# Reputational risk: depositor behaviour in South Africa


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

To my beloved father, may your soul rest in eternal peace.

(1958-06-27 † 2018-08-01)

# DECLARATION

I declare that:

"REPUTATIONAL RISK: DEPOSITOR BEHAVIOUR IN SOUTH AFRICA"

is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references, and that this dissertation has not previously been submitted by me for a degree at any other university.

SJ FERREIRA

Signature: _____

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# DECLARATION OF LANGUAGE EDITOR

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**5 November 2018**

To whom it may concern

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

**S.J. Ferreira**

for the degree

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Entitled:

***Reputational risk: depositor behaviour in South Africa***

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

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

**Keywords:** operational risk, reputational risk, banks, depositor behaviour, demographic factors, behavioural finance, risk tolerance, sources of information, structural equation modelling, South Africa

The central function of a bank inherently exposes it to various financial risks where each of these risks has the possibility to influence stakeholders' perception. This perception, which is linked to the trustworthiness, credibility and performance of the bank, translates into the reputation of the bank. Depositors can be regarded as the primary stakeholders of a bank and hence their behaviour can influence the banks' reputation. A banks' reputation represents the intrinsic current value of a bank and its ability to create or erode future value. Reputational risk dominates the South African financial market as well the banking industry. Some banks regard reputational risk a result of pure reputational events while the rest of the banks regard it as a consequence of operational risk events. Although the financial markets reaction to operational risk events have been researched widely, very few researchers have explored its influence on reputational risk. The primary objective of this study was to model depositor behaviour during operational risk events to model reputational risk in banks. This study was conducted to provide a meaningful contribution toward literature and empirical research in the field of risk management. This study made use of a quantitative research methodology following a positivist research paradigm. The target population for the study comprised of all South African bank depositors in Gauteng. The sample frame included depositors banking at any one of the 28 registered banks in South Africa, Gauteng. Due to the extensive number of small, medium and large banks registered in South Africa, a decision was undertaken to only use only Gauteng depositors from the top five banks as these represents most of the population. The top five banks in terms of market share (largest customer data base) include: Standard Bank, Absa Bank, First National Bank, Nedbank and Capitec Bank. The sample further consisted out of the following characteristics: older than 18 years; bank depositor for more than five years; earns a monthly salary that is deposited into a bank account; and lives in Gauteng. During this research endeavour, various statistical analysis such as EFA, CFA and SEM was utilised in order to create a model to identify reputational risk after operational risk events specifically in Gauteng, South Africa.

Based on the context of reputational risk within this study, a reputational risk definition was created in order to support the empirical objectives. The results from the empirical objectives found that all eight hypothetical operational events (internal fraud, external fraud, employee practices, damage to physical assets, client practises, business disruptions, execution and delivery and pure reputational events) were found to be reliable factors and indicated a significant influence on the reputational risk of a bank. Results from this study indicated that depositors' behaviour is not influenced by their demographical factors. A positive relationship was found between how depositors form their perception of a bank and their willingness to withdraw during operational risk events. Depositors seem to react to operational risk events irrespective of the type of information source that made the information known. A negative relationship between depositors' likelihood to withdraw and their risk tolerance level was also found. This indicates that depositors are more likely to withdraw their money from a bank if they are risk adverse. Reputational risk is significantly influenced by operational events, depositors who are subject towards the availability and regret bias, and depositors individual risk tolerance level.

The empirical findings of this study will help banks to profile depositor behaviour during operational risk events in order to mitigate against large losses and possible bank runs. The SEM will enable banks to forecast the factors that will influence a banks reputation, which is a banks most valuable intangible asset. This will in turn enable banks to come up with better mitigation and management strategies for reputational risk. By minimising the exposure to reputational risk, banks will be able to take competitive advantage of the opportunities that the ambitious banking industry offers. Considering the theoretical and empirical findings of this study, a few managerial implications and recommendations can be offered. Much like any research endeavour, this research study had limitations of its own. Building on the foundation of this study, future researchers are recommended to use a bigger sample size and extend the region of the sample (to not only use Gauteng but also the other provinces). Since it was found that individuals do not always apply their minds when answering a questionnaire, it is also recommended that the level of financial knowledge of depositors should be investigated. The scope of the study can also be expanded to see whether a relationship between reputational risk and brand loyalty and trust exist in the banking sector.

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## LIST OF ABBREVIATIONS

AGFI : Adjusted-goodness-of-fit index

ANOVA : Analysis of variance

BCBS : Basel Committee on Banking Supervision

BFSI : Banking, Financial Services and Insurance

BIS : Bank for International Settlements

BOE : Bank of England

BSD : Bank supervision department

BUBA : Bundesbank (Germany)

CEO : Chief executive officer

CFA : Confirmatory factor analysis

CFI : Comparative fit index

CIPS : Chartered Institute of Purchasing and Supply

COSO : Committee of Sponsoring Organisations of the Treadway Commission

DIS : Deposit insurance scheme

ECB : European Central Bank

ERM : Enterprise risk management

FA : Factor analysis

FED : Federal Reserve

FICA : Financial Conduct Authority

FNB : First National Bank

FSB : Financial service board

GFC : Global financial crisis

GFI : Goodness-of-fit index

IFI : Incremental fit index

JSE : Johannesburg Stock Exchange

KMO : Kaiser-Myer-Olkin

NCA : National Credit Act

NCR : National Credit Regulator

NFI : Normal fit index

NNFI : Non-normal fit index

ORM : Operational risk management

PCA : Principal component analysis

PWC : Price Waterhouse Coopers

PGFI : Parsimony goodness-of-fit index

PNFI : Parsimony normal fit index

RMSR : Root mean square residuals (RMSR),

RMSEA : Root mean square error of approximation (RMSEA)

RNI : Relative non-centrality index

RWA : Risk weighted assets

SARB : South African Reserve Bank

SCF : Survey of consumer finance

SEM : Structural equation model

SMC : Squared multiple correlation

SPSS : Statistical Package for Social Sciences

SRMSR : Standardised root mean square residuals

TLI : Tucker Lewis index

USA : United States of America

USD : United States Dollar

ZAR : South African Rand

# CHAPTER 1: INTRODUCTION AND BACKGROUND

*"Who steals my purse steals my trash. But he that filches me my good name, robs me of that which not enriches him and makes me poor indeed" (Shakespeare, 1622, 3.3:165).*

## 1.1 INTRODUCTION

A primary function of a bank is to identify uncertainties and mitigate risks that might stem from these uncertainties. Such uncertainties can arise from any stakeholder with whom the bank has interacted in the past, present or future (Coetzee, 2016:3).The most important task of a bank is to establish who their key stakeholders are and to prioritise responsibilities according to these stakeholder characteristics, needs, perceptions and behaviour (Louisot & Rayner, 2012:3). More than 80 percent of global companies regard their customers as the most valuable stakeholders group (Deloitte, 2014). For deposit safeguarding institutions such as retail, commercial and savings banks, depositors are their main customers and, hence, the most important external stakeholders (CIPS, 2014).

Depositors expect banks to perform financial intermediation to accumulate depositor savings and transfer it to borrowers (Mohr & Fourie, 2008:338). By performing financial intermediation, depositors form certain expectations where they expect the service and performance of the bank to add value as well as give a level of financial satisfaction. Depositors expect banks to manage risk in such a way as to protect their financial assets from harm. At the same time, when these expectations of the depositors are not met by their respective banks, depositors have the power to change services to other banks or completely withdraw their funds (Mostert & Lotz, 2010:10). This is the most undesirable scenario since depositors provide the bank with funds to be able to perform financial intermediation in the first place. The more funds customer's deposit, the more funds are available for borrowing, which ultimately leads to a more profitable bank (CIPS, 2014). Avoiding such unwanted scenarios that may lead to bank runs is not always as easy as it sounds due to the extensive risk exposure of banks (Deloitte, 2014:5).

South African banks operate in a very volatile and competitive industry, facing numerous financial risks such as operational risk and reputational risk every day (Coetzee, 2016:3). Banks are exposed to operational risk events on a daily basis and constitute a large portion of a bank's

risk exposure (Lewis, 2004:1). These operational risk events are categorised by the Basel Committee on Banking Supervision (BCBS), (2002) as (1) internal and (2) external fraud, (3) employment practice and workplace safety, (4) clients, products and practices, (5) damage to physical assets, (6) business disruptions and system failures and execution and, lastly, (7) delivery and process management. More recent events, such as the Global financial crisis (GFC) (2008) the curatorship of African Bank in South Africa (2015), as well as the credit downgrade (downgrade in creditworthiness) of several South African banks (2016) have drawn researchers focus back to operational risk (European Banking Authority, 2015).

Unlike other financial risks operational risk is classified as a pure risk (only an opportunity of a loss), as it always lead to a financial loss for a bank (Micocci *et al.*, 2009:2; Rajendran, 2012:50). As mentioned earlier, the failure to mitigate and manage operational risk effectively during past operational risk events has led to the demise of several banks and other financial institutions (Ferreira, 2016:53). The consequences of operational risk events can be felt throughout a bank as it can lead to further firm-wide risks to be extreme (Sweeting, 2011:102). A fine line exists between operational risk and other risks due to the significant social media attention that an operational risk in a bank attracts (Ferreira, 2015:53). Ferreira (2015) established a relationship between operational risk in a bank and a banks' reputation. Operational risk events such as internal and external fraud may lead to reputational risk as a result of various irrational stakeholder behaviour to operational risk events (Sturm, 2013:192).

BCBS (2009:19) acknowledges reputational risk within the banking industry and classify it as the risk arising from the negative perception of a bank's internal and external stakeholders. Reputational risk can hamper a banks' ability to form sustainable business relationships, create new relationships, or restrain the institution from generating new capital. With the global financial slowdown over the last decade (2007-2017) accompanied by rising competition, globalisation, increased irrational behaviour by depositors and bank automation services, banks are unconsciously faced with the multidimensionality of reputational risk (BCBS, 2001:2).

Since reputational risk within a bank stems from operational risk events, such risk events will influence the perception of depositors. However, the manner in which banks respond to operational risk events can ultimately determine whether a negative perception of the bank is formed or whether the perception of the bank is enhanced (Deloitte, 2014:5). Hence,

operational risk and reputational risk are closely correlated with depositors subjective perception and behaviour (Zboron, 2006:504). The everyday decisions and activities of bank can lead to reputational risk where these activities are controversial to depositor expectations (Manjarin, 2012:4). A positive bank reputation is formed where the perception of depositors is proven to be optimistic (Ferreira, 2015:23). On the contrary, a negative bank reputation is formed where depositor perception is proven to be pessimistic (Eccles *et al.*, 2007:4). A connection can also be drawn between depositor's behaviour and the amount of risk that they are willing to tolerate (Jagongo & Mutswenje, 2014:93).

