Measuring reputational risk in the South African banking sector

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"All that is really worth doing is what we do for others " (Lewis Carroll)

To my beloved parents and sister, Elrie and Johan Ferreira and Elaine Cloete

"*Our greatest weakness lies in giving up. The most certain way to succeed is always just to try just one more time*." (Thomas A, Edison)

DECLARATION

I declare that the dissertation, which I hereby submit for the degree Masters of Commerce in Economic Sciences, is my own work and that all the sources obtained have been correctly recorded and acknowledged. This dissertation was not previously submitted to any other institution of higher learning.

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To whom it may concern

This is to confirm that I, the undersigned, have language edited the **dissertation** of

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The responsibility of implementing the recommended language changes rests with the author of the dissertation.

Yours truly,

Linda Scott

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"*None is more impoverished than those who have no gratitude. Gratitude is a currency that we mint for ourselves and spend without fear of bankruptcy*. " (Fred de Witt van Amburgh)

ABSTRACT

With few previous data and literature based on the South African banking sector, the key aim of this study was to contribute further results concerning the effect of operational loss events on the reputation of South African banks. The main distinction between this study and previous empirical research is that a small sample of South African banks listed on the JSE, between 2000 and 2014 was used. Insurance companies fell outside the scope of the study. The study primarily focused on identifying reputational risk among Regal Treasury Bank, Saambou Bank, African Bank and Standard Bank. The events announced by these banks occurred between 2000 and 2014. The precise date of the announcement of the operational events was also determined. Stock price data were collected for those banks that had unanticipated operational loss announcements (i.e. the event). Microsoft Excel models applied to the reputational loss as the difference between the operational loss announcement and the loss in the stock returns of the selected banks. The results indicated significant negative abnormal returns on the announcement day for three of the four banks. For one of the banks it was assumed that the operational loss was not significant enough to cause reputational risk.

The event methodology similar to previous literature, furthermore examined the behaviour of return volatility after specific operational loss events using the sample of banks. The study further aimed at making two contributions. Firstly, to analyse return volatility after operational loss announcements had been made among South African banks, and secondly, to compare the sample of affected banks with un-affected banks to further identify whether these events spilled over into the banking industry and the market. The volatility of these four banks were compared to three un-affected South African banks. The results found that the operational loss events for Regal Treasury Bank and Saambou Bank had no influence on the unaffected banks. However the operational loss events for African Bank and Standard Bank influenced the sample of unaffected banks and the Bank Index, indicating systemic risk.

Keywords: *operational risk, reputational risk, event study, banks, abnormal return, South Africa, volatility, exponential weighted moving average*.

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LIST OF ABBREVIATIONS

AAR : Average abnormal returns

ACCA : Association of Chartered Certified Accountants

ACE : ACE Insurance Group

AR : Abnormal returns

ARCH : Autoregressive conditional heteroskedasticity

BCBS : Basel Committee on Banking Supervision

BEA : Bank of East Asia

BFSI : Banking, Financial Services and Insurance

BIS : Bank for International Settlements

CAAR : Cumulative average abnormal returns

CAPM : Capital asset pricing model

CEO : Chief executive officer

COSO : Committee of Sponsoring Organisations of the Treadway Commission

eNCA : eNews Channel Africa

ERM : Enterprise risk management

EWMA : Exponential weighted moving average

FICA : Financial Conduct Authority

GARCH : Generalised autoregressive conditional heteroskedasticity

JSE : Johannesburg Stock Exchange

NAC : National Credit Act

NCR : National Credit Regulator

ORM : Operational risk management

PWC : Price Water Coopers

SARB : South African Reserve Bank

USD : United States Dollar

ZAR : South African Rand

CHAPTER 1: INTRODUCTION, PROBLEM STATEMENT AND STUDY OBJECTIVES

1.1 Introduction

After the 2008 global financial crisis, most developed countries financial sectors are in a recovery period. However, financial sectors of emerging economies still show signs of fragility and uncertainty (te Velde, 2009:1; Roubini, 2014). The South African banking sector has, after the financial crisis, been shaped by the severely volatile global and economic landscape. This volatile economic environment has been the main driving force behind the weakening financial results of the majority of South African banks. During 2014 the South African banking environment showed signs of volatility mainly as a result of uncertainties in the economic environment, balancing severely on business confidence (PWC, 2014a:1). South African banks currently have to compete with irreversible changes in banking regulations, automation of banking systems, and changing consumer expectations. As a result, existing bank risk management models may not be relevant in the future (PWC, 2014b:28). The South African banking industry is further faced with the challenge of whether it can withstand the numerous internal risks facing the sector.

However, South African banks have satisfied numerous fundamental functions in the economic environment. These banks are known to issue credit, safeguard deposits, transfer funds between borrowers and savers, provide debit accounts, and to offer loans to small, medium and large enterprises (Rose & Hudgins, 2013:2). Banks also have to play a number of principle roles in the economy in order to remain competitive and to respond to stakeholders expectations. Resultantly the roles and functions that banks perform, exposes them to a various risks.

In order for banks to hedge themselves against various financial risks, adequate capital levels have to be kept in place. Capital adequacy is vital to the financial sustainability and longevity of banks. The most relevant functions of bank capital include the loss absorbing function and the function to promote public confidence (Svitek, 2001:37). Sufficient capital serves as a cushion against the risk of bank failure by absorbing all operating and financial losses until the profitability of the bank can be restored (Rose & Hudgins, 2013:486). The second important function of bank capital is to maintain and restore the confidence of the public by reassuring depositors and investors that their savings and investments are not

exposed to more risk than they are willing to take on. Banks also have to ensure borrowers that all credit needs will be satisfied even in the event of an economic downturn. Therefore, the level of capital needs to be regulated in order to restrict the failure of banks, maintain the confidence of the public and to restrict unnecessary losses to the South African government that might originate from deposit insurance claims (Rose & Hudgins, 2013:486).

South African banks have to comply with the banking proposals set out in the Basel Accords. However, since the Basel Committee on Banking Supervision (BCBS) is not a regulator, its proposals may only be used as guidelines. Since its establishment by the central banks of the G10 countries in 1975, the main focus of the BCBS has been the regulation of banks' capital adequacy (BCBS, 2013:1). Basel I was published during December 1987 and was known as the 1988 Accord, which focused mainly on credit risk. Basel I introduced a new capital ratio of capital to risk-weighted assets of (8%) and was implemented in all member countries as well as non-member banks by late 1992 (BCBS, 2013:2). Furthermore, the BCBS later proposed an improved capital adequacy ratio, known as Basel II, which was released during June 2004 (BCBS, 2013:3). Basel II consisted of three pillars: (1) minimum capital requirements; (2) supervisory review; (3) market discipline. Although the principal text of Basel II was finalised in 2004, it was only implemented globally during 2008.

Operational risk, along with credit and market risk were treated in Basel II as the most significant types of risk (Ruspantini & Sordi, 2011:2). Operational risk is the risk of loss resulting from inadequate or failed internal processes, human errors, system errors or from external events such as theft of damage to physical assets (BCBS, 2011:3). Nevertheless, this definition of operational risk supplied by BCBS includes legal risk, but conspicuously omits reputational risk due to the minimum regulatory capital charges (BCBS, 2001:2). Therefore, banks complying with the Basel I and Basel II Accords were only obliged to keep adequate capital levels to hedge themselves from operational risk, but not from reputational risk (Gillet *et al*., 2009:224).

Reputational risk is the risk arising from negative perception of financial institutions customers, counterparties, shareholders, investors, debt-holders, market analysts, including other relevant parties or regulators that may affect a financial institutions' ability to maintain existing business relationships, or to create new relationships, or restrain the institution from generating capital (BCBS, 2009:19). Since reputational risk is considered to be

multidimensional by the BCBS it may reflect the perception of the market participants with regards to the institution. Therefore, reputational risk may be seen as the loss in reputation of a financial institution. Reputational risk caused by operational loss events can be quantified indirectly by the loss on a bank's market value (Micocci *et al.,* 2009:2) also indicated by the decline in abnormal returns. Any operational risk (primary risk) has the potential to cause secondary reputational damage (secondary effect) to a bank followed by loss in profits and shareholder value (Ross, 2005:8).

The reputation of a financial institution constitutes the majority of an institution's assets. A solid reputation will have the ability to affect the profitability, share price, market to book value and the amount of services demanded of the financial institution. A study by the Conference Board (2007:6) found that stock prices increased for banks with a good reputation, while on the other hand, stock prices declined for banks with a less admirable reputation. Reputational loss is most vital to a bank due to the fact that a third of investment choices are based on reputation alone (Conference Board, 2007:6).

1.2 Problem statement

Reputational risk, among the most harmful risks, has long been neglected by both BCBS and national regulators. Fiordelisi *et al*. (2014:107) argued that although a good reputation is imperative to all service industries, it is especially important to the banking industry since customers' rely on trust. According to Squires (2011:2) Economist Intelligence Unit established that 52 percent consider reputation risk as a primary risk due to pure reputational risk. However, the remaining 48 percent consider reputational risk as a secondary effect due to previous operational risks. Ross (2005:8) also found that any operational risk (primary risk) has the potential to cause secondary reputational damage (secondary effect) to a bank followed by loss in profits and shareholder value.

Reputation is the ultimate intangible asset for any financial institution (Low & Kalafut, 2002:259) and it arises from reputational losses which are now more pronounced due to the effects of growing social media and globalisation. Reputational risk remains a crucial consideration for banks, because the failure to manage reputational risk will lead to greater economic costs and the depletion of reputational capital (Ross, 2005:7). When a financial institution has suffered severe reputational risk, the institution may experience revenue loss and lower share prices, and an inability to find sufficient capital and prized employees

(Xifra & Ordeix, 2009:355). Despite the consequences of reputational risk, both international and national regulators do not regard reputational risk as a severe threat.

The Basel Committee failed to address the importance of reputational risk in the implementation of Basel I, Basel II, and Basel III. It is, however, still unclear whether reputational risk will be brought into consideration when finalising Basel IV. It is projected that a timespan of two years will elapse (end 2017) before any visibility can be shed on Basel IV (Comfort, 2015). Basel II was the only Accord that briefly acknowledged and described reputational risk, but still needed a comprehensive discussion regarding the importance, consequences and management strategies of reputational risk (Manjarin, 2012:3). The BCBS realised that reputational risk is challenging to measure, but that the committee was waiting for the banking industry to develop a sound management technique to measure reputational risk (Manjarin, 2012:2).

Although reputational risk has been widely researched in the non-financial sector, it remains neglected in the financial industry, with the principal emphasis being on operational loss and its effects on reputation rather than specifically reputation risk (Fiordelisi *et al*., 2014:107). Reputational risk further remains ignored as a result of the effort in measuring reputational risk accompanied with the inadequate understanding of how reputational risk originates (De Fontnouvelle & Perry, 2005:4). Numerous models have been developed to measure the corporate reputation of an enterprise such as the Reputation Quotient, the Brady model, the stakeholder performance indicator relationship improvement model and the Honey model (Charted Institution for Management Accountants, 2007:35). However, none of these models measure the loss in the reputation of the bank that constitutes reputational risk.

1.3 Objectives of the study

1.3.1 Primary objective

The primary objective of this study is to measure reputational risk in the South African banking sector.

1.3.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- contextualise the various risks inherent in the banking industry with regard to the Basel Accords;
- establish a theoretical framework for operational risk and identify the various operational risks that may have affected the banking industry;
- establish a theoretical framework for reputational risk in terms of its link to operational risk and its effect on banks and
- contextualise reputational risk during and in the wake of the global financial crisis through international and national examples.

1.3.3 Empirical objectives

An empirical study was included using the abnormal returns of banks captured in the sample frame. In accordance with the primary objective and theoretical objectives of the study, the following empirical objectives were formulated:

- identify the return volatility during the period of the operational loss events;
- measure the effect of operational loss announcements on the selected bank returns; and
- compare the sample of banks with non-affected banks and the overall banking industry.

1.4 Research design and methodology

This study consisted of a literature review as well as a sampling frame. The data required to perform the study were obtained from secondary data sources.

1.4.1 Literature review

The secondary data sources used in the study comprised of several books on risk management, journal articles, websites, newspaper and magazine articles (including electronic versions), as well as papers presented by the Basel Committee on Banking and Supervision.

1.4.2 Empirical study

The empirical portion of this study included an event methodology which examined the average stock market reaction to specific operational loss events using a sample of banks. The precise date of each of the operational loss announcements was determined. Stock price data were collected for those banks which had unanticipated operational loss announcements (i.e., the event). The t-test was used to indicate whether the *CAAR* (cumulative average abnormal returns) were significantly negative or positive for the post event window (+20 days). The null hypothesis stated that $CAAR$ are zero where the announcement did not influence $CAAR$. Statistical models were applied to reputational loss as negative $CAAR$ values within the post event window at confidence levels (99%), (95%) and (90%).

1.4.3 Statistical analysis

With few previous data and literature based on the South African banking sector, the key aim of this study was to contribute further results concerning the effect of operational events on the reputation of South African banks. The analysis of this study was based on four loss events experienced by four different South African banks. These banks reported a monetary operational loss between January 2000 and December 2014. These loss amounts were published within the public domain by means of newspapers, bank press releases and news and bank websites. The statistical analysis of this study are not comparable to the statistical analysis from previous studies, since the data from previous studies used different sample sizes, time periods and were denominated in different currencies. Simulation models were used to measure the reputational loss after the announcement of the operational loss event. This was done by determining the reputational loss due to operational loss events affecting the South African banking industry by analysing the stock market reaction to such loss announcements. The direct impact of operational losses on the stock market was separated from the indirect reputational risk.

In order to obtain a more accurate estimate of risk, the magnitude of volatility within each bank were had to be measured (Daly, 2011:47). The Autoregressive Conditional Heteroskedasticity (ARCH), the Generalised Autoregressive Conditional Heteroskedasticity (GARCH) models were considered to ensure conditional volatility was accounted, however the Exponential Weighted Moving Average (EWMA) model was chosen. The EWMA

model compared the return volatility of the sample of banks with three non-affected banks (First Rand Bank, Nedbank and ABSA Bank) as well as the market and Bank Index. The EWMA was chosen above the GARCH model since the EWMA is a subset of GARCH.

1.4.4 Sampling frame

The sampling frame included all banks in the South African banking sector. However, the sample consisted of two South African banks that have collapsed such as Saambou Bank, Regal Treasury Bank. However, specific cases of Standard Bank as well as African Bank were also included. These four banks were chosen due to the fact that all of them experienced unanticipated operational loss announcements. The leading reason to the reduced numbers of observations (four operational loss events) in the final sample is distinctive to the sound banking sector in South Africa. Only a few operational loss events have been reported over the past 14 years. Other operational loss events were deleted from the sample due to incomplete information published (either the loss event date or the loss amount).

It can be assumed that the announcement of operational losses led to the reputational damage these financial institutions concerned (Ferreira, 2014:70). The time period of 14 years of data were used for specific events that occurred during these 14 years starting with the first operational loss announcement of Regal Treasury Bank in 2000, Saambou Bank during 2002, and Standard Bank early in 2014 followed African Bank in August 2014. A total of four events during the 14 years were analysed.

1.5 Chapter outline

This study comprised of the following chapters:

Chapter 1: Introduction and background to the study. This chapter served to introduce the topic of the study. The overall research objective as well as the theoretical and empirical objectives was described and the research methodology used in the study was explained.

Chapter 2: Theoretical framework for operational risk. The various risks inherent in the banking industry with regard to the Basel Accords were contextualised in this chapter. It also included an explanation on how and why South African banks need to be regulated. The reason for the existence of the BCBS was elucidated upon. The various risks that Basel

includes in their regulation framework were also discussed. A theoretical framework for operational risk in terms of its link to reputational risk and its effect on banks were also established.

Chapter 3: Theoretical framework for reputational risk. The background behind reputational risk and the reasons why reputational risk has been neglected by regulators for so long were deliberated. Reputational risk through international and national examples was contextualised within this chapter.

Chapter 4: Research design and methodology. This chapter provided information regarding the research methodology and data collection techniques. This included explanations of the sample size, choice of sample and the data collection process. The model used in the simulations was elucidated upon.

Chapter 5: Results and discussion. The results and findings of the simulations conducted were presented in order to determine the reputational risk in the sample of banks. The analysis of reputational risk in the South African banking sector was concluded. A consensus was reached, backed by theory as well as supporting evidence and data.

Chapter 6: Conclusion and recommendation for future work. Relevant recommendations were made regarding the measurement of reputational risk in the South African banking sector.

CHAPTER 2: THEORETICAL FRAMEWORK FOR OPERATIONAL RISK

2.1 Introduction

The introductory section 2.2 and 2.3 defined a bank, as well as the South African banking sector to emphasise the importance of banks within the South African banking industry. The section 2.4 provides a brief overview of the various risks inherent in the banking sector, namely, credit risk, liquidity risk, market risk, operational risk, reputational risk, business risk, legal risk and systemic risk. Each of these risks is elaborated upon briefly. The third section begins by discussing the need to regulate banks and how the BCBS plays a role within the regulation of international and South African banks. A summary of the Basel Accords is provided.

The fundamental purpose of this chapter is to review the literature on operational risk. The occurrence process of how operational risk events and losses originate are discussed before operational risk is defined in detail. International and national examples of operational events are given. International examples include the bankruptcy of Barings Bank during 1995 when the bank faced a loss of USD1.4bn due to internal fraud. The Allied Irish Bank is also among the international examples along with the 11 September 2001 terrorist attack.

Operational risk is discussed further in detail under the Basel regulations to give clarity on the origins of this type of risk. Operational risk is defined in terms of its direct and indirect loss categories (BCBS, 2001:2), its four risk factors, and operational event types to distinguish between different events. The severity levels for classifying operational loss events are illuminated upon. Furthermore, in order to sustain effective operational risk management, 11 principles are proposed by the BCBS (BCBS, 2011). The significant consequences of operational risk are also discussed (including the decline in earnings and profits, damage to physical assets, credit downgrades, loss in market value of bank equity and reputational damage). Lastly, a link is drawn between operational risk and its effect on reputational risk.

2.2 Defining a bank

Despite the important economic and monetary role that banks play in South Africa, there still exists confusion regarding the definition of a bank. However, Rose and Hudgins (2013:2) defined a bank according to the various functions in the economy that a bank performs; the personalised products and services a bank offers to its customers; and the authorisation behind the existence of banks. In order for banks to function as legal entities and adhere to banking regulation, regulators need to know what exactly a bank is (Rose & Hudgins, 2013:5). The Unites States (US) government settled on a single definition of a bank that defined a bank as "an institution offering deposits subject to demand withdrawals and making loans of a commercial nature" (Board of Governors of the Federal Reserve system v. Dimension Financial Corporation, 1985).

Banks are defined according to the wide range of financial products and services they offer to customers (Asmundson, 2012). Traditional banking services include exchanging currencies, accepting saving deposits, offering credit accounts, extending credit to the local government to support government activities, reassuring customers of the safekeeping of the valuables, and managing financial affairs in return for a bank service fee (Rose & Hudgins, 2013:11). Therefore, a bank refers to the range of services offered by depository institutions rather than to a specific type of institution (Koch & Macdonald, 2006:13).

Banks can be identified by the most important economic and monetary function that they perform, namely financial intermediation (Asmundson, 2012). The ultimate role of banks is to collect consumer savings and transfer it to debtors. This enables the circulation of money in the economy by facilitating the payment of goods and services (Mohr & Fourie, 2008:338). The activities of banks can also contract or expand economic growth since the South African Reserve Bank can control money supply through changing the level of credit extended to banks. Consequently, the strength of a community will reflect the strength of its financial institution and the attractiveness of its banks (Koch & Macdonald, 2006:13).

2.3 Overview of the South African banking sector

Stability in the South African banking sector plays a prominent role in the long-term economic growth (Dorogovs *et al.*, 2013:911). The South African banking sector has evolved into a well-structured banking system parallel with that of several industrialised countries. Consolidation, technology and legislation have been the main driving forces

behind the dramatic transformation in the banking sector (Munro, 2014:39). In 2010, the South African banking sector was awarded sixth place out of 133 countries for its financial market sophistication and the soundness of its banks (Coovadia, 2011:6).

The South African banking sector is faced with numerous uncertainties and risks that can influence their revenue and operational costs, much as any industrialised country. Both South Africa and other global markets face a constant set of challenges. Harsh economic and financial market conditions continue to provide the banking sector with both short-term and long-term risks (Ernst & Young, 2012:1). Global regulatory and supervisory changes in line with funding and liquidity continue to pose strategic, operational, and possibly systemic risks. South African banks intend to improve capital within the banks' risk management structure by increasing the risk adjusted return flowing to shareholders in order to illuminate the importance of both risk and return (UK Essays, 2013).

The South African banking sector experienced a banking crisis during 2002 due to the loss of confidence in Saambou Bank and Regal Treasury Bank, leading to the closure of these banks. As a result, smaller banks also failed and some banks were not allowed to renew their licence (Coovadia, 2011:4). This was followed by a decline in the number of registered banks from 41 registered banks in 2001 to 27 in 2003 (Van Wyk *et al.*, 2012:75).

According to Koch and Macdonald (2006:2), these banking failure were the result of an unremittingly changing banking environment. The costs in managing banking risks are substantial, since South African bank customers today have greater financial service preferences than ever before. Despite of the traditional banking services that banks offer, it is the customer's preference that banks also offer security underwriting, insurance against financial risks, as well as financial planning and advice. Therefore, banks can no longer limit their services to the traditional list since they have become all-purpose financial service providers (Rose & Hudgins, 2013:2). The nature of South Africa's market-based economy allows the free entry and exit of participants who wants to establish a bank. Any participants capable of capitalising a bank with the intent of pursuing a suitable public good accompanied by a dynamic business plan will have a fair opportunity to establish a bank (SARB, 2002:10).

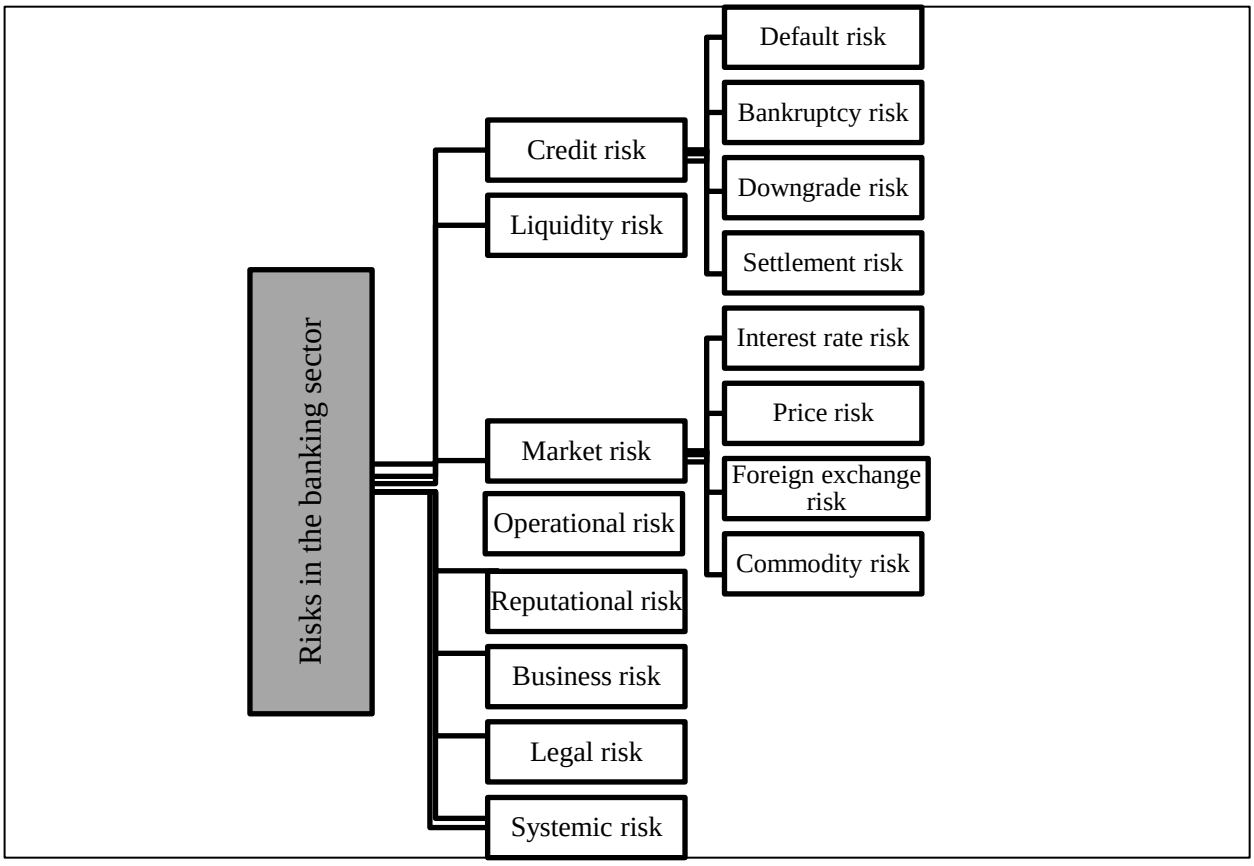
As a result, banks compete aggressively to both obtain and preserve their market share (Koch & Macdonald, 2006:2). Rivalry amongst banks puts pressure on innovation and

accuracy in providing personalised products and services, which leaves room for risks and uncertainties. Most financial institutions have gained more profound risk management systems through regulation in some areas. However, some banks still are left with a competitive disadvantage regarding the regulation of certain risks and the endangerment of financial stability (European Central Bank, 2014:3; Koch & Macdonald, 2006:3). The main fear is that the constantly changing banking environment will influence South African financial markets, product and services and financial institutions so rapidly that the aggregate risk in the banking sector will ultimately increase (Koch & Macdonald, 2006:34).

2.4 Risks inherent in the banking sector

Financial behaviour is affected fundamentally by risk. Nonetheless, the term risk has no uniform definition since the definition depends mainly on the context in which the term risk is expressed (Chernobai *et al.*, 2007:14).

Figure 2.1: Various risks in the banking industry



Source: Crouhy *et al.* (2014:24)

The term risk is referred to as future uncertainty regarding the deviation from the expected outcome (The Economic Times, 2015). Chernobai *et al.* (2007:15) added to this definition by explaining risk in the context of investment where risk may be the volatility of the expected cash flows. Since the outcome of volatility can be positive or negative, this definition does not ignore positive outcomes. Therefore, risk may not always lead to negative outcomes. Chernobai *et al*. (2007:15) further defined risk as "a measure to capture the potential of sustaining a loss". This definition, on the other hand, proposes that the term risk has a negative outcome and refers to the danger that one might face when the actual outcome deviates undesirably from the expected outcome. Risks can originate from any situation in any institution as a result of the uncertainty rising from numerous factors that are influencing the institution or situation (The Economic Times, 2015). As indicated by Figure 2.1, the most common types of risks in the banking sector are credit risk, market risk and operational risk.

2.4.1 Credit risk

Retail banks have the most experience with credit risk, since it is the risk that has been regulated and managed the longest (Li *et al*., 2013:165). Bank customers borrow funds from the bank and pay a percentage interest on the amount borrowed whereafter the full loan amount has to be repaid (Global Association of Risk Professionals, 2015:3). Credit risk can be regarded as the monetary loss that a bank will suffer in the event that the counterparty fails to repay its loan, *inter alia* fails to meet its debt obligations (UK Essays, 2013). Due to harsh economic conditions, credit risk is the principal and most frequent risk that South African banks face and arises from loans not repaid either partially or in full (Global Association of Risk Professionals, 2015:3). Credit risk can further be categorised into four types of credit risk:

- default risk;
- bankruptcy risk;
- downgrade risk; and
- settlement risk.

Default risk can be defined as the risk resulting from the borrower's inability to repay their loan by means of not paying the interest or principal payments on the loan. Customers are considered to default on their loans after 60 days of non-payment (Crosbie, 2003:1; Crouhy

et al., 2014:30). Bankruptcy risk occurs when the debt holders of a company take over from the shareholders. This refers to the risk of having to take over defaulted assets from the counterparty. Downgrade risk is the risk that a bank or financial institutions' creditworthiness be downgraded, representing the future estimation of credit risk (Standard & Poor, 2014). Settlement risk occurs as a result of an exchange of cash flows in order to settle a transaction. The failure to settle a transaction generally is caused by insufficient liquidity levels, default by a counterparty, or operational problems (Crouhy *et al*., 2014:30).

2.4.2 Liquidity risk

A bank that is liquid refers to the banks capability to settle obligations immediately. On the other hand, a bank that is illiquid will be unable to settle its obligations, *inter alia* default on obligations. Thus, liquidity risk can be defined as the risk of a bank becoming incapable of immediately settling its obligations (Drehmann & Nikolaou, 2010:2). Whenever a bank is short on liquidity it can be regarded as a liquidity risk. The greater the probability of a bank becoming illiquid, the greater the liquidity risk will be. Greater liquidity risk will represent a greater probability of the bank becoming illiquid in the future (Nikolaou, 2009:16).

2.4.3 Market risk

Since South Africa has a market-based economy, most of the financial institutions face severe market risk, which exposes them to a great deal of fluctuations and uncertainties regarding market rates and prices (Rose & Hudgins, 2013:184). Market risk is the risk of loss in off-balance sheet positions arising from severe volatility in market price movements. Market risk originates from positions in a bank's trading book accompanied by positions in the balance sheet that might pose commodity and foreign exchange risk (European Banking Authority, 2015a). There are four main categories of market risk (Crouhy *et al.*, 2014:25):

- interest rate risk;
- price risk;
- foreign exchange risk; and
- commodity price risk.

Interest rate risk occurs when the value of a fixed income security declines due to an increase in interest rates. Thus, interest rate risk reflects the inverse relationship between price and interest rates. This risk generally occurs as a result of a maturity mismatch

between the bank's assets and liabilities. Adverse interest rate movements tend to influence a bank's equity since an increase in interest rates will cause the value of assets to decline more than the value of the liabilities (Global Association of Risk Professionals, 2015:4).

Equity price risk includes risk of volatility in stock prices and stock market indices, which may result in a direct loss (Al Baraka Banking Group, 2015). Banks in particular purchase stocks in other companies, which may expose them to risk when the values of these stocks move in adverse directions (Crouhy *et al*., 2014:26).

Foreign exchange risk takes into account the volatility in the value of a bank's assets and liabilities as a result of exchange rate volatilities (Global Association of Risk Professionals, 2015:5). Since banks purchase foreign exchange for their own account and for their customers, foreign exchange risk has the ability to depreciate the returns of foreign investments. Thus, foreign exchange risk will place a bank in a competitive disadvantage against international competitors (Crouhy *et al.*, 2014:26).

Commodity risk poses a problem for commodity prices in the event of severe fluctuations in prices. This definition includes all commodities such as agricultural, industrial and energy commodities. In South Africa, commodity prices are exposed to severe volatility due to changes in weather, and local and international demand and supply volatilities (Global Association of Risk Professionals, 2015:5).

2.4.4 Operational risk

Regulation obliges banks' risk management systems to effectively manage and mitigate operational risk. Operational risk is the risk of loss arising from inadequate or failed internal processes, people and systems or from external events (BCBS, 2001:2). Operational risk includes legal risks, while intentionally omitting reputational risk. Operational risk is not a new concept in the banking industry. The term has become more significant as a result of greater manifestation of unique losses. Globalisation of the banking and financial system has led to greater emphasis on operational risk (European Banking Authority, 2015b).

Operational risk has been broadened to include types of risks other than credit and market risk that may impact the way in which a bank conducts its day to day business activities. The various risks inherent in operational risk often overlap each other significantly (Sweeting, 2011:102).

2.4.5 Reputational risk

According to Sweeting (2011:109) reputational risk is that which arises from various operational risks. For instance, process or technological risk may lead to a loss in confidence in a financial institution and ultimately reputation damage. Besides considering the direct loss resulting from an operational risk, financial institutions have to consider the additional costs arising from reputational risk as a result of a loss in customers (Sweeting, 2011:110). Financial institutions in particular face significant reputational risk due to the nature of their business, since customers rely on trust (Crouhy *et al.,* 2014:41).

2.4.6 Business risk

Business risk refers to the general risks inherent in the business industry. This risk is affected by a financial institution's strategic risk management strategies and the reputation of the institution. Uncertainties such as the demand and supply for financial products may be viewed as a business risk for banks. Business risk remains a poorly defined term and has been excluded from the BCBS definition of operational risk, implying that banks do need to keep capital to hedge them against business risk (Crouhy *et al.,* 2014:36).

2.4.7 Legal risk

The term legal risk has no uniform definition since legal risk can be caused by numerous factors. Nevertheless, Anderson and Black (2013:2) defined legal risk as a risk arising from:

- faulty transactions that may have been intentional or unintentionally caused;
- a legal claim made or other events that may lead to a liability for the bank or another form of loss;
- failing to adequately protect the assets of the bank and its customers; and
- amendments to existing banking laws and regulations.

Legal uncertainty or contrasting interpretations of the law are the main causes of legal risk. Legal risk may be undetectable within the operations of a bank where the management of a bank, accompanied by the legal department, are unaware that employees or certain departments within the bank are not complying with laws and regulations (Anderson & Black, 2013:2).

2.4.8 Systemic risk

Systemic risk refers to the breakdown of an entire financial system as a result of the spill-over effects of the failure of an individual institution. Such inter-linkages within a financial system, can lead to a significant economic downturn (Systemic Risk Centre, 2015).

2.5 Bank regulation in South Africa

Financial stability is the mutual goal of international regulators and local governments. The foundation for financial stability is the regulatory supervision of financial institutions (banks) (BFSI, 2015:40). Regulators carefully monitor their banking activities, risk management standards and implement an idiosyncratic set of minimum regulatory capital standards within their banks. Therefore, national governors have a vigorous responsibility to ensure that banks continue to meet their obligations (Crouhy *et al.*, 2014:68). Hence, the South African financial sector is divided into different segments, each with its own regulatory system. South African banks are regulated by the SARB to monitor the deposit activities of these banks along with the compliance of the BCBS (Van Wyk, 2012:123).

The SARB distinctly focusses on four risk management processes. First, a strategic risk process, which is integrated into the bank's activities, aimed at identifying and assessing strategic risk. Secondly, foreign exchange market transactions are managed through financial risk management processes and procedures. Thirdly, all operational activities that might pose operational risk are managed by operational committees aimed at mitigating operational risk. Lastly, the SARB includes a reputational risk management process, which is solely managed by the executive management (SARB, 2014).

In addition to most central banks, the SARB admits to being a risk adverse institution. The SARB is passionately aware of the high performance expectations by other central banks. Risk management is an integral and essential part of the bank's corporate governance system (SARB, 2014).

According to Koch and Macdonald (2006:3), South African banks need to be regulated in order to:

- prevent financial institutions from exploiting bank customers;
- ensure a competitive and efficient banking system;
- provide monetary stability in South Africa;

- preserve the integrity of the national payment system; and
- safeguard the soundness of financial instruments by minimising risks.

The financial crisis can be referred to as a period where consumers with a sub-prime level of creditworthiness were granted extended mortgage loans. Undoubtedly, the extension of credit led to miss-selling of assets, extending customer limits by irresponsibly granting credit and incorrect pooling of assets. The South African banking system (which can be described as well-established and meritoriously regulated) sheltered South African banks from the severe consequences of the financial crisis (Coovadia, 2011:13). South African banks enjoyed limited exposure to foreign assets attributable to the banks exchange control, tight risk management and efficient disclosure (Van Wyk *et al.,* 2012:123). Nevertheless, the financial crisis has shaped the regulation of financial systems of both South Africa and international countries. The crisis has directed regulators towards a more regulated financial system in which emphasis is placed on consumer protection (Van Wyk *et al.*, 2012:77).

South African regulators also have the responsibility to ensure the robust capitalisation of banks in order to avoid systemic risk (which can often be referred to as the domino effect) where the failure of a single bank disseminates to the failure of the entire banking sector (Crouhy *et al.,* 2014:68). After the financial crisis, numerous international regulators have designed and implemented strategies to address the major flaws exposed by the financial crisis. Numerous regulations have been finalised by the BCBS and introduced by the SARB to amend current regulation to avoid future financial risks (Coovadia, 2011:13). Therefore, the importance of regulation in banks is fundamental to the success of the banking industry.

2.5.1 The role of the Basel Committee on Banking Supervision

The Basel Committee on Banking Supervision (BCBS) is acknowledged internationally for its primary role in setting standards for the regulation of banks. The BCBS has the responsibility to improve regulation within banks to ensure the enhancement of global financial stability (BIS, 2014).

2.5.1.1 The reasons beyond the existence of Basel Committee on Banking Supervision

The BCBS came into existence after significant disruptions in global financial markets. One of these disruptions included the losses suffered by banks during the collapse of the Bretton

Woods system in 1973. Thereafter, Bankhaus Herstatt's licence was revoked after the bank had exposed their foreign exchange far beyond its capital level. As a result, banks beyond Germany suffered severe losses adding weight to the catastrophe (BCBS, 2013:1). Bankhaus Herstatt was not the only bank that suffered soon after, Franklin National Bank, situated in New York, closed after experiencing tremendous foreign exchange losses. As a result of these financial market disruptions, the G10 countries introduced a committee on banking supervisory (Rose & Hudgins, 2013:494).

The main responsibility of the BCBS is to set minimum regulatory and supervisory standards in order to enhance banking supervision techniques. BCBS address the problems faced by diversified financial institutions in coorporation with other regulators (BCBS, 2013:1). Nonetheless, the BCBS has no lawful power. In summary, the BCBS merely designs standards and guidelines and make recommendations to financial institutions to ensure the best practice with the hope that these institutions will implement them. Through the actions of the BCBS, the committee sets a path towards convergence and harmonisation (BCBS, 2013:1).

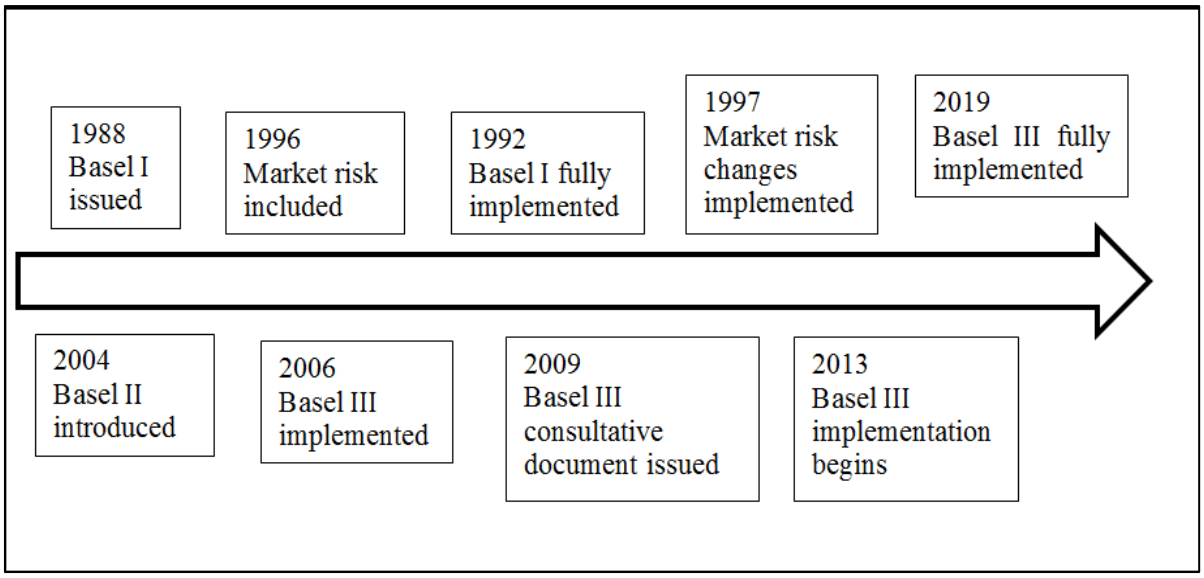
2.5.2 Summary of the Basel Accords

Before Basel I came into existence in 1988, each country had its own independent regulatory framework, notwithstanding any uniform set of rules (BFSI, 2015:41). Basel I proposed that banks should keep a minimum capital level to hedge themselves against credit risk (capital to risk-weighted assets of 8%) (BCBS, 2013:2). The Basel I Accord was envisioned always to evolve over time and in January 1996, the BCBS introduced a document named: Market Risk Amendment to the Capital Accord, to be phased in during 1997 (BCBS, 2013:2). Resultantly, international bank failures transferred the focus from credit risk towards operational risk (Ferreira, 2014:60).

Basel II, therefore, was introduced to be more risk sensitive and safeguard financial institutions against additional risks – one of which was operational risk (Herring, 2002:43). The revised capital framework comprised of three pillars: (1) minimum capital requirements for credit risk, market risk and operational risk (2) supervisory review to ensure a reasonable level of capital (3) and public disclosure to ensure sound market discipline (BCBS, 2013:3). Consequently, Basel II had numerous discrepancies as illustrated in Table 2.1. One of the shortcomings was to mitigate the consequences of the 2008 financial crisis on banks

(Ferreira, 2014:32). Most banks failed during the financial crisis as a result of inefficient capital levels unable to absorb operating losses. In order to prevent another financial crisis the BCBS developed Basel III. Basel III has enhanced Basel II by introducing new capital and liquidity standards, which have improved the quality of capital (The Banking Association of South Africa, 2013:2). The BCBS introduced proposals to Basel III in 2010 aimed at improving and strengthening the pillars of Basel II (BCBS, 2013:4). Figure 2.2 demonstrates how Basel evolved over 25 years.

Figure 2.2: Basel and capital regulation



Source: BIS (2013) & Crouhy *et al*. (2014)

Table 2.1: Summary of the evolution of the various Basel Accords

BASEL I	BASEL II	BASEL III
Introduced in 1988	Introduced in 2004 (effective Jan 2008)	Introduced in July 2009
Main focus: credit risk	Focused on credit risk (maintained capital ratio of 8%), market risk and operational risk	Introduced to correct the shortcomings of Basel II
Credit risk ratio (capital to risk-weighted assets) = 8%	Risk calculated amended to include market risk and operational risk. Credit risk calculation improved.	Increased the capital charge, tightened the definition and improved the quality of capital.
Omission of market risk corrected by amending Basel I to include it in 1996. Allowed banks to calculate their own risk weights	Introduced three pillars: (1) Minimum capital requirement, (2) Supervisory review process, (3) Market discipline	Required a better mix of loss absorbing capital, protection against other risks (liquidity and counterparty risk), improved governance, and improved cyclicality management
Discrepancies		
Market risk excluded	Capital requirements proved to be inadequate during the financial crisis in 2008.	Higher capital ratios will cause banks to struggle to comply
Excluded all other banking risks including operational and reputational risk	Capital requirement calculation excluded liquidity, counterparty and reputational risk.	Excluded reputational risk
Not granular enough in terms of its five risk weights and, therefore, regarded as fair.	Banks held a weaker combination of capital besides the low levels of capital that was kept.	Bank earnings may decline as a result of higher credit costs
Had a one-size-fits-all approach and did not take into account that each financial institution has their own set of risk exposures.	Definition of capital was inadequate with no emphasis on equity capital.	High leverage ratios may discourage lending which leads to less income. May also place too much emphasis on capital, but not on how banks should fund the increased capital.
To overcome these shortcomings, Basel II was developed	Lacked a counter-cyclical buffer to protect capital against economic cycles	Bank profitability may be influenced by improved liquidity ratio

Source: BCBS (2009); BCBS (2013); BFSI (2015); & Crouhy *et al*. (2014); Johansson (2012); KPMG (2011); Rose & Hudgins (2013)

2.6 The origins of operational risk

Generally, risk management comprises the management of four major risk types: credit risk, market risk, liquidity risk and operational risk (Jarrow, 2008:870). However, operational risk has become a key instrument in bank risk management (Mitra *et al.*, 2015:123). Operational losses originate within every financial institution and are one of the oldest risks faced by banks. Without notice, banks will face their first operational risk long before their first market or credit risk transaction (Lewis, 2004:1).

