CEO Compensation Structure and Bank Risk Taking

A study of CEO Compensation Structures in relation to Bank risk taking in the South African Banking Sector

BUSN79

Degree Project in Accounting and Finance, Corporate Finance
Master Level

Spring 2017

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Abstract

Title: CEO Compensation Structure and Bank Risk Taking. A case study of CEO Compensation structures in relation Bank risk taking in the South African Banking Sector.

Seminar Date: 29th May 2017 ***Course:*** BUSN79 Degree Project in Accounting and Finance, Corporate Finance, Master Level

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Key words: CEO compensation, Annual Salary, Bonus incentives, Equity based compensation, Moral Hazard, Agency theory, Bank risk taking, Deposit Insurance, Regression analysis.

Purpose: The aim of this research is to determine whether CEO compensation structures promote increased bank risk taking among local banks in South Africa. The study further analyses the effects of equity based compensation and the effects of the presence of deposit insurance schemes on encouraging risk taking following regulatory reforms made in 2008.

Theoretical Framework: This follows the incentive alignment proposition by the Agency theory and the moral hazard hypothesis in relation to optimal contracting. We discuss the presence of deposit insurance system and take into consideration the insurance system and CEO compensation regulation within the South African context. Finally, we analyze literature on the design of compensation structures, components and their individual relations to risk taking as identified by findings of previous studies.

Methodology: The study uses the z-score statistic to obtain a measurement of bank risk taking. The measurement of risk is subsequently included as a dependent variable with bank charter values, the proportion of debt to total liabilities the bank share of banking sector assets as explanatory. Diagnostic tests and correction measures were applied to the model to ensure accuracy and consistency.

Empirical Findings: The regression analysis identifies insignificant relationships between bank risk taking, annual salary, bonus and equity compensation and therefore derive that CEO compensation structures within local South African banks do not promote risk taking. We do however identify positive relationships between bank risk taking and bank charter values and the bank share of banking sector assets. Based on a 95% confidence interval.

Conclusions: In South African local banks, CEO compensation structures do not promote risk taking. We therefore suggest they are not used as incentive alignment tools but rather as an extraction of rent as discussed in the managerial power theory. Through the bank share of banking sector assets we identify the presence of moral hazard brought about by the 'too big to fail' concept. With a broad and implicit deposit guarantee, larger banks take advantage of the possibility of contagion risk upon bankruptcy and engage in riskier decisions. This moral hazard could be eliminated through the introduction of explicit deposit insurance.

Table of contents

Acknowledgements

Firstly, we would like to thank our supervisor Maria Gårdängen for her valuable insight, guidance and advice during the course of this thesis. We also wish to thank our family and friends for their support throughout the duration of this program.

Lund, May 2017.

Chapter 1: Introduction

This chapter discusses the general background of CEO compensation and risk taking within the banking sector. The problem discussion identifies the research justification whilst the research questions, purpose, scope and limitations determine the direction of the research. We finally conclude with the thesis structure.

1.1 Background

In their paper on regulating bankers' pay, Bebchuk and Spamann (2010) noted that increased risk-taking in the financial sector played an important role in the global financial crisis that commenced in 2008–2009. Besides that, there had been a widespread concern that executive compensation packages have encouraged risk-taking with various researchers having empirically proven this relationship such as John et al (1995). Chen et.al, (2006) gives additional insight on the fact that despite operating within restrictions imposed by regulators, the discretion in making certain decisions like setting executive pay packages, can have a significant impact on the risk appetite of the institution. In regards to these insights, governments and various regulatory bodies have introduced steps and various regulatory actions as a means of restricting executive remuneration to curb high levels of risk taking. However, without specific guidelines on the incentive alignment design, and noticeable gaps in the regulatory framework, moral hazard is still highly likely and the availability deposit guarantees could also play a role in risk shifting. Reflecting on the vulnerability of the financial sector, the repercussion on the overall economy cannot be overemphasized especially for a country like South Africa. Therefore, this thesis endeavours to identify whether CEO compensation structures; both fixed and variable components, is likely to promote increased risk taking behaviour within the South African banking sector.

1.2 Problem Discussion

Following the global financial crisis in 2008, there was an increased focus on CEO compensation structures in the US and their role in promoting risk taking that contributed to the crisis.

Segerström (2008) identified the role that CEO compensation structures played in motivating increased risk taking without taking into consideration the risks associated with the decisions made. Coles et al (2003) further discusses CEO compensation structures and the association with relatively riskier investment and capital structure policies within the firm. Within these policies the risk appetite of the firm is determined and therefore this discussion forms a basis on the research of CEO compensation structures in relation to risk taking decisions. This is in addition to compensation packages being designed to profit from gains and be insulated from losses, Aureli and Salvatori (2012) criticized the performance targets used for incentive alignment. The study discusses that the traditional compensation structure called for an alignment to performance indicators that did not include risk factors despite performance measures being subject to uncertainty and risk. The identification of these flaws in the compensation structure led to subsequent global regulatory reforms to enable adequate monitoring of CEO compensation structures by the regulatory bodies.

The South African financial sector has been subjected to heavy criticism from politicians, labour unions, and the media on the high CEO compensation packages in comparison to employee minimum wage standards adopted nationally. Based on the fact that South Africa has one of the largest disparities between CEO incentives and average employee pay, as identified in the World Bank Gini coefficient (World Bank, 2017), these results fuel the already controversial debate. The South African banking sector reports three main compensation components being annual salary, bonus incentives and equity based compensation. PricewaterhouseCoopers (2016) in their analysis of the total guaranteed pay for CEOs in South Africa, identified that the guaranteed pay in the financial sector was more variable than other sectors. Aureli and Salvatori (2012) also identified that variable components of CEO compensation packages tend to be more focused in creating short-term market returns than in serving shareholder interests of long term value creation

In addition to analysing each of the above compensation components, we are drawn to analyze equity based compensation to get more insight on CEO behaviour as shareholders themselves and the effect on management decisions. Designed as an incentive alignment package to motivate CEOs to pursue profitable ventures, equity based compensation introduces a measure that aligns management decisions to shareholder interests and thereby minimizing the agency problem.

Jensen and Meckling (1976) however discuss the double moral hazard behaviour brought about by the introduction of this incentive that could either lead to increased risk taking decisions to generate a higher market return or risk aversion and engaging in conservative decision making to secure their interests. Bebchuk and Spamann (2009) highlight that these management decisions are normally made to impact stock market returns over the short term and therefore encourage risk taking to improve short term results. It is also important to consider the power and interests of other shareholders in determining the level of risk taking within a firm. Laeven et al (2007) in their study highlighted that shareholder interests are best served through increased risk taking and that the higher the influence shareholders have on management decisions, the higher the risk taking measures. Despite the fact that increased risk taking may serve shareholders best, we also take into consideration the regulatory perspective that requires adequate risk management to ensure that risky decisions do not affect the sector and overall economy performance.

Additionally, moral hazard has been identified resulting from the presence of deposit insurance schemes adopted. Seen as a protection scheme for depositors in the event of bankruptcy, Merton (1977) discusses the level of moral hazard from the financial institution's point of view and therefore introducing the incentive for risky investment decisions in order to receive implicit transfers from the deposit insurer. Additionally, the likelihood of increased risk taking increases through the presence of deposit insurance because it introduces less control incentives for the depositors and debtholders in managing liabilities. Caprio and Levine (2002) discuss the effects of the presence of deposit insurance shown through increased financial leverage and a larger portfolio of small scale depositors rather than the use of wholesale deposits. In regards to South Africa, the country currently has an implicit deposit guarantee in place but there is also an ongoing debate of introducing an explicit deposit guarantee scheme. On the other hand, the inclusion of substantial bank premiums to support the explicit deposit insurance scheme is said to have the role of reducing the level of moral hazard (Gundogdu, 2015). Despite not having a formal explicit deposit insurance scheme in place, the South African Reserve Bank has in the past used public funds to bail out banks such as Regal Bank in 2002 and African Phoenix Bank in 2013 that went bankrupt because of misappropriated deposits. Additionally, the Financial Sector Assessment report by the International Monetary Fund, (2015) discussed the fact that since the South African Banking sector has a highly concentrated structure, many banks are considered

'too big to fail' and would still have to be bailed out to prevent contagion within the sector. Five (5) of the sampled banks in this research hold about 90% of the total banking sector's assets and liabilities and therefore could potentially undertake increased risk taking and result in moral hazard behaviour because of the implied assurance of bail out from the government. This is detrimental from a regulator's point of view as it shifts the risk of default onto tax payers and the public sector.

Stathopoulos (2004) finds that the regulatory framework within which the firm operates also heavily influences compensation structures and consequent opportunities for risk taking. In South Africa, the Companies Act 71 of 2008, King code of Corporate Governance and JSE listing requirements are the primary regulatory tools that provide guidance on CEO compensation. Significant improvements have been made to the regulatory framework since 2008 forming emphasis around the inclusion of the shareholder in the CEO compensation design which addresses previous concerns on incentive alignment. However, this regulatory framework does not provide guidance on incentive alignment that would serve debt-holder and regulatory interests in taking into consideration various risk factors discussed by Aureli and Salvatori (2012). Further the Banking Act No. 94 of 2007 implemented by the South African Reserve Bank has no guidelines on the use of the current implicit deposit guarantee and therefore without conclusive guidance and a credible implementation structure, leaves room for unethical manipulation by the banks.

Taking these into consideration, the research revolves around the relation of the CEO compensation structure to bank risk taking, the effects of equity based compensation structures and the effects of the deposit insurance towards promoting risk taking. This is formulated in the research questions highlighted later on.

South Africa, being one of Africa's largest economies, is a likely benchmark for neighbouring African countries due to its mature financial industry. The high disparities between CEO compensation and employee pay, the current implementation structure of the implicit deposit guarantee and the regulatory framework governing CEO compensation structures make South Africa an interesting country to study for insight into this specific topic within an emerging market. It is quite important to note that this study comes at a time when South Africa is going

through an economic downturn with the downgrade in the sovereign rating and a slowdown in overall economic activity. In addition to the contribution of knowledge in this research area with a specific focus on South Africa, this study provides a perspective that could be considered by both the private sector and regulatory stakeholders on the effects that the current CEO compensation structure has on bank risk taking measures and how this could ultimately impact the sector. The conclusions and recommendations highlighted in Chapter 6 could therefore be adopted for discussion on suitable measures to further regulate CEO compensation within South Africa.

1.3 Research Questions:

a). Do CEO compensation packages have influence on overall bank risk taking in the banking sector?

b). Do Equity based compensation packages encourage risk taking and pave way for moral hazard?

c). Does the presence of deposit insurance pave way for moral hazard among CEOs?

Studies done by Laeven and Levine (2006), John, Mehran and Qian (2008) and Brewer III, Hunter, and Jackson III (2004) find a relationship between executive compensation and bank risk- taking. However, most studies on this topic are based on banks in the US and other developed countries. With this thesis we seek to answer the above questions with focus on South Africa, which though considered an emerging market, is representative of the developing economy of Africa.