Several researchers have therefore analysed the effects of reputational risk. Researchers such as Perry and De Fontnouvelle (2005), Fiordelisi *et al.* (2013) and Fiordelisi *et al.* (2014) have empirically researched the effect of operational risks on the market value of banks. Micocci *et al.* (2009) instead focused on the insurance sector while Gillet *et al.* (2010) and Sturm (2013) considered the financial sector in general. The majority of the studies made use of event methodologies while analysing stock market prices in the United States and Europe. These studies were branded as the foundational research for reputational risk (Eckert & Gatzert, 2017:123). Boyle *et al.* (2015) was the first quantitative study making use of primary data collected from depositors themselves. The study analysed withdrawal risk based on set of hypothetical banking failures and the level of deposit insurance in that country. The study also considered the risk tolerance levels of 349 depositors based in the United States, Europe and New Zealand which indicated how much risk depositors are willing to take on concerning their countries respective deposit insurance schemes. Reputational risk was however outside of the scope of the study. Analysing the relationship between depositors behaviour and reputational risk is therefore imperative to a bank since a third of banking and financial decisions are based on reputation alone (Honey, 2012).

## 1.2 PROBLEM STATEMENT

Banks are primarily regarded as risk averse but not always fully risk aware (Vardy, 2015:1). Hence, banks are unintentionally exposed to various financial risks due to their economic and monetary role. These financial institutions must furthermore strive in a continuously changing banking regulation and risk management environment, bank automation (non-traditional sources) and consumerism; all of which can be attributed to changing depositor behaviour

(Coetzee, 2016:24). These changes and the uncertainties that stem from them, might significantly influence bank revenue and operational costs (Ernst & Young, 2012). The primary fear among regulators is that changing depositor and financial behaviour in the banking environment will influence global financial markets severely that the total risk in the banking industry will escalate (Koch & Macdonald, 2006:34).

The financial behaviour of depositors are fundamentally affected by numerous risk events, among these are operational risk events (Chernobai *et al.*, 2007:14). Financial behavioural theories such as the rational choice theory (Scott, 2002:126) assumes that depositors are rational when it comes to their life savings, however, studies have found depositors to be irrational with regard to their perceptions and financial decisions (Jagongo & Mutswenje, 2014:93). These irrational perceptions and decisions are influenced by psychological factors, which will eventually determine depositors' behaviour. A change in depositor behaviour may lead to a change in the reputation of a bank, which could influence bank revenue and cost (Coetzee, 2016:24). It is therefore vital that banks take depositor behaviour as key external stakeholder into account when constructing a risk management framework (Vardy, 2015:1). Yet, reputational risk has been left out of most revised frameworks based on the challenges in including the human factor for this type of risk (Perry & De Fontnouvelle, 2005:4). Therefore, future bank models may not be relevant in predicting stakeholder behaviour (Ferreira, 2016:120).

Previous research studies such as Perry and De Fontnouvelle (2005), Gillet *et al.* (2010) and Fiordelisi *et al.* (2013) have only focused on reputational risk by analysing the effect on the stock market after operational events. The novelty of this studies research is hinged on the fact that the current study deviates from the empirical studies which analyse the stock market reaction to real operational risk events. Original stock market reaction measures of cumulative abnormal returns may be a lose proxy for reputational risk perceptions. No previous researcher has focused on reputational risk by analysing participant behaviour rather than the stock market behaviour. The overriding objective is to predict reputational risk by analysing bank depositors' behaviour after operational risk events. Focus will be placed on the behaviour of depositors in terms of their withdrawal behaviour, the source of information they use, behavioural finance biases they are subject towards and the level of risk they are willing to tolerate in terms of their bank deposits. The rationale behind profiling depositors' behaviour during operational risk

events will contribute toward constructing a model for reputational risk. A better indication of how depositors react during operational risk events may lead better prediction of reputational risk within banks.

## 1.3 OBJECTIVES OF THE STUDY

### 1.3.1 Primary objective

The primary objective of this study was to model depositor behaviour during operational risk events in order to identify reputational risk in banks.

### 1.3.2 Theoretical objectives

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

- Contextualise the banking sector within South Africa;
- Elucidate upon the various stakeholders within the banking sector with emphasis placed on their financial behaviour;
- Provide a theoretical framework for reputational risk;
- Contextualise a definition for reputational risk based on theory;
- Explore the relationship between reputational and operational risk by giving emphasis to previous studies;
- Elucidate upon the main consequences of reputational risk in relation to depositor behaviour; and
- Contextualise current theoretical reputational risk mitigation models.

### 1.3.3 Empirical objectives

In accordance with the primary objective and theoretical objectives of the study, the following empirical objectives were formulated:

- Identify the most significant operational risk events leading to reputational risk;
- Determine how demographical factors influence depositors' likelihood to withdraw;
- Determine how bank reputation influences depositor likelihood to withdraw;

- Identify the behavioural biases that drive depositor behaviour;
- Determining depositor behaviour, the regarding the source of information;
- Determine depositors level of risk tolerance; and
- Construct a model to identify reputational risk by profiling depositor behaviour.

## 1.4 RESEARCH DESIGN AND METHODOLOGY

The purpose of this research study is to take action in order to inform. Therefore, it is important to highlight the research design and methodology. This study implemented a quantitative research approach by means of a self-structured questionnaire. Furthermore a positivistic research paradigm was followed since the study aimed to challenge the traditional notion of "the absolute truth of knowledge" (Henning *et al.*, 2004:17). The general objective of a positivist researchers is to test theory and try to enhance the predictive understanding of the phenomena in question (McKinney, 1966:68; Myers, 2013). In the study, the researcher was concerned with passive human behaviour that can be controlled and determined by the external environment and which is based on realism. The following section comprises a literature review description and an outline of the methodological subsections of the empirical study.

### 1.4.1 Literature review

The literature review focused on the challenging banking environment where operational risk events transfers into reputational risk and the impact of these events on the behaviour of depositors. Previous research in the South African context and international was also considered. The secondary information sources include several books on risk management, social research and management studies, journal articles, websites, newspapers and magazine articles (including electronic versions).

### 1.4.2 Empirical study

The empirical portion of this study comprised of the following methodological subsections:

### 1.4.3 Target population and sample frame

A target population must be selected carefully since researchers make inferences regarding the whole population based on a selected sample. An incorrectly selected target population will

lead to skewed results as the true characteristics of that population will not be reflected (Stagnor, 2015:112). Upon selecting the target population, the population parameters need to be set (Quinlan, 2011:206). The target population for the study comprised of all South African bank depositors in Gauteng. The sample frame included depositors banking at any one of the 28 registered banks in South Africa. According to the SARB (2017) as well as The Banking Association South Africa (BASA) (2017) 28 banks (excluding mutual banks and foreign representative branches) are registered within South Africa. The banks that are not deposit-taking institutions were eliminated from the sample frame.

### 1.4.4 Sample size and method

Due to the extensive number of small, medium and large banks registered in South Africa, a decision was undertaken to only use the top five banks as these represents most of the population. The top five banks in terms of market share (largest customer data base) include: Standard Bank, Absa Bank, Capitec Bank, First National Bank and Nedbank, with Capitec Bank as the leader (BusinessTech, 2016; Smith, 2017). A comprehensive list is required to ensure a representative sample (Hair *et al.*, 2008:140). The list of characteristics for this sample includes the following participant characteristics:

- 18 years or older;
- a bank depositor for more than five years;
- earns a monthly salary which is deposited into a bank account; and
- lives within Gauteng and banks with one of the largest five banks in South Africa.

For this study non-probability purposeful sampling (snowball sampling) was used to filter those individuals who meet the exclusion criteria of the sample; 18 years and older, more than five years banking experience, some form of education, owns a deposit account at the top five banks in Gauteng. Considering the time and cost available to the researcher, the sample size of this study consisted of 417 South African depositors. This figure is in line with sample used in similar studies of Mäenpää *et al.* (2008); Zhu and Chen (2012); Zarvrsnik and Jerman (2012); Vazifedoost *et al.* (2013); Boyle *et al.* (2015), and Ozkan-Tektas and Basgoze (2017). Most importantly, it sufficiently meets the requirements of the statistical analysis that was applied to achieve the stated objectives of the study.

### 1.4.5 Measuring instrument and data collection method

Quantitative data were gathered from participants who completed a self-administered questionnaire consisting of five sections. The questionnaire was introduced to participants by means of a cover page, explaining the significance of the study as well as the participation of the participants. A pilot study was also conducted on a convenient sample of 120 South African depositors, which was excluded from the final sample to ensure its reliability. The electronic questionnaire used for the pilot study was amended since factor analysis was not possible. The final questionnaire consisted of the following sections: (A) demographic information, (B) operational risk scenarios (C) bank perception and reputational risk, (D) sources of information and behavioural finance and (E) risk tolerance.

The first section, (Section A) included various demographic questions such as age, gender, level of education, current bank and the income of depositors. Section B consists of a 24-item scale, which includes eight operational risk events where depositors are required to indicate the likelihood that they will withdraw their current deposits. The depositors' likelihood to withdraw will be measured on a six-point Likert scale (1 = very unlikely, 6 = very likely). This approach will have several advantages over a traditional survey (Boyle *et al.*, 2015:592). Firstly, the hypothetical operational risk events will ensure that the responses of depositors are less susceptible to social desirability and retrospection biases. Secondly, it will allow the researcher to examine what actions depositors will take in several different operational risk events.

The third section (Section C) focused on bank perception and reputational risk. Depositors were asked to indicate the amount that they will withdraw from their deposit accounts when faced with operational risk event experienced by their respective bank. A six-point interval scale was used to indicate the percentage (0% -100%) that depositors will withdraw. A subsequent question was asked where participants had to indicate how likely the operational event will negatively influence their perception of the bank using a six-point Likert scale (1 = very unlikely, 6 = very likely). Section C also included questions regarding the reputation of the samples' respective banks. These questions were formed from theory to determine how depositors form their perception of a bank i.e. the reputation of a bank. A four-item scale was

used to measure reputation using a six-point Likert scale (1 = strongly disagree, 6 = strongly agree).

