive or statistically significant relationship in any form.

Hypothesis 5 regarding the positive relationship between excess SCC and abnormal TSR is accepted on the basis of a consistently positive relationship both descriptively when employing various methods, as well as statistically significant when performing different tests. The relationship, however, appears weak.

Hypothesis 4 regarding the existence of a positive relationship between excess TC and abnormal TSR is rejected due to inconsistent findings. Descriptively there

appears to be a positive relationship, but statistical tests reveal that this relationship is only significant for a few quarters, and changes when employing a different statistical method.

**Table 37: Results of Chapter 6: Analysis of the relationship between pay and future performance**

No.	Hypothesis	Result
H <sub>4</sub>	A positive relationship between excess total compensation (TC) and abnormal future total shareholder return (TSR) exists.	Reject
H <sub>5</sub>	A positive relationship between excess short-term cash compensation (SCC) and abnormal future total shareholder return (TSR) exists.	Accept
H <sub>6</sub>	A positive relationship between excess long-term incentive compensation (LIC) and abnormal future total shareholder return (TSR) exists.	Reject
H <sub>7</sub>	The companies with CEOs in the top decile of the relative proportion of LIC to TC, earn higher equally weighted future abnormal TSR than the companies of the CEOs in the bottom decile, when forming portfolios at the start of the calendar year.	Reject



## CHAPTER 7: CONCLUSION AND FUTURE RESEARCH

### 7.1. Research conclusions

This study had two research objectives:

1. to analyse and describe compensation levels and pay structures for the largest 100 companies listed on the Johannesburg Stock Exchange (JSE) for 2011 to 2013; and
2. to investigate and analyse the relationship between the level and structure of CEO compensation and the future total shareholder return (TSR) in South Africa (SA).

In meeting these research objectives the study presented the following key findings related to CEO compensation in SA. Firstly, this study highlights the skewed distribution of CEO compensation in the top 100 JSE listed companies in South Africa towards the lower end of the spectrum with nearly two thirds of CEOs earning total compensation less than the mean of R20.5 million. Long-term incentive compensation (LIC) is not paid by 27% of the largest 100 listed companies in South Africa. Secondly, a statistically significant relationship between CEO total compensation (TC) and company size (as measured by revenue) was found, but not industry grouping. This may be evidence that the sales maximisation hypothesis put forward by Baumol in the 1920's (McGuire *et al.*, 1962) is applicable in the SA context, that the practice of benchmarking of CEO compensation on company size may exist in SA, and it corroborates the international literature that CEO pay and company size are related. Thirdly, this study corrects the view expressed in prior South African pay-performance sensitivity studies that LIC is an insignificant component of total compensation (TC) and so can be ignored as a component of TC. This study found that LIC comprises 38% of total compensation at the overall level (28% at the median). Finally, a weak positive relationship between excess short-term cash compensation (SCC) and future abnormal TSR was found in this study. No relationship was found to exist between either excess TC or excess LIC and future abnormal TSR.

The study contributes towards filling several gaps in the South African (SA) literature: Firstly, no prior SA study followed the international norm of adequately including long-term incentive compensation (LIC) as a component of CEO compensation or measuring company performance in terms of total shareholder return (TSR). Secondly, previous SA pay-performance sensitivity studies did not consider future company performance. Thirdly, prior studies are generally limited to specific industries or company size groups. Finally, no previous SA study adequately controlled for company size, with implications for the interpretation of the results thereof. The contribution of this study in addressing these gaps is set out below.

## **7.2. Contributions of this study**

Unexpectedly this study finds a positive relationship between abnormal future TSR and SCC, but not LIC. The non-existent relationship between excess LIC and abnormal TSR is of concern and qualitative studies that have the potential to investigate and explain this phenomenon are needed. Even though only a three year compensation period is considered, thus including only short-term abnormal returns, this study does provide a first glimpse into the relationship between LIC and future company performance. If a significant relationship does exist, it would have been expected that some evidence of that relationship would start appearing, even in a limited time period, similar to that between SCC and abnormal TSR.

This study generally corroborates the international literature that reports no linear relationship for a large part of the sample; however, the finding in the international literature that the highest paying companies report a negative association between excess LIC and future abnormal TSR does not apply to SA.

This study is the first in South Africa that explicitly investigates the link between CEO compensation and company size, and found that it is statistically significant. Consequently, a problem in prior SA studies is identified: Existing studies that report a strong positive relationship between SCC and size-related accounting

measures of company performance are in fact reporting a relationship between CEO pay and the size of the company, and not the performance thereof.

After controlling for company size in different ways, this study found a weak to moderate positive relationship between SCC and abnormal short-term future TSR. This study does not attempt to find explanatory reasons for this relationship, but raises the question of why this relationship exists. It is suggested that labour market theory (talent attraction) has the potential to answer this question; however, qualitative research would be helpful in exploring possible reasons for this relationship, by allowing reality to show itself freely, without conditioning it by the parameters set in place by quantitative empirical research.