1.4 Research Purpose

The main purpose of this thesis is to investigate the relationship between CEO incentives structures, and risk taking in local banks in South Africa, taking into consideration the recent regulatory changes implemented in 2008. Chen, Steiner and Whyte (2006) particularly associate

equity-based compensation with risk and investment opportunities. With this in mind, we further seek to study effects of equity based compensation on bank risk taking and take into consideration whether the risk appetite of a local South African bank is determined by the presence of deposit insurance. Based on this, we endeavour to provide more insight into whether CEO compensation packages promote risk taking.

1.5 Scope and Limitations

We focus our study exclusively on banks domiciled and incorporated in South Africa and consequently exclude other financial institutions namely; non-depository credit institutions (credit and mortgage companies), Micro-finance Institutions, Insurance companies, Security brokers and dealers, and exchanges i.e. (investment bankers). Since South Africa is an emerging market, we recognised the fact that we might not be able to get information/data prior to disclosure requirements implemented in 2008, therefore we limit our time period to 2009-2015. Our study is also limited to publicly available information on the banks in our research sample accessed through publicly used software and respective annual reports.

1.6 Thesis Structure.

The thesis is organised as follows; In Chapter 2, we have the literature review, based on which we develop research hypotheses. In Chapter 3, we discuss the methodologies employed. In Chapter 4, we present and interpret the results from the empirical study. Chapter 5 will cover the subsequent discussion based on the empirical analysis, and lastly Chapter 6 concludes the thesis. Additional information, which provides further detailed insights into the results of the study, is included in the appendix.

Chapter 2: Literature Review

This chapter seeks to analyse existing literature to determine a relevant theoretical and hypothesis development framework. We delve into the analysis of the use of management contracts as a solution to the agency problem, the moral hazard problem in optimal contracting methods and specific compensation structure elements. Critical findings from previous empirical studies are highlighted for a deeper understanding before finally concluding with the main points of the discussion.

2.1 Economic Theories on Shareholder-Management Conflict of interest

Executive compensation contracts emerge from the Agency theory as an effective tool of resolution to the classic shareholder management conflict of interest problem. This poses as a method to align the interests of shareholders in obtaining a market return for their investments, with the CEO's goal towards personal gain. The Agency theory highlights incentive alignment and adequate monitoring tools as the two most effective strategies to align shareholders interests with that of management. Below we discuss the details of the agency theory and what it purports specifically in relation to compensation contracts. We then analyse the stewardship theory as a contradicting theory and their recommendations on effective adequate tools in comparison to compensation contracts.

2.1.1 The Agency Theory

Jensen and Meckling (1976) discuss the agency theory and the conflicts of interest identified between shareholders and management; known as the principal and agent respectively. The basis of this conflict stems from the fact that both parties are utility maximizers and therefore would support decisions and opportunities that would benefit their personal interests. This goes in line with the level of management ownership claim; the less ownership management has of the firm, the less the motivation to devote significant effort towards profitable ventures. As a means of minimizing this divergence of interests, the agency theory recommends appropriate incentive alignment through the use of adequately designed compensation packages.

Ortiz-Molina (2007) further goes on to analyze the two crucial agency costs that influence the

structure of the compensation package. The **agency cost of equity** encourages the use of debt as a means of mitigating the shareholder-management conflict through inducing additional monitoring from lenders and subsequently reducing the free cash flow problem. In order to minimize the agency costs of equity, compensation packages may be structured in a way that would encourage increased leverage as key performance indicators acting in the best interest of the shareholder; encouraging an increased risk in the overall investment decisions of the firm. The **agency cost of debt** however introduces the shareholder-debt holder conflict of interest into consideration of both investment decisions and the design of optimal incentives for management. This arises from evidence identifying that when management is aligned to shareholder interests, investment decisions made benefit the shareholder at the expense of the debt holder. As a recommendation Ortiz-Molina (2007) suggests that management incentives should be lowered as a means of reducing the agency cost of debt, however at the expense of the agency cost of equity. Based on this discussion, management incentives that do not take into consideration the shareholder – debt holder conflict of interest are likely to be aligned towards increased financial leverage. A balance in the incentives and performance indicators would have to be achieved to ensure that investment decisions benefit both the shareholder and debt holders. As an important consideration, we note that although shareholders may prefer a riskier portfolio to generate a return, the increased risk is at the expense of other stakeholders such as debtholders and regulators. Even though an optimal level of risk taking can not be strictly defined, the analysis of the study relates the findings to the three main stakeholders being; shareholders, debtholders and regulators.

2.1.2 Theoretical approaches to analyzing the effectiveness of CEO compensation

To determine a true relationship between compensation packages and other variables relating to firm decisions, the effectiveness of the management incentives would need to be analyzed. Bebchuk and Fried (2003) discuss two approaches, which we take into consideration in our research and ties to the conclusions derived from the analysis.

The **optimal contracting approach,** specifically derived from the agency theory, recognizes the agency problem and therefore assigns the board of directors the responsibility of designing adequate incentives that are aligned to the shareholders' interests. Bebchuk and Fried (2003) discuss these alignments being done either through arms-length bargaining with the CEO or

through market standards set. The emphasis on incentive alignment in this approach therefore may result in higher compensation packages for CEOs, provided the motivation is towards relevant incentives that enhance shareholder value (Jensen and Murphy, 1990). The limitations identified with this approach is the fact that the board may also be subject to the agency problem and hence undermining the ability to effectively address the divergence of interests between shareholders and management (Bebchuk and Fried, 2003). Further, because of the nomination process of board of directors and their lack of access to independent information, the level of influence held by the CEO plays a major role in determining the incentive structure.

Bebchuk and Fried (2003) also discuss the contesting **managerial power approach** where executive compensation is also viewed as part of the agency problem. It suggests that managers have a substantial influence over the design of their compensation and therefore viewed as the 'extraction of rent' rather than a form of incentive alignment. This approach also introduces the element of outrage costs and constraints that determines that the adoption of a compensation structure as favourable based on public perception. In response to outrage costs, camouflage is used as a means of minimizing actual outrage costs and legitimizing the extraction of rent, giving rise to moral hazard (Bebchuk and Fried, 2003).

With respect to the banking industry, Laeven et al (2007) identify a significant positive relationship between bank risk taking and the power of shareholders and the incentives towards their interests. The study further identified that the relationship between the bank risk and other variables; capital regulations, deposit insurance, policies and restrictions on bank activities was critically dependent on corporate governance structures. This analysis confirms the earlier mentioned literature on the needed balance between agency cost of equity and agency cost of debt in ensuring optimal risk levels that suit both shareholders and debt holders. The effect of corporate governance structures also has a considerable influence on the effects of capital regulation on the overall risk taking. Whereas Kim and Santomero (1994) discuss the intended purpose of capital regulations to decrease risk taking in banks, Laeven et al (2007) provide contesting views that bank owners may compensate for the loss in utility resulting from stringent measures by having a riskier portfolio, therefore leading to an overall increase in the risk taking. This is further confirmed by Jensen and Meckling (1976) in their indication that "…where banking theory states that regulations affect the risk taking incentives of owners, corporate

governance theory suggests that the ownership structure affects the ability of owners to influence risk." These findings give adequate evidence on the already existing relations between corporate governance structures and risk taking in banks hence motivating our study

2.1.3 The Stewardship Theory

Although the agency theory is one of the most widely used management tool according to Madison (2014), Davis and Donaldson (1991) introduce a contradicting theory; the **stewardship theory,** where shareholder interests' are believed to be maximized by the shared incumbency of the roles between board chairman and the CEO. Both the agency theory and stewardship theory examine the relationship between the principal and management from a behavioural and structural perspective of solving the problem of conflicts of interests. Madison (2014) identifies that whereas the Agency theory recognizes cost minimization and greater efficiencies as the desired outcome, the stewardship theory concentrates on maximum firm performance in the form of sales, growth and profitability. The theory therefore suggests that a steward would behave in a pro-social manner that would be aimed at the interest of the principal and therefore serving the organization. The essence of the stewardship theory is based on the choice to serve the principal's interests based on the intrinsic motivation, high identification and personal power (Madison, 2014) rather than the use of performance contracts as an incentive alignment tool. The strong sense of membership therefore illustrates that steward managers are motivated through intangible higher order awards. Davis and Donaldson (1991) discuss performance variation and firm decisions as dependent on the organizational structure rather than the compensation package and performance contracts. In their research, they provide empirical evidence on significant market returns being achieved in firms where the CEO held the duality role in comparison to firms with an independent board. From this their conclusion was therefore that through the empowerment of executives, interests are more aligned to that of shareholders. We take this view of incentive alignment into consideration in investigating performance contracts and compensation packages in relation to bank risk taking.

2.2 Moral hazard and Contracting hypotheses

Most bank manager remuneration schemes are tied to performance and at the same time such managers' actions may neither be observable by depositors nor shareholders since such institutions are known to be opaque to some extent as shown by studies done by various

researchers for example Jens Forssbaeck & Lars Oxelheim (2015), Sheng et al(2016).

In a nutshell, banks differ from other traditional non-financial firms in some important ways i.e. the institutions' primary responsibility apart from increasing shareholders wealth is to be able to transform liabilities (deposits) into assets (loans) while being constrained by regulations regarding capital reserves. These actions may lead to high leverage among banks and with that there could result in a probability of default risk. The fact that deposits are normally insured, and that government guarantees provide a solution to potential bank runs, may give an incentive to CEOs to pursue inherent risks. Inherent risk taking could include among other things decisions that either increase or decrease bank asset value, however, the general expectation is seen to be a negative effect. The decrease in asset value not only affects shareholders but debtholders, regulators and the overall economy performance (Bebchuk and Spamann, 2010). Thus, both regulators and shareholders should monitor executive compensation that is in place in the banking industry due to the fact that there exists potential double moral hazard affecting both of them in regards to CEOs investment decisions (Mehran, 1995).Charles & Mathew (2016) gives insight on the role of Deposit insurance. In their paper, *Deposit insurance : Theories and Facts*, they point out that deposit insurance is designed to serve the public interest by mitigating systemic risk in the banking system through the reduction of liquidity risk. They also highlighted that deposit insurance schemes serves the private interests of banks, bank borrowers, and depositors, potentially at the expense of the public interest. O'Driscoll (1988) also discusses the need and purpose for deposit insurance initiated in the US banking system as a benchmark for the setups of subsequent deposit insurance structures globally. Firstly, the study discusses the risk of an individual bank failure which would make the bank incapable of paying off its depositors in full. Additionally, the failure of a bank considered 'too big to fail' may result in contagion risk that affects other banks within the industry. The creation of the Federal Deposit Insurance Corporation (FDIC) through the Banking Act of 1933 in the US was to primarily provide for the safer and more effective use of assets thereby avoiding bank runs and protecting payment mechanisms. An additional motive of the FDIC was to regulate interbank control within the banking sector and prevent the undue diversion of funds into speculative operations. These incentives established by the insurance system set in place therefore paved way for the regulatory framework and structure around deposit insurance (O'Driscoll, 1988). This therefore highlights that a set structure of the deposit insurance scheme is crucial in the formation of the regulatory

framework to re-enforce the structure in place. The study also discusses the insurance premium level where larger banks pay larger premiums however riskier banks of any size pay no more than conservatively managed ones. With this premium structure, O'Driscoll (1988) suggests that a level of risk taking is introduced which provides incentive to manage a riskier portfolio to increase their expected return. Therefore creating the moral hazard problem where the provision of the insurance diminishes the incentives to avoid risk.