The fourth section (Section D) includes a nine-item behavioural finance scale, which includes statements aimed to elucidate the biases on which depositors base their financial decisions. Depositors have to relate their decisions to withdraw on the behavioural finance biases using the six-point Likert scale (1 = strongly disagree, 6 = strongly agree). A seven-point ranking question was included to determine depositors' reaction to various sources of information. This question was included to determine to which source of information depositors will react to most upon hearing of operational risk events.

In the last section (Section E), two validated measures of risk tolerance will be used to capture the risk attitude of depositors. Section E incorporated the first scale of risk tolerance, the survey of consumer finance (SCF). The SCF does not fully incorporate all of the variables of financial risk tolerance (four-item scale) but is a comprehensive measure for investment choice attitudes and experience (Grable & Lytton, 2001:43). The second risk tolerance scale included statements designed to elicit information about participants' risk tolerance. This information will indicate whether depositors are predominantly risk adverse or risk aggressive when faced with operational risk events. For this section, a validated questionnaire by Grable and Lytton (1999:163) will be used. Grable and Lytton developed this 13-item risk assessment instrument since financial risk tolerance is such a contributing variable to household financial decisions.

## 1.5 STATISTICAL ANALYSIS

Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS), Version 25 for Microsoft Windows. The following statistical methods were used to analyse the captured data:

Descriptive analysis was conducted to determine the demographics of participants. Descriptive statistics were used to determine the minimum, average and maximum amount that depositors will withdraw when faced with operational risk events. Factor analysis was conducted to identify the most significant operational risk events within the sample. This factored the most severe operational events to determine which of these events which led to reputational risk. Correlation analysis was conducted to establish a relationship between the likelihood of

depositors to withdraw and their level of risk tolerance. This is an important part of the analysis since it indicates which level of risk tolerance is associated with how likely depositors are to withdraw. The behavioural biases that drive depositor behaviour were identified by means of analysis of variance (ANOVA). ANOVA was also used in order to determine depositor behaviour regarding the source of information, where these sources were television, electronic newspapers, internet, word-of-mouth and various social media platforms. This gave an indication of the likelihood of depositors to react to certain information sources. A depositor's level of risk tolerance was determined by means of correlation analysis. Structural equation modelling (SEM) was used to profile South African depositors. Depositors were profiled according to their likelihood to withdraw during operational risk events that led to reputational risk based on their demographics, risk tolerance levels and behavioural biases.

## 1.6 ETHICAL CONSIDERATIONS

The study was conducted according to the ethical guidelines and principles as prescribed by the North-West University (NWU, 2016:15). The anonymity of the participants was guaranteed and their responses remained confidential. The participants were instructed not to include any identifying markers or details on the questionnaire. The information provided by the participant was treated as highly confidential and only the researcher has access to this information. The research study obtained ethical clearance from the Research Committee of the Faculty of Economic Sciences and Management Sciences with the relevant ethics clearance number ECONIT-2018-02.

## 1.7 CONTRIBUTION OF THE STUDY

South African banks operate in a very volatile and competitive industry facing numerous operating risks every day. This is not to mention the continuously evolving stakeholder needs and preference. Depositors can be regarded as the main stakeholders of banks and hence their behaviour can influence the reputational risk of a bank. With very limited research on reputational risk and depositor behaviour within the South African banking sector, the main purpose of this study is to provide a meaningful contribution toward the literature and empirical analysis. Stock market reaction measures of cumulative abnormal returns may be a lose proxy for reputational risk perceptions. This study models participant behaviour and perceptions

about the reputation of the bank. Therefore, the novelty of this study is hinged on the fact that the current study deviates from the empirical studies which analyse the stock market reaction to real operational risk events Furthermore, the work is an extension of the researcher's own work on operational risk events and reputational risk in South Africa. In addition, the empirical findings of this study will help banks to profile depositor behaviour during operational risk events in order to mitigate against large losses and possible bank runs. The structural model will enable banks to forecast the factors that will influence a banks reputation, which is a banks most valuable intangible asset. This will in turn enable banks to come up with better mitigation and management strategies for reputational risk.

## 1.8 CHAPTER OUTLINE

This study comprised the following chapters:

**Chapter 1: Introduction and background to the study**. Chapter 1 introduced the topic of this study, depositor behaviour and reputational risk. Furthermore, it extended on the primary research objective, theoretical objectives and empirical objectives. The research methodology and approach used was also elaborated upon.

**Chapter 2: South African banking environment and depositor behaviour.** This chapter concerns itself with the competitive banking environment in South Africa. The various challenges faced by modern banks were elucidated upon in this chapter, as well as the role that various stakeholders including depositors play within the banking environment. This chapter further elaborated on the theories behind financial decisions and how these may impact the behaviour of depositors. Furthermore, risk tolerance relating to the types of risk profiles was explained to draw a line between depositor behaviour and depositors risk tolerance level.

**Chapter 3: Reputational risk.** Chapter 3 focussed on providing to review of the origin of reputational risk as a consequence of operational risk. Operational risk was defined in terms of its operational risk events and its effect on reputational risk. One of the main objectives of this chapter was to form a definition for reputational risk since no set definition exists. Previous research studies on operational risk and reputational risk was contextualised within this chapter. This chapter concluded with a section on the management of reputational risk by referring to existing mitigation models.

**Chapter 4: Research design and methodology.** Chapter 4 provided an outline of the research process, which was followed. The research methodology and research approach was selected and discussed, which was followed by the data collection method. Chapter 4 also indicated how the sample size was selected and how the data were collected. The various statistical techniques performed in the study were highlighted in light of the empirical objectives as stated in Chapter 1.

**Chapter 5: Analysis and interpretation of empirical results.** The results and findings of this study were presented in accordance with the empirical objectives stated in Chapter 1. Analyses were conducted and results were presented in order to determine whether depositors would withdraw their deposits from their bank deposit accounts after operational risk events. A consensus was reached, regarding whether the behaviour of depositors will incur a reputational risk and to what extent.

**Chapter 6: Conclusion and recommendations**. A summary of the achievement of both the theoretical and empirical objectives were provided. Relevant recommendations for future research were elucidated upon. The limitation of the study was also mentioned in order to contribute towards future research endeavours.

# CHAPTER 2: THE SOUTH AFRICAN BANKING ENVIRONMENT AND DEPOSITOR BEHAVIOUR

*Money in the bank is like toothpaste in a tube, easy to take out but hard to put back.*

*Earl Wilson (1907-1987)*

## 2.1 INTRODUCTION

Chapter 2 focusses on achieving the theoretical objectives of this study by contextualising the South African banking sector and depositor behaviour. Chapter 3 of this study provides the last literature section by illuminating on the management of reputational risk, which is influenced primarily by depositor behaviour. The first section of Chapter 2 elaborates upon the nature of banks including the definition of a bank, the functions of a bank and the financial risks inherent within the functions of a bank. The role of various internal and external stakeholders is also illuminated. The chapter further gives an overview of the history of the South African banking industry including previous bank failures. It is also necessary to contextualise the current (2018) regulation framework including regulation and legislative changes. Deposit insurance as a safeguard measure is discussed along with its benefits and drawbacks. The banking sector is constantly faced with risks and challenges of which globalisation, regulation and evolving stakeholder rationale are contributing factors. Changing depositors' rationale may lead to changes in depositors' behaviour and, ultimately, the amount of risk they are willing to tolerate. These challenges can influence the revolution of risk management framework and the way banks are regulated.

## 2.2 THE NATURE OF BANKS

A principal function of banks is to identify uncertainties and mitigate risks that might stem from these uncertainties. Such uncertainties can arise from any stakeholder with whom the bank has interacted in the past, present or future (Coetzee, 2016:3).

### 2.2.1 The meaning of a bank

The concept of banking as understood today originated from Italy during the 14$^{th}$ century. The word bank is derived from the Italian word *banca*, meaning bench or a money exchange table (Gold, 1976:295).

Banks are defined according to the nature of their functions, services and the monetary role that they perform in the economy (Coetzee, 2016:3). Amongst the general services that banks provide are (Rose & Hudgins, 2013:11):

- financial intermediation;
- personalised banking services;
- safekeeping of deposits;
- extension of credit;
- exchanging currencies; and
- authorisation of transactions.

Bank thus refers to the nature of the services provided to various stakeholders instead of a particular type of financial institution (Koch & Macdonald, 2006:13). However, for banks to be able to function as legal financial deposit institutions, it is important that all market participants have a mutually-agreed definition of a bank (Rose & Hudgins, 2013:5). In South Africa, a bank is simply defined as a financial institution whose primary objective is to borrow and lend money in the South African market for commercial gain (Otto & Henderson, 2005:16). The Federal Reserve of the United States concurs with the South African definition by stating that a bank is "an institution offering deposits subject to demand withdrawals and making loans of a commercial nature" (United States Federal Reserve Board, 2017). In a modern economy, no financial system can function without banks or even a rudimentary type of banking system. The sections below focus on the financial intermediation role that banks perform in an economy.

## 2.3 FINANCIAL INTERMEDIATION

At the heart of a bank's purpose lies its role in the economic and monetary functions that banks perform (Coetzee, 2016:4). According to the Bank Act (94 of 1990), this economic and monetary role (financial intermediation function) that banks play is invaluable to a country's economic progress. Therefore, the primary functions of a bank are:

- financial intermediation;
- wealth creation;
- providing liquidity;
- providing credit;
- facilitating payments;

- risk diversification;
- financial services and advisory;
- acting as an agency;
- providing trust and fiduciary advice;
- acting as a guarantor; and
- acting as a depository institution.

The purpose of financial intermediation is to accumulate surplus funds from surplus economic units (individuals, businesses and governments) in the form of depositor savings and transfer them to those in need, called deficit economic units (individuals, businesses and governments), in the form of loans. The process of financial intermediation enables monetary circulation (wealth creation function) due to the indirect investment and financing contributions (Mohr & Fourie, 2008:338). A bank's asset is dependent on loans, cash and reserves, investments and other assets. On the other hand, bank liabilities are formed by deposits and non-deposit borrowings. Banking activities can influence economic growth of a country since the central bank of a country can control money supply by either expanding or contracting, by altering the level of credit extension to banks. Subsequently, the robustness of a country mirrors the strength of its banking sector and the financial soundness of the banks within it (Koch & Macdonald, 2006:13).