Overall, operational risk may be classified as a pure risk, unlike credit risk and market risk, since it results in negative losses for all institutions (Micocci *et al*., 2009:2; Moses & Rajendran, 2012:50). By taking on more operational risk the option value of deposit insurance will not be enhanced (Herring, 2002:43). Operational risk is one of the most difficult risks to anticipate. As a result, its sudden appearance can lead to a decline in the market value of financial institutions (Lewis, 2004:1). When not effectively managed, operational risk can be the most damaging to any financial institution. Failure to manage operational risk has led to the demise of numerous institutions, since operational risk causes other firm-wide risks to be extreme (Sweeting, 2011:102).

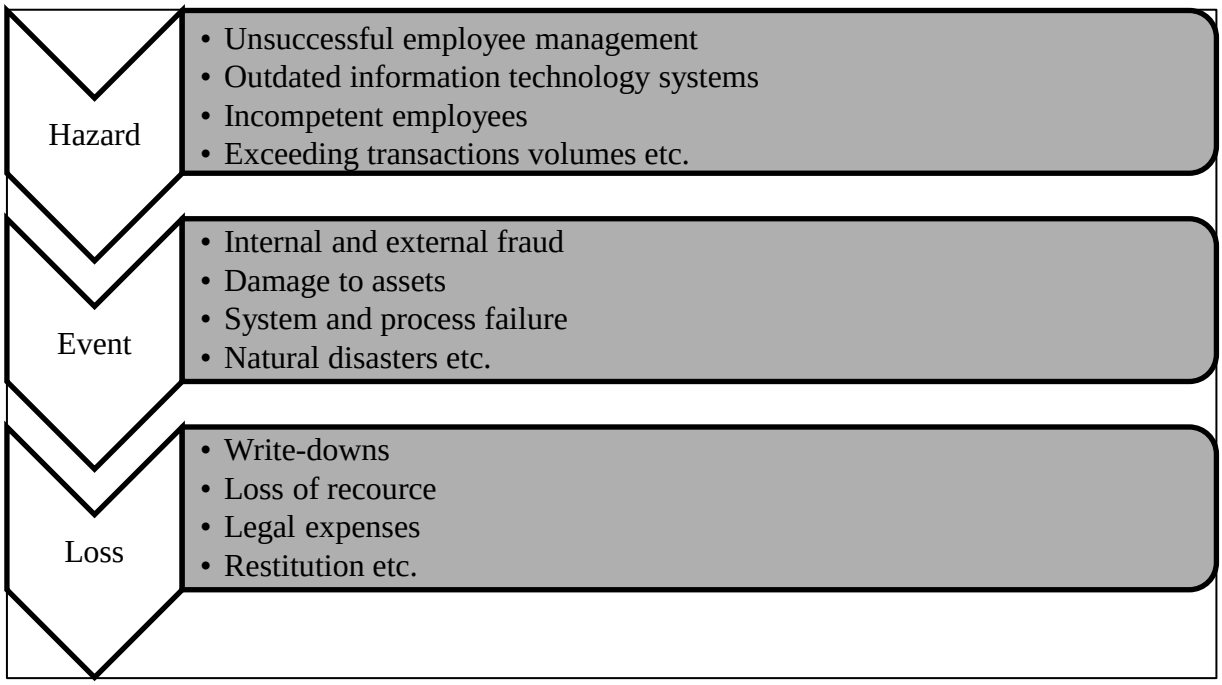
Confusion exists regarding the process of how an operational loss originates. According to Chernobai *et al.* (2007:22), an operational loss arises from an operational event, which is caused by an operational hazard. Therefore, as demonstrated by Figure 2.3 it can be reasoned that an operational hazard causes an operational event, which ultimately leads to an operational loss. For the sake of completeness, a distinction between an operational hazard, operational event and an operational loss will be given before operational risk is defined by the BCBS:

- An operational hazard includes numerous factors that will increase the likelihood of an operational event. This may include unsuccessful management, outdated information technology systems, incompetent employees, exceeding transaction volumes and organisational diversity and cultural differences.

- An operational event is a specific event whose consequences will directly result in operational losses. This definition of an operational event encompasses internal and external fraud, damage to assets, and system and process failure.

- An operational loss can be characterised as the monetary amount of financial damage caused by the operational event. Operational losses may involve write-downs, loss of recourse, legal expenses, fines and penalties as well as loss or damage to physical assets.

Figure 2.3: The occurrence process of operational losses



Source: Chernobai *et al.* (2007:23), Mori & Harada (2001:3)

2.6.1 International examples of operational events

The bankruptcy of Barings Bank in 1995 is an international example of poor operational risk management. Barings Bank experienced an USD1.4b operational loss as a result of internal fraud by one of its employees (Gillet *et al*., 2010:224). Despite the fact that Barings Bank was in existence from 1763, a single employee brought down the entire corporation, which demonstrated globally just how fatal inadequate risk management can be. It was evident that inadequate internal control measures also contributed to the collapse of Barings Bank (Global Association of Risk Professionals, 2015:6).

Ireland's second largest bank, Allied Irish Bank (AIB), uncovered an internal fraud event committed by John Rusnak, a trader, during 1997. However, it was not until February 2002 that the banks management became aware. Rusnak had repeatedly falsified bank statements in order to recoup the losses he inccurred on a misplaced proprietary trading strategy (Chernobai *et al*., 2007:8). Astonishingly, Allied Irish Bank emphasised the negligence of

banks to acknowledge the lessons demonstrated by the collapse of Barings Bank, which had occurred a decade earlier.

The terrorist attack on New York on 11 September 2001, is a striking and devastating example of an operational event that involved damage to physical assets, disruption of normal business days, and severe losses caused by external events (Chernobai *et al.,* 2007:10). The World Trade Centre and the Pentagon, located in Pennsylvania, were victims of terrorist attacks when two airline jets were hijacked and crashed into the sites (Barron, 2001). Despite the tremendous loss in human resources, the financial expenses mounted towards USD70b (Chernobai *et al.*, 2007:10).

Global operational events (Micocci *et al*., 2009:2) over the past decade, combined with technological developments (e-commerce) (Gillet *et al.,* 2010:224), have shifted the focus of regulators towards the regulation of operational risk (BCBS, 2013:2). Inadequate risk management processes, unreliability of traditional operational risk management systems, and inadequate capital provisions transferred the BCBS focus towards regulating operational risk by means of capital (Jobst, 2007:423).

2.6.2 Operational risk under the Basel Committee on Banking Supervision

During 2001, the BCBS published a consultative document in addition to the new Basel II Accord that included a comprehensive discussion on operational risk. The aim of the document was to make the new Basel Accord more risk sensitive by including risk other than credit risk and market risk (BCBS, 2001:1).

2.6.2.1 Operational risk defined by the Basel Committee on Banking Supervision

Researchers have broadly defined operational risk; however, in light of the context in which operational risk is focused on within this study, a definition provided by the BCBS was more appropriate. Therefore, operational risk is defined by the BCBS (2001:2) as the risk of direct and indirect losses arising from inadequate or failed internal processes, people and systems or from external events. Operational risk includes legal risk but intentionally omits reputational risk due to the purpose of a minimum regulatory operational risk capital charge (BCBS, 2001:2). Operational risk, however, remains a poorly defined concept. Although the definition provided by the BCBS has a variety of meanings, banks are allowed to formulate their own definition of operational risk, provided the main concepts are included.

The first part of the definition can be explained by defining direct and indirect losses (Raj & Sindhu, 2013:69). Chernobai *et al.* (2007:18) classified direct losses as losses directly arising from operational events as classified by Table 2.2. The BCBS (2001:2) realised the inclusion of the costs in managing operational events, expenses paid to third parties and possible write-downs. On the contrary, indirect losses can be regarded as the opportunity costs inherent in the losses from managing operational challenges such as contingent, latent and near-miss losses (Chernobai *et al.*, 2007:18).

BCBS (2001:3) also distinguished between a capital charge for expected and unexpected operational losses. According to this consultative document on operational risk, a capital charge will be kept to protect banks against unexpected losses, whereas provisions made for such losses will cover expected losses. Moses & Rajendran (2012:51) defined expected losses as those losses that are anticipated by banks (have a high likelihood of occurring), while unexpected losses are those that are not anticipated by banks (very low likelihood of occurring or reoccurring).

Table 2.2: Direct operational loss categories

Write-down	Where the value of the bank's assets has to be reduced as a result of direct theft, internal fraud, market losses or credit losses due to operational events.
Loss of recourse	Include the outflow of funds made to the wrong parties and where the funds were unable to be recovered.
Restitution	Include the compensation having to be paid to customers or stakeholders as restitution for the operational loss incurred.
Legal costs	Any legal liabilities to be paid to settle disputes as a result of operational losses.
Regulatory and compliance	Include fines and penalties to be paid for not complying with laws and regulations.
A loss or damaged assets	May include physical loss in assets such as damage by natural disasters.

Source: Chernobai *et al.* (2007:18) & BCBS (2001:2)

Operational risk can be defined further in terms of its four risk factors (Young, 2006:12):

- people risk;
- system risk;
- process risk; and
- external events.

People risk is a significant risk faced by all financial institutions that may include attitudinal and behavioural factors of employees. Since it is the most valuable resource, people are vital to the operation and functioning of any institutions. This risk can extend to the employment of incompetent personnel (Sweeting, 2011:105). This definition allows for human error such as errors in carrying out transaction, internal fraud by top management and employees to deliberately falsify records or manipulate stock prices, and overall incompetence of employees (Young, 2006:13).System risk arises when both management and employees do not adequately implement the systems designed for banks. System risk is often the result of new complex technological information systems that may lead to unexpected operational losses. System risk is also related closely to people risk since greater technological systems require employees to improve their current technological and information skills (Young, 2006:14). Process risk encompasses losses that occur due to operational process failure, the inadequate processing of data, and insufficient business processes leading to unexpected operational losses. Process risk may include the process of new products and services, reporting processes, and control and management processes (Young, 2006:16).External events are those factors that do not fall under the control of the financial institution itself but can directly influence the operational losses and risks. This definition includes events such as external fraud committed by a party outside the institution itself. Events such as these may lead to a direct unexpected loss in terms of fines paid by the financial institution for not having sufficient preventative measures in place to prevent fraud (Young, 2006:17). However, external events and losses are challenging to avoid, therefore, banks should implement some sort of hedging strategies to limit external operational losses (Chernobai *et al.*, 2007:19).

2.6.2.2 Operational loss event types

The BCBS (2006:305), in the international convergence of capital measurement and capital standards, described operational events according to Table 2.3.

Table 2.3: Operational loss event types

Operational loss event type	Definition	Categories	Example
Internal fraud	An event caused by the deliberate embezzlement of assets, evading of laws and regulations by any internal party that may involve theft or insider trading.	Unauthorised activity	Transactions not reported (intentional) Transaction type unauthorised Mismarking of position (intentional)
		Theft and fraud	Fraud / credit fraud / worthless deposits Theft / extortion / embezzlement / robbery Misappropriation of assets Malicious destruction of assets Forgery Check kiting Account take-over / impersonation / etc. Tax non-compliance / evasion (wilful) Bribes / kickbacks Insider trading (not on firm's account)
External fraud	An event caused by the deliberate embezzlement of assets, evading of laws and regulations by any third party that may involve theft or system security.	Theft and fraud	Theft/Robbery Forgery Check kiting
		Systems security	Hacking damage Theft of information (w/monetary loss)
Employment practice and workplace safety	Includes loss events that may consist of these three categories of employee relation, health and safety, discrimination.	Employee relations	Compensation, benefit, termination issues Organised labour activity
		Safe environment	General liability (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity and discrimination	All discrimination types

Operational loss event type	Definition	Categories	Example
Clients, products and business practices	Operational losses from intentional or unintentional failure to meet specific obligation to clients or from the way in which a product is made and its intent.	Suitability, disclosure and fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail customer disclosure violations Breach of privacy Aggressive sales Account churning Misuse of confidential information Lender liability
		Improper business or market practices	Antitrust Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity Money laundering
		Product flaws	Product defects (unauthorised, etc.) Model errors
		Selection, sponsorship and exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory activities	Disputes over performance advisory activities
Damage to physical assets	Include operational losses that may arise from loss or any damage sustained to physical assets by means of natural disasters.	Disasters and other events	Natural disaster losses Human losses from external sources (terrorism, vandalism)
Business disruptions and system failures	Operational losses due to any disruptions in the normal course of business or due to system failures. These may include software disasters.	Systems	Hardware Software Telecommunications Utility outage / disruptions

Operational loss event type	Definition	Categories	Example
Execution, delivery and process management	These events may include failure in the capture of transaction, wrongful monitor and reporting processes, incorrect customer documentation and management, loss from trade counterparties and suppliers.	Transaction capture, execution & maintenance	Miscommunication Data entry, maintenance or loading error Missed deadline or responsibility Model / system miss-operation Accounting error / entity attribution error Other task miss-performance Delivery failure Collateral management failure Reference data maintenance
		Monitoring and reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
		Customer intake and documentation	Client permissions / disclaimers missing Legal documents missing / incomplete
		Customer / Client account management	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets
		Trade counterparties	Non-client counterparty miss-performance Misc. non-client counterparty disputes
		Vendors and suppliers	Outsourcing Vendor disputes

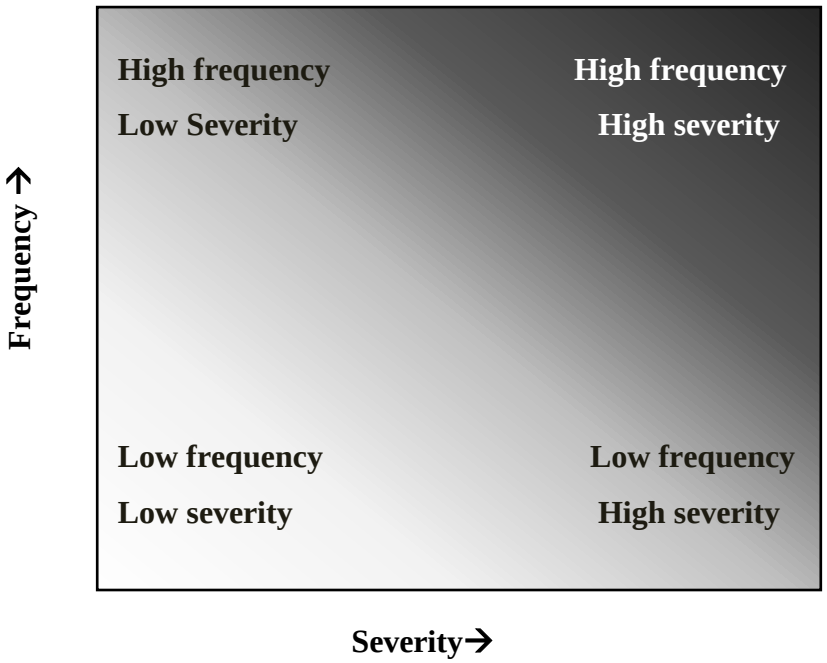
Source: BCBS (2006): Chernobai *et al.* (2007:24); Crouhy *et al.* (2014:510); Moses & Rajendran (2012:52)

2.6.2.3 Severity levels for operational risk

According to Chernobai *et al.* (2007:23), operational losses can be categorised into four categories as illustrated by Figure 2.4:

- Low frequency and low severity;
- High frequency and low severity;
- High frequency and high severity; and
- Low frequency and high severity.

Figure 2.4: Classification of operational losses by frequency and severity

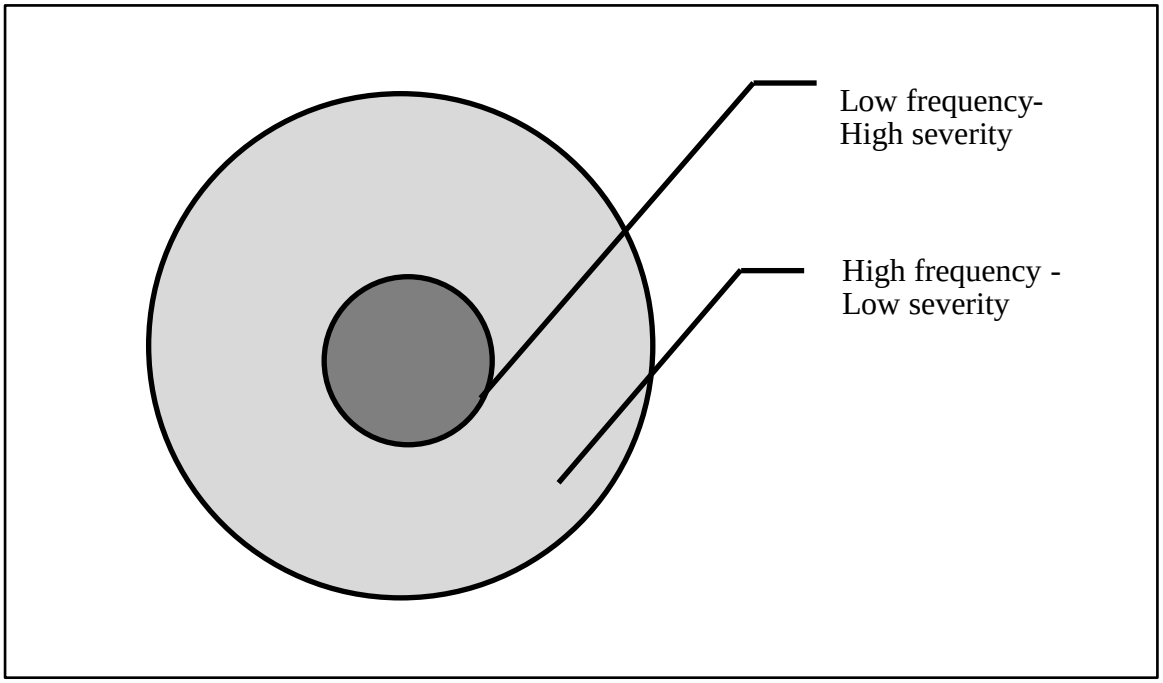


Source: Compiled by author

However, Samad-Khan (2005:2) argued that a high frequency combined with a high severity level is unlikely. This level of risk would have to occur thousands of times and will have to cause catastrophic losses each time it occurs. Further research into operational losses indicated that low frequency and low severity losses are not realistic (Chernobai *et al.*, 2007:25). Resultantly, two levels of operational losses remain as depicted by Figure 2.5. Operational losses that have a high frequency of occurring but with a low level of severity are not deemed significant as these losses can be regarded as expected losses for which provisions are made. On the other hand, losses with a low frequency of occurring but with a high level of severity pose the greatest losses to a financial institution. These losses can be

seen as unexpected losses and can potentially lead to bankruptcy (Chernobai *et al.*, 2007:26).

Figure 2.5: Reformed classification of operational losses by frequency and severity



Source: Compiled by author

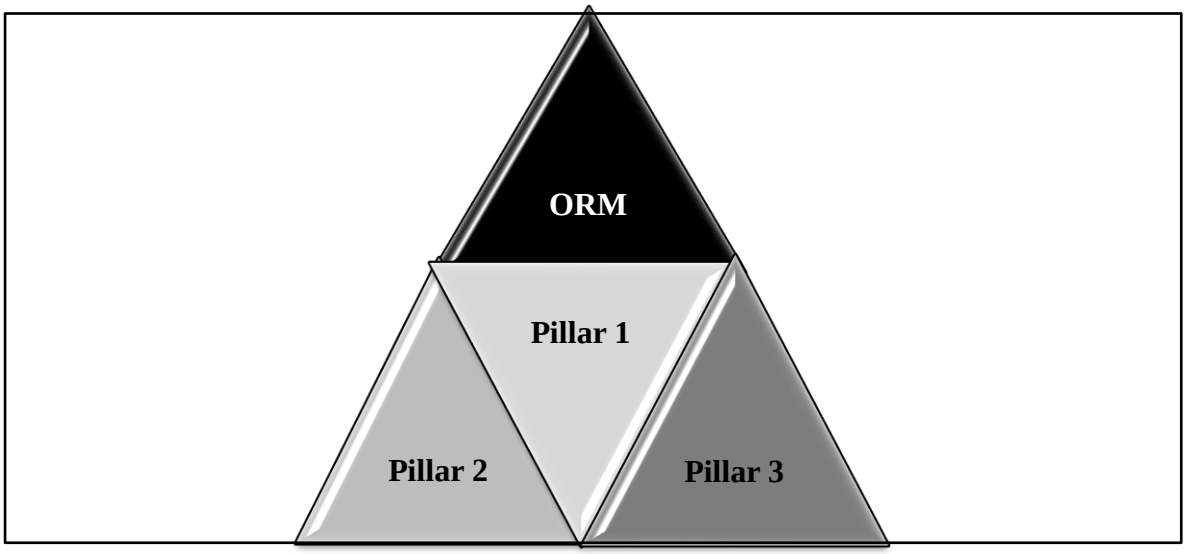
2.6.2.4 Capital charge for managing operational risk under Basel II

According to Micocci *et al*. (2009:3), the BCBS introduced a new capital charge for operational risk during 2001, as part of the revised Basel II Accord, which had to be implemented by early 2007. The capital charge stated that banks should keep sufficient capital levels to cover unexpected operational losses, where provisions should cover expected losses (Chernobia *et al*., 2007:39). Likewise, all three pillars included in Basel II, namely (1) minimum capital requirements (2) supervisory review and (3) market discipline play an interrelated role in operational risk management (ORM) as illustrated by Figure 2.6 (BCBS, 2001:4).

The first pillar of minimum capital requirements forced banks to keep a specific capital level for operational risks (Crouhy *et al.,* 2014:501). These levels of capital will serve as a buffer to the bank against losses resulting from operational risks (Chernobia *et al.,* 2007:29). According to BCBS (2001:5), the level of economic capital allocated for operational risk entails an average of 20 percent. Basel II also included three approaches for measuring

operational risk, namely basic indicator approach, standardised approach and the advanced approach (Swanepoel, 2012:153).

Figure 2.6: The relationship between Basel and operational risk management



Source: Compiled by the Author

Under Pillar 2 of Basel II banks are obliged to evaluate their levels of economic capital to support operational risk where this evaluation is reviewed by supervisors later (BCBS, 2001:4). Whenever insufficient capital levels are allocated towards operational risk, it is expected from the bank to correct the situation. Pillar 3 requires banks to disclose the mitigation processes used for operational risk publicly, along with its regulatory capital allocation procedure (BCBS, 2001:4).

Furthermore, in order to sustain effective operational risk management, the BCBS proposed 11 principles for banks to adhere by (BCBS 2011; BCBS 2009 & Crouhy *et al*., 2014:505; Micocci *et al*., 2009:3):

- Principle 1: A strong risk management culture throughout the financial institution should be developed by the board of directors and senior management.
- Principle 2: An operational risk management process, which is fully unified with the banks risk management process, should be implemented. Each operational management process will be dependent on the nature of risks, and the size and severity.
- Principle 3: The established operational framework approved by the board, has to be reviewed annually to monitor all systems, processes and policies at each management level.

- Principle 4: Risk appetite and tolerance levels should be reviewed and approved in order to articulate the exact level of operational risk that the bank is willing to take on.
- Principle 5: A robust governance structure with clear lines of responsibility should be developed by senior management and approved by the board of directors.
- Principle 6: The identification and assessment of operational risk should be ensured by senior management inherent in all material products, bank activities and systems.
- Principle 7: The senior management of the bank should implement an approval process for all new products and services, processes and systems as well as all bank activities that evaluate operational risk.
- Principle 8: Operational risk profiles and exposure to operational losses should be monitored by a process that includes reporting mechanisms at each business level.
- Principle 9: A strong control environment should be established by all banks in order to utilise its policies, processes and systems, internal control measures and mitigation strategies.
- Principle 10: Each bank should establish business resiliency and continuity plans to ensure the full ability of the bank to continue with its operations, at a minimum loss level, in case of severe disruption.
- Principle 11: The banks public disclosures should allow the banks stakeholders to view the banks approach to operational risk.

2.6.3 Consequences of operational risk

Sound operational risk management is often regarded as the mirror image of the board of directors' effectiveness in overseeing the banks products, services, processes and systems (BCBS, 2009:3). However, failure to manage operational losses successfully can have severe consequences.

2.6.3.1 Decline in earnings and profits

Since operational risk has to do with the uncertainty regarding a bank's earnings, one of the leading concerns of operational risk is that it leads to a decline in earnings and profits as a result of unanticipated events (Rose & Hudgins, 2013:185). Operational risk can lead to the closure of institutions for extended periods and can cause disruptions in services provided. Closed institutions due to operational risk do not allow firms to generate earnings or gain profits (Rose & Hudgins, 2013:186). Resultantly, enormous operational losses will lead to a

greater magnitude of risk exposed to the earnings per share of a bank (Joosub, 2006:17). Therefore, earnings per share is influenced by the way in which a bank's operational risk is managed (Joosub, 2006:21).

2.6.3.2 Credit downgrade

Credit ratings are an indication of what the banks investors can expect to recoup in the case of an event or operational loss. A credit rate may refer to the bank's ability and willingness to meet its financial obligations in full (Standard & Poor, 2014). Credit ratings conducted by Standard & Poor, Moody's or Fitch Rating Agency may include quantitative and qualitative analyses that contains the financial analysis, management of the bank, the banks attractiveness, expected growth and exposure to industry cycles (Crouhy *et al.*, 2014:342). Large operational losses may lead to a lower credit rating, which indicates that these rating agencies believe that the concerned bank has a higher probability of default than before. High debt burdens, inadequate levels of required minimum capital, and regulatory changes may lead to credit downgrades. Therefore, a decreased credit rating will lead to a negative outlook of the relevant bank and discourage investors and creditors (Ferreira, 2014:15).

2.6.3.3 Loss in the market value of bank equity

Numerous studies have analysed the severe consequences of operational loss announcements on the stock market. The majority of research such as by Cummins *et al.* (2004:1) argued that operational losses increase the volatility in stock prices. Since operational losses tend to be negative (Moses & Rajendran, 2012:51), it can be assumed that operational risks will ultimately result in a decrease in a bank's stock prices. At whatever time, the market loss is greater than the operational loss, the bank's reputation shall be negatively influenced (Sturm, 2013:193).

Furthermore, research conducted by Cannas *et al.* (2009:1), which included a sample of 20 operational loss events, indicated that whenever internal fraud occurs (operational loss event), stock prices tend to fluctuate and react negatively to operational loss announcements (Sturm, 2013:193). After the announcement of operational losses incurred by banks, abnormal returns also indicated a negative trend (Gillet *et al.*, 2010:224) along with greater trade volumes (Sturm, 2013:193). Therefore, operational losses will decrease the value of a bank, relative to market prices, and will most definitely have a negative impact on a banks value (Jarrow, 2008:873).

2.6.3.4 Reputational damage

As previously stated, operational losses can be direct or indirect. However, the magnitude of operational losses extends further than a loss in earnings, profits and market value (Sturm, 2013:192). Since operational losses include some sort of failure, these losses attract media attention despite the fact that the financial loss may be small. This increased attention on operational losses is the reason why these losses can pose severe threats to an institutions' reputation (Sturm, 2013:192).

Numerous studies have examined reputational risk caused by operational loss events beyond the impact on the market value of banks. Damage to a banks reputation, caused by operational risk can be seen as an indirect operational loss (Chernobai *et al.*, 2007:30). Whenever, the market loss exceeds the initial operational loss, future reputational damage to the bank is evident (De Fontnouvelle & Perry, 2005:2).

On the other hand, Basel II forces banks to include operational risk in their minimum capital requirements (along with credit risk and market risk) but omits a capital requirement for reputational risk (Gillet *et al*., 2009:224). The multidimensional nature of operational losses contributes to the difficulty in distinguishing between operational risk and other types of risks. Although reputational risk is excluded from the Basel version of operational risk "the risk of direct and indirect losses, arising from inadequate or failed internal processes, people and systems or from external events" (BCBS, 2001:2) it is still acknowledged that operational risk affects the reputation of financial institutions, posing a risk exceeding far beyond the financial loss itself (Sturm, 2013:192). Reputational risk though, has its own list of consequences (Ferreira, 2014:16).

2.7 Summary

South African banks are exposed to numerous financial risks that may include credit risk, market risk, liquidity risk, legal and regulatory risk, systemic risk, business risk, operational risk and reputational risk. These risks may originate in any bank, from any situation as a result of uncertainty. Therefore, financial stability within the banking sector is the ultimate goal of South African regulators. Regulators carefully monitor their activities to be able to assign appropriate capital levels to credit risk, market risk and now operational risk. The SARB is the local regulator of all locally controlled banks accompanied by the guiding principles of the BCBS. The BCBS has no lawful power since it merely designs standards

and guidelines and make recommendations to financial institutions to ensure the best practice.

Although the BCBS only focused on credit risk during Basel I in 1988, changes were made later to include market risk in 1996 and operational risk in 2001. Eventually the BCBS released a formal globally acknowledged definition of operational risk which is still used today. This definition is argued to be vague due to the deliberate exclusion of other types of risks such as reputational risk.

Since operational risk can be deemed as one of three important bank risk categories, comprehensive operational risk management is regarded as the reflection of the effectiveness of management overseeing products, services, processes and systems. However, failure to manage operational losses successfully has severe consequences that include a loss in earnings and profits and a downgrade in a bank's credit status. Since it is difficult define operational risk, due to the complexity of its nature, supervisors often find it difficult to draw the line between operational risk and other risks. Due to the fact that operational events draws significant social media attention, operational losses may lead to reputational damage and risk as a result of the market's reaction to the announcement of such operational events.

CHAPTER 3: THEORETICAL FRAMEWORK FOR REPUTATIONAL RISK

3.1 Introduction

Section 3.2 of this chapter defines reputational risk as perceived by financial institutions and its stakeholders. The second section provides an overview of the factors contributing to the growing importance of reputational risk around the globe. Each of these factors is elaborated upon briefly. In order to understand the course of reputational risk within a bank, and how it evolves over time, reputational risk is described as a process.

Furthermore, the fundamental purpose of this chapter is to review the origin of reputational risk. The role that expectations and stakeholders play in the origin of reputational risk is explained. Stakeholders can be classified either as internal or external stakeholders. Internal stakeholders include the chief executive officer, and all other employees, whereas external stakeholders include social media, government and regulators, customers, shareholders and the larger community in which the bank may function. Reputational risk is discussed further by elaborating on the three main causes of reputational risk, namely cultural risk, managerial risk (operational risk) and external risk. The provocative consequences of reputational risk are illuminated upon. The difficulty in measuring reputational risk due to vague and abstract definitions provided for this type of risk is also discussed. The role that the Basel Committee on Banking Supervision (BCBS) play with regards to the quantification of reputational risk is inevitable and, therefore, is included.

Lastly, international and national examples of operational loss events in banks are given where these events led to reputational risk. International examples include the Wells Fargo Bank during 2008 when the bank faced a loss of USD294m due to external fraud and the bank of East Asia. National examples include the failure of Regal Treasury Bank (2001), Saambou Bank (2002), African Bank (2013) and Standard Bank (2014). Each of these banks announced operational loss events, which were followed by reputational damage.

3.2 Defining reputational risk

"Everything an organization does or says creates an indelible impression in the minds of its key stakeholders — senior management, employees, customers, local communities, investors, and so on. The sum total of all these interactions represents your reputation." *Oliver Wyman (2014).*

Financial institutions such as banks have constantly faced risks that could be harmful to their reputation. However, those risks are becoming more pervasive and immediate (ACE, 2013:2). Reputational risk constitutes a value even if it is not yet possible to express it financially (Chartered Institute for Management Accountants, 2007:17) due to the lack of a uniform definition and extensive research. Both the BCBS and the Committee of Sponsoring Organisations of the Treadway Commission (COSO) have avoided defining reputational risk. The lack of a uniform definition of reputational risk indicates that institutions perceive reputational risk differently (ACE, 2013:8).

Reputational risk has been defined broadly as:

> The possibility of losing one's reputation (Aula, 2010:44).
>
> The ultimate intangible. It is nothing more than how the organisation is perceived by a variety of people (Low & Kalafut, 2002:259).
>
> The risk that the banks' performance does not live up to the expectations of its stakeholders (Honey, 2012:3)
>
> The risk of potential damage to an undertaking through deterioration of its reputation or standing due to a negative perception of the undertaking's image among customers, counterparties, shareholders and/or regulatory authorities (The Committee of European Insurance and Occupational Pension Supervisors, 2007).
>
> The risk arising from the negative perception of the bank, based on the view of its clients; associates; stakeholders; investors; debt-holders; or regulators. These parties can undesirably affect a bank's ability to sustain its existing, or new business relationships and to continue to be a provider of sources of funding (BCBS, 2009:19).

> The risk that arises from other operational risks which can result in a loss in confidence in the institution due to reputational damage (Sweeting, 2011:109).

> The risk that negative publicity, true or untrue, can affect a bank's customer base or bring forth costly litigation, hence negatively affecting profitability (Koch & Macdonald, 2006:81).

Despite the vague and abstract definitions above, it is clear that one central theme can be adopted when defining reputational risk. The main theme suggests that an institution can become well-known over time by its observers, and establish a comprehensive understanding for which the institution can be judged constructively or critically by its observers (Lange *et al*., 2011:154). All the definitions suggest that reputational risk presents an indirect loss rather than a direct loss resulting from the way in which the institution is operated. It is also clear that reputational risk includes risks associated with the stakeholders of an institution, *inter alia* failure to meet stakeholders' expectations (Chernobai *et al.*, 2007:28). A bank's reputation is embedded in its past behaviour. However, the banks reputation can change on the arrival of new information about historical or current behaviour that may be concerning to stakeholders (Lange *et al*., 2011:153).

3.3 The growing importance of reputational risk

Reputational risk is a major risk in all financial institutions and needs to be considered alongside all other fundamental risk categories such as operational risk, credit risk and market risk (Chartered Institute for Management Accountants, 2007:1). The growing importance of reputational risk has been a consequence of five factors, namely (Mukherjee *et al.*, 2008:5):

- globalisation and social media;
- regulation and governance;
- reputation as an intangible asset;
- changing expectations; and
- the benefits of having a solid reputation.

3.3.1 Globalisation and social media

Reputational risks are more profound in the 21st century due to the effects of social media and globalisation (De Marcellis-Warin & Teodoresco, 2012:5). Globalisation has changed the views, activities and expectations of banks globally. The rapid growth in the banking sector has led to an increased number of global financial competitors. The risk of increasing competition had led to increased reputational risk from both internal and external sources (Mukherjee *et al.,* 2008:6). Financial institutions have no room to hide any information anymore. Globalisation, the Internet, social media and other mobile technology have made it possible for information to be broadcast within minutes (Chartered Institute for Management Accountants, 2007:1). Through a globally connected world, an announced loss can virtually spread through the Internet and spiral into a full-scale crisis in an instant (ACE, 2013:6).

3.3.2 Stricter regulation and governance

A stricter financial environment poses severe threats in terms of the management of various risks. The evolution of the BCBS and its continuous incorporation of more types of risks in the Basel Accords have highlighted the negligence of reputational risk (Mukherjee *et al.,* 2008:5). The growing importance of compliance has also led to the illuminated awareness of its link to reputational risk. Failures to comply and manage core business risks will have a disproportionate impact on the reputation of financial institutions (ACE, 2013:12).

3.3.3 Reputation as the most vital intangible asset

The reputation of financial institution can be perceived as the most important asset it possesses. Nonetheless, it is also the most challenging asset to protect (Zboron, 2006:504). Reputation can also be seen as the most important asset within a bank, since it is the only asset that cannot be recuperated by buying it back (Scandizzo, 2011:41). Since reputation cannot be classified as a physical asset on the balance sheet (Chartered Institute for Management Accountants, 2007:6) it may be seen as the ultimate intangible asset (Low & Kalafut, 2002:259). A bank's reputation is especially important due to the fact that a third of investment choices are based on reputation alone (Conference Board, 2007:6). Government laws have also been amended to encourage banks to declare non-financial assets, thereby forcing banks to manage and monitor reputational risk as a key indicator (Mukherjee *et al.,* 2008:6).

3.3.4 Constantly changing expectations

Neither values nor expectations are fixed in time (Walter, 2007:8). The constantly changing expectations of stakeholders (customers, employees, associates, government or regulators) is another factor contributing to the growing importance of reputational risk (Eccles *et al.*, 2007:3). The expectations regarding a bank's performance will ultimately vary from stakeholder to stakeholder (Zboron, 2006:504). Whenever the expectations regarding a bank's performance change but the banks actual performance stays the same, the gap widens and reputational risk increases. Norms also do not remain static. Changing policies and regulations can shift expectation, which can jeopardise the reputations of banks that still abide by old norms and standards (Eccles *et al.*, 2007:4).

3.3.5 The benefits of having a solid reputation

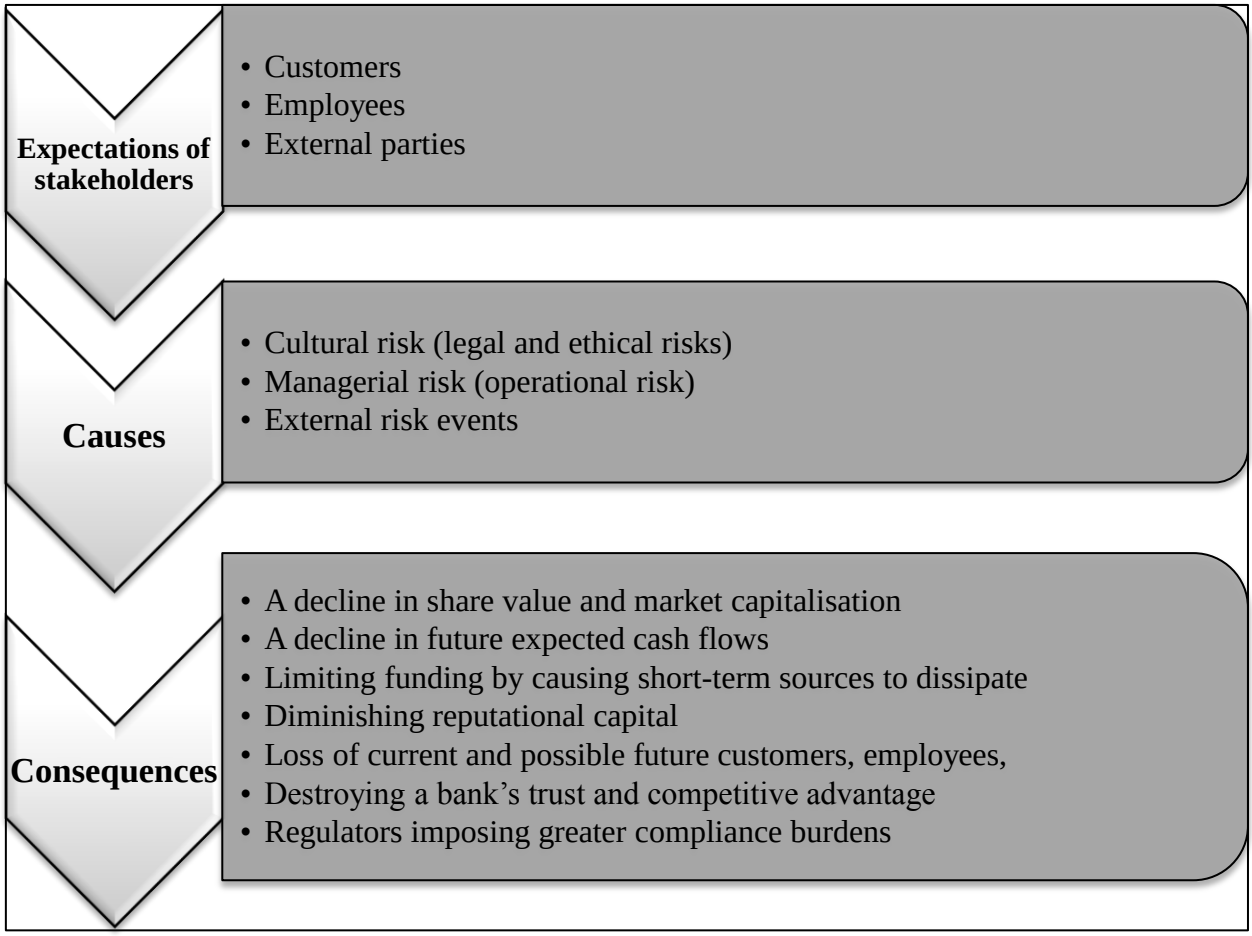
A solid banking reputation will affect the profitability, share price, market to book value and the amount of services demanded in a constructive way. A bank with an exceptional reputation can be regarded as more exclusive since acquiring firms will have to pay a premium for purchasing such a bank (Conference Board, 2007:6). These banks will also benefit in terms of their share price performance and customer trust. A solid reputation will also create a reserve of goodwill, which will assist against future crisis (ACE, 2013:6). A good reputation may further contribute to the efforts in optimising shareholder value and attract high quality employees. Conversely, a bank with a negative reputation will be much easier to purchase in the mergers and acquisitions market (Conference Board, 2007:6). A low ranking reputation will reflect a mediocre share price performance with little attraction towards quality customers and future employees. Banks that are acknowledged for their good reputation will be more likely to find valuable investors and business partners. Regulators may also focus less on oppressive scrutiny on banks with excellent reputations (Magrann-Wells, 2011:2).

3.4 Reputational risk as a process

In order to understand the course of reputational risk within a bank, and how it evolves over time, reputational risk needs to be described as a process as illustrated by Figure 3.1. In the banking sector, customers, employees and various other external parties play the role of bank stakeholders. Reputational risk is the loss in a banks reputation due to the deviation between the banks performance and the stakeholders' expectations (Honey, 2012:3).

Reputational risk may be caused by cultural risks (legal and ethical risk), managerial risks (operational risk), and external risk factors (Chartered Institute for Management Accountants, 2007:20; Gatzert *et al.,* 2014:10). Although reputational risk and its consequences have been neglected in the past, several impacts are now obvious. These may include loss in share value and market capitalisation, decline in cash flows and deteriorating liquidity position. Each of the components illustrated in Figure 3.1 will be discussed in detail in the following sections.