Merton (1977) additionally shows that due to deposit insurance, banks have incentives to take risky investment decisions in order to receive implicit transfers from the deposit insurer. Bebchuk and Spamann (2009) further emphasise the risk shifting effect resulting from deposit guarantees; from management and shareholders to taxpayers. As a consequent result, riskier decisions seem likely to capture the full upside through profits, while losses are borne by the government as insurer of deposits if the bank goes bankrupt. The use of deposit insurance reduces the controlling incentives of depositors and debt holders and this may have an outright effect on the risk levels adopted by banks. ECB Report on Deposit Insurance, Moral Hazard and Market Monitoring (2004) investigates the relationship between deposit insurance and risk taking as an indication of the moral hazard problem. This relationship is discussed in relation to three factors being; bank charter values, effectiveness of monitoring by non-deposit creditors and the 'too big to fail' perspective. The Financial Sector Assessment Report by the IMF (2015) highlights the risk of a concentrated banking sector to the government in the event of a bankruptcy. With 5 banks being considered 'too big to fail', the South African Reserve Bank may be pressured into bailing out to prevent contagion risk. This insight brings us to our 1st hypothesis where we investigate the moral hazard problem caused by the presence of deposit insurance, taking the South African context into consideration.

H1. The presence of deposit Insurance increases risk taking.

Studies done by Jensen and Meckling (1976) point out that moral hazard in banks may be associated with a number of factors, i.e. compensation structure, value of deposit insurance etc. A CEO with a compensation package inclusive of equity based remuneration may tend to have double moral hazard behaviour. If a CEO is compensated through equity, he/she becomes a shareholder and this might in some instances impair judgement in important investment decisions. The fact that shareholders have residual claims may motivate CEOs to undertake

negative NPV projects and other inherent risks. At the same time a CEO may be risk averse and undertake conservative projects so as to protect their stake in a firm. One might even argue that bank executives holding common shares in the bank holding company would have an incentive to be more conservative and risk averse than would be in the interest of other common shareholders who have other diversified portfolios(Bebchuk & Spamann,2009), however this is yet to be determined. Chen, Steiner and Whyte (2006) argue that '' …as the option-based executive compensation increases and as the stock of option-based wealth grows, the executives face the same incentives as stockholders and, as such, will pursue strategies that increase bank risk'', studies done by Ju, Leland, and Senbet (2002) however, show that though depending on managerial risk appetite, certain options can induce both over and under investment relative to the optimal risk level for the firm. Bebchuk and Fried (2004) also points out that by enabling executives to cash large amounts of equity-based and bonus compensation before long-term consequences of their decisions on investments are realized, this provides incentives to focus excessively on short-term results and give insufficient weight to the consequences that risk-taking would have for long-term shareholder value.

Based on the findings of Bebchuk and Fried (2004), we aim to investigate the relationship between equity based compensation and risk taking in relation to the double moral hazard highlighted. This is therefore measured by the below contradicting hypotheses on whether equity based compensation either makes the CEO risk averse or engages in riskier decision making.

H2a: *stock compensation packages lead to CEO's risk aversion*

H2b*: stock compensation packages lead to CEO's overall risk taking*

These analyses stem from studies conducted by Saunders, Strock, and Travlos (1990) where they argue that shareholder incentives work in different directions with that of bank depositors and other stakeholders and therefore shareholders can increase their value by taking on additional bank risk. As highlighted earlier on the fact that a CEO is compensated through equity for a long time, may in some instances become a shareholder by building up his/her portfolio leading to pursuant of inherent risks in order to increase shareholders value.Prendergast (2002) also suggests that Equity-based compensation encourages CEOs to explore and undertake newer and more profitable investment opportunities to increase shareholder value

On the other hand, Smith and Watts (1985) and Haugen and Senbet (1981) suggest the use of equity based compensation to mitigate managers risk aversion to investing in risky positive NPV projects contracting hypothesis simply implies that firms with more growth, options are not highly geared. This is due to the difficulties associated in observing actions of firms with higher growth opportunities, and therefore such firms tend to use equity-based compensation to align managers' interest with that of the firm i.e. as sort of a monitoring tool.

2.3 CEO compensation structure

A typical CEO compensation structure in the banking industry differs significantly from the structure in other industries both in terms of total compensation and in terms of the relative importance of the individual elements that makes up the total compensation evidenced by Houston and James, (1995). Thus, remuneration packages may have various levels: *guaranteed package* (base salary, medical, and other local benefits) these are considered fixed, *one time off dependent variable package* (annual bonus based on performance), and long- term incentive plans (equity based incentives) which are basically *variable packages* (Frydman and Jenter, 2010). The financial reward system can be segmented as follows (21st Century Pay Solutions Group, 2010):

Figure 1: CEO Compensation Structure

Figure 1
Total reward

Source: 21st Century Pay Solutions Group (2010)
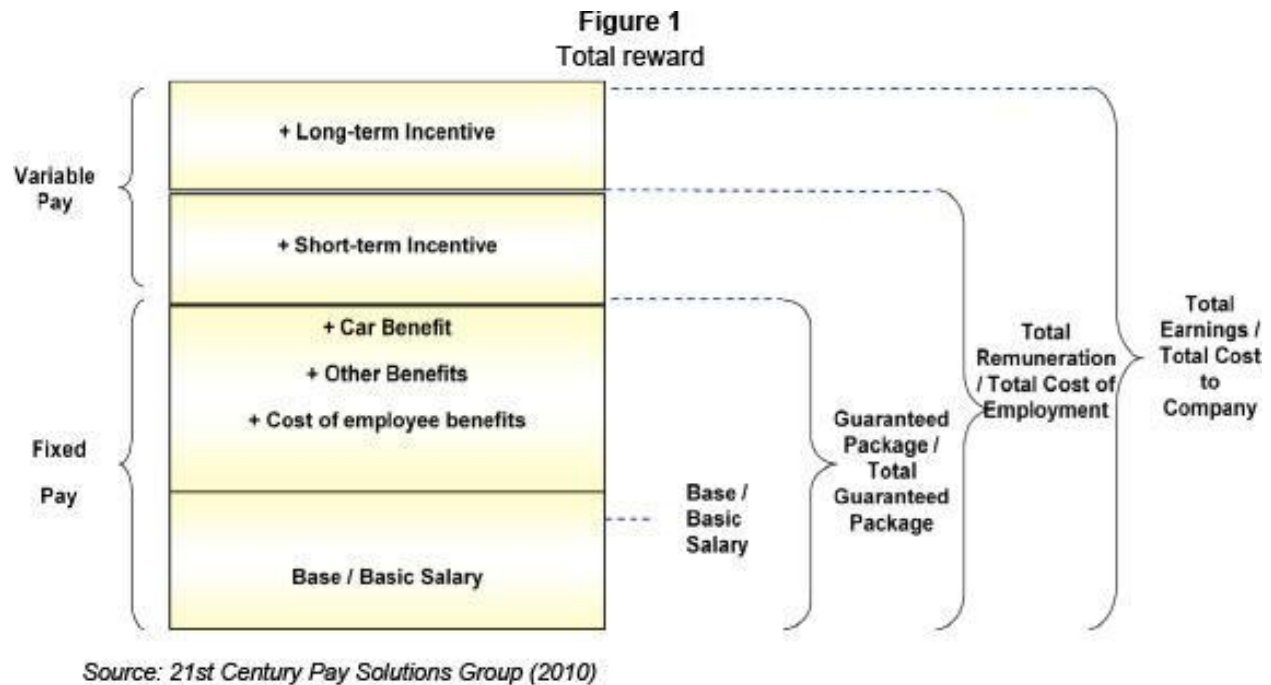
While this may be considered as a representative compensation structure, it is also important to note that not only are compensation practices heavily influenced by the regulatory framework within which the firm operates (Stathopoulos, 2004), but also other factors like the size of the firm, cultural differences, and human resource play an important role in determining how the overall structure will look like. Therefore the overall structure is important since it shapes how CEOs behave and additionally helps in determining what kind of CEOs firms attract (Jensen and Murphy, 1990). A good compensation structure must be designed to attract, retain and motivate top notch CEOs who will act according to the interest of shareholders.

With this in mind and the visual representation in Figure 1, we now analyse the individual components in terms of how they are used, and their effect on firm risk taking. It is also important to note that for this thesis we concentrate primarily on annual salary, short-term variable incentive (bonuses) and equity- based compensation because we believe that they each play an important role in eventual decision making by the CEO and thus affect the value of the firm.

2.3.1 Guaranteed Packages (Annual Salary)

As mentioned above this constitutes annual salary which is considered fixed and mandatory in

every compensation scheme, medical, and other local benefits like car allowance, house allowance, and club memberships, other perks like defined pension contributions, severance pay etc. Faulkender and Yang (2010) suggests that benchmarking against other similar firms operating in the same environment may be one of the ways to set such a package. However, other factors like CEO experience and previous performance, company policies regarding compensation, size of the company and/or culture may also be used. Market capitalisation also acts as a guideline in setting base salaries.

In relation to compensation packages, basic pay is a component that is independent from the performance levels of individuals or groups of employee. As they do not depend on bank performance, CEOs receive the same amounts in a certain period regardless of their contribution. Consequently they have no motivation to take risky projects but prefer risk-free investments which certainly bring stability to the bank (Bhagat & Bolton, 2013). Many large companies seek to limit CEO annual salary pay due to taxation effects, and provide increased remuneration in the form of either annual bonuses or long term incentives linked to company results. However, studies show that the majority of CEOs prefer high fixed salaries as attested in Hoffmann et al (2012) where they find that risk-averse managers rather favour a rise base salary than a corresponding rise in the value of variable compensation such as restricted stock awards.

Since valuation of other compensation elements normally depends on the annual salary, e.g. annual bonus payments which are usually expressed as percentage of annual salary, pensions, and gratuities, a change in the magnitude of fixed-income will automatically have an impact on salary-dependent components of the overall structure (Murphy 1999).

2.3.2 Short -Term Variable incentive (STVI)

As indicated above this part of the compensation plan constitute annual bonuses (usually in form of cash) that are awarded if performance exceeds a certain threshold or predetermined targets within the firm's short-term business strategy. Although this compensation plan is based on both qualitative and quantitative factors such as target measures, and can either be discretionary or subjective, usually it is based on outright performance and attainment of specific objectives. Execcomp.org. (2017) list such objectives as; increasing revenue or market share, improving profit margins, implementing a new corporate strategy, expanding to new markets, and completion of a critical project. Execcomp.org. (2017) also suggests that most annual incentives

include a three-tier structure; a 'threshold' level, below which no award is earned, a 'target level which is the executive's normal expected performance, and a 'stretch' component meaning that the company would have to obtain extraordinary results for the maximum incentive to be paid. All this this is done to encourage executives to aim for better results and maximise shareholders value.