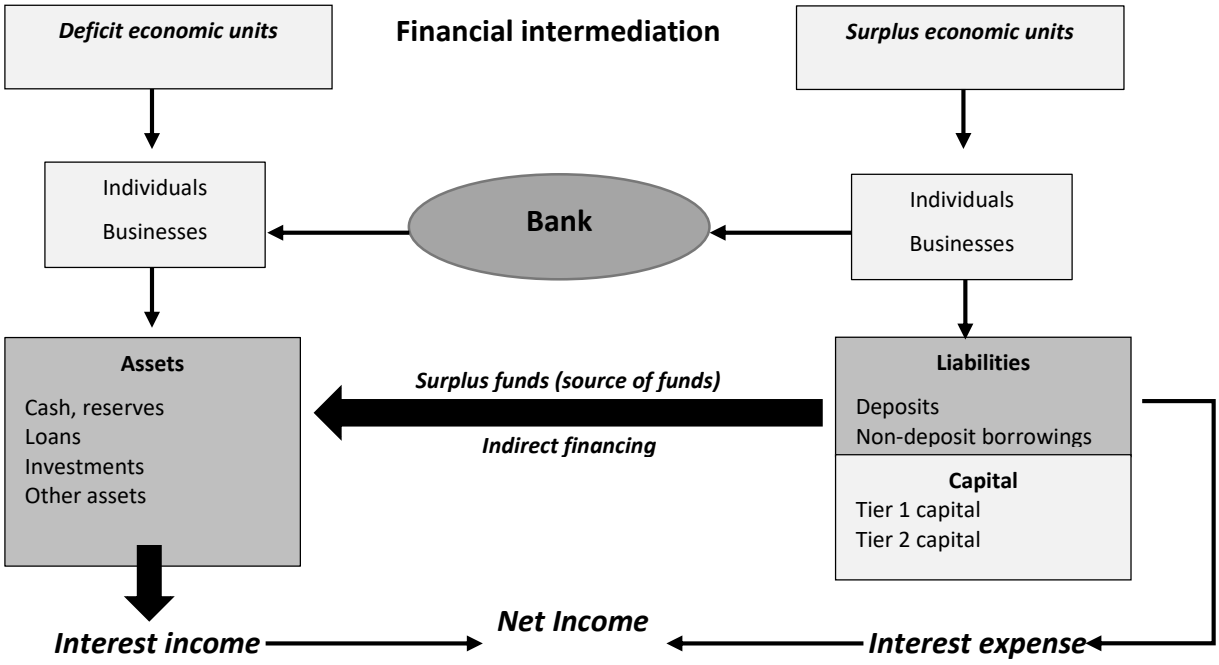
Banks create credit (credit function) to supply market participants with the funds that are needed (Rose & Hudgins, 2013:10). Credit can be used to acquire production equipment, property, distribution of goods, buy automobiles or any other type of asset that can help create wealth (Crosse & Hempel, 1973:4). The extension of credit assists in creating wealth by helping market participants to acquire goods that were not possible before. However, credit is not created in isolation. The amount of credit extended in the form of loans (asset side) depends on the excess funds deposited (liabilities side) with the bank (Coetzee, 2016:18). Banks are also able to generate interest income from the loans extended using the source of funds on the liability side of the banks. Banks further provide financial advice and act as agents on behalf of their clients. Some of these financial services might include trust assets where the banks manages the funds and avoid excessive risks (Coetzee, 2016:19).

Despite the importance of the credit function using the source of funds, the depository function also takes priority on the consumer side. When market participants are asked why they deposit their funds into a bank, the general answers are always related to safety or convenience. These

two concepts are only partial truths that illuminate the main function of banks as depository institutions (Coetzee, 2016:17). The most obvious reason for making use of the depository function of a bank is to utilise the easy payment facilities that the bank offers (payment function). This enables depositors to make payment while compensating the bank for their payment services in terms of bank costs (demand deposits) (Crosse & Hempel, 1973:5).

The second reason is for the purpose of liquidity (liquidity function). Depositors have anticipated current and future expenditures and need funds in the most liquid form possible that cannot be invested on a temporary basis. Having an excess amount of liquidity where this can be easily exchanged for other assets, with a low minimum level of risk attached, serves as a cash reserve (Rose & Hudgins, 2013:11). This enables depositors to have a higher purchasing power for future needs. The last reason for making use of the depository function is merely for the convenience of accumulated savings (Coetzee, 2016:18). The purpose of these savings is usually non-specific and they are accumulated over an extensive period of time (Crosse & Hempel, 1973:5). Generally, these funds have less volatile interest rates than the current market and provide more stability and access than investment funds. Figure 2.1 represents the financial intermediation function of a bank and the significance of the depository function as the source of surplus funds on which a bank's income depends.

**Figure 2.1: Financial intermediation**




Source: Adapted from Coetzee (2016:5)

## 2.4 TYPES OF BANKS

Table 2.1 represents all the types of banks and the various services they offer to their stakeholders.

**Table 2.1: Banks and banking services**

| Type of bank | Services offered |
|---|---|
| Commercial bank | Accept deposits, offer loans and offer basic investment services |
| Community bank | Locally centred commercial and savings bank |
| Saving bank | Accept deposits and offer loans to individuals |
| Cooperative bank | Offer financial assistance to farmers in terms of acquisition of goods or equipment |
| Mortgage bank | Do not accept deposits, solely provide mortgage loans |
| Investment bank | Service corporate customers by underwriting issues of securities |
| Merchant bank | Service corporate customers by offering debt and equity |
| International bank | Commercial banks present in numerous nations |
| Wholesale bank | Major commercial banks offering services to corporations and governments |
| Retail bank | Minor banks offering services to consumer households and small businesses |
| Banker's bank | Offer cheque clearing and trading of securities to other banks |
| Insured bank | Reserve deposits, which are backed by deposit insurance plans |
| Affiliated bank | Banks who are partially or fully owned by a holding company |
| Virtual bank | Banking services solely offered over the Internet. |

Source: Adapted from Rose and Hudgins (2013:3)

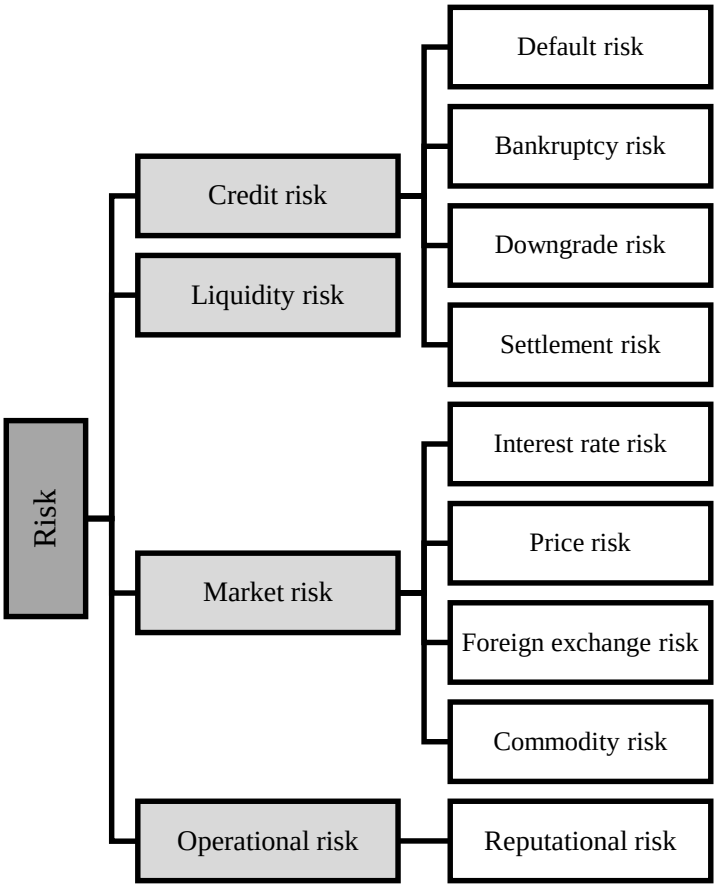
This study only focuses on banks that are deposit-safeguarding institutions such as commercial banks, retail banks and savings banks. Insured banks do not fall within the scope of this study since the South African banking sector does not have an insurance deposit scheme.

## 2.5 TYPICAL RISKS WITHIN BANKING

The preceding discussions based on the functions of a bank introduce, but do not emphasise, the core element of the nature of banks – the risk inherent in banking. According to the Oxford English Dictionary (2017b), risk is "the possibility of danger, loss, injury or other severe

consequences". Within banking, this risk is of a financial nature and generally results in a monetary loss. Risk taking is said to be the foundation on which the functions of a bank are based. Banks that are operated on the principle of evading all the risks illustrated in Figure 2.2 will remain stagnant and will not live up to the stakeholder expectations. On the contrary, banks that take excessive risk without considering the possible monetary loss will suffer considerably during an economic recession (Crosse & Hempel, 1973:61). This will also pose serious risks for bank stakeholders. Figure 2.2 and Table 2.2 present the risks in the banking sector.

**Figure 2.2: Typical risks within the banking sector**




Source: Adapted from Crouhy *et al*. (2014:24) and Ferreira (2015:12)

**Table 2.2: Banking risks**

| | |
|---|---|
| **Credit risk**<br>Credit risk is defined as a risk that occurs due to failure from the counterparty to pay where a potential loss exists (Li *et al.*, 2013:165; Poitras, 2013:6; Chance & Brooks, 2016:537). | |
| **Default risk** | Default risk arises when customers borrow money and fail to make promised payments (Crosbie & Bohn, 2002:1; Rose & Hudgins, 2013:487). |
| **Bankruptcy risk** | Bankruptcy risk is the result of taking over the collateralised assets of a default borrower (Bordeianu *et al.*, 2011:250; Crouhy *et al.*, 2014:30). |
| **Downgrade risk** | Downgrade risk is when the issuer of bonds/stocks faces a decline in the credit standing of the specific bonds/stocks (Bessis, 2010:29). |
| **Settlement risk** | Settlement risk is a risk that occurs as cash flows are exchanged when a transaction is settled (Crouhy *et al*., 2014:30). |
| **Liquidity risk**<br>Liquidity risk is when a bank fails to quickly convert assets into cash to settle obligations (Chance & Brooks, 2010:557). | |
| **Market risk**<br>Market risk is defined as the uncertainty and possible loss associated with adverse interest rate movements, foreign exchange rates, price movements or commodity prices (Bodie *et al.*, 2013:149; Chance & Brooks, 2013:557). | |
| **Interest rate risk** | Interest rate risk exist when several market interest rates fluctuate and cause price movements in assets and liabilities (Megginson *et al.*, 2010:124; Rose & Hudgins, 2013:487). |
| **Price risk** | Price risk is a result of adverse movements in market variables such as prices, which could potentially cause a decline in value of a financial portfolio (Seale & Shonkwiler, 1987:111; Young, 2006:3). |
| **Foreign exchange risk** | Foreign exchange risk is the result of imperfectly hedged positions in a foreign currency that dominates assets and liabilities that cause fluctuations in profits of the local currency (Crouhy *et al.*, 2014:26; Mbabazize *et al.*, 2014:16). |
| **Commodity risk** | The risk that an business's financial position will be negatively affected due to price movements of commodities (Larson *et al.*, 1998:16; CPA Australia, 2012:3). |
| **Operational risk**<br>Operational risk is the uncertainty with regards to an organisation's earnings due to human errors, failures of computer systems, floods, lightning strikes and misconduct by employees. Earnings are decreased due to unexpected operating expenses (BCBS, 2001:2; Rose & Hudgins, 2013:185; Hopkin, 2017:631). | |
| **Reputational risk** | Reputational risk is a result of the flow of negative information about an organisation's operations and/or internal controls (Perry & De Fontnouvelle, 2005:4; Young, 2006:4). |

Source: Author compilation

The most general risk in banking can be regarded as credit risk – where borrowers are unable to repay their loans or meet any debt obligations (Li *et al.*, 2013:165). Banks, generally, will avoid extending poor loans or making poor investments to mitigate credit risk. However, various factors such as economic downturns, war and changes in demand cannot always be accurately predicted and, ultimately, will influence the quality of credit extended (Crosse & Hempel, 1973:63). From Table 2.2 and Figure 2.2 it is clear that credit risk is divided into four risk categories, namely default-, bankruptcy-, downgrade- and settlement risk.