Figure 3.1:Reputational risk as a process



Source: Compiled by the author

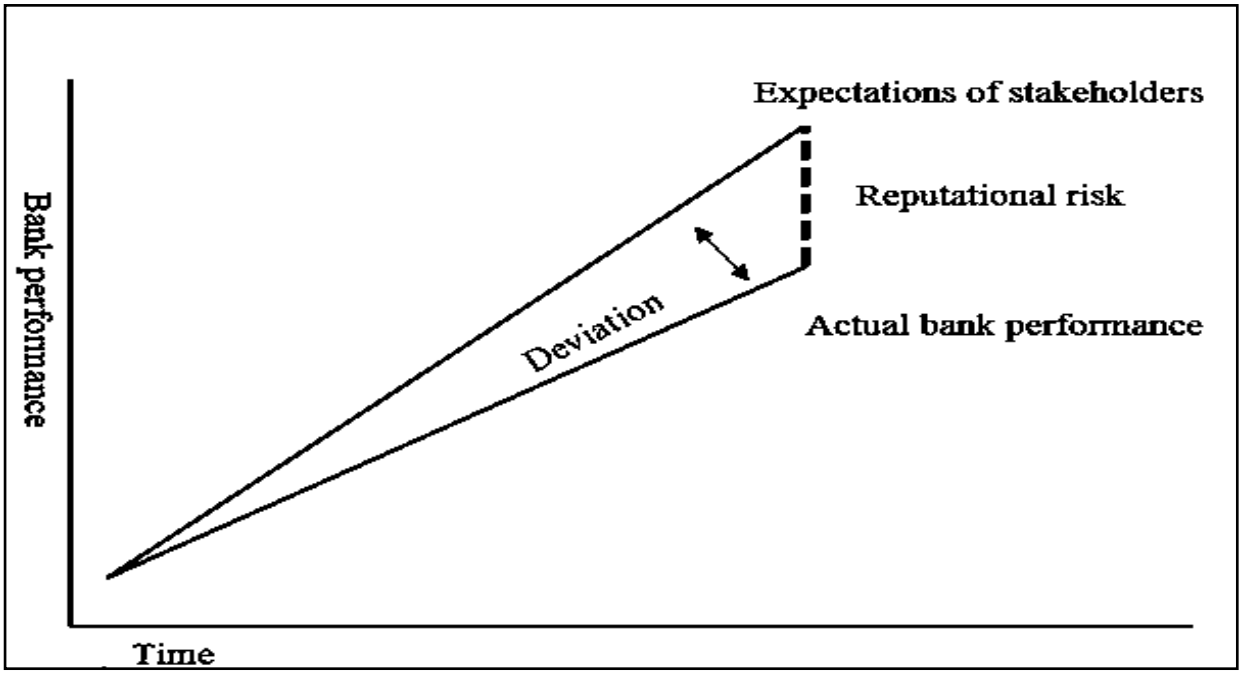
3.5 Origin of reputational risk

Reputational risk is regarded as the negative perception of a bank by its stakeholders (investors, customers, employees, national regulators, government, international regulators and the society) in the environment in which the bank operates (Eccles *et al*., 2007:4). Reputational risk is considered multidimensional by BCBS as it may reflect the perception of stakeholders with regards to the bank (BCBS, 2009:19).

3.5.1 The role of expectations

Despite the fact that reputational risk is challenging to quantify, it is linked meaningfully to the opinions and perceptions of stakeholders. Even though these opinions and perceptions are subjective in nature, they originate as a result of the banks' performance and activities (Zboron, 2006:504). The failure to meet such expectations will influence a bank's perception negatively and lead to a loss in reputation (Zboron, 2006:504). Figure 3.2 indicates that reputational risk occurs whenever a bank's performance does not meet the expectations of its stakeholders, whereas reputational opportunity occurs whenever a bank's performance exceeds stakeholder expectations (Deloitte, 2014:5; Honey, 2012:3). Furthermore, the more a bank's performance deviates from stakeholder expectations, the bigger is the possibility of reputational risk. Perceived performance is driven by the banks actual performance (what a bank does, and not only what a bank says) (Deloitte, 2014:5). Low actual performance mostly can be attributed to poor products or services, low earnings or profits, or from false market reports (Honey, 2012:3).

Figure 3.2: Reputational risk



Source: Honey (2012:3)

The manner in which each bank manages the expectations of stakeholders will determine whether the banks reputation is diminished or enhanced (Deloitte, 2014:5). All banking activities and decisions have the probability of leading to reputational risk whenever these

activities are proven to be controversial by the stakeholders (Manjarin, 2012:4). A bank will gain a positive reputation if the perception of the bank among its stakeholders is proven to be optimistic. On the contrary, a bank will gain a negative reputation if the perception of the bank among its stakeholders is proven to be pessimistic (Eccles *et al*., 2007:4). The expectations of stakeholders are based mainly on the banks history in terms of their previous performance as well as on the banks strategy established and communicated to the public (Deloitte, 2014:5).

3.5.2 Relevant stakeholders

According to Banhegyi (2007:126), the shareholder theory states that shareholders are the main determinants with regards to a banks reputation, since they invest money within the bank in order to increase their return. On the other hand, the stakeholder theory argues that not only do shareholders have an interest in a bank but also the employees, customers and the general public (Banhegyi, 2007:126). Stakeholders can be classified either as internal or external stakeholders (Chartered Institute of Purchasing & Supply, 2014:1). Internal stakeholders will include the chief executive officer, and all other employees, whereas external stakeholders will include social media, the government and regulators, customers, shareholders and the larger community in which the bank may function (Chartered Institute of Purchasing & Supply, 2014:1).

3.5.2.1 Internal stakeholders

Furthermore, 68 percent of companies regard their employees as the most important stakeholders when managing reputational risk (Deloitte, 2014:3). A favourable perception of a bank by its employees will foster a constructive attitude in the performance of the employees. A good reputation will increase the employees' aspiration to improve their social status by being employed by a highly regarded bank. The manner in which current employees perceive the bank will influence the banks' ability to attract potential future employees. Any deviation between a bank's performance and the expected performance, known to employees, will result in employees' dissatisfaction and uncertainty about the bank (Tonello, 2007:16). Employees often become shareholders in a bank where their main focus may shift towards the return on their investments and protecting their interests. Thus, employees have the power to buy and sell their share based on their perception of the bank,

influencing the share price as well as the perception of the rest of the financial market (Chartered Institute of Purchasing & Supply, 2014:2).

3.5.2.2 External stakeholders

According to Deloitte (2014:3) 81 percent of companies regard customers as the most important stakeholder group when managing reputational risk, 73 percent favoured the government and regulators, and 68 percent argued that the senior executives and employees are deemed the most important stakeholders. Therefore, in a world of pervasive social media, the management of customer expectations are imperative. Whenever an event within the bank affects a customer negatively, the share price will follow in the same direction. A good reputation as perceived by customers will only occur when these customers are satisfied with the banks decisions and activities and view the services offered as valuable to them (Mostert & Lotz, 2010:10).

Banks acknowledge the importance of regulators since they reflect the foundations of confidence in the banking sector (Deloitte, 2014:3). Both the government and regulators are concerned with the level of economic activity, compliance, legislation, and community development and employment. Banking activities that may negatively influence any of these factors will ultimately influence the reputation of a bank (Chartered Institute of Purchasing & Supply, 2014:1). Other relevant external stakeholders may include auditors; rating agencies; financial analysts; associates; insurance companies; and trading partners (other commercial or investment banks). If a bank is perceived to have uncertain financial records or have a long history of non-compliance, it may point towards a high probability of default. This will create uncertainty in the mind of investors and depositors regarding the safety of their assets (Ross, 2005:8; Scandizzo, 2011:56).

3.5.3 Causes of reputational risk

Reputational risk dominates financial markets and financial service institutions. The degree of reputational risk exposure is the reflection of the effectiveness of each institutions internal risk management process, as well as its response to external effects (Magrann-Wells, 2011:2). The main cause of reputational risk remains elusive as 52 percent of banks consider reputation risk to be caused by pure reputational losses, while 48 percent consider reputational risk to be caused by previous risks (operational risks) (Squires, 2011:2). Numerous empirical studies have attempted to separate the main causes of reputational risk.

A joint study by the Chartered Institute of Management Accountants and the Strategic Risk Magazine in 2006 found the following factors to be valid causes of reputation risk (Gatzert *et al.,* 2014:10).

3.5.3.1 Cultural risk: legal risk and ethical risk

These types of risks generally are not identified since they are planted in the culture of a bank and concerned with the bank's practises and policies. Such causes may take the form of failure to comply with codes of conduct and rules of operations imposed by a third party such as the proposals set out by the Basel Committee (Chartered Institute for Management Accountants, 2007:20). Legal risks generally are associated with the proposed rules and reporting regulations, reporting negligence and statutory compliance (Koutsoukis & Roukanas, 2014:7). Further, legal risks may arise due to various reasons, which may include legal costs from lawsuits and adverse judgements that may lead to disruptions to the operations of a bank (Koch & MacDonald, 2006:81). However, the Basel II Accord classified legal and regulatory risk under operational risk (Crouhy *et al.,* 2014:35).

Ethical risk refers to the failure to comply with the self-imposed standards by a professional institute in order to advise banks relating to their norms and ethics. Ethical risk generally occurs due to a deviation between the vision and mission of a bank and its actual actions (Chartered Institute for Management Accountants, 2007:20). A bank may be regarded as ethical if it respects the society and the environment (Koutsoukis & Roukanas, 2014:7). When these risks are not managed, they may lead to reputational risk (Chartered Institute for Management Accountants, 2007:21).

3.5.3.2 Managerial risk: executive risk and operational risk

Topping the list of fundamental causes of reputational risk is operational risk (Deloitte, 2014:7); however, all relevant causes of reputational risk are mentioned for the sake of inclusiveness. Although other causes of reputational risk exist, the main focus for this study is placed on operational risk as the leading cause of reputational risk. Executive and operational risks generally are identified as an internal audit committee reviews them. The fact that executive and operational risks still pose severe reputational damage shows how important it is to mitigate these risks. Executive risk and operational risk cannot be sidestepped by banks and therefore have to be managed (Chartered Institute for Management Accountants, 2007:20).

Executive risk mainly involves the banks performance indicators; meeting financial targets while satisfying customers. On the other hand, operational risk involves the expectations of stakeholders and the quality of product, services, processes and procedures (Chartered Institute for Management Accountants, 2007:21). Sweeting (2011:109) identified reputational risk as a form of operational risk as it classifies reputational risk under operational risk. Furthermore, Aula (2010:44) distinguished reputational risk as a pure operative risk that involves the low functioning of internal operations, systems, people or any external events that will result in direct or indirect losses to a bank. Operational loss events that might lead to reputational risk include internal and external fraud; unethical employment practices and workplace safety; failure to meet obligations in terms of clients, products and business practices; damage to physical assets; business disruptions and system failures; and failed execution, delivery and process management (Chernobai *et al.,* 2007:24, Crouhy *et al.*, 2014:510, Moses & Rajendran, 2012:52).

According to Micocci *et al.* (2009:2), equity markets react gradually to reputational damage caused by operational loss events. Operational loss events will lead to depreciation in a bank's share price (expected value of future cash flows) as stakeholders react to new market information. Since operational losses reflect the banks effectiveness to manage risk, stakeholders are likely to lose confidence in a bank and to suspect future losses on their investments (Magrann-Wells, 2011:2). Therefore, the reputational risk caused by the operational loss event can be quantified indirectly by the loss on a bank's market value (Micocci *et al.,* 2009:2) also indicated by the decline in abnormal returns. Any operational risk (primary risk) has the potential to cause secondary reputational damage (secondary effect) to a bank followed by loss in profits and shareholder value (Ross, 2005:8).

Furthermore, the size of a bank, its profits as well as operational loss events will influence the degree of reputational risk (Ferreira, 2014:26; Fiordelisi *et al*., 2013:1366). High profiting banks are prone to greater reputational risk, whereas, low profiting banks experience less reputational risk. High profit banks experience larger negative stock price reactions than smaller banks. Resultantly, reputational risk is more general for large banks than for smaller banks (Fiordelisi *et al*., 2013:1366).

3.5.3.3 External risk: risk of associate

Reputational risk does not necessarily only arise from internal factors. Reputational risk can also arise from external factors that do not originate within the firm (Ferreira, 2014:26; Scandizzo, 2011:46). Therefore, the bank's actions as well as the actions of its associates will have a strategic impact on its reputation (Koutsoukis & Roukanas, 2014:8).

Risk of associates may stem from banking products or services that are delivered by a third party (Chartered Institute for Management Accountants, 2007:21). Each time a bank enters into a transaction with one of its associates it creates a relationship with the relevant party. These relationships will represent a potential threat to the banks reputation since the bank is perceived to be connected with its associates (Scandizzo, 2011:56). Nonetheless, banks have no say in these parties' activities or performance. Dissatisfying performance by these parties will cause reputational damage to a bank and will lead to a further decline in profits and shareholder value (Ross, 2005:8). Once investors and depositors have identified such performance they may choose to withdraw their funds, as the bank is perceived to be associated with these parties. Similar events in the past have resulted in bank runs that wiped out numerous related institutions (Ferreira, 2014:27; Ross, 2005:9). Banks should carefully consider their associates when entering into an agreement. Business should be encouraged with those institutions that have a sound reputation and avoid those with an uncertain reputation. Banks should ensure that all of its associates' values and standards are consistent with that of the individual entity (Ferreira, 2014:28; Scandizzo, 2011:46).

3.6 Consequences of reputational risk

As profoundly stated by Warren Buffet, "it takes 20 years to build a reputation and only five minutes to ruin it. If you think about that, you will do things differently" (Mukherjee *et al.*, 2008:1). The fact that reputational risk can influence the long-term sustainability of any financial institution is therefore undeniable. Reputation has a different dynamic since its value can change much faster than other assets as a result of its intrinsic volatility (Chartered Institute for Management Accountants, 2007:12). Prior to the 2008 financial crisis, most international banks failed to acknowledge the reputational risk and its challenging consequences (International Association of Risk and Compliance Professionals, 2015). However, the following consequences are now obvious (Fiordelisi *et al.*, 2011:5):

- A decline in share value and market capitalisation;

- A decline in future expected cash flows;
- Limiting funding by causing short-term sources to dissipate;
- Diminishing reputational capital;
- Loss of current and possible future customers;
- Loss in valuable employees;
- Destroying a bank's trust and competitive advantage;
- Reduction in current or future business relationships; and
- Regulators imposing greater compliance burdens.

Reputational risk will lead to high economic cost and the depletion of reputational capital when not adequately mitigated and managed (Ross, 2005:7). As mentioned above, reputational risk occurs from internal and external causes when the bank's performance does not live up to the expectations of its stakeholders (Honey, 2012:3). Whenever reputational risk arises, it leads to low levels of reputational capital, which can be regarded as the fluctuating value of the banks reputation (Xifra & Ordeix, 2009:355).

The reputation of a bank dictates a bank's behaviour and the amount of trust placed within a bank by its stakeholders (Chartered Institute for Management Accountants, 2007:14). Reputational risk does not only lead to a damaged reputation, immediate or differed monetary costs, but also diminished trust (Chartered Institute for Management Accountants, 2007:15). The amount of trust that stakeholders have in their bank can be used as a competitive advantage if the bank is able to build up a positive reputation. Once stakeholders distrusts a bank it can lead to financial difficulty since they no longer have faith in the management of the bank, forfeit their support and neglect to provide additional capital when necessary (Zboron, 2006:505).

More than 40 percent of executives are concerned about the loss in earnings from reputational events (ACE, 2013:9). Reputational risks will in fact hamper the bank's ability to generate earnings and support its capital position (Zboron, 2006:506). Nearly 40 percent of bank executives show concern towards the severe impact on share prices (ACE, 2013:9). Damage to a banks reputation may lead to a decline in share value and market capitalisation (Chartered Institute for Management Accountants, 2007:12). A survey conducted by Deloitte (2014:12) found that financial service institutions who had experienced reputational

risks regard regulatory investigation (45%), loss in stock prices (44%) and loss in revenue and earnings (38%) as the main consequences.

Reputational events result in a declined present or future value of expected cash flows, which will lead to a decline in the bank's equity value (Fiordelisi *et al,* 2011:5). This may be attributable to the fact that a bank's share price is equivalent to the current discounted expected cash flows. Whenever a bank is perceived to have a weak internal control, stakeholders might perceive losses as imminent. Therefore, reputational risk may either erode future cash flows or lead to a higher market required rate of return (Fiordelisi *et al,* 2011:5). Bank customers (depositors, creditors and investors) need to be confident that their financial resources and assets are secure within the concerned bank (Reserve Bank of Australia, 2011:45). Reputational risk may also pose severe threats to a bank's liabilities as market confidence and the capacity to fund activities are linked carefully to a banks reputation (International Association of Risk and Compliance Professionals, 2015).

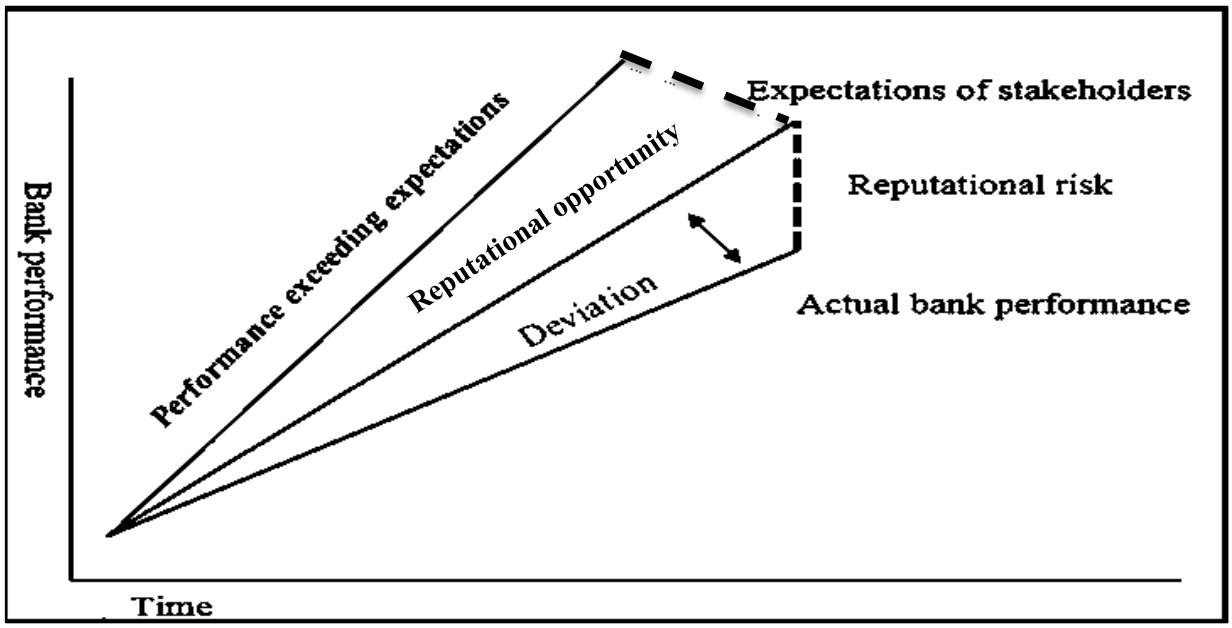
At whatever time a bank fails in its loss absorbing function, it points toward the banks inability to fund its liabilities with its assets, resulting in a decline in customer confidence and diminished integrity (Svitek, 2001:38). In an attempt to avoid reputational damage, banks often call its liabilities (such as subordinated debt), affecting the liquidity profile and capital position of the bank. A loss in reputation may ultimately lead to a loss in counterparties confidence and thus limiting funding, causing short-term funding sources to dissipate (Magrann-Wells, 2011:4). This is evident in new established banks lacking a long track record of success (Svitek, 2001:38).

More than 50 percent of bank executives are concerned about the impact that reputational risk will have on their existing relationships, while the remainder of executives are concerned about the consequences that reputational risk will have on their bank's ability to form new relations (ACE, 2013:9). Reputational risks and events will create doubt in the minds of its stakeholders that will render fear, and construct a bank run that will destroy the institution (Ross, 2005:8). Whenever bank customers refrain from supporting the concerned bank, the amount of products and services sold will decline, putting direct pressure on liquidity (ACE, 2013:6).

On the one hand, the monetary cost (loss in returns, crisis management, higher compliance burdens, and re-establishment of reputation) of reputational losses is significant (Ferreira,

2014:28). On the other hand, the opportunity cost (loss of valuable employees, customers, associates and market share) is extraordinary (Ross, 2005:8). Banks need to mitigate the consequences of reputational losses but should also be seeking the upside opportunities as illustrated in Figure 3.3 that may enhance their reputations (Chartered Institute for Management Accountants, 2007:1).

Figure 3.3: Reputational opportunity



Source: Deloitte (2014:5)

3.7 The difficulty in quantifying reputational risk

Generally, the term risk is referred to as something that needs to be evaded rather than embraced. Most investors find it strange that many risks are measured with the unmistakeable purpose of avoiding these risks (Chartered Institute for Management Accountants, 2007:25). Reputational risk is often one of these risks. Most managers are not certain how to categorise or quantify reputational risk (Xifra & Ordeixb, 2009:356), mainly due to the vague and abstract definitions that have been provided (Koutsoukis & Roukanas, 2014:6). Reputational risk often is acknowledged as a more elusive risk category compared to operational risk, market risk and credit risk, attributable to the struggle to measure its consequences and finding its origin (Micocci *et al.,* 2009:2).

Some researchers regard reputational risk as a risk due to other risks, whereas others rather regard reputational risk as a consequence of a risk rather than a risk itself (ACE, 2013:8). As a result of the high level of importance that banks attach to their reputation, it becomes

essential to quantify reputational risk in terms of its likelihood, severity and financial impact. Only 28 percent of top management around the globe argue that they can accurately quantify the financial effects of reputational risk (ACE, 2013:8). These managers measure reputational risk as the difference between the immediate loss by a firm and the loss in the firm's market capitalisation. Any losses in shareholder value after the initial event may also be regarded as reputational losses (De Fontnouvelle & Perry, 2005:11). Therefore, reputational events clearly have an impact that is quantifiable in terms of a banks market value and financial value (ACE, 2013:10).

However, several models to measure reputation itself have been used for over 10 years (Chartered Institute for Management Accountants, 2007:25). The reputation quotient developed by Harris interactive (European Institute for Brand Management, 2009:1) involved 20 characteristics based on six dimensions (emotional appeal, products and services, financial performance, vision and leadership, work environment and social responsibility) (Scandizzo, 2011:43). The reputation quotient model analysed the reputation of an institution among its stakeholders (European Institute for Brand Management, 2009:1) but omitted the magnitude of reputational risk that a particular institution could be exposed to (Ferreira, 2014:22).

The Brady model, developed in 2005, identified seven key sources (knowledge, emotional influence, leadership, vision, quality, financial responsibility, social responsibility) of an institutions reputation (Chartered Institute for Management Accountants, 2007:35). These seven sources of reputation are similar to the six dimensions of the reputation quotient model. Nevertheless, the Brady model had three limitations. First, the Brady model cannot rank an institution given their reputation; secondly, changes in reputation over time cannot be measured. Lastly, reputational risk itself cannot be measured in monetary terms (Scandizzo, 2011:43).

The stakeholder performance indicator relationship improvement model developed by Keith MacMillian aimed to help institutions identify their key stakeholders and to improve the quality of these stakeholders. The model consisted out of four classifications of indicators (emotional, behavioural, influence and experience) that are divided further into 16 attributes (Chartered Institute for Management Accountants, 2007:36). The Honey model, referred to as a strategic planning tool was established to contribute to the decision making in institutions. Contrary to the previous models that omitted the magnitude of reputational risk

that an institution could be exposed to, the Honey model attempted to address the expectations of its stakeholder (Chartered Institute for Management Accountants, 2007:37). This is due to the fact that reputational risk is regarded as the gap between the expectations of stakeholders and an institutions actual performance. The Honey model included various components (stewardship, sustainability, attention, and association) of reputation (Scandizzo, 2011:43).

The various models that have been established to measure the corporate reputation such as the reputation quotient; Brady model; stakeholder performance indicator relationship improvement model and the Honey model do not focus on the loss in reputation of banks that creates reputational risk (Chartered Institute for Management Accountants, 2007:35). The lack of a dependable set of influences that may determine reputational risk contributes to the quantification challenge (Lamont, 2015:10). Despite the fact that a bank's reputation contributes to its market value and future sustainability (Lamont, 2015:10), reputational risk still remains unnoticed due to the difficulty in measuring the monetary value, accompanied by the poor understanding of the origin of reputational risk (De Fontnouvelle & Perry, 2005:4). These contentious limitations in measuring reputational risk elucidate the need for contributing empirical studies (Fiordelisi *et al.,* 2013:1359).

3.7.1 The relationship between capital and the quantification of reputational risk

Bank regulators still have controversial opinions regarding whether or not to keep additional capital to hedge against reputational risk (Christiaens, 2008:1). Capital plays an incontestable role since the regulation thereof protects a bank from unexpected events that may lead to uninsured losses (Svitek, 2001:37). In the case where a bank does experience unexpected operational events, capital will absorb operating losses, and preserve and restore the confidence of the concerned bank (Svitek, 2001:37). Adequate capital will cover losses and in possible cases cover the banks liabilities, as long as the aggregate losses do not deplete the aggregate capital (Ferreira, 2014:18).

Reserving capital for unexpected events that may be attributable to reputational risk will require a quantitative risk assessment (Christiaens, 2008:2). However, the negligence of capital to protect against reputational risk may diminish the banks' competitive advantage in several ways. First, low levels of reputational capital, which is the value of the bank at risk in everyday banking operations, will provide a poor cushion against reputational damage

combined with a greater probability of bankruptcy (Xifra & Ordeix, 2009:355). Secondly, low or no reputational capital may present a deteriorated resilience against forthcoming reputational losses (Scandizzo, 2011:47). Up to now, a quantification method for measuring the amount of reputational capital that needs to be kept has been challenging due to the lack of a measurement methodology that has not been generally acknowledged (Christiaens, 2008:2).

Nevertheless, this does not imply that the quantification of reputational capital is a useless effort (Christiaens, 2008:2). Ensuring the right amount of additional capital for reputational risk may be one of the most important components since it will guarantee daily operations and longevity of any bank (Rose & Hudgins, 2013:486). Resultantly, any bank that is able to identify its exposure to reputational risk through its quantification and management will gain a competitive advantage (Christiaens, 2008:2). Therefore, the controversial perceptions do not originate from the decision whether or not to keep additional capital for reputational risk, but rather from the difficulty in determining how much capital needs to be kept for reputational risk.

3.7.2 The quantification of reputational risk under Basel Committee on Banking Supervision

Basel I focused mainly on credit risk (Mukherjee *et al.,* 2008:8) and recommended that all banks should retain a minimum required capital level to protect against credit risk (BCBS, 2013:2). Nevertheless, global bank failures moved the focus from credit risk towards operational risk (Ferreira, 2014:60). Within this period, operational risk was thought the most significant risk and no examination was done on the measurement of reputational risk in isolation (Ruspantini & Sordi, 2011:2)

The original Basel II yet again overlooks the importance and measurement of reputational risk when defining operational risk as "the risk of losses resulting from inadequate or failed internal process, people and systems or from external events" (BCBS, 2011:3). The definition provided includes legal risk and compliance risk, but omits reputation and strategic risk (Rose & Hudgins, 2013:185). Resultantly, banks were not obligated to reserve capital to protect against reputational risk (Gillet *et al*., 2009:224). It is clear that the BCBS omitted a comprehensive discussion of reputational risk because of the limitations in

developing a measurement framework (Scandizzo, 2011:42). This was viewed as one of the many drawbacks of the original Basel II framework (Ferreira, 2014:32).

Reputational risk was defined by BCBS (2009:20) as "the risk arising from negative perception of customers, counterparties, shareholders, investors, debt-holders, market analyst, and other appropriate parties or regulators that can affect a bank's ability to preserve existing, or establish new business relationships and secure sources of funding".

Reputational risk often is acknowledged as a more elusive risk category compared to operational risk, market risk and credit risk, attributable to the struggle to measure its consequences and finding its origin (Micocci *et al.,* 2009:2). Consequently, the Basel II framework proposed that "in order to escape reputational damage and preserve the confidence of the market, banks should improve methodologies to measure the consequences of reputational risk as accurately as possible by means of credit risk, market risk, liquidity risk and operational risks, to which it may be exposed to" (BCBS, 2009:20).

This statement was later amended and proposed that banks should identify probable causes of reputation (business lines, liabilities, joined operations, off-balance sheet vehicles and marketplaces) to which it may be exposed to. The Basel II 2009 enhancements started to acknowledge the extent that reputation events have on a bank's performance, earnings, liquidity, and capital position (Gatzert *et al.,* 2014:10), but were still unable to provide a comprehensive framework. However, the BCBS still expected the industry to establish measurement and management techniques for reputational risk (Manjarin, 2012:2).

Basel III was established to provide a full set of improved regulation, supervision and risk measures within the banking sector, to improve the ability of banks to absorb financial losses, as well as to improve the transparency and disclosure of banks (BCBS, 2011:1). Salmon (2012) reasoned that the Basel III Accord was an additional layer built over the foundation of the Basel II Accord. Hence, the Basel III Accord contained the same weakness as Basel II. One of these weaknesses is the failure to recognise the importance of measuring reputational risk. Although the improvements made in Basel III required banks to keep additional capital, it omitted reputational risk from this requirement (Ferreira, 2014:34). This is opposed to one of the key functions of capital − the responsibility to promoting public confidence and minimising reputational risk within the bank (BIS, 2004).

The BCBS failed to notice the worth of reputational risk during the execution of Basel I, Basel II, and Basel III. Nevertheless, it is unclear whether reputational risk will be brought into consideration when completing Basel IV. The significance of reputational risk remains neglected in the previous Basel Accords, attributed to its quantification challenge and the poor understanding of the sources of reputational risk (De Fontnouvelle & Perry, 2005:4).

3.8 Practical examples of reputational risk around the globe

Numerous banks across the globe have suffered severe reputational risk from cultural risk, managerial risks (operational risk) and external risks. A few of these examples emerged during the 2008 financial crisis. Instead, some banks were just victims of reputational risk as a result of the operational failures of their associates. Reputational risk is not indigenous to one region. The South African banking sector has also faced a certain degree of reputational risk. South African examples of Regal Treasury Bank, Saambou Bank, African Bank and Standard Bank are also included in the section below.

3.8.1 Wells Fargo Bank (2008)

Wells Fargo is a national financial service company in the United States that provides a wide range of services including banking, insurance, mortgage, investments and other commercial financial services (Wells Fargo Bank, 2015:2). The nature of the company is retail banking that consists of lending and retail loan services (ORX, 2013).The bank extends it services through more than 8700 locations in 90 business banks (Wells Fargo Bank, 2015:2). Wells Fargo has a strong asset base of more than USD1.7t and more than 266 000 employees. With the help of its employees the bank provide services to more than 70 million customers situated in 8700 locations (Wells Fargo Bank, 2015:2).

3.8.1.1 Operational risk of Wells Fargo Bank

The main vision of Wells Fargo is to satisfy its customer's financial needs in order to help these customers to succeed financially (Wells Fargo Bank, 2015:2). The bank achieved this vision on 28 January 2008 when it announced a write down of USD294m. Fargo customers were unable to repay their loans since the majority of customers were victims of one of the largest frauds in Wall Street history (ORX, 2013). According to AM Golden Accounting Corporation (2014) Wall Street legend Bernard L. Madoff ran a Ponzi scheme in which he paid his investors purported returns on their investments using the principle amounts from

other investors, leading to catastrophic losses. Madoff's customer base extended from Palm Beach Florida through Long Island, New York. Investors lost an aggregate amount of USD64.8b. Among these customers were hedge funds, charities, universities and wealthy individual investors (Levy, 2009). The chief financial officer of Wells Fargo stated that their customers went from being wealthy to not having any money at all (New York Times, 2009). In order to support customers financially, the bank had to write off their non-performing loans and suffer USD2.55b loss (Levy, 2009). The operational loss event type of Wells Fargo Bank is illustrated in Table 3.1.

Table 3.1: Detailed loss event type of Wells Fargo Bank

Operational loss event type	Categories	Example
External fraud	Theft and Fraud	Theft Forgery Fraud

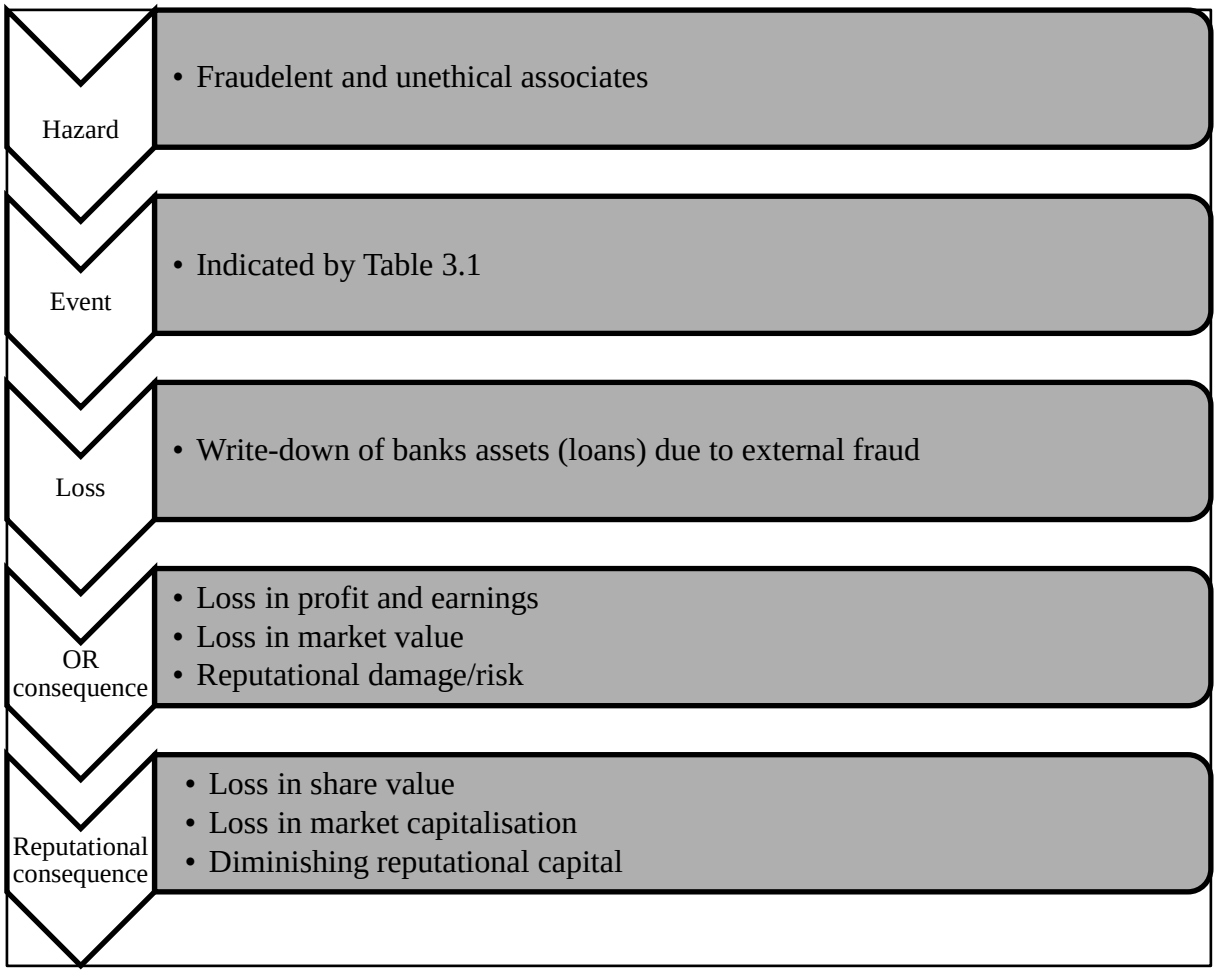
Source: BCBS (2006:304)

3.8.1.2 Reputational risk of Wells Fargo Bank

Wells Fargo suffered a direct loss from the financial write-down from the external fraud committed by Madoff Investment Securities, as well as an indirect loss from reputational risk (ORX, 2013). Reputational risk does not necessarily always arise from internal factors, but can also arise from external factors that do not originate from within the bank (Ferreira, 2014:26; Scandizzo, 2011:46).

Figure 3.4 demonstrates the origin of the reputational risk of Wells Fargo Bank. Since Wells Fargo has no control over external parties or its associates, the bank could not have prevented the catastrophe as a whole from occurring. The dissatisfying performance by Madoff Investment Securities caused reputational damage to the bank and led to a further decline in profits and shareholder value (Ross, 2005:8). The announced loss by Fargo due to the external risk by Madoff constituted 5c of the 79c share loss by Wells Fargo Bank (Levy, 2009).

Figure 3.4: The origin of reputational risk of Wells Fargo



Source: Compiled by the author

3.8.2 The Bank of East Asia (2008)

The bank of East Asia was established during 1918 and is aimed to provide comprehensive banking both commercial and personal (BEA, 2015). The Bank of East Asia, which can be regarded as one of Hong Kong's largest banks, experienced a bank run on 24 September 2008 (Bradsher, 2008). However, the bank run ended almost earlier than it started.

3.8.2.1 Operational risk of Bank of East Asia

Hong Kong has not experienced a bank run since 1997, when the International Bank of Asia suffered due to large deposit withdrawals (Wong &Tang, 2008). Asian depositors rushed to its 91 branches to withdraw their deposits after they had received anonymous text messages indicating that the bank was experiencing severe liquidity problems (ORX, 2013). The text messages claimed that The Bank of East Asia was on the verge of bankruptcy due to its exposure to Lehman brothers and American International Group. The bank of East Asia

responded to the market indicating that its exposure to Lehman Brothers was roughly USD61m, which constituted less than 0.2 percent of the bank's assets withdrawals (Wong &Tang, 2008). The rest of the exposure was bailed out the previous week (The Telegraph, 2008). The depositor's reactions to the text message were exaggerated by the failure of Lehman Brothers the previous week (Bradsher & Timmons, 2008). Depositors stated that if a large institution such as Lehman can fail, then anything is possible. However, the financial turmoil was a larger problem in the United States than it was in Asia (Wong &Tang, 2008). The bank suffered a total operational loss of USD60 881 056m. A detailed example of the Bank of East Asia's operational loss is given by Table 3.2.

Table 3.2: Detailed loss event type of the Bank of East Asia

Operational loss event type	Categories	Activity
External fraud	Theft and Fraud	Theft Forgery Fraud

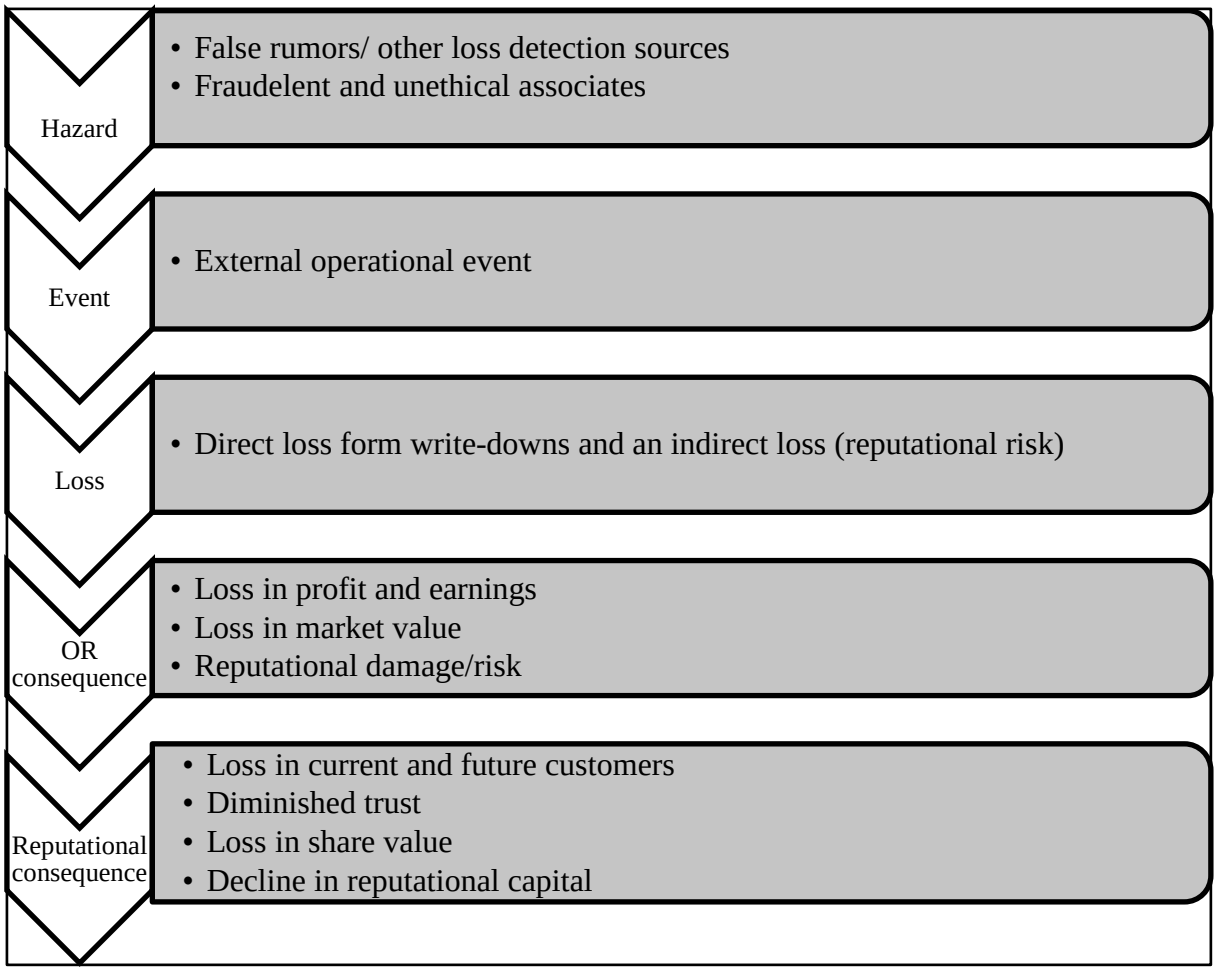
Source: BCBS (2006:304)

3.8.2.2 Reputational risk of Bank of East Asia

Wall Street executives have repeatedly tried to overcome previous bank runs during 1907. However, their efforts were proven insufficient during the collapse of Bear Stearns, Lehman Brothers and Merrill Lynch (Bradsher, 2008). The Bank of East Asia survived its first bank run since 1997. The success was a result of fast cooperation among the local regulators (Bradsher, 2008). Hong Kong's central bank injected USD500m into the money markets to ease the tension (Wong & Tang, 2008).

Although the bank survived the bank run, it still suffered substantial reputational risk. The majority of the depositors needed assurance from regulators, stating that they would rather be on the safe side than lose their life-savings (Bradsher & Timmons, 2008). The banks share price dropped 6.9 percent on 24 September 2008 since depositors had received the text messages (Lau & Mitchell, 2008). The bank run further created concerns regarding the financial stability of the banking sectors of emerging markets (Bradsher & Timmons, 2008). Figure 3.5 demonstrates the origin of reputational risk of the Bank of East Asia.

Figure 3.5: The origin of reputational risk of Bank of East Asia



Source: Compiled by the author

3.8.3 Regal Treasury Bank (2000)

Regal Treasury Bank (Regal Treasury Bank) was established in 1997 and listed during 1999 (Makhubela, 2006:94). Regal Treasury Bank consisted out of ZAR1.6bn in assets, 1600 depositors and 120 employees. Since the banks establishment the company was trapped in controversy, which ultimately led to reputational damage.

3.8.3.1 Operational risk of Regal Treasury Bank

Regal Treasury Bank suffered from operational hazards such as incompetent employees and management, organisational diversity and fraudulent and unethical management as illustrated by Figure 3.7. Yet, the banks problems arose in the beginning of the financial year 2000 when the bank came into disagreement with its external auditors, Ernst & Young (Levenstein v The State, 2013:5; Roodt Attorneys, 2015). At the root of the controversy lay the task to prepare the banks financial statements for the year 2000 in which a valuation

needed to be made regarding a certain asset of the bank (the banks right to receive a portion of the shares issued by other companies that uses the Regal Treasury Bank name and trademark) (Roodt Attorneys, 2015).