Studies done by Moody's Investors Service Report (2005) show that compensation that is highly sensitive to short-term financial performance may create incentives for CEOs to manipulate short-term measures of a firm's performance even if such manipulation adversely affects long-term value of the firm. They also find that bonuses by themselves shed light on moral hazard. An example given by Execcomp.org (2017), where they highlight that, if the CEO's bonus depends entirely on operating income, the individual has an incentive to adopt aggressive accounting practices to maximize short-term financial results, even if in so doing, long- term financial performance is compromised. This could be an indication that CEOs could pursue inherent risks in order to capture the benefit from bonuses. Studies done by PricewaterhouseCoopers (2013) show that over the last decade, bonuses have increased significantly in South Africa from around 60% of guaranteed package, to nearly 200%. Salami (2009) and Fortin, Goldberg, et al. (2010) in their research shows that bonuses induce executive to take greater risks. However, Palia and Porter (2004) find that bonus levels and consequently salaries of CEO compensation are negatively related to bank risk, consistent with the theory of John et al. (2000) that bank risk (measured by the standard deviation of stock returns) decreases when managers' bonus and salary increase. Ayadi (2011) showed the evidence that annual bonuses negatively related to bank risk. Vallascas and Hagendorff (2013) also supported for this result by showing that banks where CEOs received large bonus payments showed lower level of default risk. They further separated "highly risky" banks out of "least risky" banks and found out that at highly risky banks, both CEO cash bonuses and stock option holdings increase bank risk-taking, whereas at the least risky bank, CEO bonuses lower risk and stock options do not induce risk-taking. This is further supported by Gormely et al (2012) and Guo et al (2013) who show that unless coupled with a form of equity based compensation, bonuses in general encourage increased risk taking and are not aligned to shareholders incentives.

In our study on South African banks, we also focus on this part of compensation and seek to find the relationship between bonus and risk taking and thus we aim to answer the following question,

which forms our third hypothesis.

H3: *Increase in bonuses increases overall risk taking*

2.3.3 Long-term Incentive Plans (LTIP)

These are equity based compensation plans, which are usually in form of share options and restricted share awards. Options give the right to buy shares in the future at a pre-specified price and are equal to the share price on the grant date. While on the other hand, restricted share awards are the outright grant of shares that are restricted in that they cannot be transferable and are subject to a certain vesting period. Once vested, they are actually equivalent to outright ownership of stock and as such owners enjoy all the other benefits of stock ownership, such as voting rights and dividends. During the vesting period CEOs are not allowed to sell their holdings. Additionally, if a CEO leaves the company during the vesting period, he or she has to forego the holdings (Execcomp.org, 2017). The main purpose of such long-term incentives is to reward executives for achieving certain or specific strategic objectives that will maximize shareholder value over a longer period time. The vesting period of such plans is between three and five years or up ten years especially for options. Long-term incentive goals may vary by company and based on various underlying performance measures such as total return to shareholders, earnings per share and return on assets. Just like bonuses, long-term incentives are also based on targets and usually have a stretch component to encourage executives to achieve superior performance. Huang, Wu, and Liao (2013) points out that including LTIP as part of overall compensation helps to motivate executives to work harder, since they will be sharing gains and losses with shareholders and that LTIP aligns the interests of shareholders with that of the executives.

Most research has been done on options as part of the compensation structure and their effect on CEOs risk preferences. Smith and Stulz (1985) holds that options provide incentives for managers to invest in risky projects and that they are also used as a means of corporate governance structure (Holmstrom and Kaplan, 2001). We also note that most of the criticisms are usually towards the use of option plans and the lack of equilibrium between costs and benefits of such granted options (Hall and Murphy, 2003). Studies done by Chin Yu and Thuan Luu (2014) also show that equity-based compensation induces managers to take value-enhancing risky

projects. They also find that ''...high equity-based compensation induces managers to undertake the projects with high risk, high stock compensation negatively influences a firm's risk taking; while high option-based compensation positively affects a firm's risk taking…''

Chen et al (2006) highlights that stock ownership and option-based compensation represents both current ownership and future ownership. While the current ownership may increase or decrease in value, the future ownership (stock options) has more volatility due to the leverage effect. This makes stock options one of the important variables for investigating risk related agency problems in banking. However, the banks which we focus on in our research sample, do not use options as part of the compensation plan, and therefore we focus on the value of restricted share awards instead.

Earlier on, under the moral hazard hypothesis we analysed the possible risk taking behaviour that a manager could have as a result of equity based compensation. The price volatility of shares tends to dictate the risk behaviour of CEOs because any price movement will directly affect them. However, it is held that share ownership solves the agency problem by aligning shareholders interests with that of managers and that after awarding of such, CEOs may consider themselves as part of the company and therefore all their undertakings will be to the mutual benefit of both. Smith and Watts (1992) note a positive relation between information asymmetry and the presence of growth opportunities and predict that firms with high growth opportunities tend to use more performance-based compensation such as cash bonuses or stock options. Yermack (1995) show that firms prefer or rather place more emphasis on long-term performance, favouring equity-based compensation. Studies done by Saunders et al. (1990) found a positive relation between insider ownership of top management and bank risk taking. In their hypothesis, they found that managers who own more shares in the bank have incentives to take higher risk than managers who own only small part. However, Chen, Steiner and Whyte (1998) actually found an opposite result. While such studies provide valuable insights, their findings are however conflicting though the differences can be explained by the agency and moral hazard hypotheses described earlier on.

2.4 CEO Compensation in South Africa

Preston (2013) studies in their report the CEO compensation structure within the South African

context taking into consideration the high inequality levels reported and criticized by politicians, labor unions and media. The study highlights the fact that inequality in remuneration packages pose a long term risk to allocations of capital and therefore having an effect on the levels of investment. In 2013, when the study was conducted, CEOs on JSE listed firms earned 300 times more than the average employee in South Africa with a high proportion of it being guaranteed pay. The results of this study suggests that this is a reflection of high inequality in the long term average pay rather than a one off anomaly resulting from variable results. World Bank (2017) further calculates the Gini Coefficient of the pay gap as 63.1, being the highest level of inequality globally.

In trying to further analyze the high CEO compensation packages, Preston (2013) takes into consideration the fact that a large number of companies in South Africa have international operations and therefore the pay gap may be influenced by this. They further highlight the large dominance of US companies operating within South Africa and argue that local executives may be using US executives as comparables. This comparison plays a role in determining CEO pay without necessarily taking into consideration the South African context and macroeconomic factors. In view of this, Preston (2013) recommend that US compensation not be treated as the global norm and therefore considering company performance, employee wages determined by labour laws and other macroeconomic factors in the design of suitable compensation packages.

Preston (2013) identifies an upward trend in the wage gap between CEO total compensation and average employee compensation looking at the years 2009 to 2013, rising from 120 times to 140 times respectively. A similar trend is noticed when analyzing the gap between CEO base salary and average employee compensation. The results therefore suggest that the trend may be more of a result of guaranteed pay than just variability in bonus incentives and share awards.

Further statistics analyze the proportions of bonus incentives in comparison to guaranteed pay within the banking sector. According to Preston (2013) more than 70% of CEOs receive variable compensation which was 50% greater than the base salary. Additionally, more than 50% receive variable compensation that is 100% of their base salary. The conclusions from these results are therefore that CEO performance targets within South Africa are low thereby enabling CEOs receive bonus incentives for not much effort. However the complex structure of the design of incentive schemes and lack of adequate disclosure lead to the recommendation of more

shareholder involvement in CEO compensation design.

2.5 Regulatory framework of CEO compensation in South Africa

The South African regulatory framework on compensation stems from the issues of inequality experienced during the apartheid period (Meinie and Nepali, 2011), therefore introducing framework focused on ensuring that senior management and board of directors are more representative of the greater society. To establish this, the King Code I of Corporate Governance was implemented in 1994, shortly after independence to stipulate the codes of conduct for acceptable practices in companies. Although the regulatory framework within the banking sector consists of the Companies Act 71 of 2008, JSE listing requirements and banking regulations, the King Code was identified as the most comprehensive publication that dealt with corporate governance issues (Meinie and Nepali, 2011). Subsequent amendments were made to the King Code in 2002 and 2008 with the King Code III being the most recent framework providing guidance. The overview of the King Code III provides a specific focus and regulatory improvements on the remuneration policy and its focus on enhancing shareholder value. An additional improvement brought about by the King Code III was an all-encompassing reporting framework to address the flaws of isolated reporting which did not benefit the societal dimension of company operations. This introduced the mandatory use of integrated reports instead of the previous focus on just annual financial statements. Lastly, the King Code III introduced the non binding shareholders vote on company's executive remuneration policy. Although this is a step forward at having more shareholder involvement in the design of compensation packages as recommended by Preston (2013), the company has no legal obligation to abide by the outcome of the vote.

2.6 Deposit Insurance in South Africa

South African banks currently do not have an explicit deposit insurance system in place. However should banks become unable to meet their short term obligations, depositors have the belief that they will be reimbursed by the government, highlighting more of an implicit deposit guarantee system(Cheng and Ellyne, 2011). Despite not having a formal explicit deposit insurance scheme, previous reimbursements have been made to depositors for failed banks such

as Regal bank and Saambou in 2002, and African Phoenix bank in 2013. The assumption of deposit reimbursement has therefore been consistent with past experiences. Additionally, the highly concentrated banking structure identified under the Financial Sector Assessment Report by IMF(2015) shows 5 banks holding about 90% of the total banking sector assets and therefore being considered 'too big to fail'. This structure therefore forces government to bail out such banks to prevent contagion risk in the event of bankruptcy (Cheng and Ellyne, 2011). The cost of insurance is currently borne by the public sector through the South African Reserve Bank. Currently the cost of insurance is borne by the public however with talks of shifting this to the private sector. As a means of introducing the explicit deposit insurance system, the National Treasury and South African Reserve Bank commenced discussions and debates in 2005 with banking players to formulate the proposed structure and implementation plan. This has however not been discussed further.

2.7 Critical findings on previous studies on CEO compensation influence on bank risk

One of the earlier studies by Houston and James (1995) sample 134 commercial banks in the Forbes survey and analyse the influence of executive compensation on risk taking in comparison to non banking firms. The study focuses on the moral hazard and contracting hypotheses discussed above that take into consideration the influence of the deposit insurance on management decisions and the influence of cross sectional differences in compensation across firms. In their analysis, they do find an insignificant relationship between equity based compensation and risk taking. However, they do identify that bank management receive less compensation in comparison to other industries but sensitivity to performance was much higher.

Later studies gave a contesting view from the findings in 1995. Bebchuk and Spamann (2009) in their qualitative study of US banks address critical factors that provide bank CEOs with the excessive incentive to taking risk, therefore implying a positive relationship. They base it on the fact that current compensation structures are designed to motivate short-term results and discuss the linkage between equity-based compensation and the capital structure encouraging higher leverage. With the deposit insurance in place there is less control from depositors and debt holders and therefore incentives do not attach adequate weight to the downside associated with risky strategies. In the conclusions Bebchuk and Spamann (2009) state that the corporate

governance structures in place such as monitoring, shareholder say on pay and restricted stock awards cannot eliminate the problem because of shareholder views of increasing returns by partaking in excessive risk taking behaviour.

Salami (2009) provides the same results from a different perspective; the Canadian banking industry where a significant positive relationship is identified between equity based compensation and risk and bank performance whereas there is an insignificant relationship with financial leverage. The study therefore concludes that Canadian banks are not affected by the moral hazard hypothesis because of the insignificant relationship with financial leverage.

Hoffman et al (2012) identifies a positive relationship between 'performance related pay' and total firm risk. Performance related pay components in this study were option awards, exercisable options, and un-exercisable options and restricted stock holdings. They further identified a positive relationship between equity based compensation and R&D and capital and acquisition investments, which highlights the direction of management investment decisions. Based on the analysis, the study concluded that the possession of company shares might lead to less risk aversion and therefore providing incentive for excessive risk taking.