An omnipresent risk is liquidity risk. This risk is defined as a bank's inability to settle outstanding debt in a timely manner. Moreover, liquidity risk is typically when a bank becomes unable to settling debt commitments (Drehmann & Nikolaou, 2010). In order to hedge against liquidity risk, banks need to sustain a sufficient liquidity level, which can easily be converted into cash. This risk arises when a bank has a deficit of liquid funds. The more liquidity risk accumulates, the more possibility exist for a bank to reach illiquid status in the future (Nikolaou, 2009).

Rose and Hudgins (2013:184) state that when a country is a market-based economy, the majority of banks experience market risk. This in return exposes these financial institutions to many fluctuations and uncertainty relating to market prices and rates. Market risk, therefore, is referred to as volatile market price movements that can possibly cause a loss in off balance sheet positions (European Banking Authority, 2015). Market risk originates from the position in the trading book and, simultaneously, the position in the balance sheet that revolves in commodity risk and foreign exchange risk (Crouhy, 2014:25). Table 2.2 and Figure 2.2 explain that market risk can be categorised into four sub categories, namely interest rate risk, price risk, foreign exchange risk and commodity price risk.

One of the focus points of regulation in terms of risk management is to identify, mitigate, respond and manage operational risk effectively. Operational risk is the risk that arises from inadequate or failed internal processes, people and systems or external events, which result in a loss (BCBS, 2001:2). Operational risk is an historic term used in the banking industry and has manifested more recently due to unique losses banks experience. Emphasis was placed on operational risk because of globalisation of the banking and financial system (European Banking Authority, 2015). Operational risk includes other types of risks not covered under

credit and market risk, which can possibly impact a bank's daily activities (Sweeting, 2011:102).

## 2.6 THE SOUTH AFRICAN BANKING SECTOR HISTORY

Although banking started as early as the 14th century, it was not until 1793 that South Africa established its first bank called the Bank van Leening, aimed at supporting farmers and backed by the government. By 1840, South Africa received its first ever private bank called the Cape of Good Hope Bank (Otto & Henderson, 2005:16) and by 1861, 28 private banks had been established (Van Niekerk, 2016:131). The South African mining industry along with the discovery of gold attracted foreign banks such as the London South African Bank (1861) and the Standard Bank of British South Africa (SB) (1962) were established. The Netherlands Bank of South Africa (later renamed Nedbank Ltd in 1971) originated in 1888.

In addition to the discovery of gold, the Johannesburg Stock Exchange (JSE) – developed in 1887 to fund the gold mining industry by generating investments for South Africa (Van Niekerk, 2016:132). It was not until after World War I that the first Currency and Banking Act (31 of 1920) came into force to stabilise currency and monetary concerns. Since commercial banks had been issuing banknotes and converting these notes into gold without any uniform legislation, a need for a national regulator emerged. Under the Currency and Banking Act (31 of 1920), the South African Reserve Bank (SARB) was formed in 1921. According to SARB (2017) this Act has been amended several times from Act 29 in 1944 to the latest SARB Amendment Act 4 of 2010.

During 1926, Barclays National Bank entered the South African banking sector whereby Barclays and Bank of British South Africa dominated the market during the 1930s (SARB, 2017). Due to high community prices, good economic growth and comprehensive risk diversification, more foreign banks established branches and subsidiaries in South Africa (Van Niekerk, 2016:131). These foreign banks contributed substantially to the establishment of some of South Africa's most popular banks, namely Standard Bank, Nedbank, First National Bank and ABSA Bank (previously called Amalgamated Banks of South Africa) (Otto & Henderson, 2005:16). These four banks dominated the South African banking sector during the 1990s when South Africa was isolated from international markets due to political instability. By 1995, these four banks held more than 90 percent of the country's private bank assets (Otto & Henderson, 2005:17).

After two more decades, numerous banks were registered in South Africa including local banks as well as several representative offices of foreign-controlled banks. During 2017, South Africa had 10 locally-controlled banks, three mutual banks, six foreign-controlled banks, 15 foreign-representative banks and only two banks in liquidation. During 2017, these four banks, First National Bank (1838), Nedbank (1888), Standard Bank (1962) and ABSA Bank (1991), along with Capitec Bank (2001) remained the largest commercial banks in South Africa (SARB, 2017).

## 2.7 THE BANKING REGULATION FRAMEWORK IN SOUTH AFRICA

The concept of a regulation framework, generally, is adopted by a static or formal paradigm, ordinarily defined as a structure of an underlying system (Otto & Henderson, 2005:46). In a more complex sense, a banking regulation framework is more than an aggregate structure of banks, but rather a dynamic structure keeping banking forces parallel (Crosse & Hempel, 1973:13). In aggregate, the banking regulation framework includes all financial intermediaries involved in transforming public savings into loans and investments, which ultimately form the credit supply of the economy (Crosse & Hempel, 1973:15).

A functional banking structure encompasses laws, regulations and traditions that institute the environment in which banks operate (SARB, 2017). The underlying objective of any country's regulation framework is the achievement of financial stability. The degree of financial stability is dependent on the regulatory supervision of the banks within that specific country (BFSI, 2015). Therefore, banking activities are carefully monitored and regulated to ensure adherence to risk management standards. Regulators grant banks a certain level of idiosyncratic authority and power, which may be of a permissive nature. In the same sense, this specific level of authority and power may also be restrictive in order to prevent monetary instability, banking failures and systemic collapse (Crosse & Hempel, 1973:34). Regulations not only ensure competitive and efficient banking but also help sustain the integrity of the national payment system. Implementing regulatory supervision protects not only the regulator and individual bank, it also protects bank customers from being exploited by unethical transactions or conduct (Koch & Macdonald, 2006:3).

The following section elaborates on the most recent banking conduct regulations implemented in South Africa.

### 2.7.1 Banking conduct regulation in South Africa

The SARB is accountable for domestic banks and their financial and debt obligations (Crouhy *et al.*, 2014:68). Hence, South African banks are under the regulation, risk management and supervision of the SARB to monitor the banking activities (deposits and loans) of these banks along with the docility of the Basel Committee on Banking Supervision (BCBS) guidelines (SARB, 2017). The SARB consists of a bank supervision department (BSD) for robust capitalisation by implementing the supervisory methodologies set by BCBS, namely the 29 core principles for effective banking supervision and the Basel Accords (SARB, 2017). The BSD, within the SARB, prudentially issues banking licenses and regulates and supervises South African banks along with numerous other regulations. Since the South African banking sector is highly fragmented as well as interconnected, different laws and regulations apply to various departments of banking, insurance and investment (Coetzee & De Beer, 2016:69). For this reason, the Twin Peaks framework forms part of the regulation of the financial sector in South Africa. However, for the purpose of this study, emphasis will be given to those laws applying to banking institutions represented by Table 2.3.

Like most regulators, the SARB is risk averse when it comes to risk management and acknowledges the high performance expectations of the country. The SARB regards risk management as a fundamental and indispensable part of the bank's governance system and is the main reason for its resistance during the global financial crisis (GFC) of 2008 (SARB, 2017). Globalisation, along with the interdependence of global economies, has led countries to forget why independent regulation is important. The GFC was a period of deregulation, risky transactions, supervisory failures and financial innovation beyond our competence (Van Niekerk, 2016:139). While global economies and mainly the United States (US) were extending sub-prime mortgage loans during 2007 and 2008, the South African financial sector was limiting its exposure. The risky financial transactions in other countries such as the extension of credit, miss-selling of assets, extending customer limits and incorrect pooling of assets led to a shadow banking system (Coovadia, 2011:12). This unsupervised, risk-aggressive system led to most financial transactions falling outside the safety nets provided by deposit insurance.

The factors, which sheltered South Africa from the 2008 GFC, can be attributed to high profitability, low levels of leverage, limited exposure to global markets and sound

capitalisation. Hence, the South African banking system, during the GFC, could be described as meritoriously regulated and supervised as the sector avoided state support (Van Wyk *et al.*, 2012:123). Although South Africa had limited exposure to the GFC, regulation was amended with emphasis placed on consumer protection (Van Wyk *et al.*, 2012:77). The existing regulations with regards to South African banks are defined in Table 2.3 below.