The valuation model used by Regal Treasury Bank to valuate this asset was based on potential rather than the actual income. During the valuation of this branding income by Ernst & Young, the external auditors refused to approve the value determined by Regal Treasury Bank (Levenstein v The State, 2013:7). A substantial gap emerged between the two company's valuation methods, where Regal Treasury Bank declared a branding income of ZAR55m on 16 May 2000; Ernst & Young did not want to declare income of more than ZAR5.5m (Levenstein v The State, 2013:7).

Ernst & Young reasoned that this branding income could not be recognised until some income was actually generated from branding (Roodt Attorneys, 2015). The external auditors granted the bank some time to amend the financial statements, whereafter the banks financials were redrafted to reflect the ZAR5.5m as indicated by Ernst & Young (Levenstein v The State, 2013:13). On the other hand, the bank's chief financial officer was instructed to defer ZAR6m in order to inflate profits. An additional statement was released thereafter stating that branding income of ZAR18m has been written off, which was not true (Roodt Attorneys, 2015). The actions by Regal Treasury Bank led to an initial event loss on 16 May 2000 that involved unauthorised transactions, inaccurate external reporting and the intentional mismarking of the banks position (BCBS, 2006:304). In reality, the amount written-off by Regal Treasury Bank was only ZAR6m. Regal Treasury Bank started to lose employees, as employees viewed the actions of management as unethical and dishonest (Levenstein v The State, 2013:4).

Regal Treasury Bank was then placed under curatorship on 26 June 2001, due the banks inability to maintain market confidence (Myburgh, 2002:1). After the curatorship, the bank, its associates and employees were placed under investigation (Jacks, 2013). Jeff Levenstein, Chief Executive Officer (CEO), was charged with almost 18 charges of fraud and at least 43 violations of the Companies Act (Whitfield, 2003:1). Regal Treasury Bank complied with Basel I credit requirements and market risk requirements (BCBS, 2013:2). Since operational risk was only introduced in 2004, during the phase in of Basel II and implemented in 2008, Regal Treasury Bank was not obliged to hedge themselves against operational risk or

reputational risk (Keyser, 2010:30). Therefore, the revised Basel II framework was seven years too late and could not be implemented by Regal Treasury Bank (Ferreira, 2014:44).

According to the commissioners report, Levenstein made the following errors throughout his period of management for which Levenstein and the bank had to pay the fines or carry out the minimum sentence of 15 years imprisonment (Myburgh, 2002:3):

- transactions carried out by the CEO (Jeff Levenstein) were not done in good faith and integrity on behalf of the bank, its customers and other shareholders;
- sound capability and preventive measures were not carried out as management were incompetent, unprofessional and unethical;
- precautions were not exercised to protect the interest of depositors and various stakeholders;
- conflict of interest arose since the position of CEO and chairman was both carried out by Jeff Levenstein; and
- transactions were carried out fraudulently.

The final investigation extended up to 2009, when Levenstein was found guilty on eight counts. Six of the eight counts concerned fraud while the remaining two counts concerned the contravention of the Companies Act (Beamish, 2013). Advocate Barry Roux represented Jeff Levenstein. Count one involved the embezzlement of funds where Levenstein forced the bank's financial director to create a deferred expense account of ZAR6m. This was in violation of accounting practises since the bank recognised inappropriate income (transaction type unauthorised) (Carte, 2009).

Count two involved the misappropriation of assets. The banks CEO rewarded himself with a bonus of ZAR2m while all his other expenses where paid by the bank without being disclosed in the financial records. Further unauthorised activities also occurred since the CEO received the dividends worth 650 000 ZAR of shares that were not issued to him (Carte, 2009). Count three also involved unauthorised transactions since income of the sale of property 93 Grayston should not have been recognised. This count involved an income of ZAR36m (Carte, 2009).

Under the event type execution, delivery and process management, Regal Treasury Bank suffered losses from the negligent loss of client's assets (BCBS, 2006:304). The bank's depositors lost ZAR198m, where a single client suffered a tremendous loss of ZAR24m

(Carte, 2009). Only 550 depositors were reimbursed and the remaining depositors received 62c for each ZAR deposited (Still, 2003). Where the event type clients, products and business practises are concerned, the CEO had a fiduciary obligation to the bank, its clients and shareholders (BCBS, 2006:305). However, investigations indicated a fiduciary breach in terms of these parties trust. Depositors lost a total of ZAR198m accompanied by a ZAR200m loss by the banks shareholders (Carte, 2009).

On count four, Levenstein was also found guilty of embezzlement and forgery where he falsified the repurchase of Regal shares from Worldwide African Investment Holdings (Carte, 2009). The repurchase cost the bank ZAR62m. Levenstein was also found guilty on count five where he falsified documents and created false accounts to misrepresent an acquirement of ZAR8m Regal shares by Mettle. On the contrary, Regal Treasury Bank was profiting from its own shares (Carte, 2009). This contrived transaction led to a ZAR125m operational loss.

Under count six, Levenstein miscommunicated with his top management and acted contrary to top management's decisions by lending a significant amount of money to a company called Sempres. Levenstein was found guilty of forgery by drawing up a false sale of share agreement. The loss totalled up to ZAR5m (Carte, 2009). Jeff Levenstein was also accused of managing the bank in a reckless manner (City Press, 2002). Levenstein was not a suitable CEO and chairman, since he was obsessed with influencing Regal Treasury Bank's share price for his own interest (Myburgh, 2002:3).

Under count seven Levenstein orchestrated several schemes to manipulate the banks share price. These unauthorised transactions constituted "financial assistance" under section 38 of the Companies Act (Carte, 2009). Directors and employees were forced to accept shares in order to compensate for their low remuneration. This can be classified as an employment practises and workplace safety operational loss event (BCBS, 2006:304).

The bank's share price was manipulated further by using the bank's deposits to buy Regal shares (Theobald, 2013). Employees were further obliged to take out loans in order to be able to afford more shares. The staff member who purchased Regal Treasury Bank shares were then prohibited from selling the shares (Whitfield, 2003). Primarily, it is not unlawful to sell shares to employees, provided that these employees do not act in their own best interests and are not concerned with inflating the banks share price (Ferreira, 2014:48).

However, Regal Treasury Bank's management did not act honourably in order to ensure the worth of the depositor's funds. Resultantly, management's fixation with the share price was deemed harmful to their stakeholders (Myburgh, 2002:7).

Since the performance of the share price manipulation did not match the expectations of the CEO, Levenstein decided to manufacture income out of thin air (Theobald, 2013). On count eight, the accused knowingly provided fabricated information to its external auditors, Ernest & Young, the stakeholders as well as the Registrar of Banks (Ferreira, 2014:4; Miningmx, 2009) concerning two sales worth ZAR26m and ZAR150m respectively in order to contrive income for Regal Treasury Bank (Carte, 2009).

Jeff Levenstein operated as both the chairman and CEO of Regal Treasury Bank for a period of 19 months (Joosub, 2006:162), contrary to the regulations laid out by the King Report on corporate governance and the procedures of the SARB. According to the King Committee on Corporate Governance (2002:53), whenever the positions of chairperson and CEO are shared by the same individual, a strong, independent, non-executive director should be selected (King Committee on Corporate Governance, 2002:53). Regal Treasury Bank did not comply with various sections of the Banks Act, Companies Act as well as the principles of corporate governance (Gush, 2002).

Table 3.3: Detailed loss event type of Regal Treasury Bank

Operational loss event type	Categories	Activity
Internal fraud	Unauthorised activity	Transactions not reported (intentional) Transaction type unauthorised
	Theft and fraud	Fraud Theft / embezzlement Misappropriation of assets Forgery Insider trading (not on firm's account)
External fraud	Theft and fraud	Theft Forgery
Employment practice and workplace safety	Employee relations	Compensation, benefit, Termination issues
Clients, products and business practices	Suitability, disclosure and fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail customer disclosure violations Account churning
	Improper business or market practices	Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity
Execution, delivery and process management	Transaction capture, execution and maintenance	Miscommunication Other task miss-performance
	Monitoring and reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
	Customer / Client account management	Incorrect client records (loss incurred) Negligent loss or damage of client assets

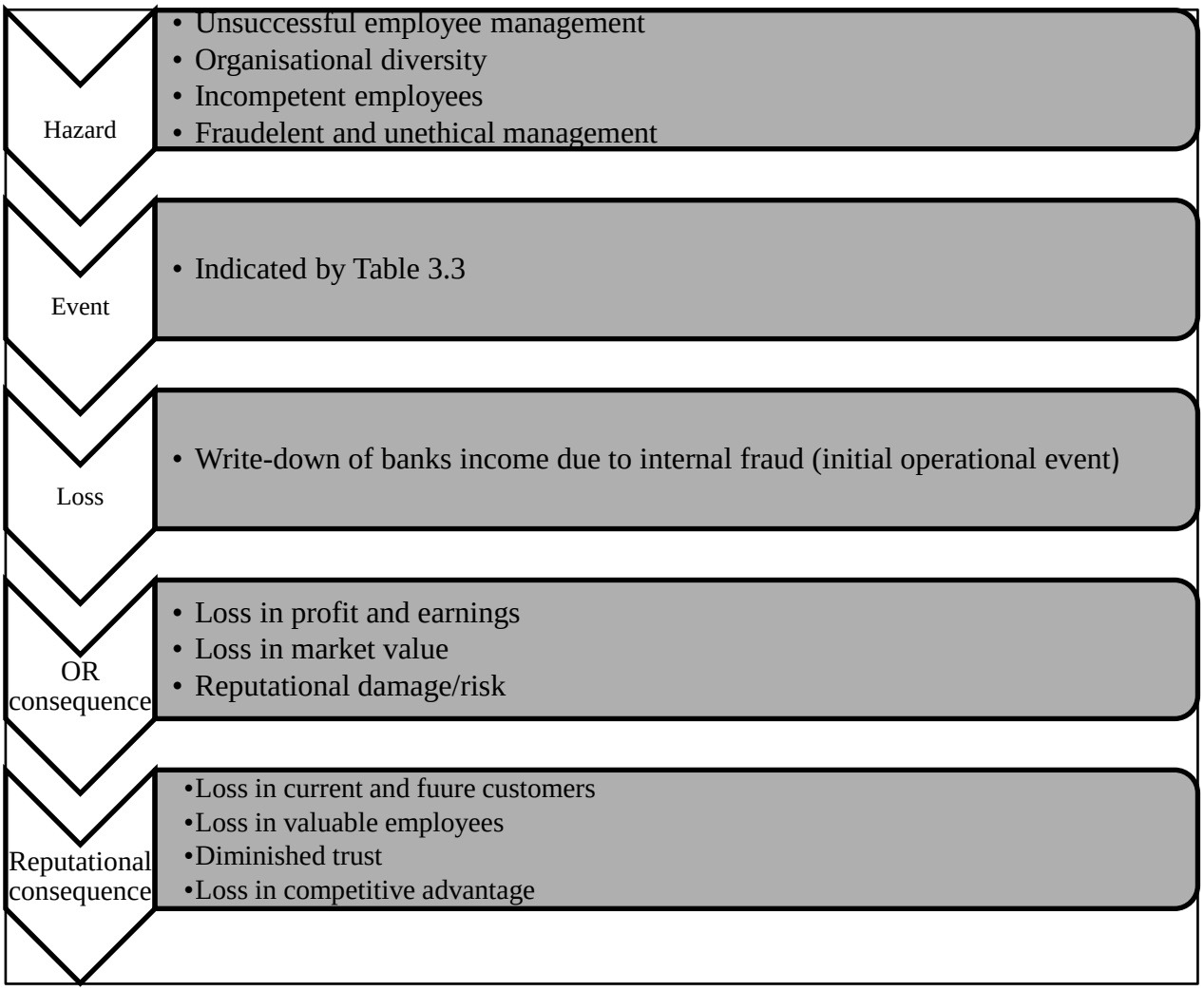
Source: BCBS (2006:304)

3.8.3.2 Reputational risk of Regal Treasury Bank

The reputation of Regal Treasury Bank was embedded in their past behaviour; however, the banks reputation changed at the arrival of new information (Lange *et al.,* 2011:153). The bank collapsed in 2001 when depositors withdrew ZAR250m within two days after external auditors, Ernst & Young, withdrew their consent to publish the 2001 financial statements (Makhubela, 2006:94). The news was made public by means of local newspapers, the Internet and other social media forums. Therefore, reputational risk emerged as depositors and investors viewed the bank as dishonest and had severe concerns regarding the safety of their assets. Regal Treasury Bank failed due to the loss of their most important intangible asset (Scandizzo, 2011:41). Regal Treasury Bank suffered a decline in their share value and market capitalisation; diminishing reputational capital destroyed customers trust and lost their competitive advantage (Fiordelisi *et al.,* 2011:5).

Resultantly, Regal Treasury Bank was left with just more than 1100 customers and ZAR600m in deposits. Ernst & Young's decision was based on Regal Treasury Bank's suspicious financial reporting during the previous financial year 2000 (Still, 2003). Regal Treasury Bank was one of the first South African banks to lose such a large amount of investors' money (Still, 2003). Administration would not have saved the bank due to the large mismatch between its assets and liabilities. The banking industry was not interested in buying Regal Treasury Bank's assets (City Press, 2002) except for Investec who attempted to purchase the banks advance book for ZAR50m (Makhubela, 2006:94). Figure 3.6 indicates the origin of Regal Treasury Banks reputational risk.

Figure 3.6: The origin of reputational risk of Regal Treasury Bank



Source: Compiled by author

3.8.4 Saambou Bank (2001)

Saambou Bank was first established in 1942 as the Union Building Society, whereafter it was renamed to the Saambou Building Society (Mbuya, 2003:8). During 1991, the society's operations merged where Saambou Bank Limited was listed as the operating initiative (Ferreira, 2014:37). Saambou Bank was regarded as a successful bank from 1998 until 2000 because of its growing share price and annual growth rate (Steyn *et al.,* 2004:75).

3.8.4.1 Operational risk of Saambou Bank

During 2001 the Financial Service Board conducted an investigation into CEO Johan Myburgh due to the suspicious selling of 200 000 of his own shares at R11.80 on 15 August. This was done shortly before the bank issued an increase in the bank's provision for bad

debts, followed by a decline in earning over the next six months (Mittner, 2005). The allegations stated that top management knew that the bank was in a crisis and informed chosen stakeholders to sell their shares in advance. Johan Myburgh denied the allegations and contended that he had to sell Saambou shares in order to meet the bank's loan requirements (Steyn *et al.,* 2004:81).

In addition, insider trading is considered illegal when traders, market advisors, or employees knowingly sell or buy securities in breach of their fiduciary obligation, due to the position of market information not yet available to the public (Wallin & Klarich, 2015). The South African banking sector prohibited insider trading by means of the Companies Act in 1973. However, the challenging attempts to counter insider trading within this Act failed. Thereafter, the Insider Trading Act replaced the regulations regarding insider trading within the Companies Act and were brought into effect in January 1999 (Myburgh & Davis, 2004:11).

Insider trading or rumours regarding insider trading can be exceptionally damaging to a banks reputation, particularly when followed by an investigation (JSE, 2015:7). Generally, the consequences of insider trading by any party (traders, market advisors, or employees) include jail sentencing, financial penalties or being barred from the financial industry (PWC, 2011:3). Insider trading as in Saambou's case is most likely to damage customer, investor, and the public domains trust (PWC, 2011:3) as additional information forms an unfair playing field (Myburgh & Davis, 2004:10). Even though it had only been reported that the CEO Johan Myburgh was suspected of insider trading by selling off a portion of his shares, it still damaged the asset flight and affected the bank's ability to conduct its business. Insider trading also results in inefficient markets, increased cost in financing capital and increases the degree of volatility within stock markets (Myburgh & Davis, 2004:11).

Saambou Bank became a victim of changing stakeholder perception and as these perceptions changed, customers withdrew ZAR1b from the bank within two days (Otter, 2002). In this case, Saambou Bank's performance deviated just a bit too far from what stakeholders expected and, therefore, resulted in distrust. Saambou Bank also experienced a credit downgrade on both its short-term and long-term ratings made by Fitch credit agency in February 2002 (Joosub, 2006:159). Since, the majority of Saambou Bank's customers withdrew their savings, the bank was unable to honour its short-term cash obligations (Venter, 2008).

The Registrar of Banks placed Saambou Bank under curatorship in September 2002 (Venter, 2008). The collapse of Saambou Bank was one of the largest corporate collapses in South African history. Before the shares were suspended from the Johannesburg Stock Exchange (JSE), Saambou's shares closed at R2.80 (compared to all time high of R13.60) with a market capitalisation of ZAR4467.5m (Gedye, 2005).

Table 3.4: Detailed loss event type of Saambou Bank

Operational loss event type	Categories	Activity
Internal fraud	Unauthorised activity	Transactions not reported Transaction type unauthorised
	Theft and fraud	Insider trading (not on firm's account)
Employment practice and workplace safety	Employee relations	Compensation, benefit, termination issues Organised labour activity
	Diversity and discrimination	All discrimination types
Clients, products and business practices	Suitability, disclosure and fiduciary	Fiduciary breaches / guideline violations
	Improper business or market practices	Market manipulation Insider trading (on firm's account) Unlicensed activity
	Advisory activities	Disputes over performance advisory activities
Execution, delivery and process management	Transaction capture, execution and maintenance	Miscommunication
	Monitoring and reporting	Failed mandatory reporting obligation

Source: BCBS (2006:304)

Later on in 2005, the Financial Service Board stated that there was not sufficient evidence to convict Johan Myburgh on the charges of insider trading or that Johan Myburgh had misused price sensitive information (Financial Service Board, 2005). The investigation into the illegal stock trading further spurred a range of investigations into Saambou Bank as the insider trading investigation was regarded as the tip of the iceberg (Mittner, 2005).

Sales discrimination was further seen as a human error performed by Saambou Bank (Crouhy *et al.*, 2014:400). Saambou bank was also accused of having a biased interest rate system where different races were charged different interest rates (Steyn *et al.*, 2004:83).

Saambou Bank purposefully manipulated the interest rates on its loans in order to increase the banks revenue during a period of low profit margins (IOL News, 2012:1).

After six years of investigation, two employees', namely Charles Edwards and Gerhardus De Clercq pleaded not guilty on 13 accounts of fraud, theft and violating the Companies Act. Saambou Banks's CEO Johan Myburgh was not able to testify as he died in December 2007 due to cancer (Venter, 2008).

3.8.4.2 Reputational risk of Saambou Bank

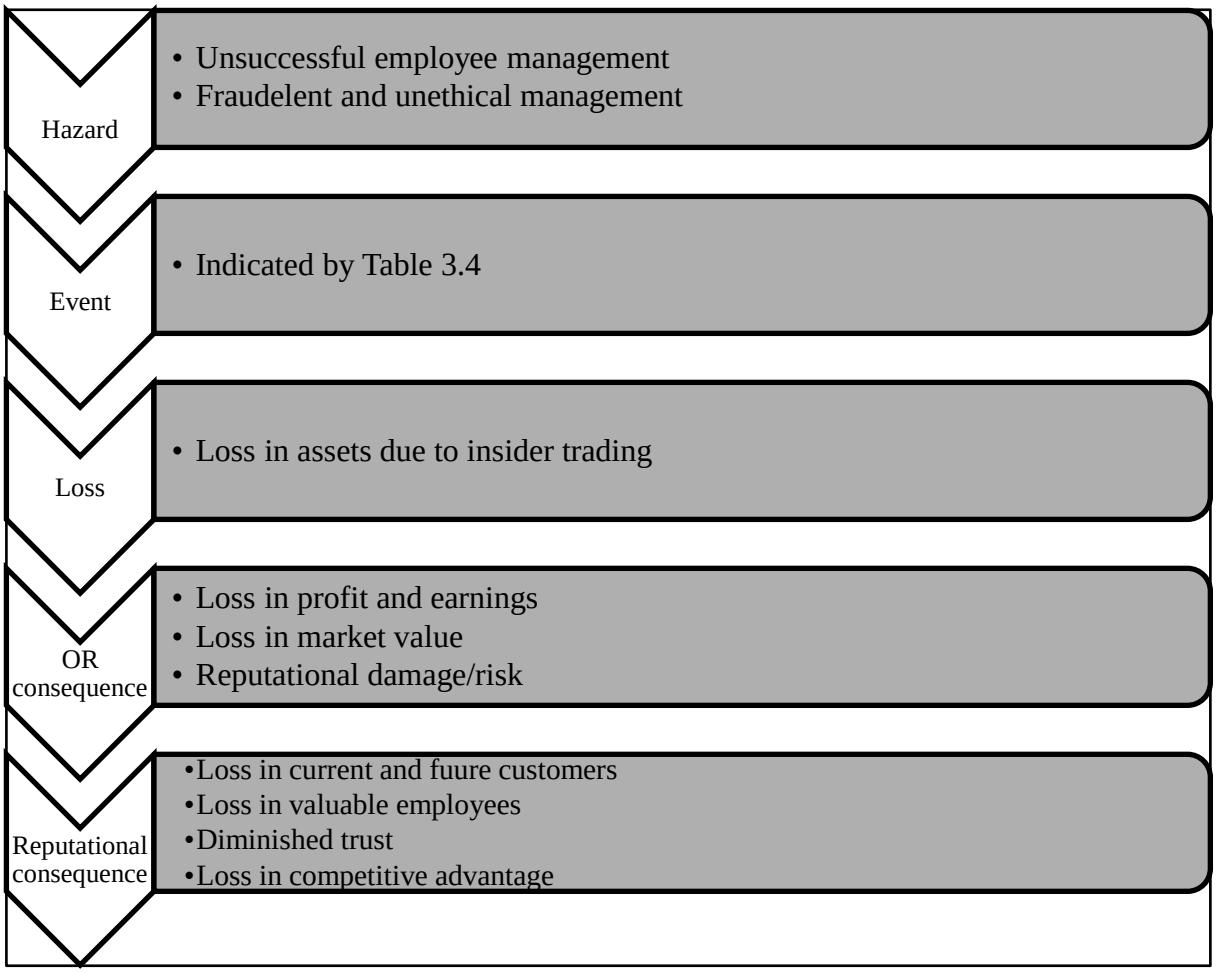
To conclude, Saambou Bank collapsed due to its rapid over-expansion in the market, increased pressure by its stakeholders accompanied with the loss in reputation and shareholder confidence (Steyn *et al.*, 2004:75). The actual performance of Saambou Bank declined below the expectations of its stakeholders and hence formed a gap for reputational risk to occur. Figure 3.7 graphically gives the origin of Saambou Banks reputational risk. Not only did the bank lack in their performance in terms of management operations, but also in communication management and liquidity management (Honey, 2012:3). Johan Myburgh, Charles Edwards, former Director, and Gerhardus de Clercq, General Manger, managed Saambou Bank in a reckless manner. Furthermore, Saambou Bank failed to realise the important role that corporate image plays within financial markets and, therefore, suffered reputational damage (Steyn *et al.*, 2004:83).

Saambou Bank was able to make provisions for operational risk but omitted the important of making provision for reputational risk. The negligence of reputational risk by the BCBS due to the purpose of a minimum regulatory operational risk capital charge (BCBS, 2001:2) prevented Saambou Bank from effectively hedging themselves against reputational risk. Since Basel II was released in 2004 but was only implemented in January 2008 the revised Basel framework was six years too late to be implemented by Saambou Bank (Keyser, 2010:30). The three pillars of the revised Basel II framework of minimum capital requirements, supervisory review and market discipline (BCBS, 2013:3) could have played a major role in the fall of Saambou Bank (Ferreira, 2014:38). Inadequate corporate governance may have contributed to the bank's collapse (Whitfield, 2002)

As a result of the above mentioned, Saambou Bank eventually failed. The bank did not expect the enormous reputational damage after the announcement of its operational losses. A detailed summary of Saambou Bank's operational loss activities is stipulated in Table 3.2.

Therefore, it can be concluded that Saambou Bank failed due to the presence of operational events and losses accompanied by their incompetence to manage their reputation (Ferreira, 2014:39).

Figure 3.7: The origin of reputational risk of Saambou Bank



Source: Compiled by author

3.8.5 African Bank (2013)

African Bank operated as a minor commercial bank in South Africa until 1988. After this period the Theta Investment Group purchased African Bank's banking license and merged the bank with King Finance Corporate, Unity Financial Services and Alternative Finance (African Bank, 2014b). After the curatorship of Saambou Bank in 2002, African Bank acquired Saambou's personal loan book. Since the acquisition, African Bank has experienced tremendous losses as well as write-downs. Losses had to be financed by trading debt and equity due to the banks non-deposits business model (IOL News, 2014:2).

3.8.5.1 Operational risk of African Bank

African Bank is one of South Africa's largest credit providers of non-collateralised loans accompanied by a non-deposit business model (IOL News, 2014). African Bank adopted an aggressive lending policy aimed at extending loans to unfortunate, black South Africans formerly excluded from the South African financial system (Mittner, 2014). The vision statement of African Bank is to progress the quality of South African's lives by posing affordable, convenient and responsible credit to consumers (African Bank, 2014a). The main objective of African Bank is to support the creditworthiness of low-income customers and to trust that their credit will help these customers to improve their lives (African Bank, 2014b). However, it became evident that African Bank does not provide customers responsibly with credit, but extends credit in an irresponsible manner (Ferreira, 2014:43).

On 13 February 2013 the National Credit Regulator (NCR) announced that African Bank was fined ZAR300m for their reckless lending business model, which is the largest fine the regulator have ever imposed on a South African bank (Dirk, 2013). The fine involved the manipulation of the banks affordability calculations. An investigation found that one of its branches in Kwazulu-Natal had fraudulently breached African Bank's system (Steyn, 2013b). The fine had to be paid to the National Revenue Fund, administered by the National Treasury (Arde, 2013b). On 4 October 2013, the parties come into agreement for African Bank to pay a reduced ZAR20m fine (Steyn, 2013a). The NCR chose to take action after the number of credit active consumers with bad credit increased from 9.53 million to 9.69 million within one quarter (Dirk, 2013).

The fraudulent activity affected 397 customers and their loans to a value of ZAR15.5m (Steyn, 2013b). Some African Bank branches were suspended from extending credit for a period of 12 months (Dirk, 2013). African Bank was obliged by the NCR to write-off the loans made in bad faith (lender liability) and refund those customers. Any defaults against customer profiles had to be removed and cleared (Arde, 2013b).

Based on the operational event categories by Basel (2006:306), the reckless lending involved guideline violations; aggressive sales; lender liability; the failure to investigate clients before granting credit; and exceeding their clients' exposure limits. The fine can be seen as a result of the banks unique business (model risk) and credit model (IOL Services, 2014). The irony of this situation is that the extended provision of loans to non-creditworthy

customers led to the failure and backward movement of the bank itself and its customers. Furthermore, African Bank states, "[w]e say yes more often, because we take everything into consideration when you apply for credit, not just what you earn" (African Bank, 2014b). However, a customer's income and payment history determine the probability of default to conclude whether these customers are creditworthy.

However, this minor punishment for African Bank did not prevent the bank from continuing their aggressive business model (Williams, 2014). On 10 August 2014, African Bank was placed under curatorship with the administration of Tom Winterboer as the main curator (Barry, 2014). After the long and enduring period of recklessly extending credit to low-income customers, African Bank consisted of ZAR11bn of debt maturing during 2015 (Bonorchis, 2014). The severe debt burden was the outcome of low-income consumers defaulting on short-term debt commitments. African Bank did not have sufficient capital to withstand these losses. Basel II was implemented during January 2008 by the South African banking sector along with African Bank (Keyser, 2010:30). Therefore, African Bank was in violation of the guidelines set out in the revised Basel II framework consisting of minimum capital requirements for operational risk, supervisory review and market discipline

It is difficult to imagine that African Bank did not anticipate the large magnitude of losses since African Bank was extending credit to low-income customers during a volatile economic period (IOL Services, 2014). This can be regarded as a human error by the bank's top management. During the curatorship, African Bank's lending book was divided into two parts (healthy assets and defaulted assets). The healthy part of the lending book continued operations, while the defaulted assets, which amounted to ZAR17bn, was bought by the SARB for the value of ZAR7bn (Mittner, 2014). Table 3.5 gives a summary of the operational loss event and the various operational activities, which led to the operational loss of African Bank.

Table 3.5: Detailed loss event type of African Bank

Operational loss event type	Categories	Activity
Internal fraud	Unauthorised activity	Transaction type unauthorised
	Theft and fraud	Fraud / credit fraud / Bribes / kickbacks Insider trading (not on firm's account)
Clients, products and business practices	Suitability, disclosure and fiduciary	Fiduciary breaches / guideline violations Aggressive sales Lender liability
	Selection, sponsorship and exposure	Failure to investigate client per guidelines Exceeding client exposure limits
Execution, delivery and process management	Transaction capture, execution and maintenance	Model error or risk Accounting error in terms of affordability calculation
	Customer / Client account management	Unapproved access given to client accounts

Source: BCBS (2006:304)

3.8.5.2 Reputational risk of African Bank

Therefore, although the ZAR20m fine constituted only 1 percent of African Banks turnover, it was the start or reputational risk for the bank (Steyn, 2013b). African Bank responded by stating that the breach in their loan system by workers in Kwazulu-Natal during 2011 was only an isolated incident, not severe and should not be seen as the manner in which the bank conducts its business (Arde, 2013a).

Figure 3.8 indicates how the operational loss announcement of African Bank transposed into reputational risk. The deteriorating share price over the past years reflects the bank's weak financial performance and declining customer confidence. African Bank failed to comply with their social responsibility in terms of the bank, its workers, processes and systems to respect citizens, clients and the society (Koutsoukis & Roukanas, 2014:7) as the bank failed to reduce their supply of reckless loans to low-income customers despite the penalty and increasing debt levels (Mittner, 2014). This led to various stakeholders regarding African Bank as dishonest and untrustworthy. African Bank's activities and decisions were proven

controversial and thus increased the probability of these actions leading to reputational risk (Manjarin, 2012:4). The internal and external stakeholders of African Bank had the power to buy and sell their shares based on the perception of the bank, influencing the share price as well as the perception of the rest of the financial market (Chartered Institute of Purchasing & Supply, 2014:2). The share price continued to deteriorate until the bank was placed under curatorship and the shares were suspended. This was a pure reflection of the bad performance by the bank in the eyes of their stakeholders (Barry, 2014a).

Figure 3.8: The origin of reputational risk of African Bank

Source: Compiled by the author

3.8.6 Standard Bank (2014)

Standard Bank is deemed the largest African bank due to its magnitude of earnings and assets (Standard Bank, 2014). Standard Bank also provides a comprehensive collection of banking services.

3.8.6.1 Operational risk of Standard Bank

On January 23rd 2014, Standard Bank was fined ZAR60m by the Financial Conduct Authority (FICA) and the SARB for neglecting to implement adequate money-laundering controls and processes in order to fight terrorism (Lefifi, 2014; Cohen, 2014). The Financial Intelligence Centre Act 38 of 2001, which came into effect in 2003, was instigated in order to stop financial misconducts, like money laundering, tax avoidance, and financial terrorist actions (Sibisi, 2014). In terms of FICA, the SARB has the responsibility to monitor and enforce South African banks to comply with all FICA requirements, including those revolving around money laundering (South African Government News Agency, 2014). Standard bank received a 30 percent discount for cooperating with the authorities in their investigation (Cohen, 2014).

Despite the fact that South African banks phased Basel II in by 2008, Standard Bank has made a tremendous effort to employ Basel II since 2003 throughout its 25 banks and 120 financial institutions within a range of 38 jurisdictions (Standard Bank, 2006). Standard Bank has further implemented a ratings model, inclusive capital risk calculation and a rigorous reporting framework (Standard Bank, 2006). Since Basel II included credit risk, operational risk as well as a brief discussion on reputational risk (Manjarin, 2012:2), Standard Bank still neglected reputational risk.

Operational hazards, which may have led to operational events include the unsuccessful employee management or incompetence of employees (Chernobai *et al.*, 2007:18). Table 3.6 provides a detailed classification of Standard Bank's event loss. Standard Bank faced an operational event due to improper internal controls to investigate clients as per guidelines, failed mandatory reporting (reporting transactions larger than R24 999.99), client documents incomplete, and the failure to maintain client reference data (eNCA, 2014:2) in order to combat money laundering by identifying risky depositors (Barry, 2014b). The bank's failure to implement preventative controls and processes against fraud and money laundering further raised concerns regarding the bank's internal controls, which should function to protect corporate customers who may be connected with political figures (Cohen, 2014).

Table 3.6: Detailed loss event type of Standard Bank

Operational loss event type	Categories	Activity
External fraud	Theft and fraud	Theft/robbery forgery
	Systems security	Hacking damage Theft of information (w/monetary loss)
Clients, products and business practices	Suitability, disclosure and fiduciary	Fiduciary breaches / guideline violations
	Selection, sponsorship and exposure	Failure to investigate client per guidelines
Execution, delivery and process management	Transaction capture, execution and maintenance	Miscommunication Data entry, maintenance Loading error Reference Data Maintenance
	Monitoring and reporting	Failed mandatory reporting obligation
	Customer intake and documentation	Client permissions / disclaimers missing
	Customer / Client account management	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets

Source: BCBS (2006:304)

Standard Bank further failed to implement appropriate systems and controls to manage the risk associated with risky customers (Lefifi, 2014). The irony of the situation is that the threat of money laundering is not a new concept to Standard Bank. The bank offers numerous loans to customers who have been identified as a possible threat concerning money laundering. Some 282 Standard Bank customers out of the total 5339 are regarded as 'politically exposed persons'. Standard Bank failed to acknowledge that higher risk customers should be subjected to stricter controls (Cohen, 2014). Therefore, Standard Bank failed to investigate their clients to see whether these clients pose a threat to Standard Bank (Lefifi, 2014:2; Ferreira, 2014:53). Standard bank faced a ZAR60m direct loss in terms of regulatory and compliance fines which had to be paid for not complying.

The terror attack in Kenya Nairobi in 2013 concerning a British women Samantha Lewthwaite (most wanted female terrorist), was also directly linked to Standard Bank. The terrorist was able to transfer an enormous amount of funds from Standard Bank by means of a false South African passport (Lefifi, 2014). Client records could also have been compromised representing a form of breaching privacy. Standard Bank has been ordered to improve its controls to better detect any form of property associated with terrorists (Barry, 2014b).

3.8.6.2 Reputational risk of Standard Bank

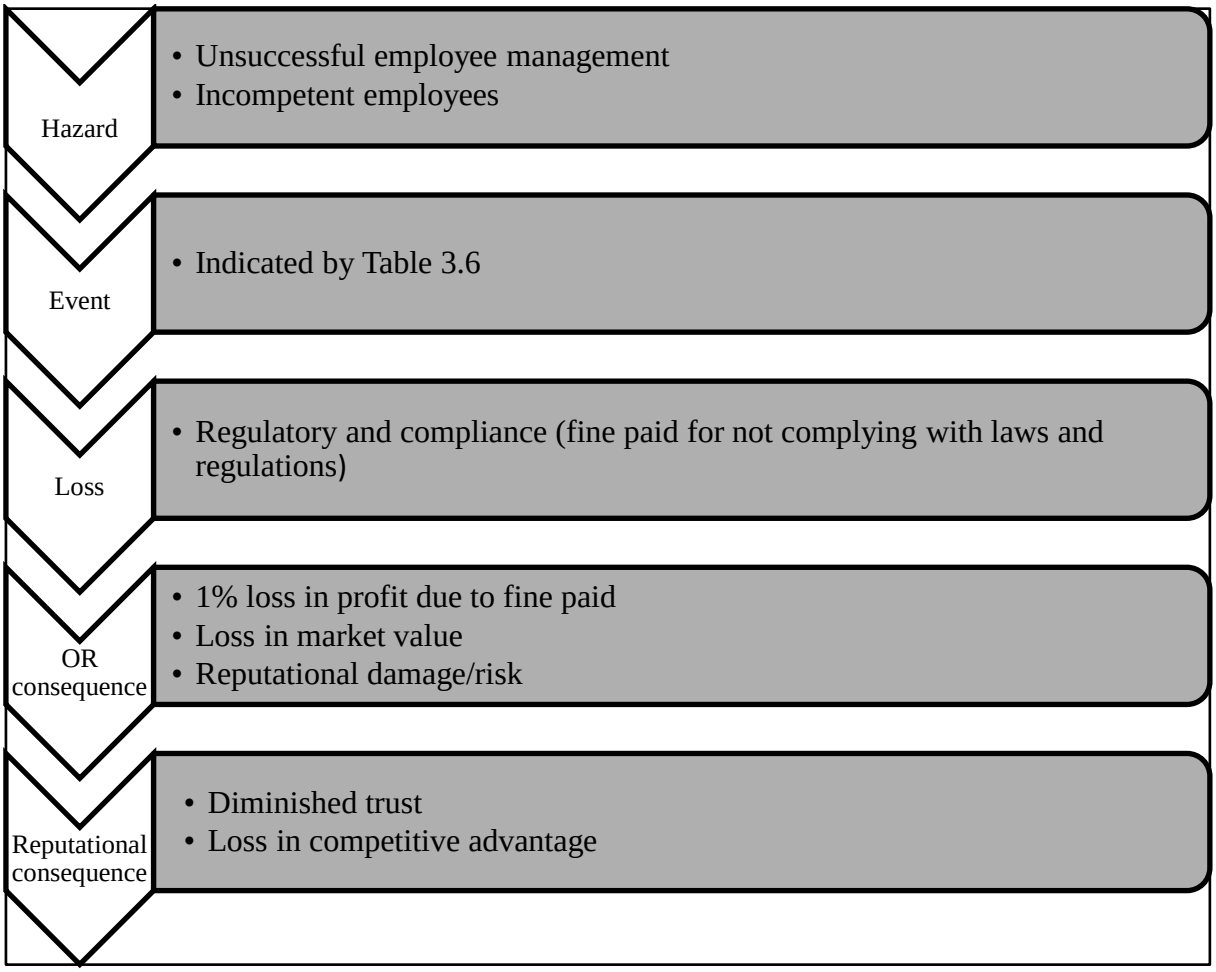
According to Ross (2005:8), external fraud had the potential to cause secondary reputational damage in terms of diminished trust and a potential loss in their competitive advantage to Standard Bank. Even though the fine constitutes less than 1 percent of the banks' profits it still represented reputational risk (Lefifi, 2014). Standard Bank creates relationships with external parties each time they enter into a transaction, make a loan or deliver a service. However, Standard Bank has no control over these parties' actions (Scandizzo, 2011:56). All of Standard Banks activities and decisions have the probability of leading to reputational risk whenever these activities are proven to be controversial (Manjarin, 2012:4).

Hence, each party or associate of Standard Bank may be regarded as a potential cause of reputational risk as the bank is now perceived to be connected with its associates and customers (Scandizzo, 2011:56). Since Standard Bank experienced severe reputational damage as a result of their operational risk, the responsibility of reputational risk still lies with every member of the bank (Ferreira, 2014:54).

Due to the fact that Standard Bank operates in an interconnected banking environment, its reputation depends on the manner in which its business in conducted. Any deviation between Standard Banks performance and the expected performance may result in employee dissatisfaction (Tonello, 2007:16). Equity markets react gradually to reputational damage caused by operational loss events (Micocci *et al.*, 2009:2). The operational loss events of Standard Bank led to a depreciation in the bank's share price (expected value of future cash flows) as stakeholders reacted to new market information. Since operational losses reflect the banks effectiveness to manage risk, stakeholders may have lowered their level of confidence in the bank and were likely to suspect future losses on their investments (Magrann-Wells, 2011:2). Therefore, the reputational risk of Standard Bank caused by the

operational loss event can be indirectly quantified by the loss on the bank's market value (Micocci *et al.*, 2009:2). Therefore, the operational risk (primary risk) of Standard Bank had the potential to cause secondary reputational damage (secondary effect) to the bank, followed by loss in profits and shareholder value (Ross, 2005:8). Figure 3.9 illustrates the reputational risk of Standard Bank as a process.

Figure 3.9: The origin of reputational risk of Standard Bank



Source: Compiled by the author

3.9 Summary

The amount of risks posing a threat to bank reputation is becoming more and more pervasive and immediate. Reputational risk has remained neglected due to difficulty for regulators to define it. Existing definitions of reputational risk remain vague and uncertain. However, one central theme can be adopted when defining reputational risk. The main theme suggests that an institution can become well-known over time by its stakeholder, and establish a comprehensive understanding for which the institution can be judged

constructively or critically by its stakeholders. Most definitions suggest that reputational risk presents an indirect loss resulting from the way in which the bank is operated. It is also clear that reputational risk includes risks associated with the stakeholders of an institution, such as failure to meet stakeholders' expectations. Although reputational risk may arise from cultural risk and external risk, the main emphasis is placed on reputational risk arising from managerial risk (operational risk).

Although reputation is not included as an item on a bank's balance sheet, it embodies a large fraction of the change between a banks market value and book value. Prior to the financial crisis during 2008, most banks failed to acknowledge reputational risk and its consequences. However, the following consequences are now obvious, namely a decline in share value and market capitalisation; a decline in future expected cash flows; limiting funding by causing short-term sources to dissipate; diminishing reputational capital; loss of current and possible future customers; loss in valuable employees; destroying a bank's trust and competitive advantage; reduction in current or future business relationships and regulators imposing greater compliance burdens.

Controversial perceptions in banks do not originate from the decision whether or not to keep additional capital for reputational risk, but rather from the difficulty in determining how much capital needs to be kept for reputational risk. Regulators such as BCBS have stirred away from attempting to quantify reputational risk due to the lack in research and difficulty in defining this type of risk. Basel I and Basel II have deliberately omitted reputational risk in defining operational risk due to the purpose of a minimum regulatory operational risk capital charge. The negligence of regulating reputational risk is evident both internationally and nationally. The examples of Wells Fargo, Bank of East Asia, Regal, Saambou, Standard and African Bank are only a few among many. These banks suffered severe reputational damage after they had announced their operational losses from operational events.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

Operational risk includes legal risks but intentionally omits reputational risk because of minimum regulatory operational risk capital charges (BCBS, 2001:2). Nevertheless, it is accepted broadly that operational losses effect the reputation of banks, consequently posing a risk beyond the financial loss itself (Sturm, 2013:192). Therefore, the effect of operational loss events on the reputation of South African banks was emphasised by analysing the stock market reaction to the announcement of operational losses. The quantification of operational risk through its capital charge by using solely nominal loss amounts, generally miscalculates the aggregate consequences of operational risk since reputational risk (as a consequence) is excluded (Sturm, 2013:192). The empirical portion of this study included an event methodology similar to previous literature, which examined the behaviour of abnormal returns to specific operational loss events using a sample of banks. However, the main difference compared to previous studies is that a sample of South African banks was used. The precise date of the announcement of the operational events was also determined. Stock price data were collected for those banks that had unanticipated operational loss announcements (i.e. the event). Statistical models were applied to the reputational loss as the difference between the operational loss announcement and the loss in the stock returns of the selected banks.

The first section describes both the sample and the data that were collected. Section two describes the type of methodology applied to this study. Within the methodology section, the relevant event window was covered, followed by the parameters within the event window. The measurements of the abnormal and aggregate abnormal returns were also elucidated upon. The measurement of the return volatility of the sample banks was discussed in the second last section. The last section provides a review of previous research related to this study focusing on operational loss events.

4.2 Data description

As a result of the prematurity of operational risk in comparison with credit risk and market risk, operational risk data are limited. The data used in this study concerning loss amounts are based on the information gathered from secondary sources such as newspapers, bank

press releases and news and bank websites. Therefore, data collected from the public domain reflect the origin of the information. With few previous data and literature based on the South African banking sector, the key aim of this study is to contribute further results concerning the effect of operational events on the reputation of South African banks. The empirical analysis of this study was based on four loss events experienced by four different South African banks. These banks reported a monetary operational loss between January 2000 and December 2014. The reported loss amounts were published within the public domain in newspapers, bank press releases and news and bank websites. Each banks' operational event loss was classified according to Basel II operational event types (Crouhy *et al.,* 2014:510).