Mai Le and Jaeger (2012) adds an interesting perspective by analysing individual executive compensation components based on a study of European and North American banks for the years pre and post global financial crisis. Their findings are that annual bonus pay and annual long-term compensation had a positive relationship with the risk-taking factor. The annual salary however results in decreasing banking risks in both the short and long term.

The view on annual salary effects is confirmed by Njogu et al (2017) in their study of Kenyan commercial banks depicting the view of an emerging market. There was no significant relationship between share ownership and risk taking. However fixed salary, allowances and bonuses were negatively related to risk taking.

2.8 Theoretical Conclusions

The analysis of existing literature gives insight into the agency problem evident in the banking sector that is generally more complex in comparison to other industries. Firstly, CEO compensation contracts were designed as incentive alignment tools to minimize the divergence of

interests between shareholders and management. Compensation structures may however be subject to flaws such as managerial power through the extraction of rent and the moral hazard problem that may eventually decrease asset value and hence bring a misalignment between management decisions and shareholder interests. In the South African context, high compensation packages is an increasing trend and although substantial regulatory improvements have been made to the framework since 2008 in the form of improved disclosure requirements and shareholder say on pay, there is still room for manipulation without adequate guidance and a robust monitoring structure. The flaw in the regulatory framework extends to the deposit insurance structure within South Africa. The risk is further emphasized through the concentrated banking sector that may increase the level of risk taking to obtain an insurance claim - moral hazard. Previous empirical research provide divergent conclusions as to whether CEO compensation promotes bank risk taking however the framework identified provides a platform for the research which is discussed in the subsequent chapters.

Chapter 3: Data and Methodology

This chapter describes the methodology used to perform the proposed research. We describe the data collection, sample size, time period under investigation, choice of variables and model specification, and finally discuss the main regression model.

3.1 Preliminaries

The extensive literature review provided us with a better understanding on the structure of the empirical analysis to carry out the research with additional guidance on the type of data needed to analyse CEO compensation in the context of bank risk taking. We therefore adapted the regression model to cater for the South African banking regulatory framework, data accessibility, and the specific investigation time period selected.

3.2 Research Approach

Based on the hypotheses derived from the theoretical framework, the aim of the research is to empirically identify a relationship between CEO compensation and bank risk taking, with considerations of the effects of the presence of deposit insurance schemes and equity based compensation in the South African banking sector. This quantitative study was conducted on the 10 local banks in South Africa for the years 2009 – 2015. Our hypotheses derived from the literature review are highlighted below:

H1*: The presence of deposit insurance increases risk taking.*
H2a: *stock compensation packages lead to CEO's risk aversion.*
H2b*: stock compensation packages lead to CEO's overall risk taking.*
H3: *Increase in bonuses increases overall risk taking*

3.3 Data Collection

The data used in the research is quantitative data on respective CEO compensation and performance financials of each bank collected from Bloomberg, DataStream software, and

respective companies audited annual reports. It is however important to note that we used publicly available data and therefore identified some missing data either due to lack of availability or lack of public disclosure by the respective banks.

3.4 Sample size

The study was conducted on the 10 local banks (listed and unlisted), incorporated and domiciled in South Africa based on the understanding that critical firm decisions are made locally. We decided to include the unlisted banks, enabling us to detect potential differences in the relationship between CEO compensation structures and bank risk taking between banks operating under same regulations but different capacities; therefore making a statistical inference on the full list of local banks in South Africa.

3.5 Investigation time period

The period 2009-2015 was primarily selected to understand the current state of the CEO compensation structure following improvements to the regulatory framework commencing in 2008. Additionally, CEO compensation data from the period prior to 2009 was not publicly available as disclosure requirements were only implemented in the year 2009.

3.6 Excluded Observations

Based on the understanding that the most crucial decisions regarding investment and capital structure are made locally at the respective headquarters, we excluded foreign branches and subsidiaries from the study as parent holding decisions may be influenced by other external factors outside the South African context.

3.7 Model Specifications

Some of the major sources of inspiration for our final model specification include among others; Houston and James (1990), Chen, Steiner, and Whyte (2005), and Brewer III et.al (2004) sources of inspiration to our final model specification.

3.8.1 Dependent Variable

3.8.1.1 Risk - Z Score

Measurement of Risk

In regards to measuring risk in banks, various researchers have employed different risk measures such as non performing loans and risk weighted assets to total assets (Shrieves and Dahl, 1992).However most recent research uses Z- Score to measure risk effects in banks (Laeven and Levine (2009), Barry et al (2011) ,Bouwens and Verriest, (2014)). The Z-Score has proven to be a popular measure of risk in banks due to its relative simplicity and the fact that it can be calculated using only accounting information. This in contrast to other risk measures makes it applicable to unlisted financial institutions. Since in its general form the Z score by itself is positively and highly skewed, it is recommended by Laeven and Levine (2009) to use the natural logarithm of the Z score which is normally distributed. Lepetit and Strobel (2015) also supports that log-transformed z-score is proportional to the log probability of insolvency, and thus the log of z-score is also insolvency risk measure. Houston et al. (2010), and Fang, Hasan, and Marton (2014) further support the inverse z-score as a proxy. In order to be consistent with the most recent research we therefore used the natural log of the Z-Score as a measure of risk in our thesis.

Bouwens and Verriest, (2014) define the Z score as "…the capital asset ratio plus the return on assets (ROA) divided by the standard deviation of the return on assets." It indicates the number of standard deviations below the expected value of a bank's return on assets at which equity is depleted and the bank is insolvent (Boyd et al., 1993). Due to the fact that we apply the natural logarithm to the z-score, a higher figure signifies a greater risk of insolvency.

$$Z - Score_{it} = \frac{ROA_{it} + CAR_{it}}{SDROA_i}$$

Equation1

Where

 ROA- returns on assets

33

CAR- is defined as the ratio of total equity over total assets

SDROA- represents each banks standard deviation of ROA

Researchers such as Bouwens and Verriest, (2014) and Barry et al (2011), and Köhler in Deutsche Bundesbank (2012) point out different components of the Z-score where the first component ROA/ SDROA measures asset risk and the second component CAR/SDROA measures leverage risk. The leading principle of the z-score measure is to relate a bank's capital levels to volatility of its returns, so that one can know how much volatility in returns can be absorbed by capital without the bank becoming insolvent. Normally, the volatility in returns is measured by the standard deviation of Return on Assets (SDROA) which is denominator of the Z-Score, while the numerator of the ratio i.e the ratio of equity capital to assets (CAR) plus ROA is based on the assumption that they will be available to support the bank if it remains in business, or in the case of loss to adjust the capital level downwards. The assumption is that a bank becomes insolvent when its capital level falls to zero. However this assumption may not be so realistic, as banks need a positive minimum level of capital to remain afloat. The main consequence of this measure is that a low-risk bank will have a high value of Z- Score, indicating that a large number of standard deviations of a bank's asset return have to go down for a bank to become insolvent (Li, X. & Malone, 2017).With this in mind one can therefore say that a lower value of Z-Score indicates higher risk of the bank. In nutshell, the components combined provides a measure of risk that is essentially a simplified distance-to-default measure i.e.it indicates the probability of insolvency and combines accounting measures of leverage, profitability, and volatility. Therefore it was the most appropriate measure of bank risk taking for our regression model as it was applicable to both listed and unlisted banks and could be applied to financial institutions.

3.8.2 Independent Variables

3.8.2.1 Annual Salary (ANSAL)

As discussed earlier on, this is the basic pay (fixed component) part of the CEO compensation and such is in fact based on regular appointment. For the purpose of this analysis it was taken as a proportion of total compensation.

$$ANSAL = \frac{Base\ salary_{j,t}}{Total\ Compensation}$$

3.8.2.2 Incentives/Bonuses (STIP)

Incentives/Bonuses mostly paid in cash, was taken as the proportion of the total compensation for the purpose of analysis.

$$STIP = \frac{Bonuses_{j,t}}{Total\ Compensation}$$

3.8.2.3 Equity based compensation -restricted share awards (EBC)

In the previous chapter we highlighted how Saunders et al. (1990) found a positive relationship between insider ownership of top management and bank risk taking. Moody's, (2005) evidenced conclusions that more recently awards of performance shares and restricted shares have gained prominence. With this in mind we considered the value of equity compensation as a proportion of total compensation for the purpose of this analysis.

$$EBC_{j,t} = \frac{Stock_{j,t}}{Total\ Compensation}$$

$$_{,\,,\,=}$$

3.8.2.4 Bank Charter Value (Tobins Q)

Demsetz et al (1996) defines a bank's charter value as the present value of profits expected in keeping the business ongoing. This compares the pricing power in loans, deposits and other markets with the expectation that banks with a higher pricing power would have a market value of assets in excess of the book value. Keeley (1990) and Demsetz et al (1996) use the measure of Tobins q as a proxy for bank charter values which offers the advantage of comparing banks with different sizes and provides a reflection of monopoly rent a bank may have. The equation is highlighted below was developed by James Tobin in 1969 shows the ratio between market value

and replacement value of the same asset.

$$Tobin's\ Q = \frac{E - L}{A}$$

Where:

E = Market value of equity

L= Total Liabilities

A= Book value of assets

3.8.2.5 Non-Deposit Creditor Monitoring Incentives (D_TL)

As adopted by the ECB report (2014), we take into consideration the monitoring incentives of the non-insured debtholders based on the understanding of the South African government responsibility to reimburse depositors. As stated by Caprio and Levine (2002), deposit insurance reduces the controlling incentives of depositors and debtholders and therefore we expect that a negative relationship between bank risk taking would be an indication of no presence of the moral hazard problem. The variable is calculated as shown below;

$$D\_TL = \frac{Debt}{Total\ Liabilities}$$

3.8.2.6 Too big to fail Concept (BTA_BS)

In investigating the level of moral hazard resulting from the presence of deposit insurance, we take into consideration the 'too big to fail' concept identified within the South African banking sector. As a measure of this, ECB Report (2014) adopts the measure in comparing the bank assets

to the country banking sector assets and conduct a regression analysis of this on bank risk taking. The expectation is therefore that a positive relationship would signify a level of the moral hazard problem as a higher in the overall share of the banking sector assets would translate in increased risk taking. The variable also allows us to control for the different sizes of banks as larger banks have a larger share of the banking sector assets. We determine the variable as below;

$$BTA\_BS = \frac{Bank\ Total\ Assets}{Banking\ Sector\ Total\ Assets}$$

Equation 6

3.8.3 GDP

In taking into consideration macroeconomic fluctuations, the GDP year on year growth rate is used as a control variable as demonstrated in Mai Le and Jaeger (2012). This caters for the effects these fluctuations have on firm performance and ultimately compensation structures. This also serves as way of isolating performance that solely relates to management decisions and the respective relationship with the compensation received.

3.9 The General Regression Model

Based on the above discussed variables, we adopted a regression model to investigate the relationship between CEO compensation and bank risk taking in both listed and unlisted local banks in South Africa. The regression is based on 7 explanatory variables regressed on bank risk taking. We also include GDP as a control variable to cater for macroeconomic effects within the selected time period.