**Table 2.3: Existing banking regulation in South Africa**

| Existing regulation | Legislation |
|---|---|
| Bank Act (94 of 1990) | Outlines prudential requirements (minimum capital requirements, liquid asset requirements, risk requirements) for South African banks (SARB, 2017). |
| King Code on Corporate Governance (1994) | The relationship between management, the board, shareholders and other stakeholders and also the responsibility of the board of directors and management to ensure and maintain these relationships (King Committee on Corporate Governance, 2009). |
| Basel Accords (1988) | Setting regulatory standard in order to improve risk management and regulation within banks to safeguard global financial stability (BIS, 2016). |
| Four-tier risk process | Four-tier process to manage strategic risk, exchange risk, operational risk and reputational risk (SARB, 2017) |
| National Credit Act (34 of 2005) | Promote the social and economic well-being of South Africans. Promote a reasonable, transparent, competitive, justifiable, responsible, efficient, effective and open credit market (SARB, 2017). |
| Financial Advisory and Service Act (37 of 2 002) | The Act aims to regulate the offering of all financial advisory and intermediary services to bank clients, to revise several bank laws and to provide for difficulties related thereto (SARB, 2017). |

Source: Author compilation

#### 2.7.1.1 The Bank Act (94 of 1990)

The Bank Act (94 of 1990) focuses on all areas of deposit taking and emphasises comprehensive risk management. The Act provided prudential requirements for the minimum capital levels, cash and liquid assets within the bank. The minimum capital requirements specify a required 10 percent of risk-weighted assets to be kept as capital. In terms of cash reserves, 2.5 percent of liabilities in the form of deposits should be kept aside. The prudential requirements for liquid assets should not be less than 5 percent of the bank's liabilities (SARB, 2017).

#### 2.7.1.2 The National Credit Act (34 of 2005)

The National Credit Regulator (NCR) under the National Credit Act (NCA) is also responsible for regulating all credit extending facilities such as banks as well as non-banking institutions. The regulator is further responsible for developing the credit market in South Africa (Coetzee & De Beer, 2016:79).

#### 2.7.1.3 The four-tier process of general risk management

Furthermore, regarding risk management, a four-tier process within the SARB exists (SARB, 2017):

- strategic risk − identify and assess strategic risk;
- exchange risk − identify foreign exchange risk;
- operational risk − identify and mitigate operational risk; and
- reputational risk − identify and manage reputational risk.

#### 2.7.1.4 The King Committee on Corporate Governance

The King Committee on Corporate Governance was assembled by former judge Mervyn King and Geoffrey Bowes where the first King report was released during 1994 (King Committee on Corporate Governance, 2002). The first report focussed on encouraging higher standards of corporate governance within South Africa, including banks. Corporate governance is important for preserving and maintaining a good corporate reputation within organisations. The successful management of corporate governance ensures the efficacious reporting of transparency of information to stakeholders (Spedding, 2014:1). Four King reports have been published, namely King I (1994), King II (2002), King III (2009) and the latest King IV report in November 2016.

The King I report established the foundation for corporate governance but lacked comprehensive detail (King Committee on Corporate Governance, 2002). Although the King I report focused on an integrated approach for risk management following the 15 principles, the economic conditions during the late 1990s required a modernised report. King II focussed on identifying operational risk, human resource risks, technological risks as well as credit, market and compliance risk when applied to the banking sector (King Committee on Corporate Governance, 2002). Banking institutions followed the seven characteristics for good corporate governance as stated in King II; discipline, transparency, independence, accountability,

responsibility, fairness and social responsibility (Coetzee & De Beer, 2016:70). King III was introduced during 2009 but only became effective in 2010. King III was mainly introduced to apply to all entities and not only business enterprises. Six main changes were made between King II and King III, which included the following areas: insight, information, incentives, instinct, independence and interconnectivity. In terms of insight, the board of directors should have the ability to identify the multiple causation of risk including those that are not directly obvious (King Committee on Corporate Governance, 2009).

The latest King IV report defines corporate governance as the exercise of ethical and effective leadership by the governing body towards the achievement of good culture, performance, effective control and legitimacy (King Committee on Corporate Governance, 2016). Ethical and effective leadership should complement each other. Ethical leadership must demonstrate integrity, responsibility, accountability, fairness and transparency. Effective leadership must focus on effective and efficient execution. It is about achieving strategic objectives and positive outcomes (King Committee on Corporate Governance, 2009). Table 2.4 below discusses the fundamentals of each King report.

.

**Table 2.4: The fundamentals of the King reports**

| KING I (1994) | KING II (2002) | KING III (2009) | KING IV (2016) |
|---|---|---|---|
| • Suggested principles of conduct for boards of directors, banks and state-owned companies.<br>• Encompassed financial and regulatory aspects.<br>• Supported an combined approach involving all stakeholders. | Appropriate to departments of state or national, provincial or local government administration. | • Included sustainability in isolation, leading to separate reporting.<br>• Governance, strategy and sustainability were integrated.<br>• Appropriate to all entities, public, private including non-profit organisations. | • Create an equilibrium between conformance and performance.<br>• Summarised in one word "transparency"<br>• In accordance with international paradigm<br>• Endorses superior accountability and transparency<br>• King IV is universally applicable<br>• Moves away from "comply" to "apply and explain" |
| ***15 Principles:***<br>• Board of director's makeup and mandate,<br>• Role of non-executive directors and supervision of non-executive directors.<br>• Appointments to the board and period for executive directors.<br>• Determination and disclosure of executive and non-executive director's remuneration.<br>• Board meeting frequency<br>• Balanced annual reporting | ***Principles:***<br>• director responsibility;<br>• risk management;<br>• internal audit;<br>• integrated sustainability reporting; and<br>• accounting and auditing.<br><br>***Characteristics of good corporate governance:***<br>• Discipline (a commitment to obey to 'proper' behaviour); | ***18 Principles:***<br>Key changes from King II:<br>• insight;<br>• information;<br>• incentives;<br>• instinct;<br>• independence; and<br>• interconnectivity.<br>Included amended principles to address new topics:<br>• Internet technology governance<br>• Business rescue<br>• Fundamental and affected transactions in terms of | ***16 Principles (plus one):***<br>Key changes from King III:<br>• outcomes based vs rule based;<br>• apply and explain;<br>• structure of King IV;<br>• broader forms of address; and<br>• sector supplements.<br><br>***Objectives of KING IV*** |

| KING I (1994) | KING II (2002) | KING III (2009) | KING IV (2016) |
|---|---|---|---|
| • The requirement for effective auditing<br>• Affirmative action programs<br>• The company's code of ethics | • Transparency (ease with which an outsider can analyse a company);<br>• Independence (use of mechanisms to prevent conflicts of interest);<br>• Accountability (decision makers must be accountable for decisions);<br>• Responsibility (for behaviour allowing for corrective action and for mismanagement)<br>• Fairness (systems must be balanced)<br>• Social responsibility (awareness and response to social issues). | director's responsibilities during mergers, acquisitions and amalgamations. | • Corporate governance as integral to running an organisation;<br>• Accessible and fit for implementation;<br>• Corporate governance as a holistic and interrelated set of arrangements.<br>• Encourage transparent and meaningful reporting to stakeholders.<br>• Concerned with ethical awareness and conduct. |

Source: King Committee on Corporate Governance (2002); King Committee on Corporate Governance (2009); King Committee on Corporate Governance (2016)

#### 2.7.1.5 Basel Committee on Banking Supervision

The SARB, as national regulator, has the obligation to warrant the capitalisation of South African banks to circumvent systemic risk. Systemic risk in a banking sector can be marked by a ripple effect where the collapse of an individual major bank can cause the collapse of the entire banking system (Crouhy *et al.,* 2014:67). After the GFC, the SARB along with other global regulators have implemented strategies to circumvent the flaws exposed in the regulatory frameworks of central banks. Additional regulations have been established by the BCBS and implemented by the SARB to mitigate banks against forthcoming financial risks. The significance of a sound regulation framework in South Africa is, therefore, central to the success of the entire banking sector (Coovadia, 2011:14).

The BCBS was established subsequently after momentous disruptions in global financial markets (Otto & Henderson, 2005:60). The Bretton Woods system was one of these major disruptions, which led to severe financial losses for Bankhaus Herstatt, Franklin National Bank as well as other major banks outside of Germany. The momentous disruptions led to the decision of the G10 countries to implement a committee on banking supervisory (Rose & Hudgins, 2013:494). The overriding objective of the BCBS is to set slightest regulatory and supervisory principles in such a fashion as to enhance global banking supervision techniques. The BCBS, furthermore, are responsible for addressing the difficulties faced by diversified financial institutions in collaboration with national regulators. Even so, the BCBS has no lawful authority (Ferreira, 2015:24) since it merely designs standards and suggests commendations to financial institutions in the hope that financial institutions will implement them (BCBS, 2013).

The BCBS has published three Basel Accords to date (2018) and is working on publishing the fourth Basel Accord (Joshi & Morris, 2018). The first Basel Accord, Basel I was published in 1988 whereby it laid the foundation for future bank regulation. Prior to the first Basel Accord, countries had their own respective regulatory framework, independent of any generic set of rules (BFSI, 2015). Basel I proposed guidelines for banks, mainly to hedge against credit risk by keeping a minimum capital level (capital to risk-weighted assets of 8 percent) (BCBS, 2013). The Basel I Accord was implemented with the objective to be a foundational framework on which banks should build on. Hence, in January 1996, the BCBS published the first amendment to Basel I, Market Risk Amendment to the Capital Accord, which was phased in by the end of 1997 (BCBS, 2013:2).

The continuation of banking failures around the globe resulted in emergence of the Basel II Accord. The Accord was aimed at being more risk sensitive by providing supplementary guidelines to financial institutions to hedge against additional risks. Among these risks were operational risk (BCBS, 2001). The integration of operational risk provided the third component of the first pillar of the capital framework. After Basel II, the amended capital framework then included of three pillars, first, minimum capital requirements for credit risk, market risk as well as operational risk, secondly, supervisory review to ensure sufficient capital levels and, thirdly, public disclosure to guarantee market discipline (BCBS, 2013).

As shown in Table 2.5, each of the Accords had shortcomings that had to be addressed in the forthcoming frameworks. Thus, Basel II had a few shortcomings, which formed the foundation for Basel III. Among the shortcomings was the inability to fully hedge financial institutions against the magnitude of the GFC in 2008 (Ferreira, 2014:32). Most financial institutions failed during the GFC in 2008 because of insufficient capital levels unable to absorb operating losses. Not only did Basel III provide improved liquidity standards, but also the improved quality of capital to be kept (BASA, 2014:2). Figure 2.3 shows the evolution of the Basel Accords. While proposals for a Basel IV have been circulating, so has the resistance against some of the suggested amendments. One of the proposals is to restrict banks of making use of their own simulations to calculate their own capital buffers. On the other hand, banks will be required to increase capital and liquidity ratios while displaying greater disclosure.

The BCBS released a proposed reformed capital framework during December 2017, which is frequently referred to as Basel IV within the financial industry (Joshi & Morris, 2018). With this proposed framework the BCBS aims to improve the capital regulatory framework by making it more resilient and increase confidence within the global banking industry (BIS, 2017). The improvement to the capital framework adjusts the weighted capital calculations with the objective of being able to compare outcomes across banks globally. The Basel IV proposals also restrict banks in the manner that banks calculate their risk weighted assets (RWA) using their own internal models (Joshi & Morris, 2018).