This study brings clarity to the SA literature by showing that there is a relationship between excess SCC and future company performance. This relationship is not clear from previous research because of the shortcomings of using accounting measures that are mostly related to the size of the company, instead of TSR to measure company performance. This study also highlights the importance of corroborating tests being embedded in the research design in order to consider the internal consistency of the findings, as well the risk of relying on empirical results that may change when a different methodology, time frame or sample size is used.

In conclusion, this study brings clarity to the South African literature by reporting a positive, though weak, relationship between short-term cash compensation and abnormal future total shareholder return. No such relationship is found for long-term incentive compensation, which raises the important question of considering how CEO compensation packages – and LIC specifically – are structured and used in South Africa to drive company performance.

### **7.3.Areas for future research**

The positive relationship between SCC and lack of any relationship between LIC, and abnormal TSR found in this study prompts the need for qualitative research in

order to investigate possible reasons for the ineffectiveness of LIC to incentivise future company performance, as well as to explain why SCC is positively associated with future company performance.

The apparent ineffectiveness of LIC to drive company performance could be further investigated by extending the time period of the study to include time-series analyses and by calculating abnormal returns for a longer holding period since the effect of long-term incentive schemes may take a long time to manifest in terms of company performance. The expected value of share options and performance share grants could also be calculated more accurately by using company specific assumptions for the variables in order to investigate whether more accurate LIC values will have an effect on the relationship between LIC and company performance.

The investigation of the relationship between excess CEO compensation and company performance could be refined by controlling for other variables (CEO age, CEO tenure, corporate governance structures, ownership structure, CEO shareholding) that may potentially have an effect on CEO compensation, as well as controlling for industry by breaking the sample up into smaller, more specific, industry groupings, although the small sample sizes in the SA context will present challenges to the statistical analysis thereof. The literature review did not reveal any work in SA on other theories underpinning executive compensation (labour market theory and managerial power theory). A study to investigate the effect of these theories as determinants of the relationship between CEO compensation and company performance would be of value.

Finally, while this study covered a larger sample than most South African studies, small capitalisation companies and companies listed on the Alternative Exchange could be included in a future study to describe CEO compensation and to investigate whether the same relationship between SCC and abnormal TSR exists, as for medium and large capitalisation companies. In addition to calculating excess pay based on company size only, a larger sample may make it possible to break up peer size groups further into lagged return groups to eliminate the effect that mean reversion may have on future share performance.

Other areas of suggested future research that emanate from this study are:

- A small proportion of CEOs earn a large proportion of their wealth in the form of LIC, while 91% of CEOs earned below average LIC. A study investigating whether a trend towards more or less LIC, relative to SCC, exists in SA would be of interest;
- Possible reasons for some companies not awarding LIC or bonuses may include corporate culture, performance targets not being met or that incentives were awarded in one year, but cover several subsequent years. Further research is required to identify the reasons for LIC not being awarded, as this may provide insights into the lack of a relationship between LIC and abnormal future TSR reported in this study;
- The apparent positive relationship between excess TC and abnormal TSR for the highest paying companies in SA is in contrast to a negative relationship reported in the U.S. Cooper *et al.* (2014) found evidence of CEO overconfidence in the U.S, which warrants a study investigating why the SA situation differs from the US experience, and why overconfidence is not evident locally;
- The cumulative quarterly abnormal returns generally increased during the quarters where a statistically significant relationship between SCC and abnormal TSR was found, while decreasing where this relationship was insignificant. This requires further investigation in order to identify other factors that became relatively more influential during these periods; and lastly
- The superior performance of the top two deciles in terms of excess LIC, as well as the high proportion of “mega”-sized companies in those deciles, stands out. A study aiming investigating whether this is explained by labour market theory and talent attraction is of interest.

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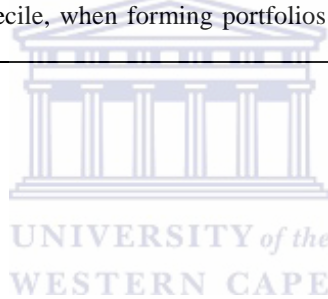
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## APPENDIX A

**Table 38: Summary of findings**

No.	Hypothesis	Result
H <sub>1</sub>	The distributions of the level of CEO total compensation of companies in four different size groups (based on revenue) are the same.	Reject
H <sub>2</sub>	The distributions of the level of CEO total compensation of companies in four industry sectors are the same.	Accept
H <sub>3</sub>	The correlation between LIC and TC is stronger than the correlation between SCC and TC.	Accept
H <sub>4</sub>	A positive relationship between excess total compensation (TC) and abnormal future total shareholder return (TSR) exists.	Reject
H <sub>5</sub>	A positive relationship between excess short-term cash compensation (SCC) and abnormal future total shareholder return (TSR) exists.	Accept
H <sub>6</sub>	A positive relationship between excess long-term incentive compensation (LIC) and abnormal future total shareholder return (TSR) exists.	Reject
H <sub>7</sub>	The companies with CEOs in the top decile of the relative proportion of LIC to TC, earn higher equally weighted future abnormal TSR than the companies of the CEOs in the bottom decile, when forming portfolios at the start of the calendar year.	Reject