3.9.1 Choice of the Regression Model

The data collected had both a time dimension and a cross sectional dimension which suggested panel data analysis under OLS assumptions to cater for heterogeneity and take into consideration both time and cross-sectional effects. It must however be noted that the small sample size serves as a limitation to the analysis. The regression analysis tests the relationship between CEO compensation and risk taking but additionally distinguishes between cash and equity based compensation in relation to adequate incentive alignment as specified in the Agency theory. Just like Hubbard and Palia (1995), the regression model

analysed both cash-based (salary and bonus) and equity-based compensation (value of restricted shares granted).

Therefore,based on the above, the model is highlighted below;

$$BANK\ RISK\ TAKING = \alpha_{i,j} + \alpha_1 CEOCOMP_{i,j} + \alpha_2 TOBINSQ_{j,j} + \alpha_3 D\_TL_{j,j} + \alpha_4 BTA\_BS_{j,j} + GDP_{rate} + \varepsilon_{it}$$

<div align="right">*Equation 7*</div>

Where $CEOCOMP = ANSAL + STIP + EBC$

<div align="right">*Equation 8*</div>

3.9.2 Methodological Problems

We had challenges in collecting data for the period prior to 2009 due to the unavailability of public information resulting in weaker disclosure requirements. This challenge therefore limited our sample size to 70 observations and therefore would limit the statistical inference to the local South African banks. Additional challenges observed included the lack of publicly available information within other African countries on CEO compensation packages. This therefore limited intentions to compare empirical findings in order to make a statistical inference on the African banking sector.

3.9.3 Validity

In confirming the validity of the data and regression model to the purpose of the research, we adopted models and variables used in previous research. To determine a suitable variable for bank risk taking, we noticed that the majority of previous empirical models focused on either asset risk or credit risk as a determinant of bank risk taking. However, taking into consideration that we have both listed and unlisted banks we adopted the z-score as used by Bouwens and Verriest, (2014). As inspiration for determining explanatory variables, we used previous studies such as Chen, Steiner and Whyte (2005) and the ECB report (2014).

3.9.4 Reliability

To ensure that the data collected was reliable, we used publicly available information downloaded from Bloomberg software. We noticed a few discrepancies during data collection and used audited company financials as supplementary. Missing data was however identified as evidenced by the unbalanced panel data set. The reliability of the methods used to test the hypotheses were done through a series of diagnostic tests as described in the subsequent chapter.

Chapter 4: Empirical results and analysis

This chapter presents the empirical findings of the regression analysis. We firstly discuss diagnostic tests conducted on the data set to support the validity of the regression estimator used and highlight the descriptive statistics of the selected variables. Finally, we present the results of the regression analyses and describe the relationships identified.

4.1 Regression Estimator

The regression model described in chapter 3 endeavoured to determine the relationship between bank risk taking and the identified CEO compensation components, bank charter values, the proportion of debt over total liabilities and the percentage of bank assets over the total banking sector assets. The regression was conducted on E-views 9.5 statistical software with the adoption of the Ordinary Least Squares (OLS) estimator and the corresponding OLS assumptions.

4.2 Diagnostic Tests

The complexity of the use of an unbalanced panel data set introduces various imperfections that could disregard the assumptions of the OLS estimator as an appropriate tool to determine the relationships sought. Below we discuss the issues present in panel data and the diagnostic tests, findings and correction measures applied to improve the efficiency of the OLS estimator.

4.2.1 Presence of Heterogeneity

Wooldridge (2003) discusses the common presence of heterogeneity in panel data stemming from the differences across the units being studied. Heterogeneity therefore results in inaccurate regression findings in the OLS pooled regression. Brooks (2014) highlights the fact that a pooled regression assumes equal intercepts for each firm and each year. Based on organizational and periodic differences, this may be an inappropriate assumption. We therefore tested for cross sectional and periodic effects for the regression to determine ways of getting more accurate results.

4.2.2 Redundant Fixed Effect – Likelihood Ratio Test

Using the Redundant Fixed Effect test, we tested for the presence of both cross sectional and period effects in the regression model to determine the necessity of catering for fixed effects. The test uses the Chi square and F statistics on restricted models of cross sectional and period fixed effects individually and the two way fixed effects model catering for both. Evidenced by the p values, we noted that the regression reflected the presence of cross sectional fixed effects while period fixed effects were insignificant. It should be noticed that through the use of the fixed effect model, the inclusion of a constant variable resulted in an error and therefore the control variable GDP had to be excluded. The results for the respective fixed effects tests are presented in Appendix 2.

4.2.3 Hausman-Test for Random Effects

A subsequent step was therefore to determine the choice between the fixed effects and the random effects model to cater for the cross-sectional effects identified in the regression model. We notice that due to the fact that the number of variables were more than the number of cross sections in the sample size selected, we were unable to carry out the Hausman-test of random effects on the E-views 9.5 statistical software used. However, in order to ensure that the effects identified were taken into consideration in the regression model, we chose to use the cross sectional fixed effects model. The choice of the fixed effect model used in the regression is the Least Squares Dummy Variable (LSDV) which is based on the inclusion of cross sectional dummy variables to estimate the coefficients using the OLS estimator.

4.2.4 Heteroscedasticity

The use of the fixed effect model gives rise to heteroscedasticity where variance of regression errors are not constant (Brooks, 2014). The presence of heteroscedasticity when using the OLS estimator, results in inefficiencies in determining coefficient estimates and therefore would need to be corrected for more efficient estimates. To correct this, we therefore made use of White robust standard errors to cater for the increased degrees of freedom brought about by the use of cross sectional dummy variables.

4.2.5 Endogeneity

In analysing the regression model, we took note of the fact that there is a possibility of endogeneity within the relationship between bank risk taking and CEO compensation as can be simultaneously derived. In using E-views 9.5 statistical software, endogeneity cannot be determined for unbalanced panel data without the use of appropriate instrumental variables that meets the independence and relevance requirements; independent of the error term and statistically relevant to the endogenous variable. In trying to determine a suitable instrumental variable we used existing literature and empirical research on the subject area. We were however unable to determine a suitable instrumental variable and therefore were limited in testing for endogeneity.

4.2.6 Non-normality Tests – Jarque Bera Test

After catering for heterogeneity and heteroscedasticity caused by the fixed effect model, we tested the normality of the regression residuals to determine whether it follows a normal distribution as specified in the OLS assumptions. The Jarque-Bera test analyses the skewness and kurtosis of the residual distribution based on the specifications of a normal distribution (Brooks, 2014). The findings of the regression portray that the residuals are normally distributed as evidenced by the p values that fail to reject the null hypothesis of non-normality. The distribution and results of the Jacque Bera test for the respective regressions are highlighted in Appendix 4.

4.2.7 Multicollinearity

Brooks (2014) discusses one of the implicit assumptions of OLS estimator being that explanatory should not be highly correlated with one another. Perfect multicollinearity deters the estimation of the coefficients in a regression analysis and therefore we would be unable to obtain the accurate relationships between the dependent and independent variables identified. We tested for multicollinearity using Variance inflation factors(VIF). Table 1 below presents the VIF results which were established to be 3.20 which is less than 10 and according to field (2009) there is no multicollinearity.

Table 1 VIF test for multicollinearity

Variable	VIF	1/VIF
BTABS	6.88	0.145260
TobinsQ	3.81	0.262155
ANSAL	3.45	0.289742
DTL	2.78	0.359944
Bonus	2.25	0.444181
EBC	1.84	0.544154
GDP	1.38	0.722107
Mean VIF	3.20	
Variable	VIF	1/VIF

4.3 Correlation analysis

Correlation coefficient values ranging between -1 and 1 measures the degree to which two variables are linearly related with the higher magnitude indicating higher degree of association between two variables (Njogu et al,2017). Tobin's Q was positively associated with risk taking being highest at 0.30 withe bonus and BTA_BS were both negative and quite small. The results distribution are highlighted at Appendix 2

4.4 Descriptive statistics

Table 2: Summary of Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
Z_SCORE	3.774670	4.027273	4.589057	0.946402	0.659428	68
ANSAL	0.461132	0.382645	1.000000	0.090241	0.280073	67
BONUS	0.346722	0.366500	0.753012	0.009722	0.151717	52
EBC	0.356967	0.370899	0.701492	0.065622	0.134917	33
BTA_BS	0.095495	0.014572	0.288695	0.000000	0.110431	70
TOBINS_Q	19.06828	1.166111	604.1019	0.000000	98.50090	70
D_TL	0.282441	0.177225	0.974918	0.000000	0.303427	70
GDP	1.746138	2.213259	3.284197	-1.538089	1.505076	70

Table 2 provides descriptive statistics which presents our proxy for bank risk taking (Z Score) and the explanatory variables (in regards to this thesis), and includes mean, median, standard

deviation, maximum and minimum of the said dependent and independent variables. Our final sample contains 10 banks, with various number of observations between them as our data was unbalanced. If the data was to be balanced, our total observations would have been 70 in each case.

Z_SCORE is the natural logarithm of Z score which measured bank risk taking in our sample. The high median of 4.02 compared to the mean gives an indication that on average most banks assumed risky behaviour, a strong indicator also being the maximum of 4.58.

ANSAL is the base salary of the fixed part of the total CEO package and is presented as a proportion of total compensation. The mean value of annual salary is 0.46 with a standard deviation of 0.28 and a minimum 0.09. The relative low median of 0.38 compared to mean suggests that a number of CEOs have very high base salaries. Also the maximum of 1.00 indicates that all CEO's(100%) get paid/ received their base salaries.

BONUS is the cash incentive paid to the CEOs and is also presented as a proportion of total compensation. The mean value of bonus is 0.34, with a standard deviation of 0.15 and a mean of 0.00.The high median of 0.36 compared to the mean may also suggest on average most CEOs receive bonuses at yearly indicated by the maximum of 0.75 i.e. 75%.

EBC is the proportion of equity-based compensation to total compensation and has an average value of 0.35 with a standard deviation of 0.13 and a minimum of 0.06 suggests that some CEOs either did not receive any stocks as part of compensation or rather received little in certain years. The maximum indicates that 70% received stock compensation during the sample period.

TOBINS_Q was used as the proxy for charter value had a median of 1.16 with a mean of 19.06 and a maximum of 604 with quite a high volatility. In equilibrium Q is normally equal to one however in this case with a median of 1.16 there is an indication that the market value is higher than the total asset value and that the banks may be overvalued. The high median may also give an indication of the difference in bank sizes with a high maximum reflecting the high monopoly rents earned by banks due to pricing power.

D_TL served as the proxy for non-depositors monitoring incentives, had a mean of 0.28, median of 0.177 with a maximum of 0.97 and standard deviation of 0.30 representing a high volatility. The high maximum may suggest that the non-insured depositors heavily rely on the government especially in the instance of a broad and implicit deposit guarantee set up. On the other hand , BTA_BS was the proxy for banks which are considered too big to fail. With a mean of 0.09, and a median of 0.01 we notice that on average most banks are not considered too big to fail. This however confirms that a few banks have the majority of the assets within the banking sector. The standard deviation of 0.11 highlights the less volatility and therefore confirms the monopoly within the sector

GDP was our control variable and the high volatility of 1.5 reflects the volatility in the economic performance and changes in the economic environment over the past 7 years. We think that banks may tend to face greater risk during periods of contracting economic activity.