The RWAs, using a bank's own internal model, should not constitute less than 72.5 percent of the risk-weighted calculation using the standardised model. This level is known as the output floor, which indicates the specified minimum level for RWAs based on the standardised model (BCBS, 2009). Likewise, when calculating RWAs using the bank's internal model, the input

parameters are also limited by input floors. Although many in the banking industry are already referring to the amended framework as Basel IV, the committee is aiming for a five-year phase in process to allow for the changes in the RWA calculation (PWC, 2017a). The phase-in period will adjust RWA accordingly (Joshi & Morris, 2018) (BIS, 2017);

- 2022 – 50 percent RWA
- 2023 – 55 percent RWA
- 2024 – 60 percent RWA
- 2025 – 65 percent RWA
- 2026 – 70 percent RWA
- 2027 – 72.5 percent RWA

**Figure 2.3: The evolution of Basel I, Basel II and Basel III phasing**


Source: Adapted from BCBS (2013); Crouhy *et al.* (2014:226); Ferreira (2015:20); (PWC, 2017a)

**Table 2.5: Basel Accords from Basel I until Basel IV**

| BASEL I | BASEL II | BASEL III | BASEL IV |
|---|---|---|---|
| Published during 1988. Very foundational not nearly granular enough. | Published during 2004. Fully implemented in 2008. | Published July 2009 to be fully implemented in 2019. | Proposals published December 2017. |
| Primary focus was credit risk. | Granular, took collateral into account, loan maturity, correlation with market factors. Dedicated to credit-, market-, as well as operational risk. | Aimed to amend the discrepancies of Basel II highlighted below. | Introduced to enhance the shortcomings of Basel III. Ensure robust capital and improve market confidence. |
| Credit ratio introduced as capital to risk to weighted assets = eight percent | Risk calculations include market and operational risk. Enhancement of credit risk calculation. | Amplified the capital charge, constricted the classification of capital and enhanced the quality of bank capital. | Suggests increased capital, liquidity and disclosure requirements for banks. |
| Corrected Basel I to include market risk in 1996. Presented concept value at risk: comprehensive, clever, easy to implement and robust. | Three pillars: (1) Minimum capital requirement, (2) Supervisory review process, (3) Market discipline | Mandatory mix of loss absorbing capital, protection against liquidity risk and counterparty risk, improved governance and improved cyclicality. | Require banks to meet a higher minimum leverage ratio. Restrict banks for making use of internal models to calculate their own capital requirements. |
| **Shortcomings** | | | |
| Market risk was omitted from this accord | Capital requirements provided little shock absorption during GFC in 2008. | Complex capital ratios will challenge bank to comply. | Standardised approach complex and granular, superior implementation efforts needed. |
| Omitted operational and reputational risk. | Capital requirement left out liquidity risk, counterparty risk and reputational risk. | Omitted reputational risk. | Changes in current product structures, business models and strategies may be needed to meet new RWA calculation. |
| Perceived as not complex enough in terms of the assigned risk weights. | Weak combination of bank capital combined with insufficient capital levels. | Decreasing earning due to increase in credit cost. | Will require extensive data relating to the amended credit risk approach |

| | | | |
|---|---|---|---|
| | | | and complex internal market risk models. |
| One-size-fits-all approach. Excluded idiosyncratic risk exposures. | Inadequate definition of equity capital. | Discourage lending due to high leverage ratios. Provided no guideline on how to fund increased capital. | Extensive efforts in reporting requirements in terms of complexity and frequency. |
| Solution: Basel II | Be deficient in a counter-cyclical buffer to safeguard capital against economic business cycles. | Increased liquidity ratios influencing bank profitability. | Extensive upgrade in data software and reporting software. |

Source: Adapted from BCBS (2001); BCBS (2006); BCBS (2009); BCBS (2011); Rose and Hudgins (2013); Crouhy *et al.* (2014); Ferreira (2015); BIS (2017); (PWC, 2017a).

## 2.8 CURRENT OPERATING ENVIRONMENT OF SOUTH AFRICAN BANKS

The current South African banking industry is known for its rapid innovation in terms of new banking products, not limited to the retail and investment banking institutions (Stemmet, 2016:35). The banking sector has further experienced tremendous growth in terms of its client base. According to the SARB (2017), 28 banks (excluding mutual banks and foreign representative branches) are registered within South Africa. Table 2.6 indicates the list of registered banks in South Africa.

**Table 2.6: List of registered banks in South Africa**

| List of banks | |
|---|---|
| Absa Bank Ltd (a member of Barclays Bank Group) | Habib Overseas Bank Ltd |
| African Bank Ltd | HBZ Bank Ltd (a subsidiary of Habib Bank) |
| Albaraka Bank Ltd | Bidvest Bank Ltd |
| BoE Private Clients (a division of Nedbank) | Mercantile Bank Ltd |
| Fairbairn Private Bank (a division of Nedbank) | Rand Merchant Bank (a division of FirstRand Bank) |
| Standard Bank of SA Ltd | Capitec Bank Ltd |
| FirstRand Bank Ltd | First National Bank (a division of FirstRand Bank) |
| Imperial Bank Ltd (a subsidiary of the Nedbank Group) | Rennies Bank Ltd (now a division of Bidvest Bank) |
| Investec Bank Ltd | RMB Private Bank (a division of FirstRand Bank) |
| Marriott Corporate Property Bank Ltd (a subsidiary of Marriott Holdings Ltd) | Sasfin Bank Ltd |
| MEEG Bank Ltd | South African Bank of Athens Ltd |
| Nedbank (a division of the Nedbank Group) | Go Banking (a division of Nedbank in association with Pick 'n Pay) |
| Nedbank Group Ltd | TEBA Bank Ltd |
| Old Mutual Bank (a division of Nedbank) | Wesbank (a division of FirstRand Bank) |

Source: SARB (2017)

In the past decade, the South African banking sector was dominated by the 'Big Four' banks, which included ABSA (as part of Barclays Bank), Standard Bank of South Africa (Standard Bank group), Nedbank (Nedbank group) and First National Bank (FNB) (First Rand Group) (Stemmet, 2016:31). During 2017, the top five banks in terms of market share (largest customer data base) included: Standard Bank, Absa Bank, Capitec Bank, First National Bank and Nedbank, with Capitec Bank as the leader (BusinessTech, 2016; Smith, 2017). The South African banking industry is closely concentrated and dominated by these five banks, hence, any adverse changes in the banking industry will affect the financial sector tremendously.

## 2.9 DEPOSIT INSURANCE IN SOUTH AFRICA

Section 2.3 described the depository role of a bank as imperative for both economic surplus units and economic deficit units. Two types of deposit insurance schemes (DIS) exist, explicit DIS, which is formal of nature, or an implicit DIS where deposits are safeguarded by the national regulator (Coetzee & De Beer, 2016:90). The main benefits and drawbacks of an explicit DIS are obvious.

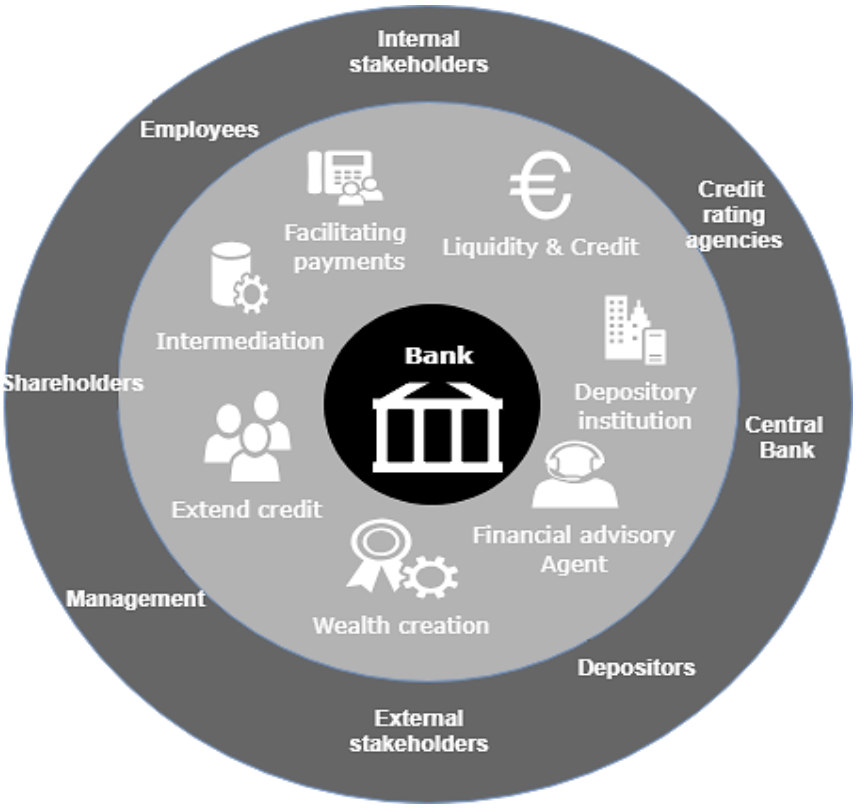
Previous studies, such as Boyle *et al.* (2015), indicate that countries without an explicit DIS face greater withdrawal risk (deposits being largely withdrawn from bank accounts). Hence, an explicit DIS improves depositor confidence regarding the safety of deposits and will most likely reduce the probability of a bank run. At the same time, it reduces time and effort depositors may have spent monitoring the risky activities of their bank, creating an incentive for future bank failures. Further studies by Demirgüç-Kunt *et al.* (2014) also found that countries that had an explicit DIS implemented before the GFC of 2008, experienced less depositor-led bank runs. In South Africa, an implicit DIS is adopted where the National Treasury and the SARB protects deposits in the event of a banking failure. Several proposals have been made to introduce an explicit deposit insurance scheme in South Africa, however, SARB opposes these proposals due to the cost involved with an explicit DIS (Coetzee & De Beer, 2016:91). Many countries such as South Africa may only consider the implementation of an explicit DIS after a systemic bank crisis. This option, however, assumes that a newly implemented DIS will be just as effective as an established DIS (Boyle *et al.*, 2015:590).