Stock market (prices and market capitalisation) data were collected from the Johannesburg Stock Exchange (JSE) as well as from INET BFA, which is a primary provider of financial data and analysis tools. INET BFA provides company information including annual reports, financial statements and global share prices of companies listed on the JSE.

To obtain reliable and accurate results, the following three assumptions were made: (1) markets are efficient (efficient market hypothesis), (2) no concurrent effects occurred during the event window, and (3) market participants did not expect the operational loss announcements. Therefore, no other factors such as investor sentiment or management considerations needed to be included since these factors were reflected already in the share prices (Woon, 2004:3). The efficient market hypothesis is a model that explains the behaviour of market performance (Holton, 2015). A market is considered as efficient when a large amount of participants are actively competing, and attempting to predict forthcoming market values of securities. Existing information were almost freely available to all participants and the competition between participants caused the full effects of new information on intrinsic values to be reflected instantaneously in actual prices (Fama, 1965:56).

4.3 Sample description

The leading reason for the reduced numbers of observations (four operational loss events) in the final sample is distinctive to the sound banking sector in South Africa. Only a few operational loss events have been reported over the past 14 years. Other operational loss events were deleted from the sample due to incomplete information published (either the

loss event date or the loss amount). The sampling frame included all banks in the South African banking sector. However, the sample consisted of four South African banks, namely Saambou Bank, Regal Treasury Bank, Standard Bank and African Bank. These four banks were chosen because they all experienced unanticipated operational loss announcements. The following list represents the sample of South African Banks:

- Regal Treasury Bank concerning an operational loss event on 16 May 2000 to the value of ZAR6m.
- Saambou Bank who announced an operational loss on 15 August 2001 to the value of ZAR2.3m.
- African Bank announced a ZAR300m loss on 15 February 2013.
- Standard Bank concerning an operational loss event on 23 January 2014 to the value of ZAR60m.

It can be assumed that the announcement of operational losses led to the reputational damage of these financial institutions concerned (Ferreira, 2014:70). The time period of 14 years of data was used for specific events that occurred during these 14 years, starting with the first operational loss announcement of Regal Treasury Bank in 2000, Saambou Bank during 2001, followed African Bank in 2013 and Standard Bank early in 2014.

The data used in this study are not comparable to the data from previous studies, since the data from previous studies used different sample sizes, time periods, and are denominated in different currencies. The mean, median, standard deviation, minimum value and maximum value for each banks' returns are given to distinguish between the expected returns and abnormal returns. Both operational losses and market capitalisation are represented in South African Rand (ZAR).

4.4. Methodology

The empirical portion of this study included an event methodology commonly used in corporate finance research (Woon, 2004:1). The event study methodology was designed to analyse the effect of the particular event on the specific dependent variable. In other words, the event methodology examined the average stock market reaction beyond expectation (abnormal returns) to specific operational loss events (Kumar *et al*., 2012:141).

Although event methodologies are used commonly due to the simplicity in interpretation, they present several limitations. Event methodologies are dependent on the efficient market hypothesis, which may not always be valid. Individual investors respond randomly to shocks, hence, prices may not always reflect all available information. Spill-over effects of other events may also influence the abnormal returns of a bank that were not caused by the specific event (Woon, 2004:1). However, the event study remained a valuable method for capturing the extent to which the market valued a bank when the market assessment of the bank changed (Gladysek & Chipeta, 2012:433). The information and data used were analysed by means of Microsoft Excel 2010 for the sample of banks concerned.

Simulation models were used to measure the reputational loss after the announcement of an operational loss event (Sturm, 2013:198). This was done by determining the reputational loss due to operational loss events affecting the South African banking industry by analysing the stock market reaction to such loss announcements. Reputational risk caused by operational loss events was quantified indirectly by the loss on the bank's market value (Micocci *et al.,* 2009:2) also indicated by the decline in abnormal returns (Gillet *et al*., 2010:229). The direct impact of operational losses on the stock market was separated from the indirect reputational risk by means of the measures below.

4.4.1. Estimation of event and post event window

An appropriate event window had to be estimated. The event window takes into account t_1 days before and t_2 days after the announcement of the operational loss had been made. Contrary to previous studies, an event window of 20 days before and 20 days after the event day zero will be used. This announcement date itself is regarded as day [0]. This time period allows sufficient time for the market to react to new information. A post event window that is too short would not have been able to reflect the aggregate economic effects and a post event window longer than 20 days might have included other effects unrelated to the concerned event (Woon, 2004:1). The event windows will be used to determine whether the operational loss announcements led to reputational losses as indicated by the negative cumulative average abnormal returns.

4.4.2. Estimation of parameters within event window

According to Longerstaey (1996:45), risks for banks often are measured by changes in prices. Price changes can be classified accordingly:

- absolute price changes;
- relative price changes; and
- log price changes.

A change in the price of a bank's shares relative to the initial price is defined as a return (Longerstaey, 1996:44). The main purpose for using returns rather than prices is that returns have more favourable statistical benefits than stock prices. Similarity exists between the log returns and relative returns for small changes in prices. Absolute returns, however, are relatively different from the relative returns and log returns (Longerstaey, 1996:45). Log returns were chosen rather than absolute returns, since absolute returns do not measure the change in terms of the given price level. Following the study of Gladysek and Chipeta (2012:433), the relative share price returns of each bank i will be measured as indicated by Equation 4.1:

$$R_{it} = \frac{P_t - P_{t-1}}{P_{t-1}} \tag{4.1}$$

where:

- R_{it} is the share return for each bank i on day t.
- P_t is the share price for the given bank on day t.
- P_{t-1} is the share price for the given bank on day $t-1$.

4.4.2.1. Estimating expected returns

The expected returns are normally calculated using the most appropriate asset pricing model such as the capital asset pricing model (CAPM) and market model commonly used in event studies. The chosen asset pricing model was assessed using data for the pre-event estimation period (Warner & Brown, 1985:7). For this study, the CAPM was used to determine the expected returns for each bank, rather than the market model, which is principally a variance model (Black, 1995:168).

4.4.2.1.1. Market model

The market model assumes that a security's return is reliant on both the market portfolio return and the degree of the security's responsiveness, which can be measured by beta (Campbell, 2011).

The market beta determines the expected return simply by construction, contrary to the CAPM where beta is determined due to an economic argument that all investors hold the same portfolio. The market model explicitly omits the inclusion of a risk-free rate contrary to the CAPM. Furthermore, in the market model the alpha value differs among assets, hence, it is not clear what are all the determinants of expected returns (Shapiro, 2003:13). Equation 4.2 can measure expected returns generated from the market model:

$$E\ (R_{it}) = \alpha_i + \ \beta_i\ R_{mt} + \varepsilon_{it} \tag{4.2}$$

where:

- R_{mt} is the $measured$ return on the market for day t.
- α_i is the intercept of the regression line on the y axis.
- β_i is the slope of the regression line.
- ε_{it} is the error term.

4.4.2.1.2. Capital asset pricing model

Lintner (1965), Mossin (1966) and Sharpe (1966) respectively, developed the CAPM (Krause, 2001:41). The CAPM functions as both a portfolio selection tool as well as an asset pricing framework. Hence, the CAPM may be used to quantify the expected return given a certain risk level (Reilly & Brown, 2009:195). In order to calculate the required return, the CAPM depends on the beta coefficient as the risk multiplier (Wagner, 2015). Beta quantifies the degree to which the value of a share will change due to market fluctuations (Gitman & Joejnk, 1990:197), *inter alia* how much a security's return is driven by the market return (Shapiro, 2003:13). Bank shares that present a large beta value indicate a greater sensitivity to market fluctuation, increase market risk and will increase the amount of expected return demanded as compensation. A share with a lower (negative) beta value indicates less sensitivity to market fluctuations, will lower the market risk and the amount of expected return demanded as compensation will decrease due to the lower risk (Shapiro, 2003:11). The CAPM model holds a few assumptions (Krause, 2001:43):

- no transaction costs, taxes or commissions;
- assets are for an indefinite period dividable;
- investors can invest into assets without restrictions or limitations;
- investors exhaust expected utility by using the mean-variance measure;

- competitive prices exists;
- static model, such as a single time period is considered;
- unlimited short sales;
- homogeneity of beliefs concerning risky assets; and
- assets are marketable.

Despite the fact that not all of the CAPM assumptions are applicable to realistic complexities, the CAPM still contributes to event studies and will for this reason be used in the event study (Bodie *et al.*, 2010:195). The CAPM has several advantages over other asset pricing methods with regards to calculating the required return, elucidating why this model has remained prevalent for over 40 years. The CAPM model considers only systematic risk (measured by beta), generating a theoretical relationship between required return and systematic risk. Since the CAPM assumes only a single risk driver, the expected return will be equal to the beta value (Saunders & Cornett, 2006:54). The CAPM model is regarded further as a superior method in quantifying the cost of equity (ACCA, 2015). The CAPM further is followed due to the allowance of incorporating a market benchmark, the JSE.

Equation 4.3 demonstrates the required return as calculated by the CAPM:

$$E\ (R_{it}) = \alpha_j + \ \beta_j\ (R_{mt} - R_{rf}) \tag{4.3}$$

where:

- R_{mt} is the measured return on the market for day t.
- α_j is the intercept of the regression line on the y axis.
- β_j is the slope of the regression line (securities beta value).
- R_{rf} is the risk-free rate, which is constant and not influenced by the market (Bodie *et al.*, 2010:195).

In this study, the JSE market index was used as a benchmark to compare the returns of the bank shares with that of the market. The South African Reserve Bank's 90 day Treasury bill rate was used as a proxy for the risk-free rate (R_{rf}). An estimation window of 100 days was used to calculate alpha and beta values and was calculated up to 20 days after the announcement date. The beta and alpha values were estimated using historical data to forecast the expected returns of each bank (Gladysek & Chipeta, 2012:433).

4.4.3. Measure abnormal returns in the event window

Abnormal returns were measured as the difference between the return achieved over a period of one day when the operational loss was made public and the expected stock return. Abnormal returns occur as a result of new market information, following the assumptions of the efficient market hypothesis (Fiordelisi *et al*., 2014:110). The efficient market hypothesis assumes that each banks' share prices will adjust according to new market information, and for this reason, the relevant share prices will reflect all information (Reilly & Brown, 2012:140).

Abnormal returns AR_{it} after the operational loss for each bank i for day t was measured by subtracting expected returns from actual returns as demonstrated by Equation 4.4. Hence, abnormal returns are a direct measure of the unanticipated change in stakeholder wealth associated with the operational event (Khortari & Warner, 2006:9).

$$AR_{it} = R_{it} - E(R_{it}) \tag{4.4}$$

where:

- AR_{it} is the abnormal return for bank i on day t.
- R_{it} is the normal return for bank i on day t.
- $E(R_{it})$ return for bank i on day t.

4.4.4. Measure aggregate abnormal returns during event window

The average abnormal returns (AAR_t) for the n bank shares on day t, regarding the event window, was calculated by averaging AR_{it} of each of the n shares, where AR_t can be defined as the excess return for security i at day t (Sturm, 2013:197). Equation 4.5 represents average abnormal returns:

$$AAR = \frac{1}{n}\sum(ARi, t) \tag{4.5}$$

The cumulative average abnormal returns $(CAAR)$ were calculated by accumulating the average abnormal returns over the event window [-20; +20] allowing for the estimation of share prices concerning the event date (Gillet *et al*., 2010:228). Equation 4.6 represents cumulative average abnormal returns:

$$CAAR\ (t_1, t_2) = \frac{1}{n}\sum CAR_i(t_1, t_2) \tag{4.6}$$

Both the cumulative average abnormal returns and cumulative average abnormal returns, adjusted for reputational damage, were reported with their relevant significance tests in Chapter 5.

4.4.5. Adjusting abnormal returns for reputational risk

In order to be able to capture the effect of operational loss events on the reputation of South African banks, the operational loss had to be accounted for (Sturm, 2013:198). Following the studies of Gillet *et al.,* (2010) and Sturm (2013), average abnormal returns were adjusted by incorporating the exact operational loss amount as seen in Equation 4.7. The operational loss announced by bank i were divided by the market value of bank i at time t and then added to the abnormal return of day t:

$$AR\ (Rep) = AR_{i0} + \frac{Op\ Loss_i}{Market\ Cap_i} \tag{4.7}$$

where:

- $AR\ (Rep)$ is the abnormal return for bank i on day t adjusted for the nominal loss amount.
- AR_{it} is the abnormal return for bank i on day .
- $Op\ Loss_i$ is the operational loss announced for bank i on day t.
- $Market\ Cap_i$ is the market value for bank i on day t.

This calculation, where abnormal returns were adjusted, captured and reflected the reputational damage of each bank and the market reaction to reputational risk (Sturm, 2013:198). The average abnormal returns, adjusted for reputational risk $AAR\ (Rep)$ regarding the event window, were calculated by using Equation 4.8 by averaging AR of each of the *n* shares, where $AR\ (Rep)$ can be defined as the abnormal return adjusted for reputational risk.

$$AAR\ (Rep) = \frac{1}{n}\sum AR(Rep)_{i,t} \tag{4.8}$$

Cumulative average abnormal returns ($CAAR$), adjusted for reputational risk, were calculated by accumulating the average abnormal returns $AAR\,(Rep)$ over the event window [-20; +20] allowing for the estimation of share prices concerning the event date. Equation 4.9 represents this:

$$CAAR\,(Rep)\,(t_1, t_2) = \frac{1}{n}\sum CAR\,(Rep)_i(t_1, t_2) \tag{4.9}$$

4.4.6. Measure of significance

The aim of the event study was to determine whether the returns at the time of the operational event were abnormal (systematically different) from what had been anticipated. The method in determination can be conducted in one of many ways. For the given performance measure (CAAR), a test statistic was calculated and equated to its distribution under the null hypothesis indicated by Equation 4.10 (Khortari & Warner, 2006:9):

$$H_0: CAAR = 0 \tag{4.10}$$

The t-test was used to indicate whether the $CAAR$ were significantly negative or positive for the post event window (+20 days). The null hypothesis stated that $CAAR$ are zero, therefore, the announcement did not influence $CAAR$. The alternative hypothesis stated in Equation 4.11 indicated that $CAAR$ are not zero, therefore, the announced event had an influence on $CAAR$.

$$H_1: CAAR \neq 0 \tag{4.11}$$

The statistical interference was conducted by means of unilateral tests: statistically significant at the 10% confidence level; significant at the 5% confidence level; significant at the 1% confidence level (Gillet *et al.*, 2010:229). The null hypothesis was rejected if the test statistic surpassed the three levels of critical values (10%, 5% or 1%) (Khortari & Warner, 2006:9). Note that RiskMetrics and many other research papers assume an average return of zero for μx (Brooks, 2002:443). A typical test statistic will be performed by means of Equation 4.12, where the $CAAR$ is divided by its standard deviation (Khortari & Warner, 2006:9; Ruspantini & Sordi, 2011:5):

$$T = \frac{(CAAR\left(\tau_1,\tau_2\right) - \mu_x)}{\frac{\sigma_x}{\sqrt{N}}} \sim N\ (0,1) \tag{4.12}$$

where:

- $CAAR\left(\tau_1,\tau_2\right)$ is the sample mean of the $CAAR$.
- μ_x is the expected mean of zero.
- σ_x is the sample standard deviation.
- $\sqrt{N}$ is the square root of the sample size.

4.4.7. Measure return volatility during event window

Since the establishment of the CAPM model volatility clustering (periods of very low and very high volatility) has become one of the most imperative features of financial data (Ferulano, 2009:124). According to Daly (2011:46), volatility is important for several reasons:

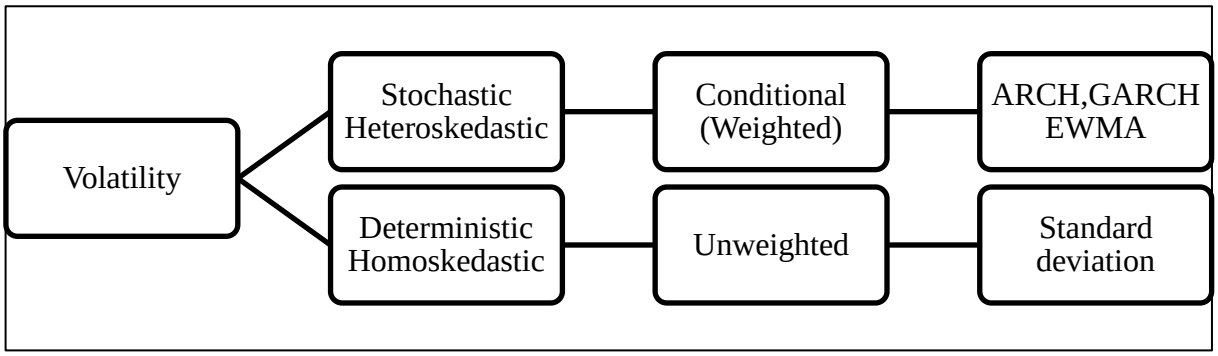
- fluctuation in asset prices over short periods may erode investor confidence;
- determining bankruptcy of a bank (high volatility may lead to greater probability of default);
- market liquidity (high volatility leads to a greater deviation between the bid and ask price of a stock);
- degree of risk (higher insurance premiums for individual firms due to higher risk);
- investors are risk adverse (investments may decline is volatility is too high); and
- greater capital requirements imposed by regulators due to greater volatility.

Since volatility is related to uncertainty and risk, the estimation of volatility contributes towards a more convincing estimate of risk (Daly, 2011:47). Volatility is conditional on past volatility (conditional volatility) meaning that if high volatility was experienced the previous day, high volatility will be experienced during the following days (Finance train, 2015). Figure 4.1 demonstrates several methods for volatility measurement. Volatility measures can either be deterministic or stochastic (Lin, 2002:18). The deterministic measures can also be referred to as time invariable (constant), whereas the stochastic measures are referred to as time variable (not constant) (Daly, 2011:49).

The autoregressive conditional heteroskedasticity (ARCH), the generalised autoregressive conditional heteroskedasticity (GARCH) and the exponential weighted moving average

(EWMA) models can be classified as stochastic, where the standard deviation as a measure of volatility can be classified as deterministic. More emphasis will be placed on the advanced conditional forecasting models such as the ARCH, GARCH and EWMA, since these models have proven their forecasting abilities (Ladokhin, 2009:12).

Figure 4.1: Measures of volatility



Source: Peyper (2014:97)

4.4.7.1. Standard deviation

The standard deviation is the most general measure used to measure the spread of returns around the mean (Hoemmen, 2007:1). The standard deviation can be obtained from the square root of the variance of returns (Lane, 2015). The deviation of actual returns away from the mean is what infuses the concept of risk into the metric. Whenever actual returns deviate further from the mean (expected returns), it adds to the amount of uncertainty that eventually leads to risk (Peyper, 2014:97). The standard deviation is categorised within the deterministic (time variant) and un-weighed category as demonstrated in Figure 4.1.

Equation 4.13 represents the standard deviation:

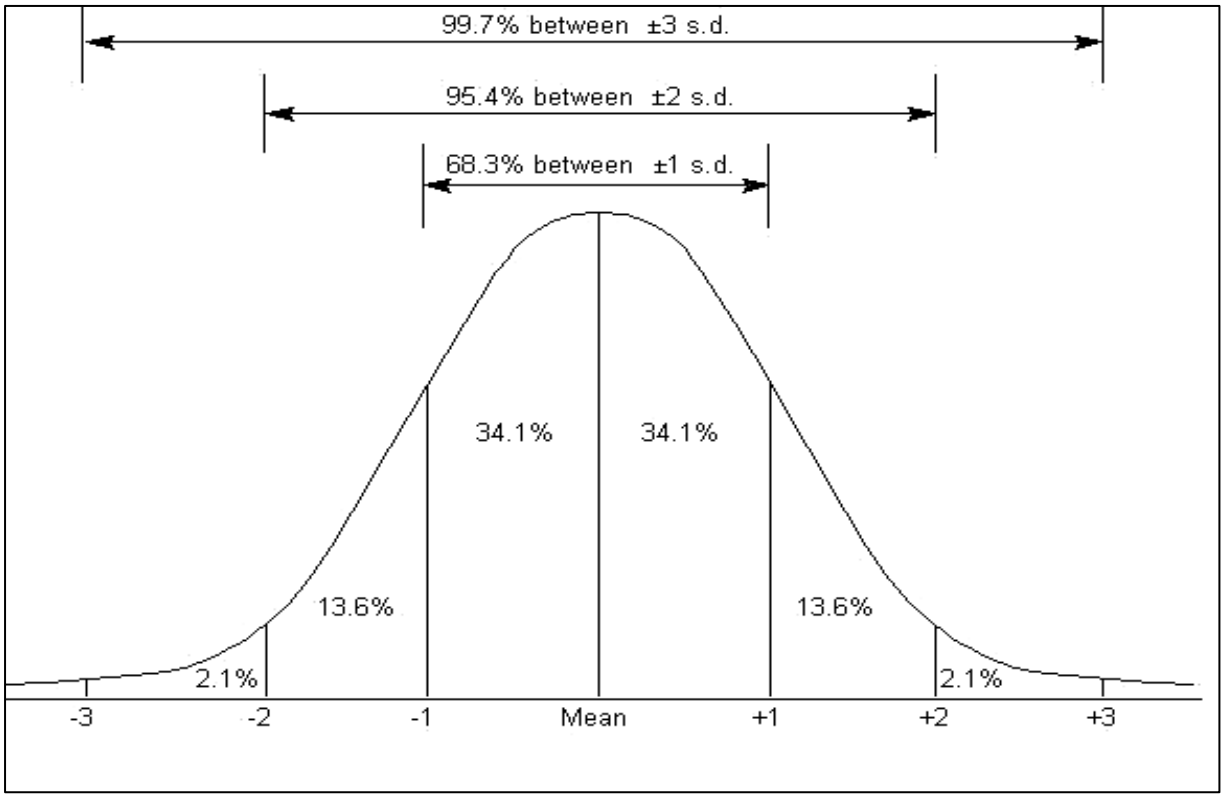
$$\sigma = \sqrt{\frac{1}{N-1}\sum_{N=1}^{N}(R_t - \bar{R})^2} \tag{4.13}$$

where:

- R_t are the relative return.
- $\bar{R}$ is the mean of the relative returns.
- N is the sample size.

Where a return distribution has a standard deviation, the data are assumed to be normal as illustrated by Figure 4.2 .

Figure 4.2: Standard deviation



Source: Gorard (2004)

Contrary to the EWMA, where recent observations carry the most weights, each observation R_t is given the same weight. This represents the main drawback of using the standard deviation as a volatility measure, since both positive and negative movements in stock returns are given the same weight. Harper (2008) argued that, based on the standard deviations main drawback, this measure can be regarded as a simple moving average due to its flaw in assigning both recent and past observations the same weight. Despite the fact that the standard deviation provides a clear overview of total risk, it does not provide the same application benefits as the other measures.

4.4.7.2. Autoregressive conditional heteroskedasticity

Engle (1982) developed an exceptional conditional volatility measure (Daly, 2011:49). The ARCH model can be used to measure the variance of time series data such as stock prices (Pennsylvania State University, 2015) and has been used with various asset pricing models such as the CAPM. The ARCH model has been used in previous research in conjunction

with the CAPM in order to capture the time varying systematic risk of the CAPM. The ARCH model inherits a common statistical characteristic, namely conditional variance, whereby past information is used to estimate future variance (Daly, 2011:51). Even though an ARCH model could probably be used to describe gradually increasing variance over a longer time period, it is preferably used during short periods of higher variation (Pennsylvania State University, 2015).

According to Bala and Asemota (2013:90), the ARCH model laid the foundation for further extensions of the ARCH. Some of the extensions include the generalised ARCH, exponential ARCH, and the threshold ARCH, just to mention a few (Ladokhin, 2009:15). The ARCH process can be defined in terms of the error distribution of the linear regression model, where y_t is the dependant variable, which can be illustrated by $y_t = x_t\beta + \varepsilon_{t,}$ where x_t is the vector of exogenous variables, affecting the conditional mean and ε_t the stochastic error (Bera & Higgens, 1993:309). The notation of q is added, which represents the autoregressive terms to the moving averages of the squared abnormal returns (Ladokhin, 2009:14). According to Engle Equation 4.14 can illustrate the ARCH model:

$$\sigma^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i {\mu^2}_{t-i} \tag{4.14}$$

where:

- ${\mu^2}_{t-i}$ is the error terms.
- α_i is the parameters of the model.

Furthermore, the ARCH model has been improved to form a generalised form of ARCH. However, a further constraint must be enforced denoting that $\alpha > 0$ to ensure positive variance σ^2 (Baum, 2013:6).

4.4.7.3. Generalised autoregressive conditional heteroskedasticity

The GARCH model stands for generalised autoregressive conditional heteroskedasticity (Gradestack, 2015). Due to the complexity inherent in the models name, it is necessary to explain the various components that distinguish the GARCH model from the rest of the volatility forecasting models:

- heteroskedasticity indicates that the variance changes with time;

- conditional indicates that the variance changes conditionally on the latest volatility; and
- autoregressive indicates that a positive correlation exists between yesterdays and today's volatility.

The GARCH (p, q) model represents conditional variance due to the fact that it estimates one period ahead for the variance calculated based on relevant past information (Brooks, 2002:452). Furthermore, the GARCH model makes use of regressed historical terms, which are variances (q) and squared returns (p). The model regresses only one return (last squared return) and only one variance (last variance) and, therefore, can be rewritten as GARCH (1,1). The values of ω, α, β are the parameters of the model (Ladokin, 2009:15). Alberg *et al.* (2008:203) demonstrated the GARCH model by means of Equation 4.15

$$\sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i {\mu^2}_{t-i} + \sum_{j=1}^{p} \beta_j \sigma_{t-j}^2 \quad (4.15)$$

where:

- ${\mu^2}_{t-i}$ is the ARCH term indicating previous volatility.
- σ_{t-j}^2 is the GARCH term indicating previous variance.
- α_i is the GARCH error coefficient.
- β_j is the GARCH lag coefficient.

Therefore, GARCH can be used when data exhibit heteroskedasticity, volatility and kurtosis (price spikes) (Perrelli, 2001:3). The GARCH model has been proven to be easy to estimate and astoundingly effective in calculating conditional variances (Engle, 2001:159). Generally, the GARCH model is superior to other conditional volatility measures due to its improvement of the ghosting feature and the incorporation of mean reversion (Brooks, 2002:452). The GARCH (1.1) model is generalised by Longerstaey (1996:100), where three parameters are the given weights as indicated by Equation 4.16:

$$\gamma + \alpha + \beta = 1 \quad (4.16)$$

In this case, y_t is the dependant variable, which is similar to the ARCH model. The GARCH model would be chosen above any other model except where the first parameter is negative ($\alpha + \beta > 1$). This result indicates that the GARCH model is unstable and another model

such as the EWMA is chosen. Also, if there is no indication of mean reversion (where persistence < 1) the GARCH model is seen as unstable and not preferred (Alexander, 1998:16).

Furthermore, Nelson (1991:347) elucidated upon the various drawbacks of the GARCH model that disallowed this model to be used:

- inflict parametrical restrictions upon the conditional variance process, whereby some estimation coefficients are violated;
- the persistence of shocks to conditional variance is challenging to construe by means of GARCH;
- provides a single estimate for the entire period of analysis, preventing the capture of daily volatility spill over effects, averting the ability to differentiate between domestic and international volatility fluctuations; and
- contrary to GARCH assumptions, evidence has been found indicating a negative and weak correlation between the volatility of current returns and the volatility of future returns.

For these reasons, the EWMA model had to be considered.

4.4.7.4. Exponential weighted moving average

In order to have identified the return volatility during the period of the operational loss events, the exponential weighted moving average model (EWMA) was used to compare the return of the sample banks relative to the benchmark. The JSE Bank Index was also used to ascertain a volatility comparison using the EWMA with the sample of banks. The EWMA was chosen above the standard deviation and the GARCH model since the EWMA is a subset of GARCH. Previous empirical research found that the GARCH model only outperformed the EWMA model during short periods (less than 20 days) (Longerstaey, 1996:100).

The EWMA is an estimation method, which was suggested by the RiskMetrics Framework during 1996 (Lodokhin, 2009:12). According to the Charted Financial Analyst Institute (2012) the EWMA is used to calculate conditional volatility of share returns. The EWMA is initially a subset of the GARCH model. The EWMA was calculated using Equation 4.17:

$$\sigma = (1-\lambda) \cdot \sqrt{\sum_{t=1}^{T} \lambda^{t-1} \cdot (r_t - \mu)^2} \tag{4.17}$$

where:

- σ is the estimate of the variance for the period.
- λ is the decay factor.
- r_t is the relative return of the relevant banks.
- μ is the mean of the relative returns.

Note that a relative return of zero for μ was assumed (Brooks, 2002:443). The EWMA model is dependent on the parameter λ where the decay factor has to be larger than zero but smaller than one (Longerstaey, 1996:78). The λ factor monitors how responsive the estimate of the daily volatility is relative to the current daily percentage change. A λ value close to one indicates that more weight is being allocated to the most recent data (Hull, 2011:464); whereas a λ close to zero indicates that, more weight is allocated to past data (Alexander, 1998:8). This is the main reason why EWMA reacts faster to changes in prices and, therefore, motivates the use of this variance model. RiskMetrics created by J.P. Morgan (Longerstaey, 1996:100) proposed a λ value of 0.94 for updating daily volatility estimates. Research done by RiskMetrics found that the proposed λ value of 0.94 forecasts the variance rate closest to the realised variance rate (Hull, 2011:464). The λ value own to the South African market was calculated by using Equation 4.18 to 4.21. A general requirement for calculating the optimal λ value is to minimise the average squared errors. Therefore, Equation 4.18 indicts the daily root average squared error (RMSE):

$$RMSE_v = \frac{1}{T}\sum_{t=1}^{T} (r_{t+1}^2 - \hat{\sigma}_{t+1}^2\,(\lambda))^2 \tag{4.18}$$

The time period $t+1$ demonstrates the forecast of the return variance r_{t+1} made one period prior (Longerstaey, 1996:98). Equation 4.18 further indicates that the estimated variance is written clearly as a function of λ. The optimal λ (which generates the most accurate forecast) was found by finding the lowest values of RMSE over different values of λ.

Generating Π, which represents the sum of all N minimal RMSEs, τ_is:

$$\prod = \sum_{i=1}^{N} \tau_i. \tag{4.19}$$

The relative error measure was calculated using Equation 4.19:

$$\theta_i = \frac{\tau_i}{(\sum_{i=1}^{N} \tau_i)} \tag{4.19}$$

The weight $\emptyset_i$ was calculated using Equation 4.20:

$$\emptyset_i = \frac{\theta^{-1}}{\sum_{i=1}^{N} \theta_i^{-1}} \tag{4.20}$$

Finally, the optimal decay factor λ was calculated using Equation 4.21:

$$\lambda = \sum_{i=1}^{N} \emptyset_i \ \lambda_i \tag{4.21}$$

The optimal decay factor represented the weighted average of the individual optimal decay factors, where the weights represented a measure of discrete forecast accuracy (Longerstaey, 1996:100). Applying this methodology to the daily returns of the sample of South African banks, a South African decay factor of 0.94 was found using ten years of data.

The EWMA has a few advantages above other simple volatility forecasting's methods. Table 4.1 indicates the similarities and differences of both the EWMA and the GARCH model. Both the EWMA and the GARCH model forecast the daily variance for a certain day, which is the weighted average of the previous day as well as the square of the proportionate change for the previous day (Akosah, 2014:163). The GARCH model adds to the EWMA by adding a long-run average variance rate contrary to the EWMA, which excludes mean reversion. The EWMA is known to allocate more weight to the most recent data than for past data and represents an extension of the historical average volatility measure (Ferulano, 2009:126).

Table 4.1: Exponential weighted moving average vs. generalised autoregressive conditional heteroskedasticity

VOLATILITY	
Stochastic/heteroskedastic	
Conditional (weighted)	
ARCH	
GARCH	**EWMA (special case of GARCH)**
Allocate more weight to most recent information	Allocate more weight to most recent information
Exponential smoothing	Exponential smoothing
Calculate conditional volatility	Calculate conditional volatility
Forecast daily variance	Forecast daily variance
Forecast proportionate change	Forecast proportionate change
Includes mean reversion	Excludes mean reversion
Dependent on $\gamma + \alpha + \beta = 1$	Dependent on the parameter λ

Source: Compiled by author

The EWMA is superior to the simple historical model since the volatility of the banks are more likely to be affected by current operational events than past operational events (Brooks, 2002:442). The volatility attributed by a single event will fall further into the past, as the weight to recent events increases. Another attractive characteristic of the EWMA is that relatively few data need to stored (Hull, 2011:464). The EWMA is also not affected by normality, contrary to the standard deviation and, therefore, works well with individual stocks (Resource Engineering, 2015). Compared to the standard deviation, the EWMA incorporates external shocks better, providing a more realistic measure of current volatility (Longerstaey, 1996:80). Comparing the stock returns of Standard Bank during 2014, when the bank had announced its operational loss, the EWMA illustrates results that are more satisfactory. The standard deviation assigns equal weights to each observation contrary to the EWMA, which may cause the standard deviation to respond slower to larger samples (Harper, 2008).

4.4.8. Measure of significance for sample variance

The F-test was used to indicate whether the variance of the sample of banks was the same as the variances of First Rand Bank, Nedbank and ABSA Bank. Where the F-test value was larger than the F-statistic, the null hypothesis (indicating that the variances are the same)

was rejected and it was concluded that the variances differ. Equation 4.22 demonstrates this. This will indicate that the announced operational loss had an effect on First Rand Bank, Nedbank and ABSA Bank.

$$H_0: \sigma_1^2 = \sigma_2^2 \tag{4.22}$$

Where the F-test value was smaller than the F-statistic, the null hypothesis (indicating that the variances are the same) was accepted. In this case, the announced operational loss of the affected bank had an effect on First Rand Bank, Nedbank and ABSA Bank. This method was also used to test the affected bank's variance against the JSE and the JSE Bank Index. Equation 4.23 indicates the alternative hypothesis.

$$H_1: \sigma_1^2 \neq \sigma_2^2 \tag{4.23}$$

4.5. Previous literature

Although reputational risk has been widely researched in the non-financial sector, it remains neglected in the financial industry, with the principal emphasis being on operational loss and its effects on reputation rather than specifically reputation risk (Fiordelisi *et al*., 2014:107). Only a few studies have researched the effect operational loss announcements had on the reputation of financial institutions.

Cummings, Lewis and Wei (2004) studied the market reaction reflected by changes in stock prices after the announcement of operational losses during 1978 and 2003 in the United States (Fiordelisi *et al.,* 2012:107). Only losses larger than USD10m experienced by banks and insurance companies were used. During this study, it was found that insurance companies suffer larger negative impact than banks. This result can be attributed to better operational risk management in banks with the comprehensive guidance of the BCBS. Both banks and insurance companies acknowledged a drop in both share prices and market value after the operational loss announcement (Gillet *et al.*, 2010:225).

De Fontnouvelle and Perry (2005) found that prices only are affected negatively on the day the loss is announced. The study further made use of a loss ratio (loss amount/market capitalisation). Whenever the market loss surpasses the announced operational loss, it

suggested evidence of reputational risk. Since the study focused on all the various operational loss event types, it concluded that price was affected mostly by internal fraud.

Micocci *et al.* (2009) attempted to quantify the reputational risk of financial institutions (banks and insurance companies) by analysing the institutions share price reaction after operational loss events, mainly internal fraud. The study included European and American institutions, which announced operational losses exceeding 20 million USD between 2000 until 2006. After having calculated the cumulative abnormal returns, evidence suggested that share prices react negatively to operational events (mainly internal fraud). This study included an estimation of a value at risk for a given confidence level for which economic capital must be kept for reputational risk (Micocci *et al*., 2009:1)

Gillet, Hubner and Plunus (2010) followed a similar approach focusing on 152 financial companies (banks and insurance companies) in the United States and Europe between 1990 and 2004. Gillet *et al.* (2010:225) introduced an advanced measure or reputational risk, whereby the difference between the market loss and the announced loss of the bank was accounted for. This advanced measure allowed for the isolation of reputational risk as a result of operational events. Contrary to previous studies, Gillet *et al.* (2010:225) categorised each financial institution according to three event dates: (1) press date (2) recognition date and (3) the settlement date. The destructive impact was comparably larger when the announced loss amount represented a larger share in these financial institutions net profit isolation of reputational risk as a result of operational events (Gillet *et al.*, 2010:224).

Ruspantini and Sordi (2011) focused on the reputational impact after the announcement of internal fraud within the Uni-credit Group Italian retail branches over the period of 2008 until 2010. Client reaction and management were used to explain the event. The studies concluded that internal fraud poses severe reputational risk due to customer complaints (Ruspantini & Sordi, 2011:1).

Fiordelisi *et al.* (2012:106) used a larger sample (investment and commercial banks) within Europe and the United States between the time period of 1994 and 2008. Research indicated that large reputational losses were suffered after the announcement of operational losses. Internal and external events were the main operational events leading to reputational risk. Losses were also found to be larger in Europe than in the United States (Fiordelisi *et al.*, 2012:105).

Overall, the amount of studies relating to the effect of operational loss events on the reputation is still restricted to the United States and Europe (Fiordelisi *et al.,* 2012:105), leaving much room for an analysis within the South African context.

4.6. Summary

The aim of this chapter was to emphasise the effect of operational loss events on the reputation of South African banks by analysing the stock market reaction to the announcement of operational losses. The main distinction between this study and previous empirical research is that a South African sample was used, which included Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank. The leading reason for the reduced numbers of observations (four operational loss events) in the final sample is distinctive to the sound banking sector in South Africa. Only a few operational loss events have been reported over the past 14 years. These four banks were chosen due to the fact that all of them experienced unanticipated operational loss announcements. It can be assumed that the announcement of operational losses led to the reputational damage of the financial institutions concerned. Data for the time period of 14 years will be used for specific events that occurred during these 14 years.

Expected returns normally are calculated using the most appropriate asset pricing model such as the CAPM and market model commonly used in event studies. The chosen asset pricing model was assessed using data for the pre-event estimation period. For this study, the capital asset pricing model (CAPM) was used to determine the expected returns for each bank, rather than the market model. Furthermore, reputational risk has been widely researched in the non-financial sector, yet it remains neglected in the financial industry. Overall, the amount of studies relating to the effect of operational loss events on the reputation is still restricted to the United States and Europe making room for this study within the South African context.

The measurement of return volatility is important for several reasons. One of them is to provide a better estimate of risk. In this case, volatility was measured by the EWMA for event window [-20; +20] for each of the sample banks (Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank) relative to the market benchmark and banking index. The EWMA can be regarded superior to other volatility measures since the volatility of the banks is more likely to be affected by current operational events than past operational

events (Brooks, 2002:442). One of the most attractive characteristics of the EWMA, is that relatively few data need to be stored. The EWMA is also impervious to normality, contrary to the standard deviation and, therefore, works well with individual stocks. Compared to the standard deviation, the EWMA incorporates external shocks better, providing a more realistic measure of current volatility. The standard deviation assigns equal weights to each observation contrary to the EWMA, which may cause the standard deviation to respond slower to larger samples.

The GARCH model was built on the foundation of the ARCH model. Both the EWMA and the GARCH model allocate a greater weight to the most recent observations. However, the GARCH model makes room for mean reversion, which was not relevant to the stated empirical objectives. Further, the EWMA is a subset of GARCH and is able to achieve comparable results. In this study, the EWMA has proven to have more application benefits than do any of the other volatility measures.

CHAPTER 5: RESULTS AND DISCUSSION

5.1. Introduction

Reputational risk has been widely researched in the non-financial sector; however, it remains neglected in the financial industry, with principal emphasis on operational risk and its consequences on reputation rather than specifically reputation risk (Fiordelisi *et al.*, 2014:107). Only a few studies have researched the degree of reputational risk within banks after operational loss announcements. These studies have focused mainly on financial institutions within the United States and Europe (Sturm, 2013:192). With previous research done only in the United States and Europe, this study will contribute and widen the geographical research base of reputational risk. This study is similar to previous event methodologies in the sense that it emphasises the effect of operational loss events on the reputation by assessing the abnormal returns. However, contrary to previous research a sample of South African banks was used in order to analyse the stock market reaction (reputational risk) to the announcement of operational losses. The South African sample consisted of Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank. These four banks were chosen due to their unexpected operational loss announcements. It will be proven within this chapter whether the announcement of operational losses led to the reputational damage of these financial institutions. The time period of 14 years of data was used for specific events that occurred during these 14 years starting from as early as 2000 until 2013.This chapter will present the results and findings of the calculations conducted in order to demonstrate the reputational risk within the sample of South African banks. The chapter consists of four sections, each describing the individual results of each bank. Within the last section, the volatility of each bank during the event window is described.

5.2. Regal Treasury Bank (2000)

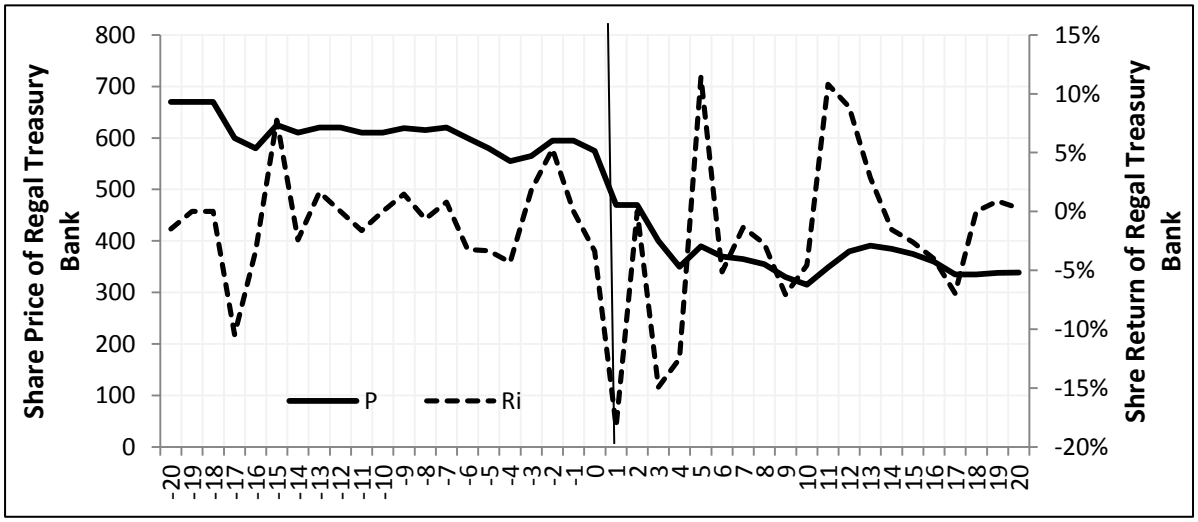
Regal Treasury Bank was established in 1997 and listed during 1999 (Makhubela, 2006:94). The bank recognised a false amount of branding income, which was not authorised until some income was actually generated from branding (Roodt Attorneys, 2015). Regal Treasury Bank suffered an operational loss event on 16 May 2000 that involved unauthorised transactions, inaccurate external reporting and the intentional mismarking of the banks position (BCBS, 2006:304). This type of operational loss announcement may be categorised under insider trading (unauthorised activity) (BCBS, 2006:304). The news was

made public by means of local newspapers, the Internet and other social media forums. The following section provides evidence of whether this operational event led to reputational risk for Regal Treasury Bank.