4.5 Regression analysis

We present and analyse the results of the OLS regression providing a summary between bank risk taking, CEO compensation, bank charter value, the proportion of debt to total liabilities and bank share of the total banking sector assets. The results of the regression are identified and summarised in Table 2 below.

Table 3. Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ANSAL	-0.390946	0.288663	-1.354335	0.1915
BONUS	-0.301438	0.341441	-0.88284	0.3884
EBC	-0.411705	0.271543	-1.51617	0.1459
BTA_BS	10.78886	4.462053	2.417913	0.0258
TOBINS_Q	0.393402	0.138001	2.850713	0.0102
D_TL	-0.307323	0.168846	-1.820142	0.0845
C	2.463107	0.613851	4.012546	0.0007

Based on our sample and data, the regression highlights that CEO compensation; annual salary,

bonus incentives and equity based compensation are insignificant to bank risk taking in local South African banks. In relation to hypothesis 2a and 2b, we expected either a positive relationship or negative relationship between equity based compensation and bank risk taking as an indication of the double moral hazard problem discussed which could either result in risk aversion or increased risk taking. Additionally, hypothesis 3 was derived from previous empirical findings on a positive relationship between bonus incentives and bank risk taking, however this relationship based on the data of local South African banks is insignificant. We also notice in agreement to previous empirical studies that there is an insignificant relationship between annual salary and bank risk taking. The regression results further highlight a 5% significant positive relationship between the bank share of the total banking sector assets and risk taking; for 1 unit increase in the bank share of total banking sector assets, there is a 10.8 unit increase in bank risk taking. This is an indication of increased bank risk taking as a result of the 'too big to fail' effect currently discussed within the South African banking sector. Despite no formal deposit insurance scheme in place, being classified as too big to fail provides an implicit assurance of bailout in the event of a bankruptcy as a means of preventing contagion risk within the industry and overall economy performance. We also note a 5% significant positive relationship between Tobin's q; proxy for bank charter values and bank risk taking. As identified earlier, Tobin's q provides insight on specific bank monopoly power and therefore indicative of the pricing power a bank has. Based on the regression results, a 1 unit increase in bank charter value results in a 39% increase in bank risk taking. Although not considered as formal deposit insurance schemes, the results of the relationship between bank risk taking and the above two variables provide insight on hypothesis 1 where we expect the moral hazard problem resulting from the presence of deposit insurance. Lastly, we take note of an insignificant relationship between debt/total liabilities and bank risk taking. Seeing as deposit insurance reduces the controlling incentives of depositors and debtholders, we expected a negative relationship between debt/total liabilities and bank risk taking. The evidence for the sample size however highlights an insignificant relationship. This may however result from the fact that banks are highly leveraged institutions due to their line of business and therefore the level of debt may not be indicative of increased bank risk taking. The results of the regression analysis is further discussed and compared with the theoretical framework in the subsequent chapter.

Chapter 5: Discussion

In this chapter, we discuss in detail the regression results under each explanatory variable; CEO compensation, bank share of total banking sector assets, Tobin's Q and proportion of debt to total liabilities with respect to the theoretical framework derived under the literature review. We further discuss bank risk taking as a dependent variable and the implications of the above regression results in comparison to theory.

5.1 Annual salary

With regards to the framework of Agency theory by Jensen and Meckling (1976), and in regards to this thesis we took CEOs as agents who receive compensation from their principals; shareholders, for the risks taken in order to maximise the latter's interests. Contrary to Fortin, Goldberg, et al. (2010), who besides considering influences of bonus payments, also studied the effects of executive salary, where he showed that banks where CEOs being paid higher base salaries take less risk and also Hoffman et al (2012) who showed that risk averse managers prefer an increase in annual salary, the regression results show that annual salary doesn't contribute to bank risk taking .Since for most banks this portion of compensation is not related to the bank undertakings but rather it is the minimum pay to the CEOs for accepting the position in the bank and regular duties. Also on the fact that this component of CEO pay is fixed and may not be used to provide motivation to CEOs to undertake activities (which may increase risk) beyond their scope of work. We also recognise that annual salary which may be based on other factors such as tenure, firm size, education and experience, market rates, and other factors, and therefore such, in itself the basic pay may have no effect in risk taking. Faulkender et al (2010) also notes that annual salary may not be sufficiently linked to long term corporate performance.

5.2 Bonus

As seen from our results bonus incentives in our sample data there is no evidence of a relationship between bonus incentives and bank risk taking in South-Africa. As highlighted in the literature review earlier on, we note that over the last decade bonuses have increased significantly from around 60% to nearly 200% however our results indicate that despite such a significant increase, bonuses had no effect in bank risk taking. In deriving H3 we expected that such an

increase will have an effect on bank risk taking in South Africa in accordance to the conclusions of various researchers such as Salami (2009) and Fortin, Goldberg, et al. (2010) which identified that bonus incentives encourage excessive risk. Previous research and empirical findings have displayed divergent results such as research by Ayadi (2011) who showed that annual bonuses negatively related to bank risk therefore there is no specific ideal result. The results could however portray that the increase in bonuses over the last decade could be attributed to other factors which increased shareholder's interests.

5.3 Equity Based Compensation

Jensen and Meckling (1976) highlights that the less ownership management has of the firm, the less the motivation to devote significant effort towards profitable ventures. This discussion gives insight into the role that equity based compensation has in aligning management decisions to shareholder interests and therefore minimizing the agency problem. Earlier in the literature review we noted that CEO compensation may be designed to increase risk taking so as to generate more returns. Jensen and Meckling (1976) further discusses the double moral hazard problem arising from equity based compensation leading either to increased risk taking or risk aversion; highlighted in hypothesis 2a and 2b. Based on the regression analysis, we note an insignificant relationship between equity based compensation and bank risk taking. Although against our expectations, the regression results are consistent with the findings of Houston and James (1995) where there is no evidence of equity based compensation promoting bank risk taking. The study identifies that this is as a result of the fewer equity compensation incentives provided within the banking sector and therefore suggesting that management is induced through other mechanisms to encourage risk taking that would benefit shareholders. We notice fewer equity based compensation within the South African banking sector with only 5 local banks providing the incentive. Based on this, we derive the same conclusions as Houston and James (1995) in that because equity based compensation packages are rarely offered in the South African banking sector, there is no evidence of promoting bank risk taking.

The insignificant relationship between CEO compensation and bank risk taking suggest that the design compensation structures are not necessarily aligned to shareholder interests but may point more towards the extraction of rent as discussed by the managerial power theory given that such

incentives are increased substantially without the motivation to take on more risk-taking activities to generate a higher return.

5.4 Bank share of Total Banking Sector Assets

As highlighted in the literature, the South African banking sector is highly concentrated with 5 banks holding 90% of the total banking sector assets. This banking structure poses a risk to the South African Reserve Bank to bail out any of the 5 banks in the event of a bankruptcy to prevent contagion risk within the sector. Although South Africa has no formal deposit insurance scheme in place and very little public information on the implementation and regulatory framework around this, we use past incidences of bail outs where the risk was passed onto the taxpayer. The 'too big to fail' concept was therefore suggests the implicit assurance of bail out in the event of bankruptcy. The regression results highlight a significant positive relationship at a 5% significance level highlighting that the larger the share of the total banking sector assets, the more the level of risk taking. The results of the regression are therefore consistent with the ECB Report (2014) where they identify the 'too big to fail' concept as more of a concern where the deposit insurance is broad and implicit as has been identified in the South African context, therefore encouraging moral hazard behaviour. Because of very little public information on the structure and implementation of the current deposit insurance scheme, the regulatory framework around the implementation is ambiguous and hence giving little guidance. O'Driscoll (1988) further indicates that the introduction of an explicit deposit insurance scheme limits the scope of the safety net provided and additionally through the payment of premium rates reduces the moral hazard. As identified earlier by O'Driscoll (1988), the explicit deposit insurance scheme requires that larger banks pay higher insurance premium and therefore assisting in eliminating moral hazard behaviour resulting from the bank size and 'too big to fail' concept.

5.5 Debt/Total Liabilities

Banks, as highly leveraged institutions differ from other institutions as the main business is to increase shareholder wealth by being able to transform liabilities into assets which requires substantially more leverage than other institutions. Caprio and Levine (2002) discusses the two - fold effect resulting from deposit insurance; an increase in financial leverage and the tactic of spreading this risk over a large number of small scale depositors hence restricting control from

large scale depositors. The study further discusses the loss of control incentives by debt-holders and depositors resulting from the presence of deposit insurance. The ECB Report (2014) uses the share of debt to total liabilities as a proxy for uninsured debt and therefore determining the level of deposit insurance. Based on the regression results, we find an insignificant relationship between the share of debt and bank risk taking at a 5% significance level however a negative relationship is identified at a 10% significance level. This is inconsistent with results obtained in the EB Report (2014) where they find a significant negative relationship which suggests that subordinated debt may act as a market-based limit to moral hazard and increased risk taking

5.6 Bank Charter Value (Tobin's Q)

Bank charters are usually a good proxy for future existence of banks (Demsetz, 1996) Charter values have two effects on banks i.e. moral hazard effect and market rent effect. Previous studies done on the relationship between bank risk taking and bank charter value by various researchers such as Keely (1990) and Demsetz et al (1996) showed that most bank risk measures have significantly negative relationship with their charter value. He also argued that banks with high charter values may tend to rethink their risky investments due to the fact that when banks takes inherent risks they may tend to lose their charters. Therefore a negative significant relationship which portrays the Moral hazard effect between the two may actually indicate that banks may choose to avoid risk in order to protect their charter values (Keely,1990).This could portray banks in South Africa in such a way that they may risk losing their charter values in case they chose to pursue inherent risks by engaging in moral hazard behaviour that could result in a bank run. This could also be due to the fact that in South Africa there exists only implicit guarantees and the absence of the Explicit guarantees gives an incentive to banks with low charter values to pursue inherent risks as compared to banks with high charter values which have less incentives to take inherent risks under the implicit guarantees (ECB,2014).

Demsetz et al (1996) also gives insights on Market rent effect which has a positive effect on risk taking. Allen & Rai (1996) also found out the same i.e. the positive relationship between charter and risk taking. Our results show a significant positive relationship between the bank charter and bank risk taking. This therefore portrays a strong market rent effect. The results also show that banks in South Africa want to hold higher monopoly power and rent in order to retain control and attract investors and depositors and that banks they may choose not to engage in inherent risks in order to protect their monopoly positions in the market.

Chapter 6: Conclusion

This chapter concludes the research by comparing the results of the analysis to the research questions identified. We finally provide appropriate recommendations based on our findings and suggest possible areas of future research.

The purpose of this study was to determine whether CEO compensation structures promote risk taking within local South African banks. We additionally aimed to identify the effects of equity based compensation and the presence of deposit insurance on the overall bank risk taking for the sample banks in the research. Through the conducted regression analysis, we were able to determine relationships between bank risk taking, CEO compensation structures, bank charter values, proportion of debt to total liabilities and share of bank assets within the banking sector. We therefore conclude the research by answering research questions stated earlier in Chapter 1.

Firstly, the main aim of the research specifically focuses on the relationship between CEO compensation and bank risk taking. In order to assist our investigation, we tested the relationship against the individual compensation components in the South African context being; annual salary, bonus and equity compensation. Our findings highlight an insignificant relationship between bank risk taking and all three components of CEO compensation.