## APPENDIX B

**Table 39: Descriptive statistics on compensation components for companies of the “mega” size group (revenue > R100 billion)**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	16 019	11 866	27 885	29 815	57 700
Median	15 574	12 748	27 561	31 092	55 785
Std. dev. (P)	5 909	7 499	11 381	26 034	27 571
Std. dev. (S)	6 017	7 637	11 590	26 512	28 077
Maximum	26 088	27 230	52 842	130 454	136 713
Minimum	5 300	-	5 300	-	5 586
% of sum	28%	21%	48%	52%	100%



**Table 40: Descriptive statistics on compensation components for companies of the “large” size group (revenue: R40 billion to R100 billion)**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	11 331	4 794	16 124	9 003	25 127
Median	7 931	4 824	14 524	7 351	22 503
Std. dev. (P)	9 645	3 757	9 273	7 539	12 083
Std. dev. (S)	9 727	3 789	9 351	7 603	12 185
Maximum	50 001	14 908	50 001	30 925	55 099
Minimum	3 501	-	5 013	-	5 614
% of sum	45%	19%	64%	36%	100%

**Table 41: Descriptive statistics on compensation components for companies of the “medium” size group (revenue: R10 billion to R40 billion)**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	5 782	4 236	10 019	4 450	14 468
Median	5 576	3 612	9 213	2 304	13 146
Std. dev. (P)	2 303	3 861	4 623	6 881	9 863
Std. dev. (S)	2 314	3 879	4 646	6 914	9 911
Maximum	15 251	16 234	25 877	48 964	70 547
Minimum	1 658	-	2 184	-	2 184
% of sum	40%	29%	69%	31%	100%

**Table 42: Descriptive statistics on compensation components for companies of the “small” size group (revenue < R10 billion)**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	4 621	3 260	7 881	2850	10 731
Median	4 166	2 291	6 275	2133	9 396
Std. dev. (P)	2 313	3 597	4 497	3688	6 521
Std. dev. (S)	2 329	3 622	4 529	3715	6 567
Maximum	10 905	16 575	21 500	17158	31 856
Minimum	1 128	-	1 431	-	1 431
% of sum	43%	30%	73%	27%	100%

## APPENDIX C

**Table 43: Descriptive statistics on compensation components for companies of the Basic Resources industry group**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	9 561	5 059	14 619	10 221	24 840
Median	8 029	3 519	11 816	5 967	18 377
Std. dev. (P)	5 440	4 898	8 365	12 943	19 757
Std. dev. (S)	5 484	4 938	8 433	13 049	19 918
Maximum	26 088	22 422	42 161	58 421	100 582
Minimum	3 070	-	3 876	-	4 816
% of sum	38%	20%	59%	41%	100%

**Table 44: Descriptive statistics on compensation components for companies of the Financial Services industry group**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	5 475	4 486	9 961	9 214	19 175
Median	5 118	3 851	9 291	3 668	13 773
Std. dev. (P)	3 349	4 378	6 050	17 528	20 194
Std. dev. (S)	3 373	4 410	6 093	17 655	20 340
Maximum	19 122	16 575	27 603	130 454	136 713
Minimum	1 190	-	1 431	-	1 431
% of sum	29%	23%	52%	48%	100%

**Table 45: Descriptive statistics on compensation components for companies of the Industrial industry group**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	6 257	4 952	11 208	3 970	15 178
Median	5 610	4 828	10 593	3 335	12 806
Std. dev. (P)	3 147	4 082	6 029	4 081	8 768
Std. dev. (S)	3 192	4 140	6 114	4 139	8 893
Maximum	13 659	16 229	29 532	17 045	42 795
Minimum	1 658	-	3 751	-	3 751
% of sum	41%	33%	74%	26%	100%

**Table 46: Descriptive statistics on compensation components for companies of the Services industry group**

	Total guaranteed package (TGP) R'000	Annual cash bonus (CB) R'000	Short-term cash compensation (SCC) [TGP + CB] R'000	Long-term incentives (LIC) R'000	Total compensation (TC) [SCC + LIC] R'000
Mean	9 016	5 116	14 132	6 511	20 643
Median	5 867	3 862	10 130	2 365	13 877
Std. dev. (P)	8 884	5 656	11 592	10 838	19 452
Std. dev. (S)	8 931	5 686	11 653	10 896	19 555
Maximum	50 001	27 230	52 842	50 220	86 916
Minimum <sup>1</sup>	1 128	-	1 751	-	3 150
% of sum	44%	25%	68%	32%	100%

<sup>1</sup> This excludes one CEO who did not earn any compensation during the period 2011 to 2013