5.2.1. Descriptive statistics of Regal Treasury Bank

Bank shares are a form of investment undertaken by investors with the hope that such shares will generate future profits. The market supply and demand forces for a certain share determine the values of such shares (Achia *et al.*, 2013:1). Following the assumptions of the efficient market hypothesis, stock prices reflect all available market information and returns are independently distributed (Fama, 1970:390). In order to explain the probability distribution of Regal Treasury Bank's share returns, the skewness (measure of asymmetry) and kurtosis (measure of flatness) is summarised in Table 5.1. During the 41-day event window with the event date as day [0], Regal Treasury Bank's price oscillated. As illustrated by Figure 5.1, the share price reached a maximum of ZAR670, however, it quickly fell as low as ZAR315.

Figure 5.1: Share price return of Regal Treasury Bank



Source: Own calculations

Following the operational loss announcement made public on day zero, Regal Treasury Bank's price followed a downward price trend due to the arrival of market information. During the event window [-20] to day [+20] the share price fluctuated violently and lost a share value of ZAR331. As demonstrated by Figure 5.1 Regal Treasury Bank's share return followed a relative trend until the event date. Returns started oscillating after the initial announcement reaching an all-time low of (-18.26%) followed by a positive (11.43%)

return. Returns were mainly negative with an average return of (-1.50%) throughout the event window.

Regal Treasury Bank's returns showed a skewness of (-0.39) and a kurtosis of (1.58). Generally, normally distributed data have a skewness of zero and a kurtosis of three. The skewness of (-0.39) indicated that the share prices are skewed to the left, whereas the kurtosis of (1.58) indicated a platykurtic distribution since it is smaller than three is (DeCarlo, 1997:292). Furthermore, the returns of Regal Treasury Bank formulated a variance of (0.35%), which suggests that returns are spread far and wide around the mean return (-1.50%) (Gujarati & Porter, 2010:78). The return distribution had a mode of (0%) indicating the return that was earned the most frequently within the event window (Stable, 2014). The middle value referred to as the median of (-1.35%) is relatively close to the mean value of (-1.50%). The standard deviation indicates how far the returns are distributed from the mean value. Therefore, the standard deviation of (5.94%) indicates that Regal Treasury Bank's returns are widely distributed from the mean value (-1.50%) (Rumsey, 2015).

Table 5.1: Distribution of the share returns of Regal Treasury Bank

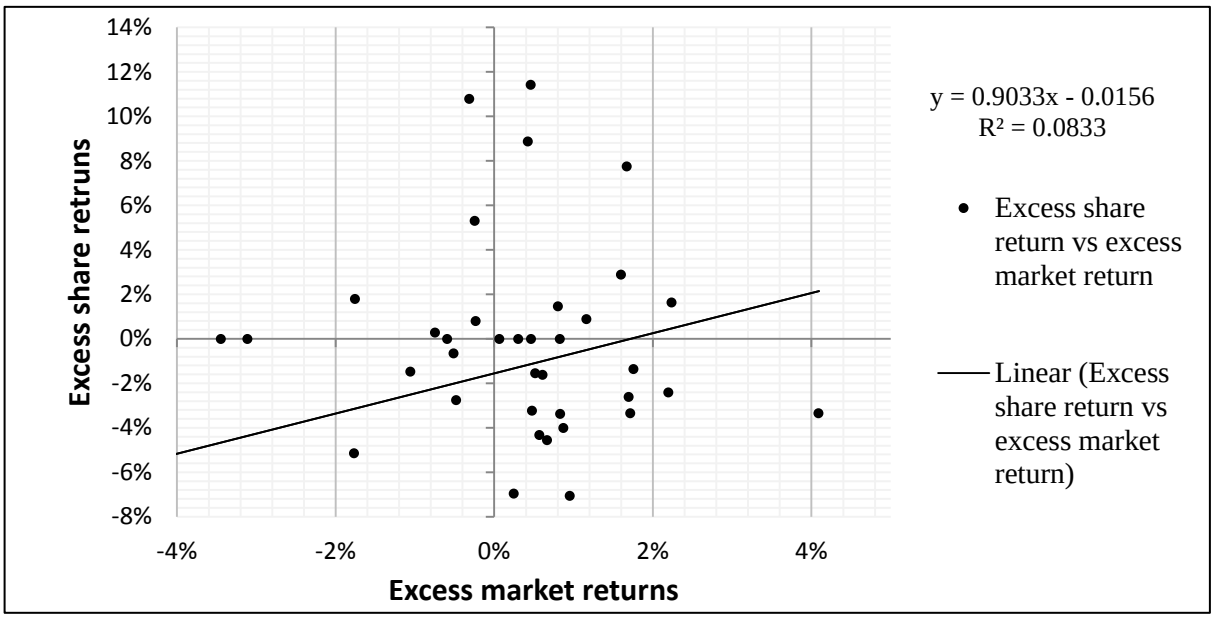
Mean	-1.50%
Median	-1.35%
Mode	0%
Standard deviation	5.94%
Sample variance	0.35%
Kurtosis	1.58
Skewness	-0.39
Minimum	-18.26%
Maximum	11.43%
Count	41
Confidence level (95.0%)	0.018

Source: Own calculations

Based on Figure 5.2, for every (1%) increase in the excess market return there will be a negative (0.0156) change in the excess share return of Regal Treasury Bank. The excess share return of Regal Treasury Bank forms the slope of the regression. Where the excess market return is equal to zero the excess share return of Regal Treasury Bank will simply be negative (0.0156) (Gujarati & Porter, 2010:41). The R^2 represents the coefficient of determination, and reflects that (8%) of the variation in the excess market return of Regal Treasury Bank, is explained by the excess market return (Codible, 2015). This is a relatively

low value since the R^2 can at most be one. The market has a beta value of one. The beta value of Regal Treasury Bank indicates how the banks expected volatility moves in comparison with the market. The beta value of (0.9033) indicates that the slope of the regression is increasing slowly with a beta value of (0.9033) (O'Loughin, 2013). The value of (0.9) (Regal Treasury Bank's beta) is very close to one (market beta) and in normal conditions would be seen as an average-risk share (Marx *et al.*, 2009:120).

Figure 5.2: Excess share returns of Regal Treasury Bank



Source: Own calculations

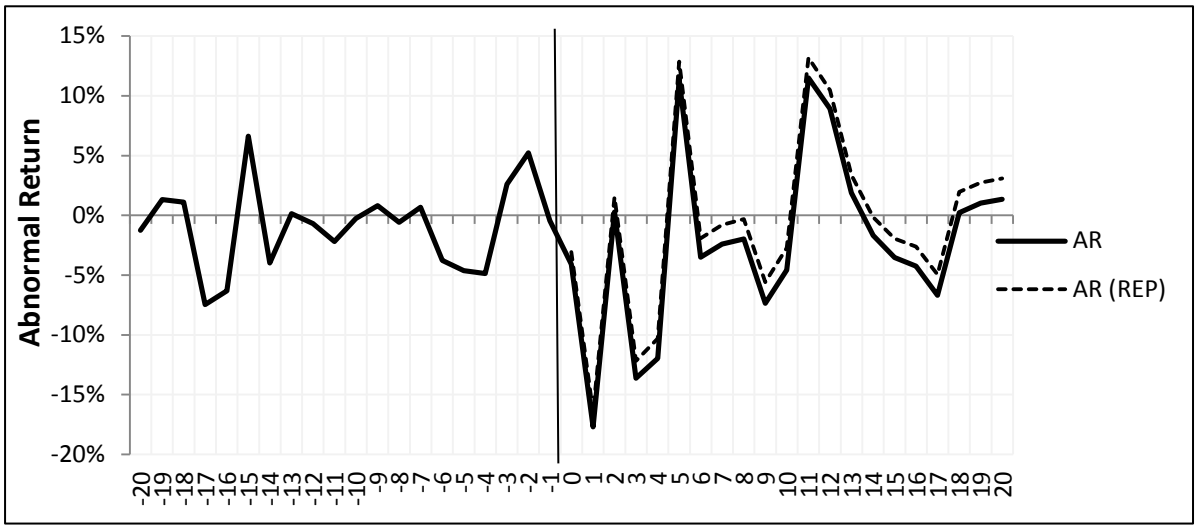
A correlation coefficient was used to determine the positive or negative linear relationship between the banks excess share return and the market excess return (Gujarati & Porter, 2010:41). Generally, the correlation coefficient lies between (-1) and (+1) expressed as $-1 \leq \rho \leq 1$. The analysis indicated that a weak positive correlation exists between the excess share returns of Regal Treasury Bank and the excess market returns, as the correlation was positive but closer to zero (0.29). Therefore, the correlation does not imply casualty, as movements in the excess market return will not necessarily cause movements in the excess return of Regal Treasury Bank (Gujarati & Porter, 2010:446).

5.2.2. Evidence of reputational risk for Regal Treasury Bank

Figure 5.3 visualises the market reaction of Regal Treasury Bank's operational loss announcement on 16 May 2000. The abnormal returns (AR_{it}) for Regal Treasury Bank ranged from day [-20] to day [+20] within the event window. The AR_{it}, adjusted for

reputational risk, is represented by the dashed line and indicates the impact on the banks reputation.

Figure 5.3: Abnormal returns for Regal Treasury Bank



Source: Own calculations

The time required for stakeholders to respond to operational loss announcements is random and may expose some market inefficiencies (Woon, 2004:9), as AR_{it} may be spread out over time and do not indicate a momentous spike in Figure 5.3. The average abnormal returns (AAR_{it}) for Regal Treasury Bank's shares were calculated by averaging the AR_{it} of each of the number of shares.

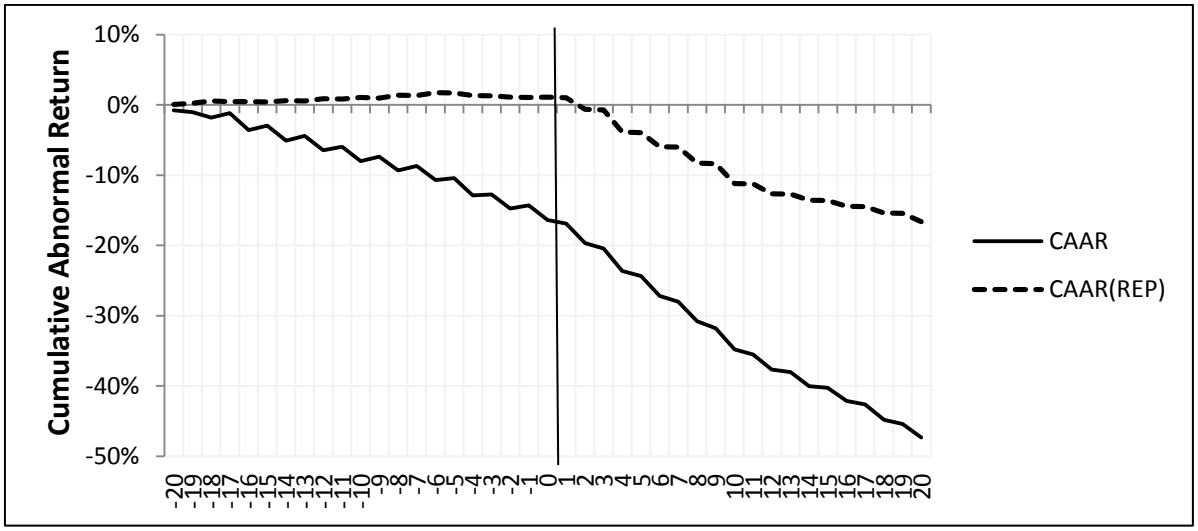
Figure 5.4: Average abnormal returns for Regal Treasury Bank

Source: Own calculations

Figure 5.4 it is clear that a relative distinction can be made between the AAR_{it} and the $AAR\ (Rep)$ adjusted for reputational risk. From event day [-20] to event day [-1] it is clear that the AAR_{it} remained relatively constant, whereafter a severe decline is seen after the event day zero. Therefore, to determine whether the loss in market value exceeds the announced operational loss Figure 5.5 needs to be discussed. The cumulative average abnormal returns ($CAAR$) were calculated by accumulating the AAR_{it} over the event window [-20; +20] allowing for the estimation of share prices concerning the event date.

The results indicated that all $CAAR$ values started to decline after the operational loss announcement on 16 May 2000. The dashed line indicates the reputational damage to the bank by adjusting the $CAAR_{it}$. The downward trend in the dashed line demonstrates the negative impact the operational loss announcement has on the share price and the reputation of a bank. Figure 5.5 clearly demonstrates a huge loss in market value greater than the announced operational loss, which further can be attributed to reputational risk (Sturm, 2013:199). Therefore, the evidence of negative $CAAR$ values is distinctive.

Figure 5.5: Cumulative abnormal returns for Regal Treasury Bank



Source: Own calculations

Table 5.2:Test statistics on cumulative average abnormal returns for Regal Treasury Bank

Mean CAAR	-16.61%
Sample standard deviation	5.55%
Sample size	20
t-test	-13.38
t-value at 90% (5%)	-1.73
t-value at 95% (2.5%)	-2.09
t-value at 99% (0.5%)	-2.86

Source: Own calculations

All $CAAR$ were negative within the post event window (+20 days) after the operational loss announcement on 16 May 2000 with a confidence level of 90% or more. The results are in line with the conjectural expectations, which indicate that operational loss news is withheld until the time of official disclosure where reputational losses then respond accordingly (Fiordelisi *et al.*, 2014:114). Therefore, the $CAAR$ was statistically significant after the operational loss announcement leading to the rejection of the null hypothesis ($H_0: CAAR = 0$). The alternative hypothesis $H_1: CAAR \neq 0$ was accepted, which indicated that $CAAR$ are not zero, therefore, the announced event had an influence on the $CAAR$.

Table 5.2 indicates the test statistics of the statistical interference, which was conducted by means of unilateral tests: statistically significant at the 10% confidence level; significant at the 5% confidence level; significant at the 1% confidence level (Gillet *et al.*, 2010:229). The null hypothesis was rejected since the test statistic of (-13.38) surpassed the three levels of critical values (-1.73, -2.09 and -2.86) providing evidence of reputational damage to Regal Treasury Bank (Khortari & Warner, 2006:9).

5.3. Saambou Bank (2001)

Saambou Bank was first established in 1942 and operated successfully until 2000 due to its mounting share price and annual growth rate (Steyn *et al.*, 2004:75). During October 2001 the Financial Service Board (FSB) conducted an investigation into the banks Chief Executive Officer (CEO) - Johan Myburgh due to the suspicious selling of 200 000 of his own shares at R11.80 during August 2001. This was done shortly before the bank issued an increase in the banks provision for bad debts, followed by a decline in earning over the next six months (Mittner, 2005). This transaction was seen as an attempt to manipulate the

market price of the shares and was regarded as insider trading on the bank's account (BCBS, 2006:304).

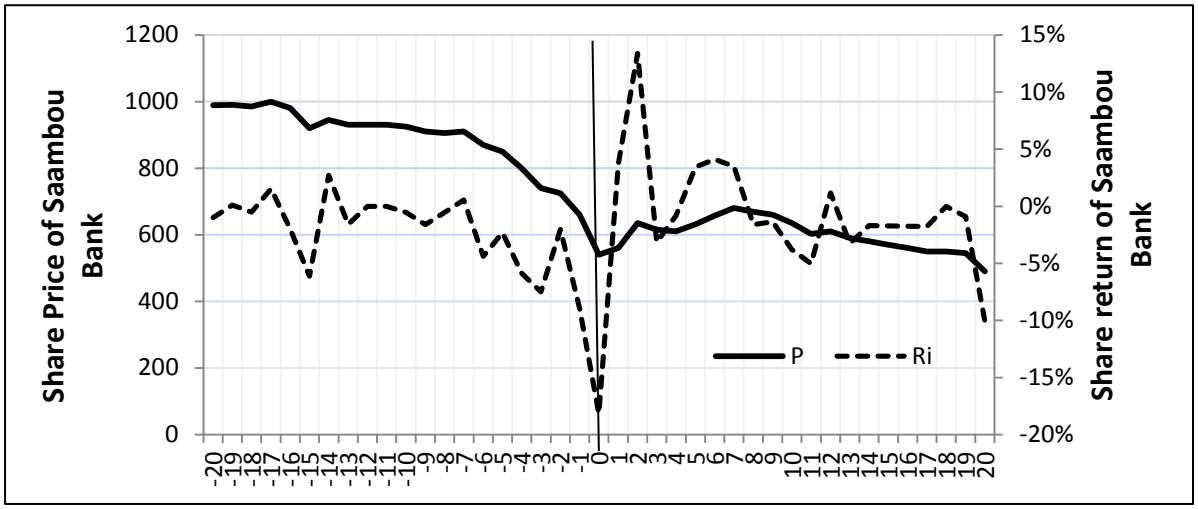
5.3.1. Descriptive statistics of Saambou Bank

The value of Saambou Bank's shares was determined by the market supply and demand for these shares (Achia *et al.,* 2013:1). Whenever good news occurred, the amount of dividends shareholder expected would increase. The value of the share would increase and be priced accordingly. On the other hand, whenever bad news occurred the banks dividend outlook would worsen and create more uncertainty. Resultantly, the bank's shares price would decline and its market value would drop (Anders, 2012). The following section elaborates on the probability distribution of Saambou Bank's share return, the skewness and kurtosis.

During the 41-day event window with the event date as day [0], Saambou Bank's share price deteriorated. The shares price (on day -20) started at an ask price of ZAR989, but within 10 days declined to ZAR540. This led to a total loss in share value of ZAR449. Figure 5.8 illustrate the maximum share price of ZAR1000 on day [-17] and minimum price of ZAR490 on day [+20]. Prior to the operational loss announcement made public on day zero (15 October 2001) Saambou Bank's share price followed a downward price trend due to the arrival of the market information. Saambou Bank tried to avert the share price from dropping too far by acknowledging the accusations against the CEO but pledged to cooperate fully with the investigation of the FSB. The result was an increase in the share price from ZAR540 to ZAR635 two days after the operational loss announcement.

During the event window from day [-20] to day [+20] the share price fluctuated aggressively and Saambou Bank lost a total share value of ZAR989. Figure 5.6 demonstrates the share return of Saambou Bank. Saambou Bank's share returns followed a volatile return pattern prior to and post the event date. The bank's returns reached an all-time low of (-18.18%) trailed by an all-time high of (13.39%) return. The sharp increase in returns may be linked with the banks positive response towards the on-going investigation. Investors might have seen this reaction as an indication of future prosperity. Returns were mainly negative with an average return of (-1.61%) throughout the entire event window.

Figure 5.6: Share price and return of Saambou Bank



Source: Own calculations

Normally distributed data have a skewness of zero and a kurtosis of three. As noted previously, daily returns are not normally distributed. The returns of Saambou Bank showed a skewness of (-0.46) and a kurtosis of (4.83). The skewness of (-0.46) indicated that the share prices are skewed to the left with most returns to the right of the mean, accompanied with extreme values to the left (Gujarati & Porter, 2010:450). The kurtosis of (4.83) indicated a leptokurtic distribution since it is larger than three, indicating a sharper than normal distribution (DeCarlo, 1997:292). The kurtosis of (4.83) increases the probability of extreme values occurring.

Table 5.3: Distribution of the share returns of Saambou Bank

Mean	-1.61%
Median	-1.59%
Mode	0%
Standard deviation	4.74%
Sample variance	0.22%
Kurtosis	4.83
Skewness	-0.46
Minimum	-18.18%
Maximum	13.39%
Count	41
Confidence level (95.0%)	0.015

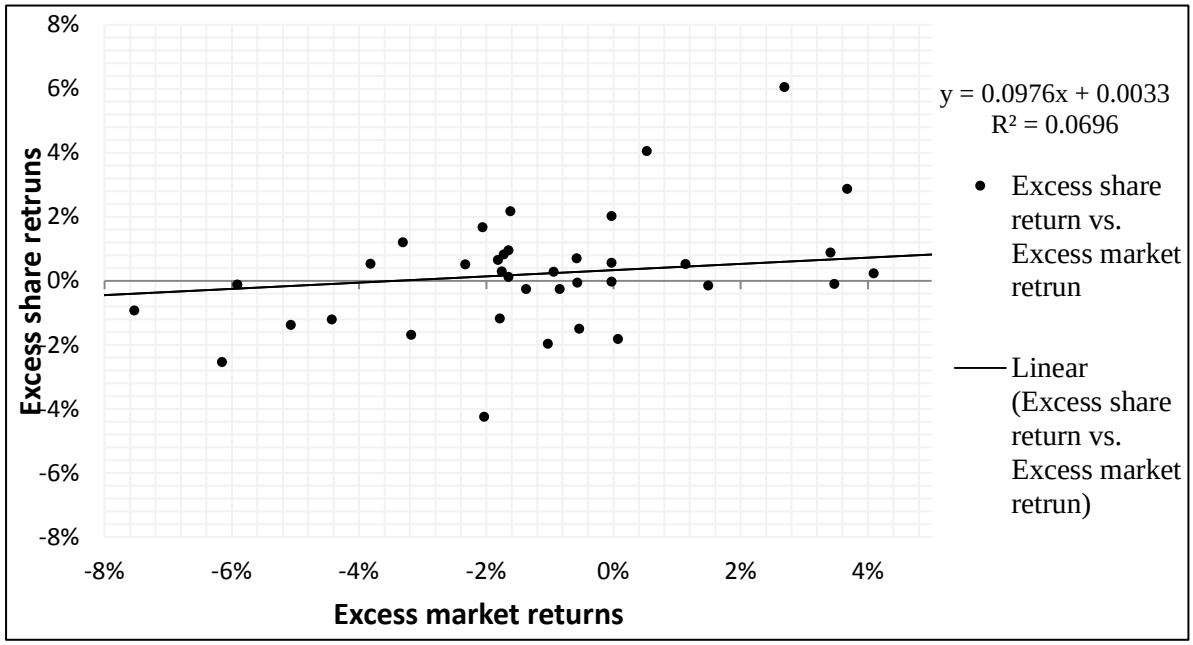
Source: Own calculations

Table 5.3 indicates a variance of (0.22%) for Saambou Bank, which suggests that returns are spread far and wide around the mean value (-1.61%) (Gujarati & Porter, 2010:78). Table 5.3

gives the return that was earned the most frequently within the event window as (0%). The middle value referred to as the median of (-1.59%) is fairly close to the mean value of (-1.61%). A standard deviation, which indicates how far the returns are distributed from the mean value, of (4.74%) was obtained. The large standard deviation indicates that Saambou Bank's returns are distributed far and wide from the mean value (-1.61%) (Rumsey, 2015). Generally, when a return distribution is skewed to the right or left, the standard deviation may be deficient and further measures of total risk and volatility may be needed (Marx *et al.*, 2009:112).

Figure 5.7 regressed the excess share return (y-axis) against the excess market return (x-axis). Figure 5.7 indicates that for every (1%) increase in the excess market return there will be a (0.003) increase in the excess share return of Saambou Bank. The excess share return of Saambou Bank forms the slope of the regression. Where the excess market return is equal to zero the excess share return of Saambou Bank will simply be positive (0.003) (Gujarati & Porter, 2010:41). The R^2 represents the coefficient of determination (Cameron, 2009) and reflects that (0.06) or (6%) of the variation in the excess market return of Saambou Bank is explained by the excess market return (Codible, 2015).

Figure 5.7:Excess share returns of Saambou Bank



Source: Own calculations

This is a relatively low value since the R^2 can at most be one or (100%). The value of (0.1) indicates that the slope of the regression is increasing slowly with a beta value of (0.1)

(O'Loughin, 2013). The CAPM model considers only systematic risk (measured by beta), generating a theoretical relationship between required return and systematic risk. Since the CAPM assumes only a single risk driver, the expected return will be equal to the beta value (Saunders & Cornett, 2006:54). The beta value further indicates the degree of volatility in Saambou Bank's shares in comparison with the market. Firms with a stable cash flow such as banks tends to have a beta value of less than one since they tend to fluctuate less than the market (Marx *et al.,* 2009:121).

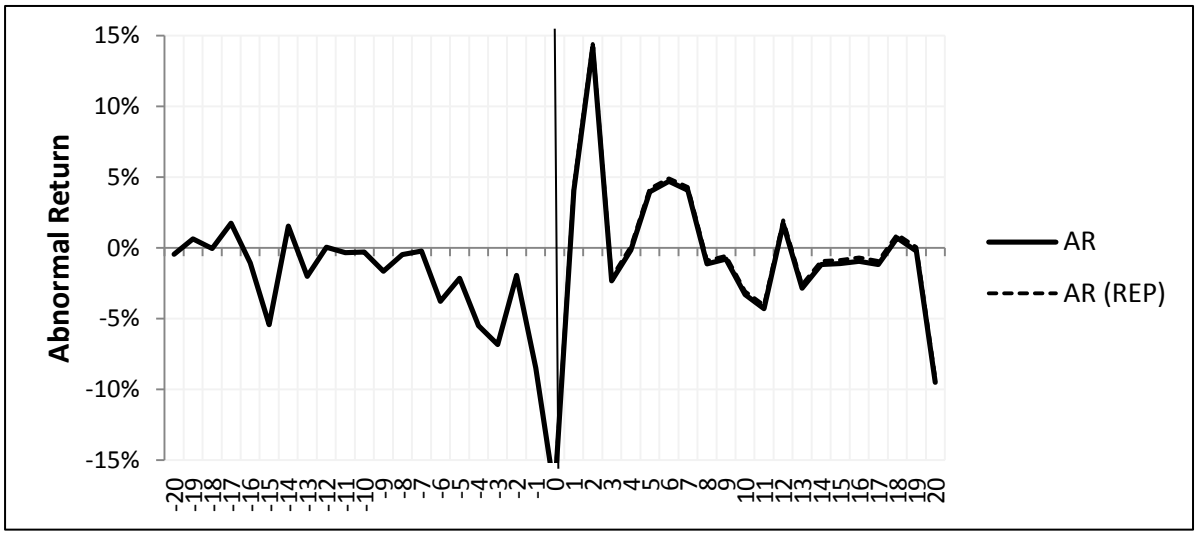
A correlation coefficient was used to determine the positive or negative linear relationship between Saambou Bank's excess share return and the market's excess return (Gujarati & Porter, 2010:41). In other words, the correlation coefficient determines the degree in which two shares (Saambou Bank and the market) move together (Marx *et al.,* 2009:114). The correlation coefficient lies between (-1) (shares move contrariwise) and (+1) (shares move in the same direction). A weak positive correlation was detected between the excess share returns of Saambou Bank and the excess market returns. The correlation was positive but closer to zero (0.26). This indicates that the returns generally move in the same direction, but not always. Hence, the correlation does not imply casualty, since fluctuations in the excess market return will not necessarily lead to fluctuations in the excess return of Saambou Bank (Gujarati & Porter, 2010:446).

5.3.2. Evidence of reputational risk

The abnormal returns (AR_{it}) are necessary to determine whether the performance of Saambou Bank shares varied from the market average during the event window. The AR_{it} for Saambou Bank were calculated from day [-20] to day [+20] within the event window. The majority of the 41 day returns were negative as a mean AR_{it} of (-1.22%) was drawn. It can be assumed that Saambou Bank underperformed in the market since the majority of its AR_{it} were negative (Ord, 2011). Figure 5.8 illustrates the market reaction to Saambou bank's operational loss announcement on the 15 October 2001.

AR_{it} were adjusted for reputational risk by dividing the operational loss amount with Saambou Bank's market capitalisation (Gillet *et al.,* 2010:227) (number of issued shares multiplied by the market value of the shares) (Marx *et al.,* 2009:166). The AR_{it} adjusted for reputational risk is represented by the dashed line and indicates the impact on Saambou Bank's reputation.

Figure 5.8: Abnormal returns for Saambou Bank



Source: Own calculations

The time required for stakeholders to respond to operational loss announcements is random and may expose some market inefficiencies (Woon, 2004:9). Previous empirical research suggests that in a weak form of market efficiency share prices react swiftly to information and no abnormal returns are experienced. Few abnormal returns may be experienced based on all publicly available information and for all AR_{it} to be negative private information is needed (Marx *et al.*, 2009:166). Therefore, as demonstrated by Figure 5.8, AR_{it} adjusted for reputational risk may be spread out over time and do not indicate a momentous spike.

The average abnormal returns (AAR_{it}) of Saambou Bank's shares were calculated by averaging the AR_{it} of each share. Figure 5.9 shows a clearer indication of reputational risk than the previous figure. In this figure, a relative distinction can be made between the AAR_{it} and the AAR (Rep) adjusted for reputational risk. From event day [-20] to event day [-6] it is clear that the AAR_{it} remained relatively constant, whereafter a severe decline is seen after day [-5]. This can be attributed to some share overreacting (semi-strong form), since banks shares moves unambiguously, or some insider trading (strong form of market efficiency). Therefore, to determine whether the loss in market value exceeds the announced operational loss, Figure 5.10 needs to be discussed.

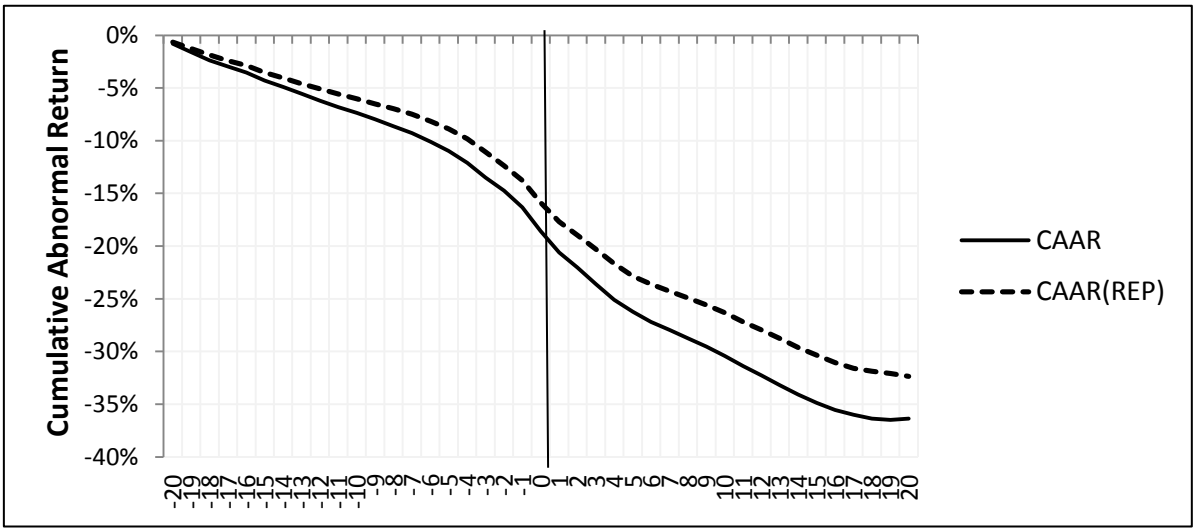
Figure 5.9: Average abnormal returns for Saambou Bank

Source: Own calculations

The cumulative average abnormal returns ($CAAR$) were calculated by accumulating the AAR_{it} over the event window [-20; +20]. Figure 5.10 demonstrates that all $CAAR$ started to decline prior to the event date of 15 October 2001. This can again be attributed to share overreacting (semi-strong form) or insider trading (strong form of market efficiency). Since the banks CEO sold off shares before the announcement date, due to the larger expected magnitude of future risk, a higher required rate of return was demanded. As a result, the expected return declined, forcing the share price downwards.

In Figure 5.10 the dashed line indicates the reputational damage to Saambou Bank by adjusting the $CAAR_{it}$. The downward trend in the dashed line throughout the entire event window demonstrates the negative impact the operational loss announcement had on the share price and the reputation of Saambou Bank. Figure 5.10 clearly demonstrates a deviation between the normal $CAAR$ values and the $CAAR$ (Rep) values, which further can be attributed to reputational risk (Sturm, 2013:199). Therefore, evidence of negative $CAAR$ values is reflected in Figure 5.10.

Figure 5.10: Cumulative abnormal returns for Saambou Bank



Source: Own calculations

Table 5.4: Test statistics on cumulative average abnormal returns for Saambou Bank

Mean CAAR	-32.35%
Sample standard deviation	4.58%
Sample size	20
t-test	-31.56
t-value at 90% (5%)	-1.73
t-value at 95% (2.5%)	-2.09
t-value at 99% (0.5%)	-2.86

Source: Own calculations

Further results indicate that all $CAAR$ values were negative within the post-event window (+20 days) after the operational loss announcement on 15 October 2001 at confidence level (99%), (95%) and (90%). Contrary to Regal Treasury Bank, the results of Saambou Bank are not similar to the conjectural expectations, which indicate that operational loss news is withheld until the time of official disclosure (Fiordelisi *et al.*, 2014:114). Due to insider trading, reputational losses started to respond before the official announcement date. As indicated by Table 5.4, the $CAAR$ values were statistically significant after the operational loss announcement, leading to the rejection of the null hypothesis ($H_0: CAAR = 0$). The alternative hypothesis $H_1: CAAR \neq 0$, therefore, was accepted, which indicated that $CAAR$ are not zero. Therefore, the announced operational event had an influence on the $CAAR$ values of Saambou Bank. This confirms that Saambou Bank sustained reputational risk after the announced operational loss. Table 5.5 indicates the test statistics of the statistical interference, which was conducted by means of unilateral tests for Saambou Bank:

statistically significant at the (10%) confidence level; significant at the (5%) confidence level; significant at the (1%) confidence level (Gillet *et al.*, 2010:229). The null hypothesis was rejected as the test statistic of (-32.35) surpassed the three levels of critical values (-1.73, -2.09 and -2.86) providing evidence of reputational damage and reputational risk to Saambou Bank (Khortari & Warner, 2006:9).

5.4. African Bank (2013)

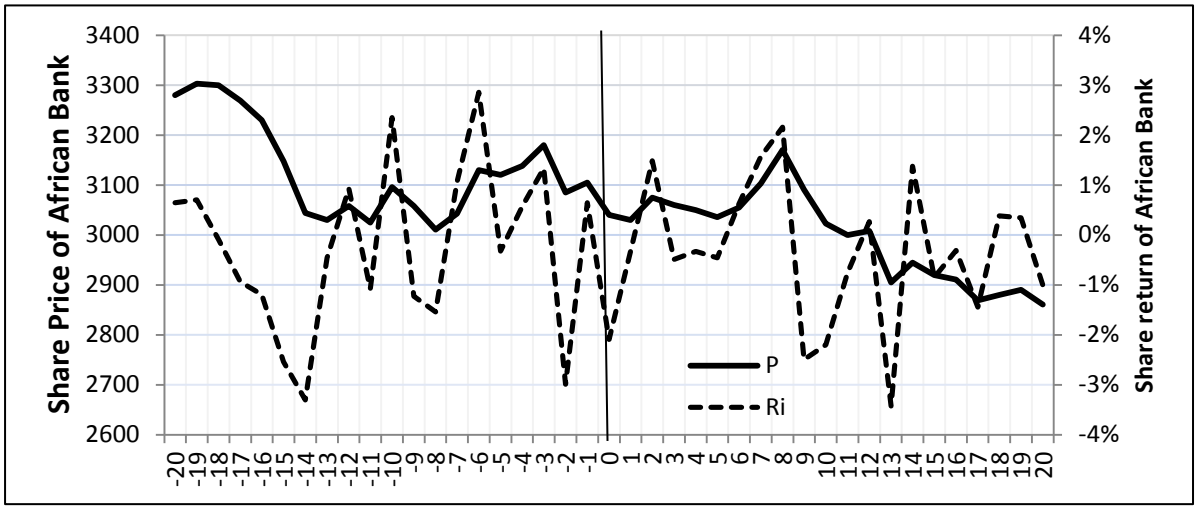
African Bank operated as a minor commercial bank in South Africa until 1988, whereafter the Theta Investment Group purchased African Bank's banking license and merged the bank with King Finance Corporate, Unity Financial Services and Alternative Finance (African Bank, 2014b). After the curatorship of Saambou Bank in 2002, African Bank acquired Saambou's personal loan book. Since the acquisition, African Bank has experienced remarkable losses as well as write-downs. Losses had to be financed by trading debt and equity due to the banks non-deposits business model (IOL News, 2014:2). On 15 February 2013, the National Credit Regulator (NCR) announced that African Bank was fined ZAR300m for their reckless lending business model, which is the largest fine the regulator has ever imposed on a South African bank (Dirk, 2013).

5.4.1. Descriptive statistics of African bank

The market supply and demand forces for these shares determined the values of African Bank's shares (Achia *et al.,* 2013:1). The assumptions of the efficient market hypothesis were followed again. Therefore, it can be assumed that the share prices of African Bank reflect all available market information and returns are distributed randomly (Fama, 1970:390). During the event window African Bank's share prices showed relative volatility. The highest price ABIL shares traded at during the 41-day event window was ZAR3303, with the lowest being ZAR2861. Following the operational loss announcement made public on 4 February 2013, African Bank's price followed a downward price trend due to the arrival of the market information. The bank lost a share value of ZAR442 during the event window [-20] to day [+20]. Figure 5.11 demonstrates the fluctuations of African Bank's share return trend prior and after the event date. On the operational loss announcement day [0] the share returns of African Bank fell to (-2.09%). The negative return was followed by a positive upswing of (1.49%) on day [+2]. African Bank reacted to this announcement by agreeing to pay the ZAR20m fine causing to share price to increase. The returns were

mainly negative with 24 of the 41 data points below zero, and an average return of (-0.31%) throughout the event window.

Figure 5.11: Share price and return of African Bank



Source: Own calculations

In order to explain the probability distribution of Regal Treasury Bank's share returns, the skewness (measure of asymmetry) and kurtosis (measure of flatness) are verified within Table 5.5. African Bank's returns showed a skewness of (-0.15) and a kurtosis of (-0.37). The skewness of (-0.15) indicated that the share prices are skewed slightly to the left whereas the kurtosis of (-0.37) indicated a platykurtic distribution where the distribution is smaller than three (DeCarlo, 1997:292). A variance of (0.02%) was generated, which indicates that returns are widely spread around the mean return (-0.31%) (Haugen, 2001:33).

Table 5.5: Distribution of the share returns of African Bank

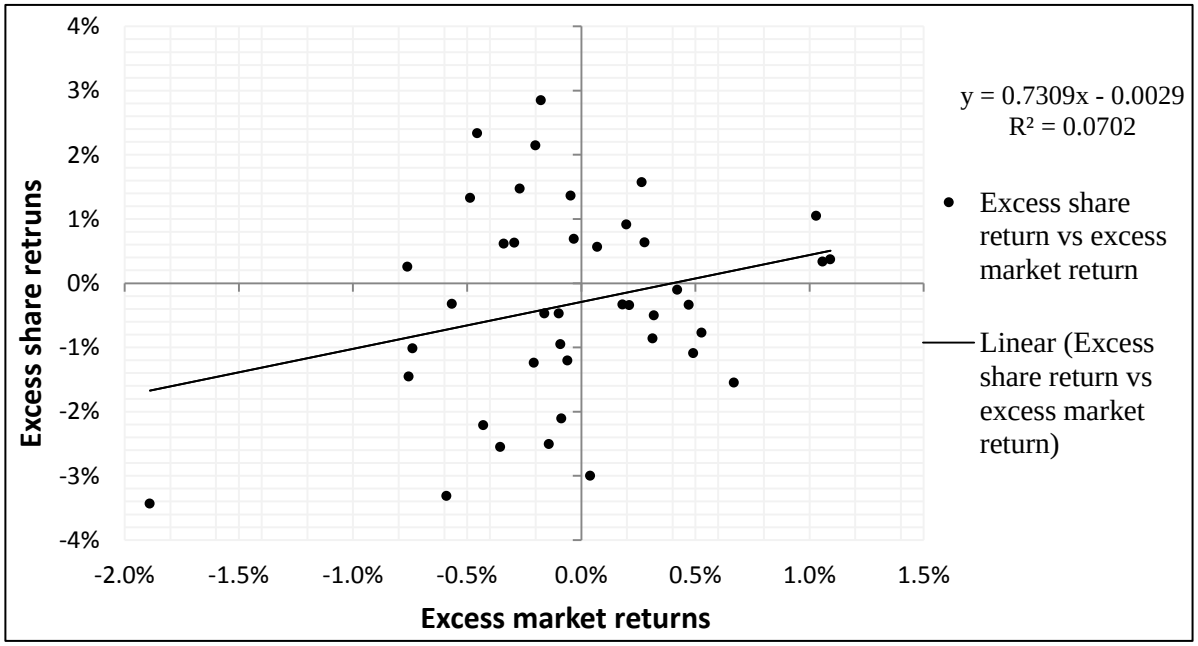
Mean	-0.31%
Median	-0.33%
Mode	0
Standard deviation	1.53%
Sample variance	0.02%
Kurtosis	-0.37
Skewness	-0.15
Minimum	-3.42%
Maximum	2.86%
Count	41
Confidence level (95.0%)	0.004

Source: Own calculations

Figure 5.12 shows how the excess share return of African Bank was regressed on the y-axis against the market excess return x-axis. For every (1%) increase in the excess market return there will be a negative (0.003) change in the excess share return of African Bank. Where the excess market return (slope of the regression) is equal to zero the excess share return of African Bank will simply be negative (0.003) (Gujarati & Porter, 2010:41). The R^2 represents the coefficient of determination (Cameron, 2009) and reflects that (7%) of the variation in the excess market return of African Bank is explained by the excess market return (Codible, 2015).

This is a relatively low value since the R^2 can at most be one or (100%). The positive value of (0.7309) indicates that the slope of the regression is increasing slowly with a beta value of (0.7309) (O'Loughin, 2013). This beta value suggests the amount of volatility for African Bank compared to the market.

Figure 5.12: Excess share returns of African Bank



Source: Own calculations

A correlation coefficient was used to determine the positive (+1) or negative (-1) linear relationship between African Bank's excess share return and the markets excess return (Haugen, 2001:41).

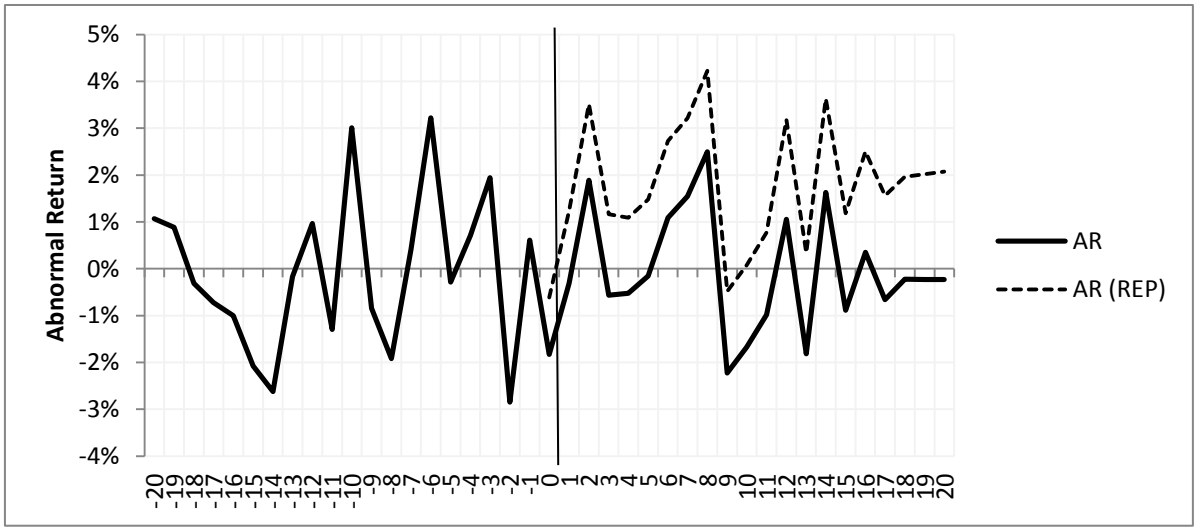
Figure 5.12 demonstrates that a weak (imperfect) positive correlation exist between the excess share returns of African Bank and the excess market returns since the correlation coefficient was positive but closer to zero (0.26). The returns are widely distributed from the

line of best fit, which decreases the total squared perpendicular distances from each individual return to the line (Haugen, 2001:43). Hence, the correlation does not imply casualty, as the returns of African Bank will not always move in the same direction as the market (Gujarati & Porter, 2010:446).