Annual salary, as discussed in the literature review is based on fixed factors such as experience, age and tenure and therefore for these reasons may not be related to the management decisions and consequent performance. The regression results on bonus incentives highlight a contradicting perspective to previous empirical studies such as Goldberg et al (2010) which may suggest that bonus incentives in the South African banking sector are not tied to performance and subsequently shareholder interests that are maximized through increased risk taking. Additionally, the research sought to further understand the double moral hazard problem from the use of equity based compensation as discussed by Jensen and Meckling (1976). The results however highlight no evidence of equity based compensation either promoting risk taking or creating risk aversion which may have resulted from the fact that very few banks within the sector offer this incentive and therefore minimizing the effect. Shareholders therefore may have instead resulted in using other mechanisms of promoting risks to ensure management decisions

benefit shareholder interests.

The increasing value in the CEO incentives (Preston, 2013) suggests a corresponding relationship with risk taking as a means of serving shareholder interests. The results of the study, contrary to this expectation, suggest that compensation contracts are being used extraction of rent highlighted under the managerial power theory rather than an incentive alignment tool. With this in mind, we tend to question the compensation contract as an adequate alignment tool to serve shareholder interests and therefore consider the stewardship theory as a more effective tool where more intangible and higher order mechanisms are adequate incentive alignment tools.

Lastly, the research aimed to identify whether there exists moral hazard in relation to the presence of deposit insurance. Earlier in the literature review, we identify the unique structure of the South African banking sector that presents the 'too big to fail' concept. The regression results identify that the larger the share of assets the bank has within the banking sector, the higher the level of risk taking. This is specifically identified under an implicit and broad deposit insurance scheme such as in the South African context and therefore suggesting that the introduction of an explicit deposit insurance scheme, would reduce the moral hazard problem especially by larger banks. The implementation structure and regulatory framework around the current implicit deposit guarantee is not publicly available and therefore leaves room for unethical manipulation and moral hazard behaviour by banks.

We also consider the relationship between bank charter value and bank risk taking which introduces the market rent effect through holding large capital reserves so as to maintain monopoly on rents and have control of the sector. Such high capital levels may also be used to increase the going concern (future expectations) of the said banks, and consistent with Demsetz (1996) banks with high charter values tend to reconsider risky investments because such risky investments may have impact on the charter value.

6.1 Recommendations

In light of this thesis and based on our findings we suggest a few recommendations for consideration:
- Based on the regression analysis finding, we notice CEO compensation contracts in South

Africa may not be adequate incentive alignment tools as they do not align with shareholder interests to have increased risk to generate return. We therefore recommend more structured regulatory guidelines around the design of compensation packages to mitigate the extraction of rent by management. We also recommend that shareholder say on pay should be binding and therefore improving alignment to shareholder interests.

- We recommend the introduction of the explicit deposit insurance scheme that would mitigate against the identified level of moral hazard resulting from a broad and implicit insurance scheme by providing a limited safety net and payment of insurance premiums to encourage caution and accountability.

6.1 Suggested Areas of Research

Based on the findings of the study, we recognize the inefficiencies of CEO compensation structure as an adequate tool in agency theory and therefore in determining its influence on bank risk taking. Therefore, following the stewardship theory discussed by Davis and Donaldson (1991) we suggest a study determining the relationship between organizational structure and risk taking.

Additionally, based on the findings on increased moral hazard behaviour resulting from the presence of a broad and implicit deposit guarantee scheme in place, it would be interesting for a study to be carried out that provides insight on the valuation of the current deposit scheme and the potential benefits through the introduction of an explicit deposit insurance scheme in South Africa.

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8.APPENDICES

Appendix 1 – List of Local Banks included in the sample

Bank
African Bank/ African Phoenix Investments
First Rand Bank
Capitec Bank
Ivestec Bank
Nedbank
Standard Bank
Grindrod Bank
Development Bank of Southern Africa
Bidvest Bank
ABSA Bank

Appendix 2- Correlation Covariance Matrix

Covariance Analysis: Ordinary								
Date: 06/18/17 Time: 07:35								
Sample: 2011 2015								
Included observations: 31								
Balanced sample (listwise missing value deletion)								
Covariance								
Correlation	Z_SCORE	ANSAL	BONUS	EBC	BTA_BS	TOBINS_Q	D_TL	GDP
Z_SCORE	0.082586							
	1.000000							
ANSAL	0.002881	0.056271						
	0.042259	1.000000						
BONUS	-0.004713	-0.016389	0.016200					
	-0.128837	-0.542820	1.000000					
EBC	0.003400	-0.012677	0.004669	0.014082				
	0.099689	-0.450328	0.309119	1.000000				
BTA_BS	-0.005800	-0.015691	0.007295	0.003586	0.011709			
	-0.186529	-0.611283	0.529668	0.279234	1.000000			
TOBINS_Q	0.075442	0.002130	-0.026338	0.005255	-0.063226	0.744364		
	0.304273	0.010406	-0.239846	0.051327	-0.677243	1.000000		
D_TL	0.002658	0.025716	-0.017001	-0.003861	-0.014026	0.053443	0.038102	
	0.047379	0.555366	-0.684275	-0.166693	-0.664062	0.317339	1.000000	
GDP	0.000182	-0.029430	0.019756	-0.057532	0.009243	0.007866	-0.013309	1.700672
	0.000486	-0.095133	0.119022	-0.371767	0.065497	0.006991	-0.052285	1.000000

Appendix 3 – Redundant Fixed Effect – Likelihood Tests

Redundant Fixed Effects Tests
Equation: Original
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	15.430409	(5,13)	0.0000
Cross-section Chi-square	60.032997	5	0.0000
Period F	0.622698	(6,13)	0.7096
Period Chi-square	7.831338	6	0.2507
Cross-Section/Period F	7.438871	(11,13)	0.0006
Cross-Section/Period Chi-square	61.600441	11	0.0000

Appendix 4– Hausman Test for Random Effects
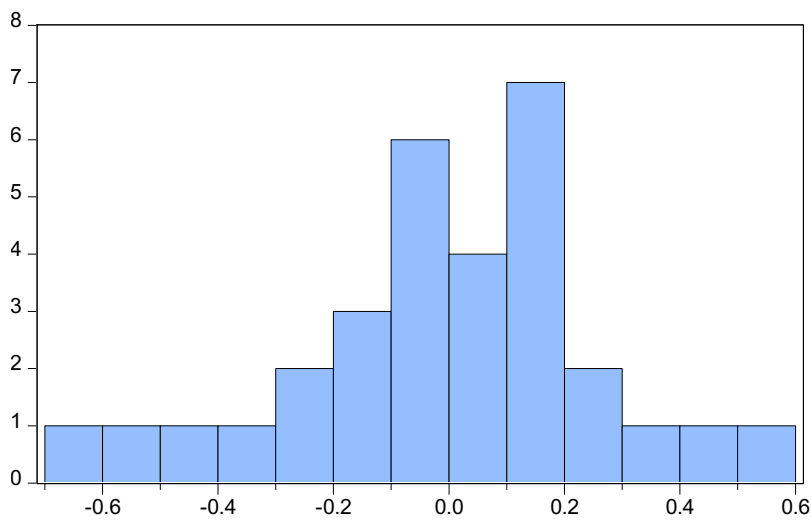
Correlated Random Effects - Hausman Test
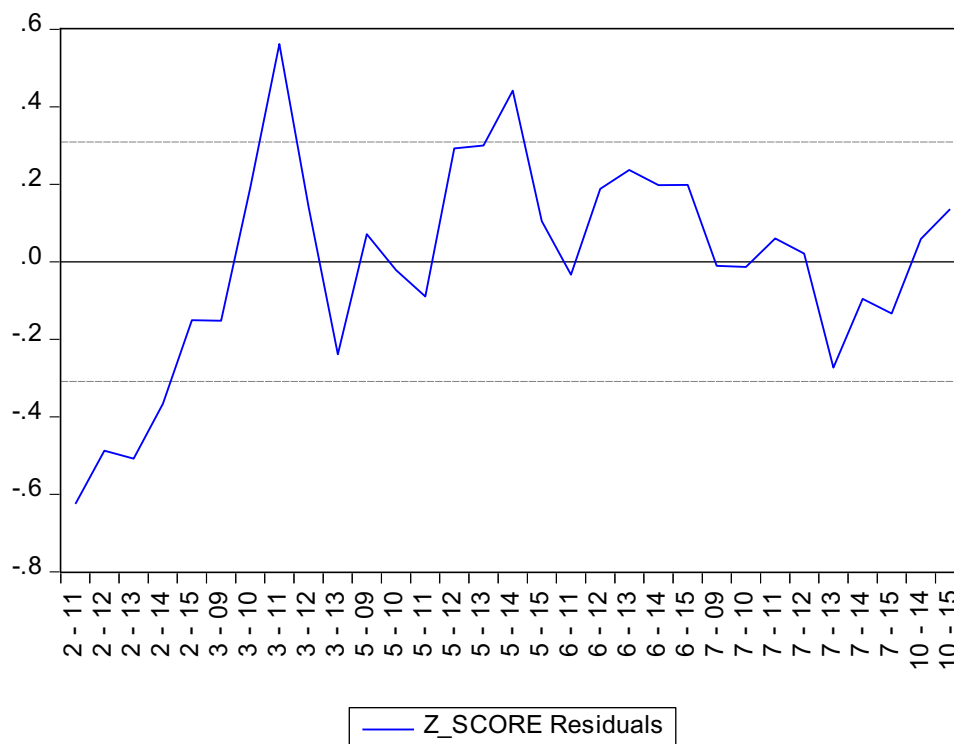Equation: Original
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.933531	6	0.9880

** WARNING: estimated period random effects variance is zero.

Appendix 5 – Non normality Jarque Bera Testing

Series: Standardized Residuals	
Sample 2009 2015	
Observations 31	
Mean	5.87e-16
Median	0.020968
Maximum	0.562187
Minimum	-0.625335
Std. Dev.	0.270259
Skewness	-0.378532
Kurtosis	3.019061
Jarque-Bera	0.740781
Probability	0.690465

Appendix 6 – Residual plots-standardized.

——— Z_SCORE Residuals

Appendix 7– Final regression

Sample: 2009 2015
Periods included: 7
Cross-sections included: 6
Total panel (unbalanced) observations: 31
White diagonal standard errors & covariance (no d.f. correction)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ANSAL	-0.390946	0.288663	-1.354335	0.1915
BONUS	-0.301438	0.341441	-0.882840	0.3884
EBC	-0.411705	0.271543	-1.516170	0.1459
BTA_BS	10.78886	4.462053	2.417913	0.0258
TOBINS_Q	0.393402	0.138001	2.850713	0.0102
D_TL	-0.307323	0.168846	-1.820142	0.0845
C	2.463107	0.613851	4.012546	0.0007

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.847473	Mean dependent var	4.139120
Adjusted R-squared	0.759168	S.D. dependent var	0.292129
S.E. of regression	0.143361	Akaike info criterion	-0.762255
Sum squared resid	0.390496	Schwarz criterion	-0.207163
Log likelihood	23.81495	Hannan-Quinn criter.	-0.581309
F-statistic	9.597110	Durbin-Watson stat	1.895316
Prob(F-statistic)	0.000013		