5.4.2. Evidence of reputational risk

Figure 5.13 visualises the market reaction of African Bank's operational loss announcement on the 4th of February 2013. The abnormal return was used to indicate whether the abnormal returns of African Bank varied from the abnormal returns adjusted for reputational risk. The abnormal returns (AR_{it}) for African Bank ranged from day [-20] to day [+20] within the event window. AR_{it} were adjusted for reputational risk by dividing the operational loss amount with African Bank's market capitalisation. The AR_{it} (Rep), adjusted for reputational risk, is represented by the dashed line in Figure 5.13 and indicates the effect on African Bank's reputation.

Figure 5.13: Abnormal returns for African Bank

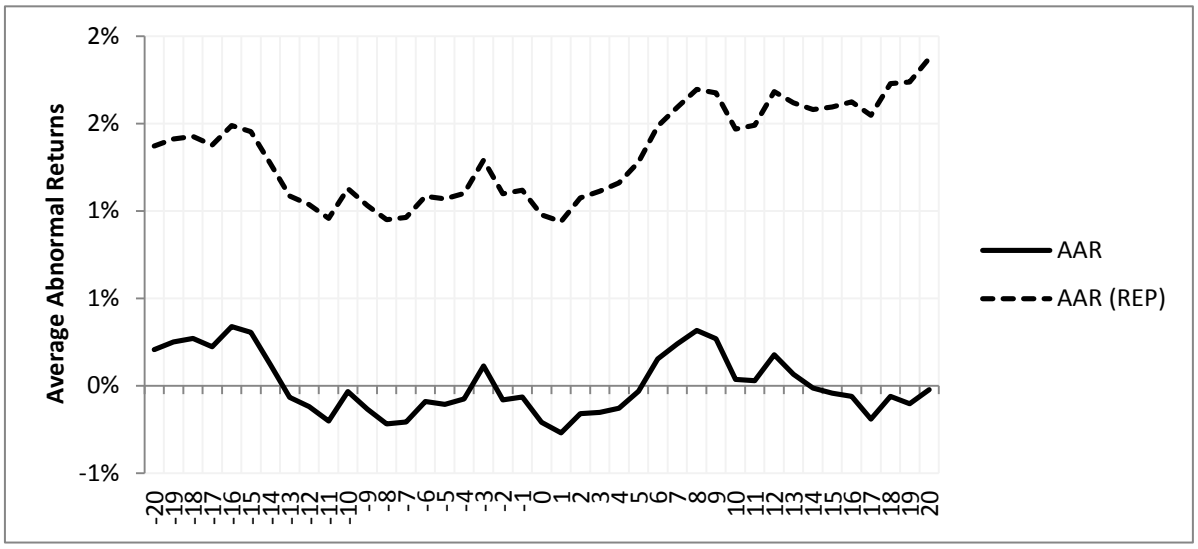


Source: Own calculations

More than half of the AR_{it} values were negative, however none of the values surpassed (-2.5%). Figure 5.13 does not reflect a large deviation between the AR_{it} and AR_{it} (Rep). This may be due to various market inefficiencies, as investors may respond in random waves and values are too widely spread to indicate disparity (Woon, 2004:9). However, it may be possible that AR_{it} (Rep) were not largely affected by the operational loss announcement on 4 February 2013.

The average abnormal returns AAR_{it} for African Bank's shares were calculated by averaging the AR_{it} of each of the number of shares. From the Figure 5.14 it is clear that a relative distinction can be made between the AAR_{it} and the $AAR\ (Rep)$adjusted for reputational risk. Both the AAR_{it} and the $AAR\ (Rep)$adjusted for reputational risk tends to be relatively volatile throughout the event window. Although a distinction can be made between the AAR_{it} and the $AAR\ (Rep)$, a further distinction should be made whether the majority of these returns were positive or negative. None of the daily $AAR\ (Rep)$ of the 41 values during the event window were negative. Therefore, to determine whether the announced operational loss had an effect on African Bank, Figure 5.15 needs to be discussed.

Figure 5.14: Average abnormal returns for African Bank

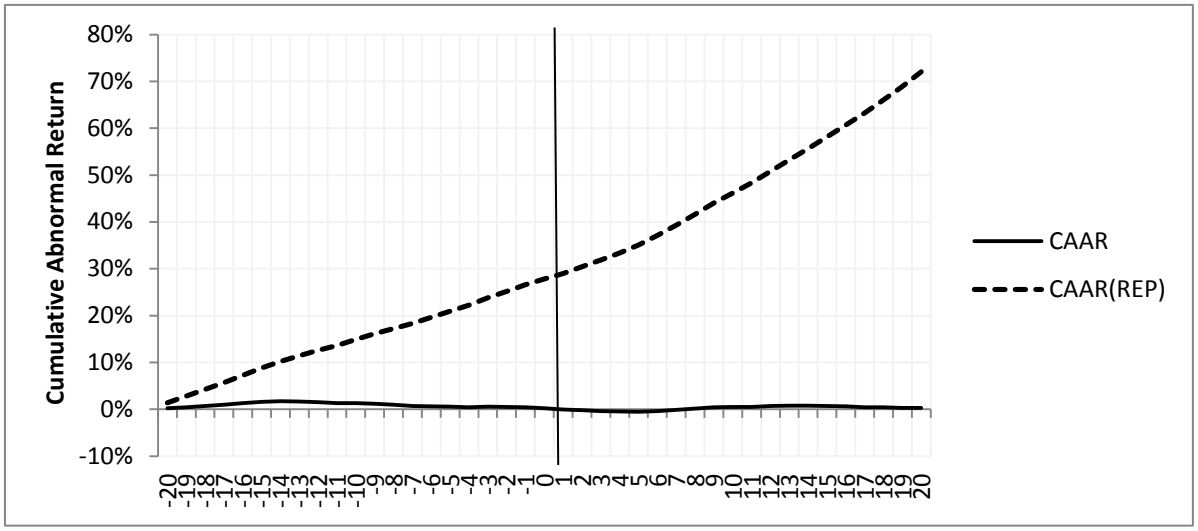


Source: Own calculations

The upward trend in the dashed line demonstrates the positive impact the operational loss announcement had on the share price and the reputation of African Bank. Figure 5.15 does not demonstrate a huge loss in market value, which indicates no severe reputational risk (Sturm, 2013:199). The evidence of positive $CAAR$ values is distinctive. The results for African Bank after the announced loss did not perform as expected.

$CAAR$ (Rep) values were extremely positive within the post event window (+20 days) after the operational loss announcement on 4 February 2013 with a confidence level of 90% or more. Table 5.6 indicates the test statistics of the statistical interference (Gillet *et al.*, 2010:229). The null hypothesis was accepted since the test statistic of (23.76) surpassed the three levels of critical values (-1.73, -2.09 and -2.86) providing evidence of no severe reputational damage to African Bank (Khortari & Warner, 2006:9).

Figure 5.15: Cumulative average abnormal returns for African Bank



Source: Own calculations

Table 5.6:Test statistics on cumulative average abnormal returns for African Bank

Mean CAAR	72.06%
Sample standard deviation	13.56%
Sample size	20
t-test	23.76
t-value at 90% (5%)	-1.73
t-value at 95% (2.5%)	-2.09
t-value at 99% (0.5%)	-2.86

Source: Own calculations

The CAAR values were positive within the post event window (+20 days) after the operational loss announcement. The actual knowledge of the real loss amount allowed African Bank to enter into an early agreement with the NCR. Therefore, the matter could be settled before severe reputational damage could be done. The early agreement to pay a ZAR20m fine showed that African Bank was taking responsibility for their actions. This positive news after the operational loss announcement prevented the bank's shares from reacting negatively. Therefore, the statistics do not allow the rejection of the null-hypothesis ($H_0: CAAR = 0$) (Khortari & Warner, 2006:9). The null-hypothesis ($H_0: CAAR = 0$) was accepted, which indicated that $CAAR$ are zero, therefore, the announced event had no influence on the $CAAR$ values of African Bank.

5.5. Standard Bank (2014)

Standard Bank is deemed the largest African bank due to its magnitude of earnings and assets (Standard Bank, 2014). During April 2014, Standard Bank was fined ZAR60m by the Financial Conduct Authority (FICA) and the SARB for neglecting to implement adequate money-laundering controls and processes in order to fight terrorism (Lefifi, 2014; Cohen, 2014). Standard bank faced an operational event due to improper internal controls to investigate clients as per guidelines, failed mandatory reporting (reporting transactions larger than ZAR24 999.99), client documents incomplete, and the failure to maintain client reference data (eNCA, 2014:2) in order to combat money laundering by identifying risky depositors (Barry, 2014).

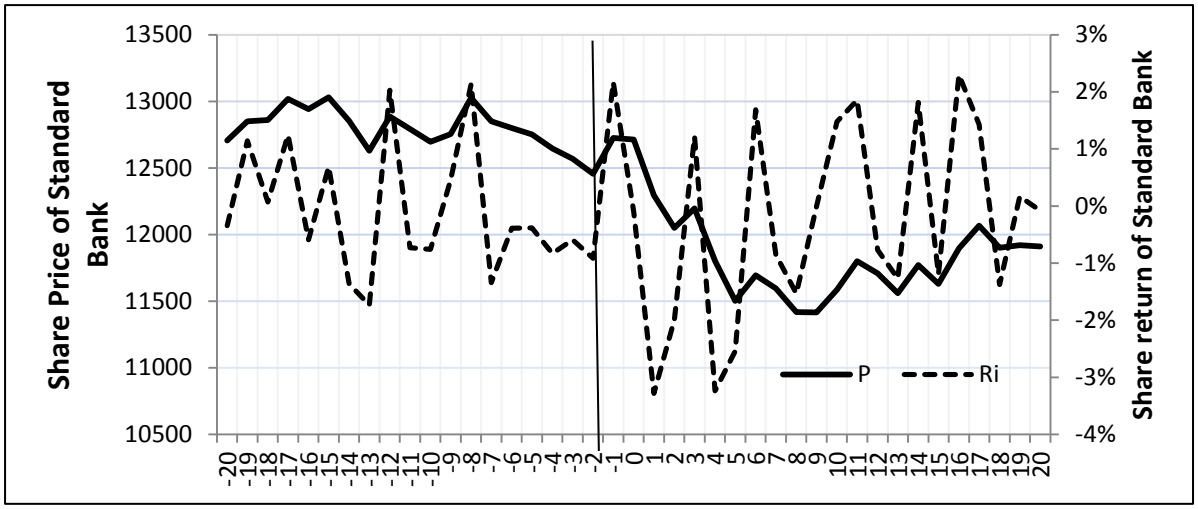
5.5.1. Descriptive statistics for Standard Bank

New market information determines the risk and return of shares (Marx *et al.,* 2009:171). Thus, the operational loss announcement of Standard Bank led to a larger magnitude of risk followed by a higher required rate of return. As a result, the expected return declined, forcing the share price downwards. Following the assumptions of the efficient market hypothesis, Standard Bank's stock prices should reflect all available market information and share returns are distributed accordingly (Fama, 1970:390). Therefore, it is necessary to elaborate on the probability distribution of Standard Bank's share returns, the skewness (measure of asymmetry) and kurtosis (measure of flatness).

During the 41-day event window with the event date as day [0], Standard Bank price fluctuated rigorously. The share price reached a maximum of ZAR13031; however, it quickly fell as low as ZAR11416 on day [9]. Following the operational loss announcement made public on day [0], Standard Bank's price followed a downward price trend due to the arrival of the market information. During the event window [-20] to day [+20] the share price fluctuated violently and lost a share value of ZAR970. The spread between the highest share price and the lowest share price is ZAR1615.

Figure 5.16 indicates that Standard Bank's share return followed a relative trend characterised by small fluctuations until the event date. Returns started wavering after the initial announcement reaching an all-time low of (-3.28%) on day [+1] followed by a positive (1.21%) return, which can be linked to Standard Bank's fast response to pay the fine that was levied against the bank. The returns of Standard Bank mostly were negative with an average return of (-0.16%) throughout the 41-day event window.

Figure 5.16: Share price and return of Standard Bank



Source: Own calculations

Table 5.7 gives the distribution of the share returns of Standard Bank. Standard Bank's returns showed a skewness of (-0.06) indicating that returns are not symmetrical around the mean (Levine *et al.*, 2014:148) and a kurtosis of (-0.59). The skewness of (-0.06) indicated that the share prices are skewed to the left with extreme small values pulling the mean value to be less than the median (Levine, 2014:148). The kurtosis of (-0.59) indicated a platykurtic distribution since it is smaller than three, indicating a slower-rising peak than that of a normal distribution (DeCarlo, 1997:292).

Furthermore, the returns of Standard Bank formulated a variance of (0.02%), which suggests that returns are not that widely spread around the mean return value of (-0.16%) (Gujarati & Porter, 2010:78). The return distribution had no mode value indicating that no return was earned more than once within the event window (Stable, 2014). The middle value referred to as the median of (-0.38%) is relatively close to the mean value of (-0.16%). This indicates that half of the values are smaller than the median value and half of the values are greater than the median value (Levine, 2014:138). The standard deviation indicates how far the returns are distributed from the mean value. Therefore, the standard deviation of (1.48%) indicates that Standard Bank's returns were relative closely distributed from the mean value (-0.16%) (Rumsey, 2015).

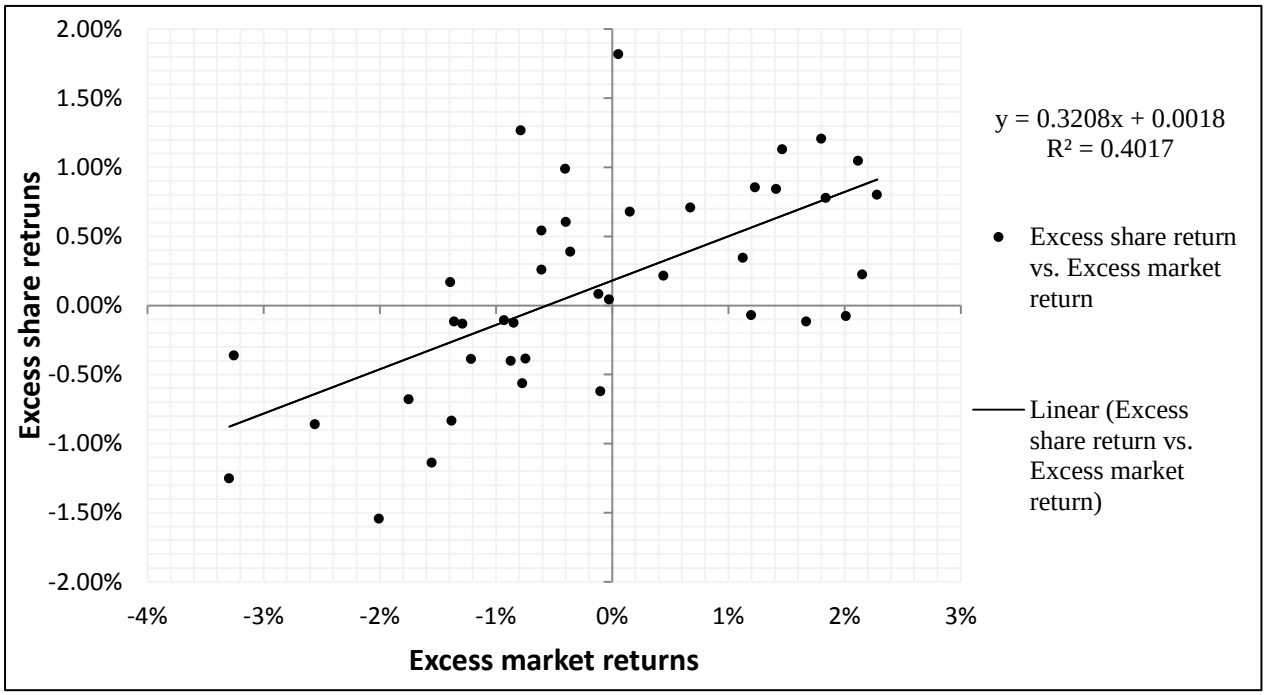
Table 5.7:Distribution of the share returns of Standard Bank

Mean	-0.16%
Median	-0.38%
Mode	0
Standard deviation	1.48%
Sample variance	0.02%
Kurtosis	-0.59
Skewness	-0.06
Minimum	-3.28%
Maximum	2.30%
Count	41
Confidence level (95.0%)	0.47%

Source: Own calculations

Based on Figure 5.17 for every (1%) increase in the excess market return there will be a positive (0.0018) change in the excess share return of Standard Bank. The excess share return of Standard Bank forms the slope of the regression. Where the excess market return is equal to zero, the excess share return of Standard Bank will simply be positive (0.0018) (Gujarati & Porter, 2010:41).

Figure 5.17: Excess share returns of Standard Bank



Source: Own calculations

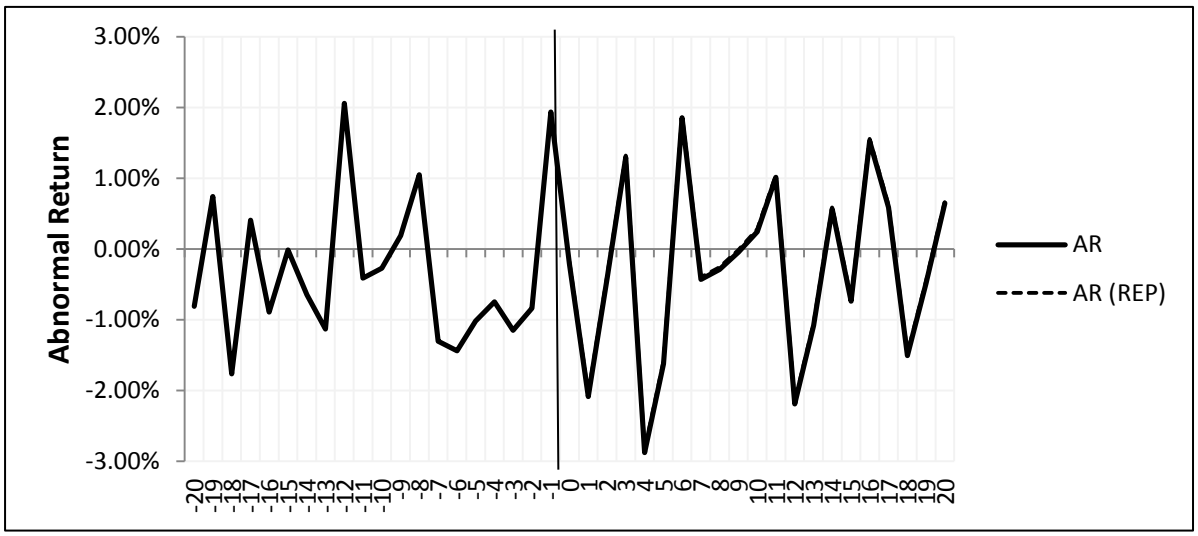
The R^2 represents the coefficient of determination and reflects that (40%) of the variation in the excess market return of Standard Bank is explained by the excess market return

(Codible, 2015). This is a relatively high value since the R^2 can at most be one or (100%). The value of (0.3208) indicates that the slope of the regression is increasing slowly with a beta value of (0.3208) (O'Loughin, 2013). This beta value is consistent with the beta value of financial firms, which tends to be less than one (Marx, *et al.*, 2009:121).A correlation coefficient was used to determine the relative strength of the linear relationship (Levine *et al.*, 2014:167) between Standard Bank's excess share return and the markets excess return (Gujarati & Porter, 2010:41). Generally, the correlation coefficient lies between (-1) and (+1) expressed as $-1 \leq \rho \leq 1$. The analysis indicated that a relatively strong positive correlation exists between the excess share returns of Standard Bank and the excess market returns as the correlation was positive but closer to one (0.63). Therefore, as the excess share returns of Standard Bank increase, there is a high probability that the excess market returns will also increase (Levine *et al.*, 2014:167).

5.5.2. Evidence of reputational risk

The AR_{it} for Standard Bank ranged from day [-20] to day [+20] within the event window. The AR_{it} were again adjusted for reputational risk by dividing the operational loss amount with Standard Bank's market capitalisation. The AR_{it} adjusted for reputational risk are represented by the dashed line and indicate the impact on the banks reputation. The majority of Standard Bank's returns were slightly negative with a mean AR_{it} of (-0.30%) observed. Figure 5.18 demonstrates the market reaction of Standard Bank's operational loss announcement on 23 January 2014.

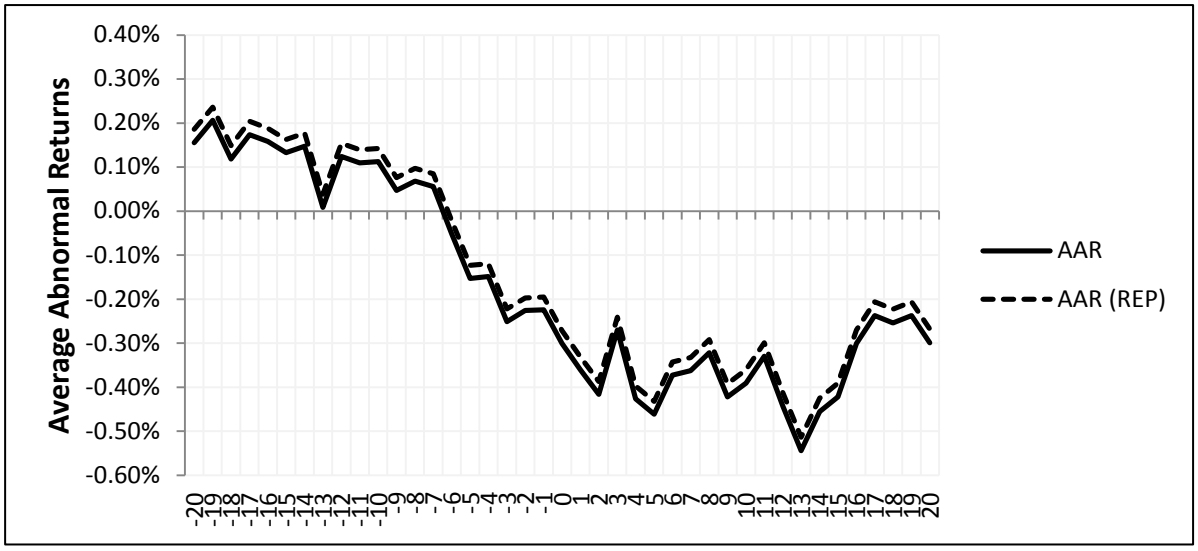
Figure 5.18: Abnormal returns for Standard Bank



Source: Own calculations

Figure 5.18 contradicts some of the efficient market assumptions (prices react immediately) (Woon, 2004:9), as the AR_{it} are widely distributed and are not reflected in Figure 5.18. This is similar to the case of Saambou Bank. The average abnormal returns (AAR_{it}) for Standard Bank's shares were calculated by averaging the AR_{it} of each of the number of Standard Bank shares. Figure 5.19 illustrates a comparative distinction between the AAR_{it} and the AAR (Rep) adjusted for reputational risk. From event day [-20] to event day [-1] it is clear that the AAR_{it} followed a downward trend and continued to decline after event day [0].

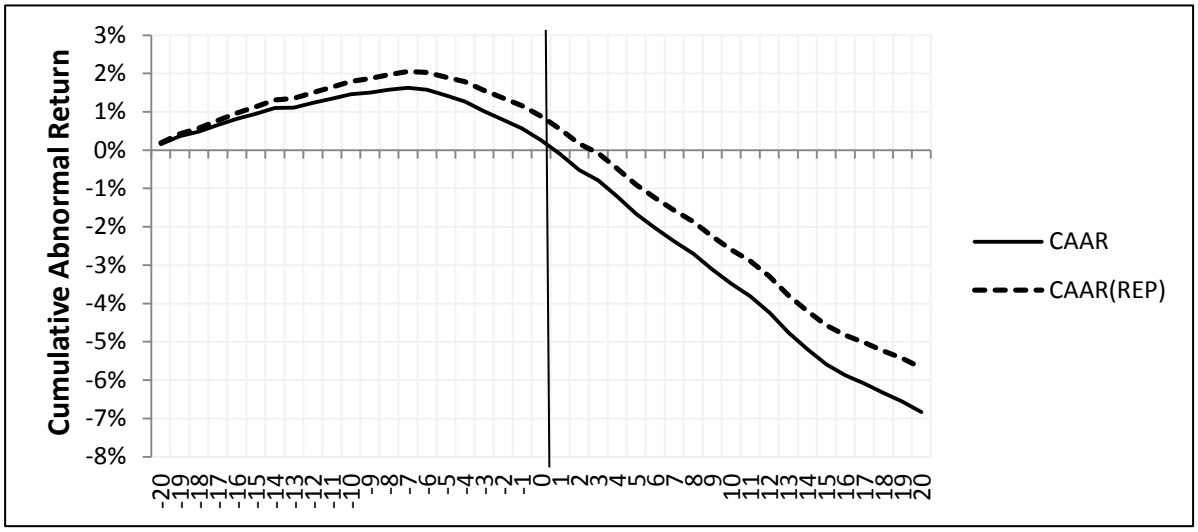
Figure 5.19: Average abnormal returns for Standard Bank



Source: Own calculations

Figure 5.20 illustrates the reaction of the cumulative average abnormal returns $CAAR$ on the event day. The dashed line indicates the reputational damage to the bank by adjusting the $CAAR_{it}$. All $CAAR$ values declined tremendously after the operational loss announcement on 23 January 2014. However, the $CAAR$ values started to decline prior to the announcement day on day [-5]. This return reaction can be attributed to market overreaction (semi-strong-form). The downward trend in the dashed line demonstrates the negative effect of the operational loss announcement on the share price and the reputation of Standard Bank. Figure 5.20 clearly demonstrates a distinction between the normal $CAAR$ values and the $CAAR$ values adjusted for reputational risk. These results further provide evidence of reputational risk (Sturm, 2013:199). Therefore, the evidence of negative $CAAR$ values is distinctive.

Figure 5.20: Cumulative abnormal returns for Standard Bank



Source: Own calculations

Table 5.8: Test statistics on cumulative average abnormal returns for Standard Bank

Mean CAAR	-5.68%
Sample standard deviation	2.03%
Sample size	20
t-test	-12.54
t-value at 90% (5%)	-1.73
t-value at 95% (2.5%)	-2.09
t-value at 99% (0.5%)	-2.86

Source: Own calculations

Table 5.8 indicates the test statistics of the statistical interference, which was conducted by means of unilateral tests: statistically significant at the 10% confidence level; significant at the 5% confidence level; significant at the 1% confidence level (Gillet *et al.,* 2010:229). $CAAR$ values were negative within the post event window (+20 days) after the operational loss announcement on 23 January 2014 at confidence intervals (99%), (95%) and more. The operational loss news may have been released within the market before the time of official disclosure where reputational losses then started to decline before the announcement day (Fiordelisi *et al.,* 2014:114).

The $CAAR$ values were statistically significant after the operational loss announcement leading to the rejection of the null hypothesis ($H_0: CAAR = 0$). The alternative hypothesis $H_1: CAAR \neq 0$ was accepted, which indicated that the $CAAR$ were not zero, therefore, the announced event had an influence on the $CAAR$. The test statistic of (-12.54) surpassed the

three levels of critical values (-1.73, -2.09 and -2.86) providing evidence of reputational damage to Standard Bank (Khortari & Warner, 2006:9). This confirms that Standard Bank sustained a reputational risk after the announced loss.

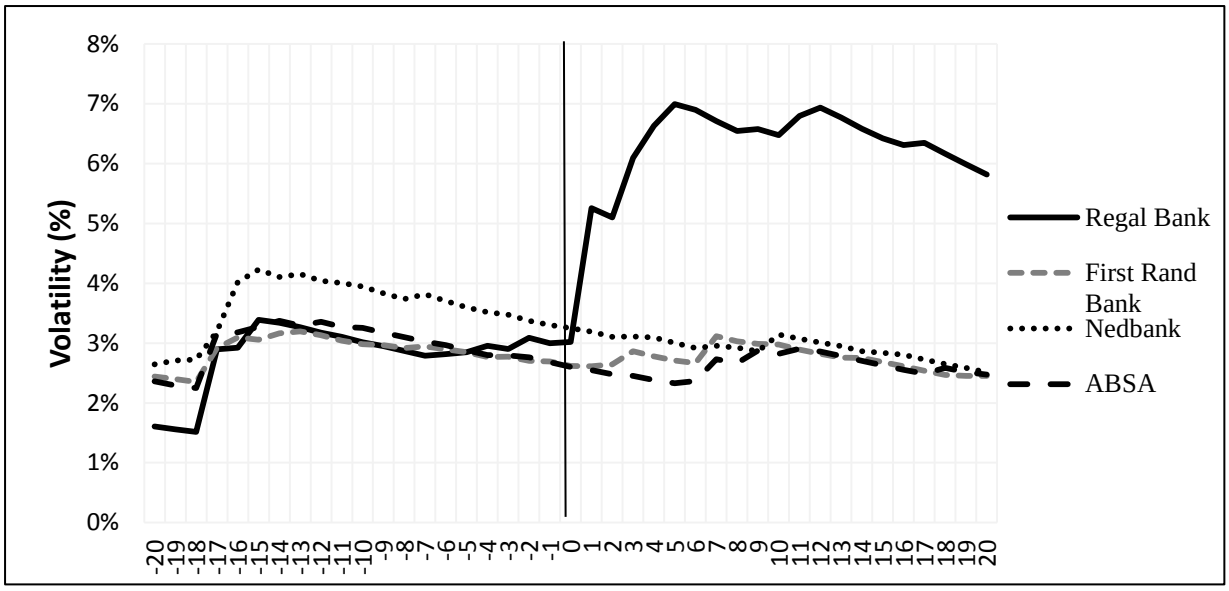
5.6. Evidence of volatility

The exponentially weighted moving average (EWMA), as discussed in Section 4.4.7.4, was used to identify the return volatility during the period of the operational loss events where the return of Regal Treasury Bank was compared relative to the benchmark. The EWMA measured the return volatility. The EWMA model is dependent on the λ where the decay factor has to be greater than zero but smaller than one (Longerstaey, 1996:78). The λ factor monitored how responsive the estimate of the daily volatility was relative to the current daily percentage change in Regal Treasury Bank. Section 4.4.7.4 demonstrated the measure used to calculate the optimal λ parameter. The optimal decay factor relative to the South African market, λ of 0.94 was generated to provide the best forecasts.

5.6.1. Regal Treasury Bank

Figure 5.21 demonstrates the daily EWMA for Regal Treasury Bank and three other banks, which had no operational events within the relevant timeframe.

Figure 5.21:Volatility of Regal Treasury Bank vs. unaffected banks



Source: Own calculations

Regal Treasury Bank experienced little volatility prior to the operational loss announcement [-20;-1]. Figure 5.21 reflects high a magnitude of volatility for Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank following the announcement day. The large standard deviation of (5.94%) indicates that Regal Treasury Bank's returns are widely distributed from the mean value (-1.50%) and consequently leads to high levels of volatility (Achia *et al.*, 2013). Table 5.9 indicates that the three unaffected banks showed a small increase in volatility on day [0] compared to day [-20] but declined as seen on day [+20]. Only Regal Treasury Bank experienced a higher level of fluctuations since the banks volatility increased from (1.61%) on day [-20] to (5.82%) on day [+20]. Resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were not affected by the operational loss experienced by Regal Treasury Bank.

Table 5.9: Volatility of Regal Treasury Bank vs. unaffected banks

Event window	Regal Treasury Bank	First Rand Bank	Nedbank	ABSA
Day [-20]	1.61%	2.44%	2.65%	2.36%
Day [0]	3.02%	2.62%	3.25%	2.60%
Day [+20]	5.82%	2.45%	2.51%	2.47%

Source: Own calculations

The F-test was used to indicate whether the variance of Regal Treasury Bank is the same as the variance of First Rand Bank, Nedbank and ABSA Bank. When the F-test value is larger than the F-statistic, the null hypothesis (indicating that the variances are the same) is rejected $H_1: \sigma_1^2 \neq \sigma_2^2$ and it is concluded that the variances differ. When the F-test value is smaller than the F-statistic, the null hypothesis $H_1: \sigma_1^2 = \sigma_2^2$ (indicating that the variances are the same) is accepted. Table 5.10 provides a summary of the F-statistic performed concerning Regal Treasury Bank's volatility. At the confidence interval of (99%), the variances of Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank were unequal.

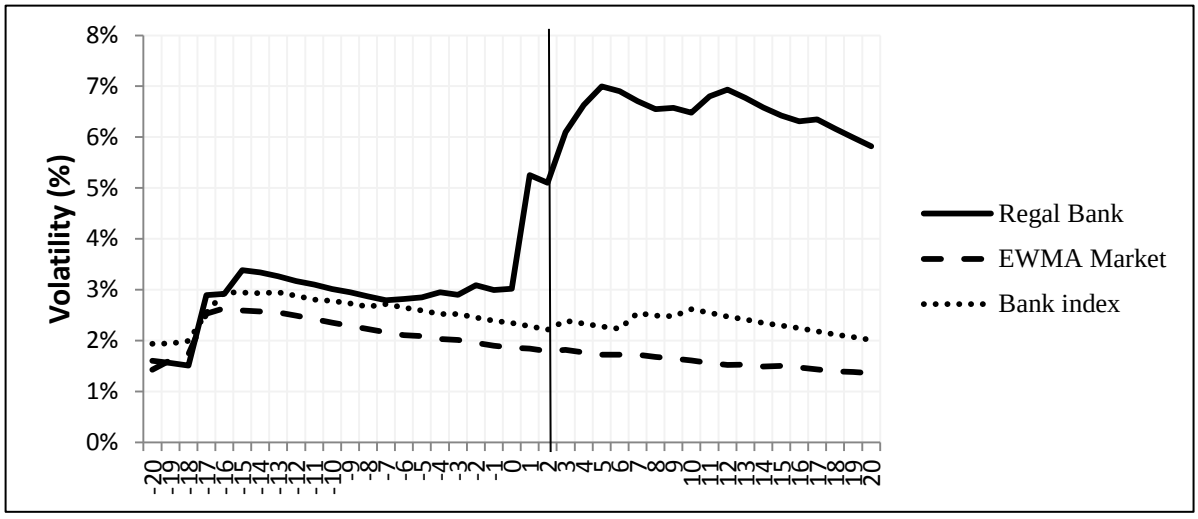
Therefore, at the (99%) confidence interval the null-hypothesis was rejected. At the confidence interval of (95%), the variances of Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank also differed and the null-hypothesis was rejected again. The null-hypothesis was rejected again at the (90%) confidence interval, as the F-test value was larger than the F-statistic. Therefore, it can be assumed that the variances of Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank were not equal within the event window.

Table 5.10: Test statistics on Regal Treasury Bank's volatility

	Regal Treasury Bank	First Rand Bank	Nedbank	ABSA
CI		**99%**		
Variance	0.00338	0.00060	0.00063	0.00061
F-statistic		3.03	3.03	3.03
F-test		5.62	5.36	5.53
Reject		Reject	Reject	Reject
CI		**95%**		
F-statistic		2.17	2.17	2.17
F-test		5.62	5.36	5.53
Reject		Reject	Reject	Reject
CI		**90%**		
F-statistic		1.82	1.82	1.82
F-test		5.62	5.36	5.53
Reject		Reject	Reject	Reject

Source: Own calculations

Figure 5.22: Volatility of Regal Treasury Bank vs. the market and Bank Index



Source: Own calculations

As mentioned above, low volatility was experienced prior to the operational loss announcement [-20;-1]. Figure 5.22 demonstrates a high magnitude of volatility for Regal Treasury Bank compared to the market and the Bank Index following day [0]. Table 5.11 indicates that both the market and the Bank Index showed a slight increase (1.86%) and (2.35%) respectively, in volatility on day [0] compared to day [-20] but deteriorated after the announcement day (1.36% and 2.02%). Since both the market and Bank Index showed signs of weakened volatility during the event window it can be assumed that both the Bank Index and the market was unaffected by the movements in the share returns of Regal Treasury Bank.

Table 5.11: Volatility of Regal Treasury Bank vs. the market and Bank Index

Event window	Regal Treasury Bank	Market	Bank Index
Day [-20]	1.61%	1.43%	1.94%
Day [0]	3.02%	1.86%	2.35%
Day [+20]	5.82%	1.36%	2.02%

Source: Own calculations

Table 5.12 provides a summary of the F-statistic performed concerning Regal Treasury Bank's volatility compared to the market and the Bank Index. At the confidence interval of (99%) the variances of Regal Treasury Bank compared to the market and the Bank Index were unequal, leading to the rejection of the null-hypothesis ($5.62 > 3.03$) ($5.36 > 3.03$).At the confidence interval of (95%) the variances of Regal Treasury Bank compared to the market and the Bank Index also differed ($5.62 > 2.17$), ($5.36 > 2.17$) and the null-hypothesis was rejected again.

The null-hypothesis was rejected again at the (90%) confidence interval, as the F-test value was larger than the F-statistic ($5.62 > 1.82$), ($5.36 > 1.82$). Therefore, it can be assumed that the variances of Regal Treasury Bank compared to the market and the Bank Index was not equal within the event window. This evidence suggests that there were no spill-over effects from Regal Treasury Bank to the rest

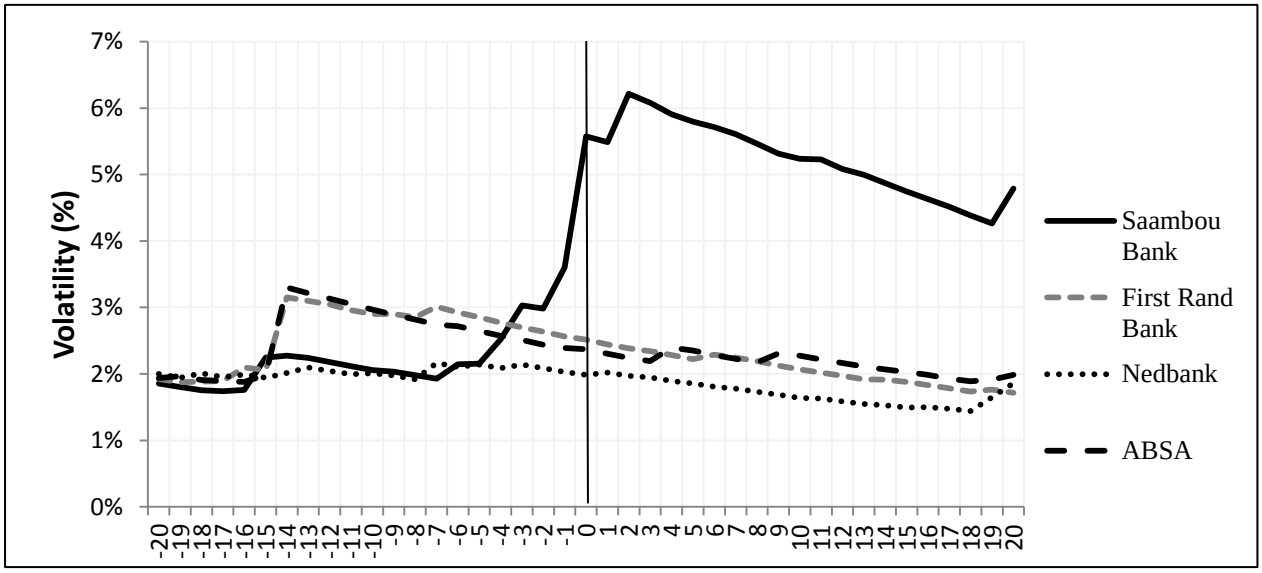
Table 5.12: Test Statistics on Regal Treasury Bank's volatility

	Regal Treasury Bank	Market	Bank Index
CI		**99%**	
Variance	0.00338	0.00060	0.00063
F-statistic		3.03	3.03
F-test		5.62	5.36
Reject		Reject	Reject
CI		**95%**	
F-statistic		2.17	2.17
F-test		5.62	5.36
Reject		Reject	Reject
CI		**90%**	
F-statistic		1.82	1.82
F-test		5.62	5.36
Reject		Reject	Reject

Source: Own calculations

5.6.2. Saambou Bank

Figure 5.23: Volatility of Saambou Bank vs. unaffected banks



Source: Own calculations

The daily EWMA for Saambou Bank is demonstrated in Figure 5.23. From Figure 5.23 it is clear that Saambou Bank experienced little volatility until day [-5], thereafter the volatility increased to an all-time high of (6.21%) on day [+2]. In comparison with First Rand Bank, Nedbank and ABSA Bank, Saambou Bank experienced a relatively higher level of volatility after the announcement day. The standard deviation of (1.48%) indicates that Saambou Bank's returns are widely distributed from the mean value (-0.16%) and, therefore, leads to higher levels of volatility (Achia *et al.*, 2013).

Table 5.13 indicates that First Rand Bank and ABSA Bank showed a small increase in volatility on day [0] compared to day [-20] but declined as seen on day [+20]. Saambou Bank experienced a higher level of fluctuations since the banks volatility increased from (1.86%) on day [-20] to (5.58%) on day [0]. On day [+20] Saambou Bank showed signs of slightly less volatility with a value of (4.79%). Resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were affected only slightly on day [0] but were not affected by the operational loss experienced by Saambou Bank over the rest of the event window.

Table 5.13: Volatility of Saambou Bank vs. un-affected banks

Event window	Saambou Bank	First Rand Bank	Nedbank	ABSA
Day [-20]	1.86%	1.92%	2.00%	1.94%
Day [0]	5.58%	2.51%	1.98%	2.37%
Day [+20]	4.79%	1.72%	1.86%	1.98%

Source: Own calculations

Furthermore, the F-test was used to compare the variance of Saambou Bank against the variance of First Rand Bank, Nedbank and ABSA Bank. Where the F-test value is larger than the F-statistic, the null hypothesis is rejected $H_1: \sigma_1^2 \neq \sigma_2^2$ and it is concluded that the variances of the banks differ. Where F-test < F-statistic the null hypothesis is accepted $H_1: \sigma_1^2 = \sigma_2^2$. Table 5.14 provides a summary of the F-statistic performed concerning Saambou Bank's return volatility. At the confidence interval of (99%) the variances of Saambou Bank compared to First Rand Bank, Nedbank and ABSA Bank were unequal as the F-test values (7.79, 6.62, & 5.83 > 3.03) were larger than the F-statistic.

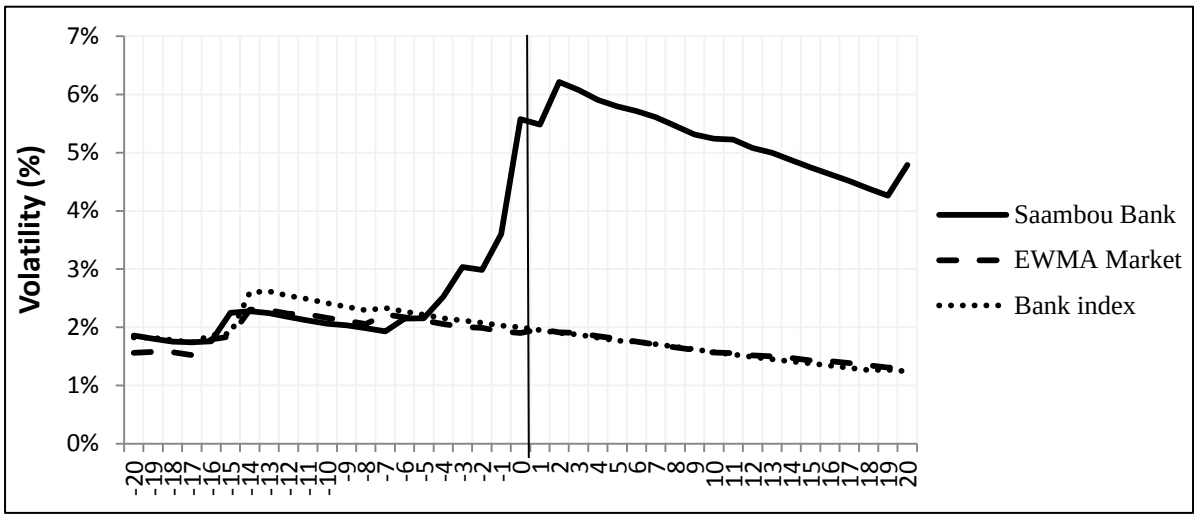
Therefore, at the 99% confidence interval the null-hypothesis was rejected. At the confidence interval of (95%) the variances of Saambou Bank compared to First Rand Bank, Nedbank and ABSA Bank also differed (7.79, 6.62, & 5.83 > 2.17) and the null-hypothesis was rejected again. The null-hypothesis was rejected again at the (90%) confidence interval, as the F-test value was larger than the F-statistic (7.79, 6.62, & 5.83 > 1.82). Therefore, it can be assumed that the variances of Saambou Bank compared to First Rand Bank, Nedbank and ABSA Bank were not equal within the event window.

Table 5.14: Test statistics on Saambou bank's volatility

	Saambou Bank	First Rand Bank	Nedbank	ABSA
CI		**99%**		
Variance	0.00230	0.00029	0.00035	0.00039
F-statistic		3.03	3.03	3.03
F-test		7.79	6.62	5.83
Reject		Reject	Reject	Reject
CI		**95%**		
F-statistic		2.17	2.17	2.17
F-test		7.79	6.62	5.83
Reject		Reject	Reject	Reject
CI		**90%**		
F-statistic		1.82	1.82	1.82
F-test		7.79	6.62	5.83
Reject		Reject	Reject	Reject

Source: Own calculations

Figure 5.24: Volatility of Saambou Bank vs. the market and the Bank Index



Source: Own calculations

As mentioned above low volatility was experienced prior to the operational loss announcement [-20;-6]. Figure 5.24 illustrates severe volatility for Saambou Bank compared to the market and the Bank Index following day [0] with a value of (6.21%). Table 5.16 indicates that both the market and the Bank Index showed a minor increase, (1.90%) and (2%) respectively, in volatility on day [0] compared to day [-20] (1.56% and 1.82%) but deteriorated after the announcement day to (1.30% and 21.24%) on day [+20]. Since both the market and Bank Index showed signs of weakened volatility during the event window it can be assumed that both the Bank Index and the market were unaffected by the movements in the share returns of Saambou Bank.

Table 5.15: Volatility of Saambou Bank vs. the market and Bank Index

Event window	Saambou Bank	Market	Bank Index
Day [-20]	1.86%	1.56%	1.82%
Day [0]	5.58%	1.90%	2.00%
Day [+20]	4.79%	1.30%	1.24%

Source: Own calculations

Table 5.16 provides a summary of the F-statistic performed concerning Saambou bank's volatility compared to the market and the Bank Index. At the confidence interval of (99%) the variances of Saambou Bank compared to the market and the Bank Index were unequal, leading to the rejection of the null-hypothesis (13.60 and 14.91 > 4.47). At the confidence interval of (95%), the variances of Saambou Bank compared to the market, and the Bank Index also differed (13.60 and 14.91 > 2.17) and the null-hypothesis was rejected again. The

null-hypothesis was rejected again at the (90%) confidence interval, as the F-test value was larger than the F-statistic (13.60 and 14.91 > 1.82). Therefore, it can be assumed that the variances of Saambou Bank compared to the market and the Bank Index was not equal within the event window. This evidence suggests that there were no spill-over effects from Saambou Bank to the rest of the market.

Table 5.16: Test Statistics on Saambou Banks volatility compared to the market and Bank Index

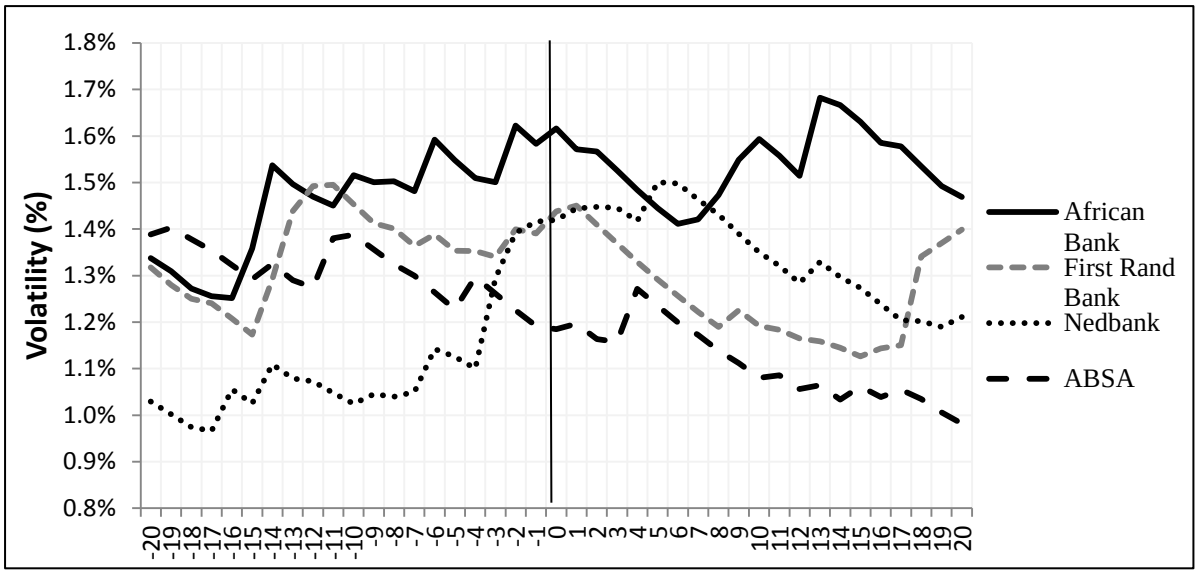
	Saambou Bank	Market	Bank Index
CI		**99%**	
Variance	0.00230	0.00017	0.00015
F-statistic		4.47	4.47
F-test		13.60	14.91
Reject		Reject	Reject
CI		**95%**	
F-statistic		2.17	2.17
F-test		13.60	14.91
Reject		Reject	Reject
CI		**90%**	
F-statistic		1.82	1.82
F-test		13.60	14.91
Reject		Reject	Reject

Source: Own calculations

5.6.3. African Bank

The daily EWMA for African Bank and three other banks (First Rand Bank, Nedbank and ABSA Bank), which had no operational events within the relevant timeframe, is demonstrated in Figure 5.25.

Figure 5.25: Volatility of African Bank vs. unaffected banks



Source: Own calculations

African Bank experienced severe volatility prior to the operational loss announcement [-20:-1]. Figure 5.25 reflects high a magnitude of volatility for African Bank along with First Rand Bank, Nedbank and ABSA Bank prior and following the announcement day. The standard deviation of (1.53%) indicates that African Bank's returns are distributed closely from the mean value (-0.3%) (Achia *et al.*, 2013). Table 5.17 indicates that the two of the three unaffected banks showed a small increase in volatility on day [0] compared to day [-20]. However, all four banks showed a decline in volatility as seen on day [+20]. Resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were affected by the operational loss experienced by African Bank.

Table 5.17:Volatility of African Bank vs. unaffected banks

Event window	African Bank	First Rand Bank	Nedbank	ABSA
Day [-20]	1.34%	1.32%	1.03%	1.39%
Day [0]	1.62%	1.44%	1.42%	1.18%
Day [+20]	1.47%	1.40%	1.21%	0.98%

Source: Own calculations

Table 5.18 provides a summary of the F-statistic performed concerning African Bank's volatility. At the confidence interval of (99%), the variances of African Bank compared to First Rand Bank, Nedbank and ABSA Bank were equal. Therefore, at the (99%) confidence interval the null-hypothesis was accepted. At the confidence interval of (95%), the variances of African Bank compared to First Rand Bank and ABSA Bank, differed and the null-

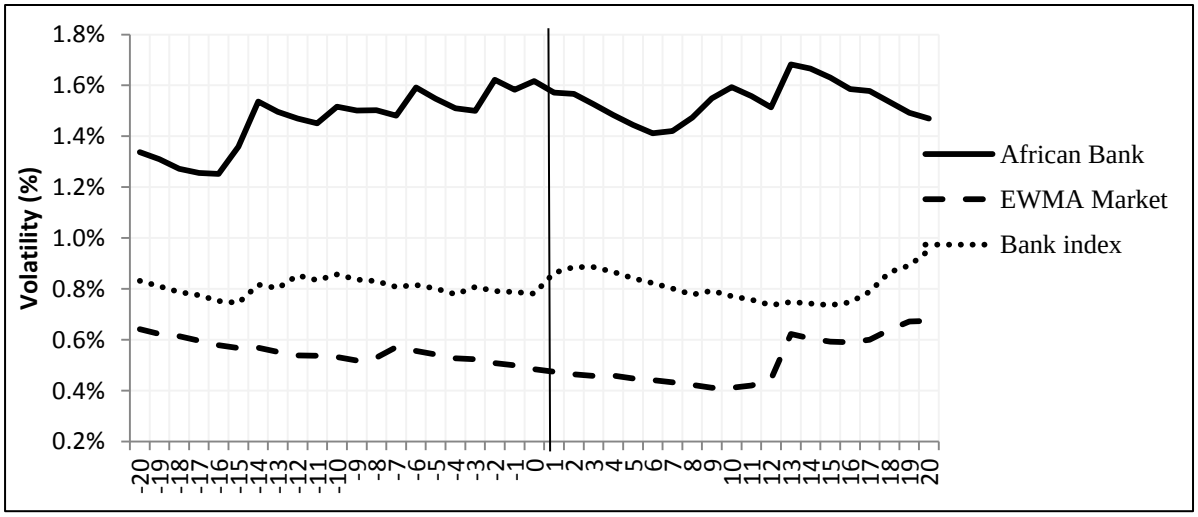
hypothesis was rejected. The null-hypothesis was accepted for Nedbank as the F-test value was smaller than the F-statistic. At the (90%) confidence interval the null hypothesis was accepted for First Rand Bank and Nedbank but was rejected for ABSA Bank. Therefore, it can be assumed that the variances of African Bank compared to First Rand Bank, Nedbank and ABSA Bank were equal within the event window at a (99%) confidence interval level. Therefore, the operational announcement had an effect on all three banks at the (99%) confidence interval. At a (95%) and (90%) confidence interval the operational loss of African Bank had affected Nedbank and First Rand Bank.

Table 5.18: Test statistics on African Bank's volatility

	African Bank	First Rand Bank	Nedbank	ABSA
CI		**99%**		
Variance	0.00022	0.0020	0.00015	0.00010
F-statistic		3.03	3.03	3.03
F-test		1.01	1.47	2.24
Reject		Accept	Accept	Accept
CI		**95%**		
F-statistic		2.17	2.17	2.17
F-test		2.24	1.47	2.24
Reject		Reject	Accept	Reject
CI		**90%**		
F-statistic		1.82	1.82	1.82
F-test		1.10	1.47	2.24
Reject		Accept	Accept	Reject

Source: Own calculations

Figure 5.26: Volatility of African Bank vs. the market and Bank Index



Source: Own calculations

Figure 5.26 demonstrates a high magnitude of volatility for African Bank compared to the market and the Bank Index the following day [0]. Table 5.19 indicates that both the market and the Bank Index show a slight decline, (0.48%) and (0.78%) respectively, in volatility on day [0] compared to day [-20] (0.64%) and (0.83%). However, the market and the Bank Index increased after the announcement day (0.67% and 0.95%). Since both the market and Bank Index showed signs of weakened volatility during the event window it can be assumed that both the Bank Index and the market were unaffected by the fluctuations in the share returns of African Bank.

Table 5.19: Volatility of African Bank vs. the market and Bank Index

Event window	African Bank	Market	Bank Index
Day [-20]	1.34%	0.64%	0.83%
Day [0]	1.62%	0.48%	0.78%
Day [+20]	1.47%	0.67%	0.95%

Source: Own calculations

Table 5.20 provides a summary of the F-statistic performed concerning African Bank's volatility compared to the market and the Bank Index. At the confidence interval of (99%) (95%) and (90%), the variances of African Bank compared to the market were unequal, leading to the rejection of the null-hypothesis ($4.74 > 4.47$), ($4.74 > 2.17$) and ($4.74 > 1.82$).

At the confidence interval of (95%) and (90%), the variances of African Bank compared to the Bank Index, also differed ($2.38 > 2.17$), ($2.38 > 1.82$) and the null-hypothesis was rejected again. The null-hypothesis was accepted at the (99%) confidence interval, as the F-test value was smaller than the F-statistic ($2.38 < 4.47$). Therefore, it can be assumed that the variances of African Bank compared to the market and the Bank Index was not equal within the event window at confidence intervals (95%) and (90%). This evidence suggests that there were no spill-over effects from African Bank to the rest of the market, except for the Bank Index at confidence interval (99%).

Table 5.20: Test Statistics on African Bank's volatility vs. the market and Bank Index

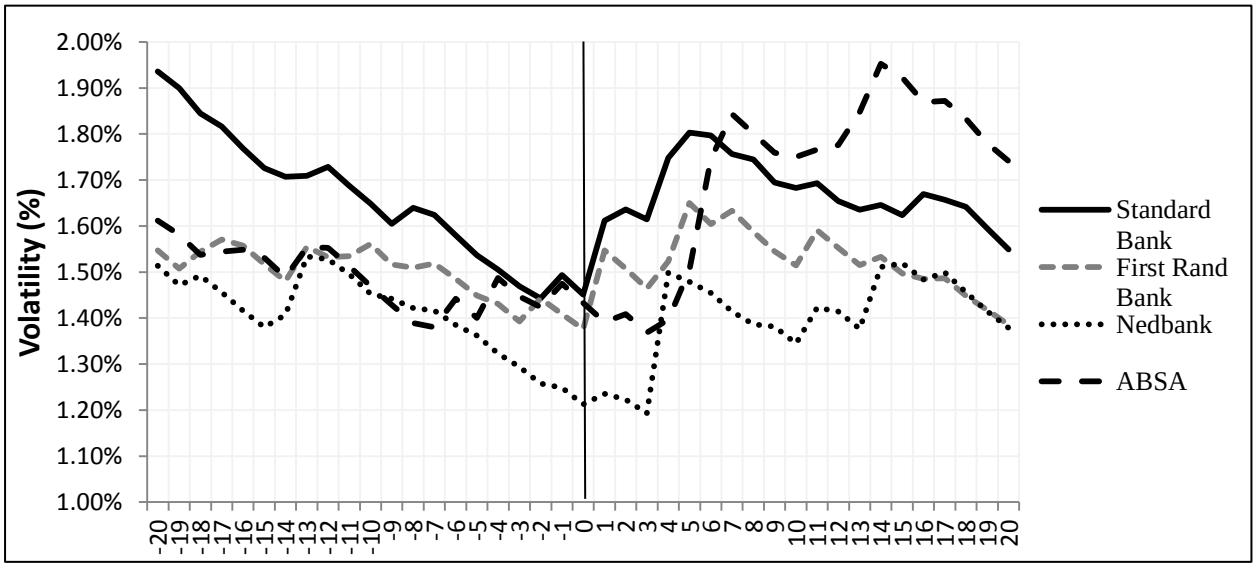
	African Bank	Market	Bank Index
CI		**99%**	
Variance	0.00022	0.00005	0.00009
F-statistic		4.47	4.47
F-test		4.74	2.38
Reject		Reject	Accept
CI		**95%**	
F-statistic		2.17	2.17
F-test		4.74	2.38
Reject		Reject	Reject
CI		**90%**	
F-statistic		1.82	1.82
F-test		4.74	2.38
Reject		Reject	Reject

Source: Own calculations

5.6.4. Standard Bank

One of the most fundamental investor behavioural principles is that the majority of investors favour stocks with less risk to more (Chance & Brooks, 2010:73). For investors, lower risk means higher value compared to higher risk, lower stock value. The volatility of Standard Bank compared to three other banks, which had no operational events within the relevant timeframe, is demonstrated in Figure 5.27 by means of the EWMA.

Figure 5.27: Volatility of Standard Bank vs. unaffected banks



Source: Own calculations

As seen on Figure 5.27 Standard Bank experienced little volatility prior to the operational loss announcement [-20;0] as the volatility was following a downward trend. Figure 5.27

reflects large increase in volatility from day [+1] for Standard Bank but also for First Rand Bank, Nedbank and ABSA Bank following the announcement day [0]. The large standard deviation of (1.64%) indicates that Standard Bank's returns are widely distributed from the mean value (-0.16%) and consequently leads to high levels of volatility (Achia *et al.*, 2013).

Table 5.21 indicates that First Rand Bank, Nedbank and ABSA Bank did not indicate a small increase in volatility on day [0]. These results may again expose market inefficiencies and prove that prices react in random waves and that investor's take time to adapt to price changes. As seen in Figure 5.27 volatility was the highest on day [+5] (five days after the operational loss announcement was made) with a EWMA of (1.80%) for Standard Bank. First Rand Bank, Nedbank and ABSA Bank also showed signs of higher volatility on day [+5] with EWMA values of (1.65%), (1.50%) and (1.50%). These values were higher than the observed values on day [0]. On day [+20] the volatility levels of all four banks seemed to be declining after the high volatility peak. Resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were affected largely by the operational loss experienced by Standard Bank as all three banks showed a higher volatility level on the same day.

Table 5.21: Volatility of Standard Bank vs. unaffected banks

Event window	Standard Bank	First Rand Bank	Nedbank	ABSA
Day [-20]	1.94%	1.55%	1.51%	1.61%
Day [0]	1.45%	1.38%	1.21%	1.43%
Day [+20]	1.55%	1.39%	1.38%	1.74%

Source: Own calculations

It was necessary to determine whether Standard Bank and First Rand Bank, Nedbank and ABSA Bank had the same level of variability (Levine *et al.*, 2014:399). The F-test was used to indicate whether the variance of Standard Bank is the same as the variance of First Rand Bank, Nedbank and ABSA Bank. Table 5.22 provides a summary of the F-statistic performed concerning Standard Bank's volatility. At the confidence interval of (99%), the variances of Standard Bank compared to First Rand Bank, Nedbank and ABSA Bank were equal indicating that the variances were the same. Therefore, at the (99%) confidence interval the null-hypothesis was accepted. At the confidence interval of (95%), the variances of Standard Bank compared to First Rand Bank, Nedbank and ABSA Bank also remained equal and the null-hypothesis was again accepted. At the (90%) confidence interval the F-test value was smaller than the F-statistic for First Rand Bank. Therefore, it can be assumed that the variances of Standard Bank compared to First Rand Bank were equal within the

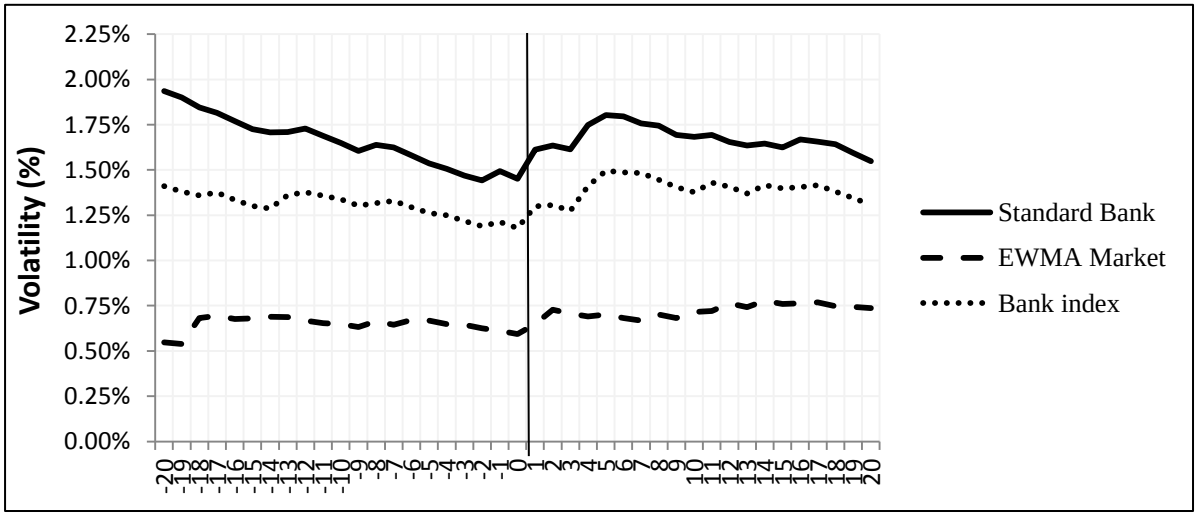
event window. At the (90%) confidence interval, the variances of Standard Bank differed from Nedbank and ABSA Bank since the F-statistic was greater than the critical value.

Table 5.22: Test statistics on Standard Bank's volatility

	Standard Bank	First Rand Bank	Nedbank	ABSA
CI		**99%**		
Variance	0.00024	0.00019	0.00019	0.00030
F-statistic		3.03	3.03	3.03
F-test		1.25	1.26	0.79
Reject		Accept	Accept	Accept
CI		**95%**		
F-statistic		2.17	2.17	2.17
F-test		1.25	1.26	0.79
Reject		Accept	Accept	Accept
CI		**90%**		
F-statistic		1.82	1.82	1.82
F-test		1.25	1.26	0.79
Reject		Accept	Reject	Reject

Source: Own calculations

Figure 5.28: Volatility of Standard Bank vs. the market and Bank Index



Source: Own calculations

As mentioned above low volatility was experienced prior to the operational loss announcement [-20:0]. Figure 5.28 demonstrates high a magnitude of volatility for Standard Bank compared to the market following day [0]. However, the Bank Index's EWMA seemed to move closer to Standard Banks EWMA, which may be attributable to the high volatility experienced by First Rand Bank, Nedbank and ABSA Bank. Table 5.23 indicates that both the market and the Bank Index did not show an increase in volatility, (0.59%) and (1.23%) respectively, on day [0] compared to day [-20]. However, both the market and the

Bank Index indicated a spike in volatility (0.70% and 1.49%) on day [+5] but remained relatively stable (1.36% and 2.02%) up until day [+20]. The Bank Index showed signs of higher volatility during the event window it can be assumed that the Bank Index was affected by the movements in the share returns of Standard Bank. The increase in the market was not that noticeable compared to the spike in the Bank Index.

Table 5.23: Volatility of Standard Bank vs. the market and Bank Index

Event window	Standard Bank	Market	Bank Index
Day [-20]	1.94%	0.55%	1.41%
Day [0]	1.45%	0.59%	1.23%
Day [+20]	1.55%	0.74%	1.31%

Source: Own calculations

Table 5.24 provides a summary of the F-statistic performed concerning Standard Bank's volatility compared to the market and the Bank Index. The variance of Standard Bank compared to the Bank Index at the confidence intervals (99%), (95%) and (90%) were equal with F-test values smaller than the F-statistic ($1.40 < 3.03$), ($1.40 < 2.17$) and ($1.40 < 1.82$) the null-hypothesis was accepted. Resultantly, the operational loss announcement of Standard Bank had an effect on the Bank Index.

At the confidence intervals (99%) (95%) and (90%) the variances of Standard Bank compared to the market were unequal leading to the rejection of the null-hypothesis with F-statistics larger than the critical value ($4.41 > 3.03$), ($4.14 > 2.17$) and ($4.14 > 1.82$). Therefore, it can be assumed that the variances of Standard Bank compared to the market were not equal within the event window. This evidence suggests that there were no spill-over effects from Standard Bank to the rest of the market.

Table 5.24: Test Statistics on Standard Bank's volatility

	Standard Bank	Market	Bank Index
CI		**99%**	
Variance	0.00024	0.00005	0.00017
F-statistic		3.03	3.03
F-test		4.41	1.40
Reject		Reject	Accept
CI		**95%**	
F-statistic		2.17	2.17
F-test		4.41	1.40
Reject		Reject	Accept
CI		**90%**	
F-statistic		1.82	1.82
F-test		4.41	1.40
Reject		Reject	Accept

Source: Own calculations

5.7. Summary

The study aimed to emphasise the effect of operational loss events on the reputation of South African banks by analysing the stock market reaction to the announcement of such operational losses. Only a few operational loss events have been reported over the past 14 years. Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank were chosen due to their unanticipated operational loss announcements.

The large reputational risk (due to large negative $CAAR$ values) indicated that reputational risk might have been a contributing factor in the collapse of Regal Treasury Bank. From the evidence provided above it is clear that Regal Treasury Bank suffered a decline in their share price and market return, diminishing reputational capital, destroying customers trust and a loss in the banks competitive advantage (Fiordelisi *et al.,* 2011:5). A high magnitude of volatility was reflected for Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank following the announcement day.

The variances of Regal Treasury Bank compared to First Rand Bank, Nedbank, ABSA Bank, the Bank Index and the market were unequal. Therefore, the null-hypothesis was rejected. The variances of Regal Treasury Bank compared to the market and the Bank Index were also unequal within the event window. This evidence suggests that there were no spill-over effects from Regal Treasury Bank to the rest of the market

The insider trading or rumours regarding insider trading were exceptionally damaging to Saambou Bank's reputation, particularly when followed by an investigation. The large reputational risk (due to large negative $CAAR$ values and test statistics) indicated that reputational risk might have been a contributing factor in the collapse of Saambou Bank. The announcement of the operational event led to diminished customer, investor, and the public domains trust. As a result, Saambou Bank suffered a loss in share value and market capitalisation. The variances of Saambou Bank compared to the Bank Index was not equal within the event window. This evidence suggests that there were no spill-over effects from Saambou Bank to the rest of the market.

The ZAR20m fine towards African Bank paid later in 2013 constituted only (1%) of African Bank's turnover. African Bank responded by stating that the breach in their loan system, by workers in KwaZulu-Natal, during 2011, was only an isolated incident, not severe, and should not be seen as the manner in which the bank conducts its business. The deteriorating share price over the past years reflects the bank's weak financial performance and declining customer confidence. However, the announced operational loss was not of such magnitude as to result in severe reputational damage. The banks fast settlement response prevented $CAAR$ (Rep) values to become extremely negative within the event window. No reputational damage was indicated at this specific point in time (4 February 2013). Further operational loss announcements followed for African Bank in 2014. However, these nominal loss amounts are unknown. The variances of African Bank compared to the market and the Bank Index was not equal within the event window at confidence intervals (95%) and (90%). This evidence suggests that there were no spill-over effects from African Bank to the rest of the market, except for the Bank Index at confidence interval (99%).

The external fraud experienced by Standard Bank caused secondary reputational damage in terms of diminished trust and a potential loss in their competitive advantage. The operational loss events of Standard Bank led to depreciation in the bank's share price (expected value of future cash flows) as stakeholders reacted to new market information. The $CAAR$ values were statistically significant after the operational loss announcement which indicated that the announced event had an influence on the $CAAR$. First Rand Bank, NedBank and ABSA Bank were affected largely by the operational loss experienced by Standard Bank as all three banks showed a higher volatility level on the same day that Standard Bank's volatility increased. The variance of Standard Bank compared to the Bank

Index was equal and resultantly, the operational loss announcement of Standard Bank had an effect on the Bank Index. The variances of Standard Bank compared to the market were not equal within the event window. This evidence suggests that there were no spill-over effects from Standard Bank to the rest of the market.

CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATION

6.1. Summary

South African banks are constantly faced with risk such as operational risk, which could harm their reputation. Nevertheless, such risks are becoming more pervasive and immediate. Reputational risk as a result of operational risk constitutes a loss in value even if it is not yet possible to express it financially due to the lack of a uniform definition and extensive research. Both the BCBS and national regulators in South Africa have avoided defining reputational risk due to the difficulty in determining a minimum capital charge. The lack of a uniform definition of reputational risk indicates that reputational risk is perceived differently by the various economic sectors. Although reputational risk may arise from cultural risk and external risk, the main emphasis is placed on reputational risk arising from managerial risk (operational risk).

Chapter 1 provided an introduction into the study and a justification for researching the problem statement. A link had to be established between the specific operational events and the effect on the reputation of the sample of banks. In order to achieve the primary objective of measuring reputational risk within the South African banking sector an event methodology had to be adopted.

Chapter 2 defined a bank according to its significant economic functions that it serves with an economy. However these functions expose banks to various risks inherent in these bank activities namely; credit risk, liquidity risk, market risk, operational risk, reputational risk, business risk, legal risk and systemic risk. Each of these risks was briefly explained. In order for banks to manage the above mentioned risks these banks have to be regulated. The SARB was appointed as the local regulator of South African banks in cooperation with the BCBS. The main focus of the BCBS had been on credit and market risk. The BCBS plays a large regulatory role in South African banks, yet the basic principles of the BCBS may only be used for guidance.

The fundamental purpose of Chapter 2 was to establish a theoretical framework for operational risk and its origin since operational risk had become a key instrument in bank risk management. General confusion existed about the origin of operational risk where after it was argued that an operational hazard causes operational events, which ultimately leads to

an operational loss. For the sake of completeness, a distinction between an operational hazard, operational event and an operational loss was given in Chapter 2. Operational hazards were classified as unsuccessful employee management, outdated information systems and incompetence. Operational events included internal and external fraud, damage to assets, process and system failures and natural disasters. Operational losses were found to be write-downs, loss of resource and legal expenses. The focus of the BCBS shifted during 2001 where the committee published an additional document to the Basel II Accord that included a comprehensive discussion on operational risk. The inclusion of operational risk in regulators set of principles allowed South African banks to be more risk sensitive. The BCBS argued that operational risk include legal risks but exclude reputational risk. The BCBS intentionally omitted reputational risk due to the purpose of a minimum regulatory operational risk capital charge.

Furthermore, four severity levels for operational risk were given where only two levels were deemed realistic in practice. These include operational events with a low frequency of occurring but a high severity level and operational events with a high frequency of occurring but with a low severity level. Sound operational risk management was identified as the mirror image of the banks effectiveness in overseeing its products, services, processes and systems. However, it was argued that the failure to manage operational losses successfully will have severe consequences. Among these consequences are the damage and loss to a banks reputation. Reputational damage as a consequences provided a link between operational events and reputation where it was argued that damage to a banks reputation, caused by operational risk can be seen as an indirect operational loss. Operational risk was further classified as a pure risk since it only results in negative losses. Therefore, it was found that operational risk will only have a negative effect on the reputation of a bank.

Chapter 3 provided the theoretical framework for reputational risk as well as the growing importance of reputational risk. Reputational risk has remained neglected due to difficulty for South African regulators to define it. Current definitions of reputational risk remain vague and undefined. However, one central theme can be adopted when defining reputational risk. The main theme identified in Chapter 3 suggests that a bank can become well-known over time, where a comprehensive understanding of the bank is established and the bank is judged either constructively or critically by its stakeholders. It was also found

that reputational risk includes risks associated with the stakeholders of a bank such as failure to meet stakeholders' expectations.

The increasing importance of reputational risk was found to be a consequence of globalisation and social media; stricter regulation and governance within banks; changing stakeholder expectations and the upside to having a good reputation. Reputational risk was described as a process where the influence of internal and external stakeholders was explained to have a great deal of influence. The main causes of reputational risk were argued to be cultural risk, managerial risk and external risk. Although other causes of reputational risk exist, the main focus for this study was placed on operational risk as the leading cause of reputational risk.

Reputational risk was classified as a pure operative risk that will most likely result in indirect losses to a bank. Operational loss events that might lead to reputational risk included internal and external fraud; unethical employment practices and workplace safety; failure to meet obligations in terms of clients; products and business practices; damage to physical assets; business disruptions and system failures; and failed execution, delivery and process management. Any operational risk (primary risk) has the potential to cause secondary reputational damage (secondary effect) to a bank followed by loss in profits and shareholder value.

Although reputation is not included as an item on a bank's balance sheet, it embodies a large amount of consequences. However, the following consequences were found to be obvious, namely a decline in share value and market capitalisation; a decline in future expected cash flows; limiting funding by causing short-term sources to dissipate; diminishing reputational capital; loss of current and possible future customers; loss in valuable employees; destroying a bank's trust and competitive advantage; reduction in current or future business relationships; and regulators imposing greater compliance burdens.

The last point of interest dealt with various operational loss events where reputational risk was regarded as a consequence. Among these examples were two international banks namely Wells Fargo Bank and the Bank of East Asia. Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank were among the local events. All of these banks were argued to have suffered severe reputational damage after they had announced their

operational losses from operational events. The consequences of the reputational damage by each bank were in line with the consequences that were set out in the theoretical framework.

Chapter 4 dealt with the research design and methodology of the study. The chapter started by describing the type of data collected and motivation behind the data. Since operational risk data is limited, data had to be collected via the internet and newspapers. The limited data and literature in terms of reputational risk further intensified the motivation to contribute towards operational risk events and their effect on South African banks. The assumptions of the efficient market hypothesis had to be followed in order to have obtained accurate results. The event window of 20 days was estimated as well as the parameters within the event window. This time period of 20 days allowed sufficient time for the share prices to react to new information.

The two most appropriate asset pricing models the CAPM and Market Model were discussed where the chosen asset pricing model was assessed using data for the pre-event estimation period. The CAPM was used to determine the expected returns for each bank, rather than the Market Model. The chapter further discussed the importance of quantifying abnormal returns and the role these returns play in identifying reputational risk. It was indicated that negative abnormal returns occur as a result of new market information (operational events), following the assumptions of the efficient market hypothesis.

The last part of the methodology briefly elaborated on the importance of considering volatility when working with financial share price data. Among these reasons were the erosion of public confidence, due to large volatility fluctuations and higher risk aversion among stakeholders. The chapter further distinguished between implied volatility measures and historical volatility measures, where emphasis was placed on the historical measurements. The historical measure where further divided into heteroskedastic measures (ARCH, GARCH and EWMA) and deterministic measures (standard deviation). The EWMA was chosen above the other historical measures due to its application benefits. The application of a decay factor adjusted for the South African market was one of the leading application benefits. The last part of Chapter 4 elaborated on previous literature and empirical studies regarding reputational risk to emphasise the exclusion of South African banks from these studies.

Chapter 5 addressed the empirical objectives of the study. The chapter discussed the effect of operational loss events on the reputation of South African banks by analysing the stock market reaction to the announcement of such operational losses. The results of the four sample banks (Regal Treasury Bank, Saambou Bank, Standard Bank and African Bank) revealed whether each bank suffered reputational risk. These affected banks were also compared to non-affected South African banks, the JSE and the Bank Index.

Concerning Regal Treasury Bank, it was found that reputational risk emerged as depositors and investors viewed the banks as dishonest and had severe concerns regarding the safety of their assets after the announced operational loss on 16 May 2000. The large reputational risk (due to large negative $CAAR$ values and test statistics) indicates that reputational risk may have been a contributing factor in the collapse of Regal Treasury Bank. From the evidence provided it is clear that Regal Treasury Bank suffered a decline in their share price and market return. Regal Treasury Bank experienced little volatility prior to the operational loss announcement [-20;-1].

A high magnitude of volatility was reflected for Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank following the announcement day. The three unaffected banks showed a small increase in volatility on day [0]. Only Regal Treasury Bank experienced a higher level of fluctuations, resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were not affected by the operational loss experienced by Regal Treasury Bank. At the confidence intervals of (99%), (95%) and (90%) the variances of Regal Treasury Bank compared to First Rand Bank, Nedbank and ABSA Bank were unequal. Therefore the null-hypothesis was rejected. The variances of Regal Treasury Bank compared to the market and the Bank Index was also unequal within the event window. This evidence suggests that there were no spill-over effects from Regal Treasury Bank to the rest of the market.

The insider trading or rumours of insider trading were exceptionally damaging to Saambou Banks reputation particularly when it was followed by an investigation. The clear deviation between the normal $CAAR$ values and the $CAAR\,(Rep)$ values further attribute to reputational risk of Saambou Bank. The $CAAR$ values started to decline prior to the event date of 15 October 2001. This can be attributed to share overreacting (semi-strong form) or insider trading (strong form of market efficiency). Since the banks CEO sold off shares before the announcement date, due to larger expected magnitude of future risk, a higher

required rate of return was demanded. As a result, the expected return declined, forcing the share price downwards. The null-hypothesis for Saambou Bank was accepted stating that the operational announcement had an effect on $CAAR\ (Rep)$. The announcement of the operational event led to diminished customer, investor, and the public domains trust. As a result, Saambou Bank suffered a loss in share value and market capitalisation. The reputational risk (due to large negative $CAAR$ values and test statistics) indicates that reputational risk may also have been a contributing factor in the collapse of Saambou Bank.

Saambou Bank experienced little volatility until day [-5], thereafter the volatility increased. In comparison with First Rand Bank, Nedbank and ABSA Bank, Saambou Bank experienced a relatively higher level of volatility after the announcement day. First Rand Bank and ABSA Bank showed a small increase in volatility on day [0] but declined later on. Resultantly, it is clear that First Rand Bank, NedBank and ABSA Bank were only slightly affected on day [0] but were not affected by the operational loss experienced by Saambou Bank over the rest of the event window. The variances of Saambou Bank compared to the market and the Bank Index was not equal within the event window. This evidence suggests that there were no spill-over effects from Saambou Bank to the rest of the market.

The ZAR20m fine constituted only (1%) of African Banks turnover. The deteriorating share price over the past years reflects the bank's weak financial performance and declining customer confidence. However, the announced operational loss was not of such magnitude to result in severe reputational damage. The banks fast settlement response prevented $CAAR$ (Rep) values to become extremely negative within the event window. No reputational damage was indicated at this specific point in time (4 February 2013). Further operational loss announcements followed for African Bank in 2014. However these nominal loss amounts are unknown.

African Bank experienced severe volatility prior to the operational loss announcement [-20:-1]. A high magnitude of volatility was reflected for African Bank along with First Rand Bank, Nedbank and ABSA Bank prior and following the announcement day. At the confidence intervals of (99%) the variances of African Bank compared to First Rand Bank, Nedbank and ABSA Bank were equal. Therefore the null-hypothesis was accepted. At a (99%) confidence interval the operational loss announcement had an effect on other banks. At the (95%) and (90%) confidence interval only First Rand Bank and Nedbank was affected. The variances of African Bank compared to the market and the Bank Index was

not equal within the event window at confidence intervals (95%) and (90%). This evidence suggests that there were no spill-over effects from African Bank to the rest of the market, except for the Bank Index at confidence interval (99%).

The external fraud experienced by Standard Bank caused secondary reputational damage in terms of diminished trust and a potential loss in their competitive advantage. Even though the fine constitutes less than (1%) of the banks' profits it still represented reputational risk. The operational loss events of Standard Bank led to depreciation in the bank's share price (expected value of future cash flows) as stakeholders reacted to new market information. Therefore, the reputational risk of Standard Bank caused by the operational loss event can be indirectly quantified by the loss on the bank's share (ZAR940) and market value.

The $CAAR$ values were statistically significant after the operational loss announcement leading to the rejection of the null hypothesis ($H_0: CAAR = 0$). The alternative hypothesis $H_1: CAAR \neq 0$ was therefore accepted which indicated that the $CAAR$ were not zero therefore the announced event had an influence on the $CAAR$. First Rand Bank, NedBank and ABSA Bank were largely affected by the operational loss experienced by Standard Bank as all three banks showed a higher volatility level on the same day that Standard Bank's volatility increased. At the confidence intervals (99%) (95%) and (90%) the variances of Standard Bank compared to the market were unequal leading to the rejection of the null-hypothesis. Therefore it can be assumed that the variances of Standard Bank compared to the market were not equal within the event window. This evidence suggests that there were no spill-over effects from Standard Bank to the rest of the market. The variance of Standard Bank compared to the Bank Index at the confidence intervals (99%), (95%) and (90%) were equal and the null-hypothesis was accepted. Resultantly, the operational loss announcement of Standard Bank had an effect on the Bank Index.

6.2. Conclusion

With few previous data and literature based on the South African banking sector, the key aim of this study was to contribute further results concerning the effect of operational loss events on the reputation of four South African banks. The study primarily focused on identifying reputational risk among Regal Treasury Bank, Saambou Bank, Standard Bank and African bank. The return volatility during the period of the operational loss events compared to the sample of non-affected banks (First Rand Bank, Nedbank and ABSA bank)

and the overall banking industry also had to be determined. Therefore, the following conclusions can be drawn:

Regal Treasury Bank experienced reputational risk as a result of the operational event due to large negative $CAAR$ values adjusted for reputational risk and the test statistics that were found. The bank experienced a severe lost in market value and share return. Regal Treasury Bank also experienced little volatility prior to the operational loss event. Therefore, evidence suggests that there were no spill-over effects from Regal Treasury Bank to the rest of the market.

The results of Saambou Bank indicated a clear deviation between the normal $CAAR$ values and the $CAAR\,(Rep)$ values which attributes to reputational risk of Saambou Bank. Concerning volatility variances of Saambou Bank compared to the market and the Bank Index was not equal within the event window. This evidence suggests that there were no spill-over effects from Saambou Bank to the rest of the market.

The $CAAR$ values were statistically significant after the operational loss announcement which indicated that the $CAAR$ were not zero. This confirms that Standard Bank sustained a reputational risk after the announced loss. Standard Bank experienced little volatility prior to the operational loss announcement. The Bank Index showed signs of higher volatility during the event window due to the higher volatility experienced by to the high volatility experienced by First Rand Bank, Nedbank and ABSA Bank. Therefore, it can be assumed that the Bank Index was affected by the movements in the share returns of Standard Bank. The increase in the market was not that noticeable compared to the spike in the Bank Index.

The announced operational loss of African Bank was not of such severity to result in reputational damage as evidence of positive $CAAR$ values were distinctive. African Bank experienced severe volatility prior to the operational loss announcement. Further evidence suggested that there were no spill-over effects from African Bank to the rest of the market, except for the Bank Index at confidence interval (99%).

6.3. Recommendations

A reduced number of observations (four operational loss events) were used in the final sample – attributable to the sound banking industry in South Africa. Additional operational events should be added as these events occur within the banking sector. This study can also

be replicated in other countries with different banking systems to determine how different banking sectors react to reputational risk after operational loss events. This may include the effect of contagion within these different banking sectors.

6.4. Limitations

The minimum loss amount of ZAR2.3m and maximum loss amount of ZAR300m represents the minimum and maximum thresholds for the Excel model. Other models can be employed if a larger loss wants to be recorded.

6.5. Avenues for further research

Further research could involve developing a mitigation model within the banking sector to hedge against reputational risk. Evidence suggests that the capital requirements for the sample of banks proved to underestimate the operational loss events, due to the negligence of reputational risk. Therefore further research can include a sophisticated capital requirement calculation for reputational risk.

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