## 2.10 THE RISK OF BANK STAKEHOLDERS

As mentioned in preceding discussions in Section 2.2.4, the functions of a bank expose it to various financial risks. On the contrary, these financial risks may also affect and influence the

stakeholders of a bank. According to Hopkin (2017:351), stakeholders can be seen as an interested party who can be referred to as individuals concerned with or affected by a bank. All stakeholders, whether internal or external, is defined as the main determinants of the banks' ideological reputation (Banhegyi, 2007:126). For this study, a distinction was made between internal stakeholders and external stakeholders. Amongst internal stakeholders are internal management and employees. External stakeholders include the South African Reserve Bank (SARB), primary customers such as depositors and shareholders. Figure 2.4 illustrates the relationship between a bank and its internal and external stakeholders.

**Figure 2.4: Primary stakeholders in a bank**




Source: Author compilation

### 2.10.1 Internal stakeholders

The following section, along with Table 2.7, elucidates upon the primary internal stakeholders of a bank. These internal stakeholders may include general staff members and management employees.

**Table 2.7: The expectations and contributions of internal stakeholders**

| Internal staff members | Expectations | Contributions |
|---|---|---|
| General staff | • Continuity of bank<br>• Employment<br>• Support and management<br>• Wealth creation<br>• Ethical conduct | • Scarce skills<br>• Value added through skills<br>• Provide labour |
| Management staff | • Profitability of bank<br>• Achieve objectives<br>• Wealth creation<br>• Ethical conduct | • Scarce skills<br>• Training and influencing of staff<br>• Influence perception of external stakeholders |
| Internal shareholders | • Expected return and dividends<br>• Wealth creation<br>• Transparency | • Owners of bank shares<br>• Influence share price and perception of financial markets |

Source: Adapted from CIPS (2014)

#### 2.10.1.1 Internal staff members

Almost 70 percent of global companies regard their internal staff as the greatest valuable assets within their companies since they provide the scarce skill resources needed (Deloitte, 2014:3), especially in-service industries such as banking, general and management staff provide labour services that cannot be substituted by automation. These internal stakeholders add value to banks through their skill and performance. Management or directors have the additional task to train and motivate general staff members. The performance of management may also influence external stakeholders (Stemmet, 2016:13).

Both internal staff and management contribute towards the ethical conduct of the bank in managing risks; however, both parties expect ethics to be a part of daily banking business (Williams, 2007:291). Internal staff members and management also play a pivotal role, as they could be interested in becoming shareholders in the bank in which they are employed. Internal shareholders generally include owners, directors and top management. Hence, taking serious interest in the banks wealth creation for its shareholders by focussing on the performance of the bank and creating certain financial expectations (Chartered Institute of Purchasing & Supply (CIPS), 2014). These internal shareholders become the beneficiaries whereby they gain financially from the bank's profits (Visser, 2007:129).

### 2.10.2 External stakeholders

Table 2.8 elucidates upon the primary external stakeholders of a bank based on their expectations and contributions. These external stakeholders may include regulators, rating agencies, shareholders and primary customers

**Table 2.8: The expectations and contributions of external stakeholders**

| External stakeholder | Expectations | Contributions |
|---|---|---|
| Regulator | • Continuity of bank<br>• Wealth creation<br>• Compliance | • Regulation of banking activities<br>• Financial support services |
| Rating agencies | • Profitability of bank<br>• Financial strength<br>• Creditworthiness | • Credit rating<br>• Influence perception of external stakeholders |
| External shareholders | • Expected return and dividends<br>• Wealth creation<br>• Transparency | • Owners of bank shares<br>• Influence share price and perception of financial markets |
| Primary customers | • Continuity of bank<br>• Satisfying expectations (added value, services, quality, experience)<br>• Intermediation<br>• Manage risk<br>• Ethical conduct | • Source of revenue<br>• Source of bank continuity<br>• Provide feedback information (survey, complaints)<br>• Ability to move to another bank or withdraw |

Source: Adapted from CIPS (2014)

#### 2.10.2.1 The South African Reserve Bank (SARB)

South African private banks recognise the importance of the SARB as national regulator, since this institution mirrors the level of confidence within the banking sector (Deloitte, 2014:3). The SARB functions as the central bank and provides numerous financial support services to all private banks without any commercial gain. The central responsibility of the SARB is to provide liquidity to the South African banking industry while implementing monetary policy (Otto & Henderson, 2005:11). Central banks from other major countries such as the USA Federal Reserve (FED), UK Bank of England (BOE) and Germany Bundesbank (BUBA) have similar responsibilities to the SARB. The European Central Bank (ECB), on the other hand, reflects a central bank that provides financial support not only to one country but to numerous countries inside European Union (Otto & Henderson, 2005:12).

On a national level, the SARB is primarily concerned with the compliance of private banks, adherence and amendments of legislation and the level of economic activity. The actions and activities of private banks that can negatively influence the primary concerns of the SARB may possibly influence the reputation of these banks negatively (CIPS, 2014). For instance, if a certain bank appears to have tentative financial reports or a long record concerning non-compliance, it may indicate financial instability. Not only will this be alarming to the central bank, but it may also create uncertainty for other external stakeholders such as rating agencies and depositors (Scandizzo, 2011:56).

#### 2.10.2.2 Rating agencies

Banks play a significant function in sovereign ratings of a country due to the depository, saving and investment function, which forms the payment infrastructure of the economy (Fitch Ratings, 2017b). Not only do credit rating agencies provide banks with a credit rating, but also influence the perception of the bank by external stakeholders. Credit rating agencies are principally concerned with the financial soundness of a bank and its ability and willingness to repay debt obligations (Fitch Ratings, 2017a). Banks should avoid downgrade risk – risk of their creditworthiness being downgraded at all times (Fabozzi, 2008:24). The collapse of a single major bank due to weak financial performance can impact the performance of the banking sector by prompting deposit and capital withdrawals, which will ultimately influence the banking sectors' credit rating. In return, a weak banking sector will influence the macro-economy and sovereign rating of the country (Fitch Ratings, 2017b). Hence, the SARB and the government intervene to influence the credit rating by regulating and supervising banking activities. Each bank's ratio of non-performing loans to assets and percentage of domestic and foreign shares and capital adequacy influences their credit rating. Further external stakeholders consist of financial auditors and analysts; associates; insurance entities and other trading parties (Ferreira, 2015:30).

#### 2.10.2.3 Depositors

More than 80 percent of global companies perceive their customers as the greatest stakeholders group (Deloitte, 2014). For deposit safeguarding institutions such as retail, commercial and savings banks, depositors are their main customers and hence, the most important external stakeholders (CIPS, 2014). Depositors expect banks to perform financial intermediation to accumulate depositor savings and transfer it to borrowers (Mohr & Fourie, 2008:338). By

performing financial intermediation, depositors expect the service and performance of the bank to add value as well as give a level of financial satisfaction. While providing products and services, banks are expected to comply with laws and regulations and conduct ethical business transactions.

Depositors expect banks to manage risk in such a way as to protect their financial assets from harm. At the same time, when these expectations of the depositors are not met by their respective banks, depositors have the power to change services to other banks or completely withdraw their funds (Mostert & Lotz, 2010:10). This is the most unwanted scenario since depositors provide the bank with funds to be able to perform financial intermediation in the first place. The more funds customer's deposit, the more funds are available for borrowing, which ultimately leads to a more profitable bank (CIPS, 2014).

Depositors can also become external shareholders if they are satisfied with the bank's performance. These external shareholders become the beneficiaries whereby they gain financially from the bank's profits (Visser, 2007:129). Shareholders are a principal determining factor of a bank's continuity since these shareholders invest in the bank by buying shares. As compensation, these shareholders expect the required rate of return, which is based on the bank's estimated return (inherently based on the bank's performance) (Banhegyi, 2007:126).

## 2.11 EVOLVING NATURE OF RISK WITHIN THE BANKING SECTOR

Recent global events have brought risk under higher attention due to the evolving nature and magnitude of risks within the banking sector (Hopkin, 2017:2). Challenging regulatory changes, expansion of global markets, previous global financial crises as well as changing stakeholder rationale represent some of the most severe evolving risks banks are facing. These evolving risks exist in addition to the rather mundane financial risks discussed earlier in this chapter.

### 2.11.1 Regulation

Regulation is part of the business of banking. However, the new regulatory paradigm adopted by global governments and banking sectors after the global financial crisis of 2008 is imposing much stricter banking controls (ACE, 2013:9). As financial markets and banks continue to globalise, the regulatory banking environment is becoming more challenging to manage than ever. Compliance and transparency are key drivers in the new regulatory paradigm as

stakeholders are becoming acquisitive for transparent reporting (Mukherjee *et al.*, 2015:5). With the new proposed capital requirements that were published in 2017 in accordance with Basel III, South African banks will be required to increase both the quantity and quality of capital. Furthermore, banks are still faced with mitigating risks in line with the current regulation framework, which is by no means an easy task due to globalisation (Coetzee, 2016:25).

### 2.11.2 Globalisation

Since the South African banking sector is highly competitive, banks have entered the process of globalisation to expand their services to stakeholders (Mukherjee *et al.*, 2015:6). Evolving globalisation has made South African banks more efficient, more diverse and has given banks the chance to capture new opportunities. However, as banks expand their global footprints and grasp these new opportunities, more risk is attached (ACE, 2013:12). Advances in technology and the radical spur in social media have changed the manner and speed in which information flows. Technology has changed in such a way that information can travel easily and faster from one point of the earth to another in seconds. As intriguing as this is in terms of data flow, it can just as easily present major risks in terms of stakeholder perception (Mukherjee *et al.*, 2015:6). Hence, it has become more and more difficult for banks to operate within the highly interconnected, competitive and complex banking industry that thrives on innovation (Coetzee, 2016:25).

### 2.11.3 Evolving stakeholder rationale

As the banking sector evolves, stakeholders' rationale and, hence, their expectations will evolve. It may happen that stakeholder's rationale and expectations can become contradictory of the banks rationale and performance (Hopkin, 2017:351). The leading South African banks are recognising the evolving stakeholder rationale and what is at risk − market share (Accenture, 2015). Banks could do more to comprehensively track and evaluate changing perceptions of their most important external stakeholders, namely depositors. Only by doing this will banks be able to identify their vulnerabilities in such a fashion as to create opportunistic competitive advantage (Louisot & Rayner, 2012:4). Depositors' risk perception of banks is imperative to the prosperity and profitability of a bank. A healthy risk perception will only occur if depositors are satisfied with the manner in which a bank manages the risk posed to depositors (Mostert & Lotz, 2010:9). Depositor risk perception and risk tolerance are

associated but often misinterpreted. The risk perception of an individual depositor plays an integral role in the financial decision-making process (Finucane, 2002:237). Risk perception is furthermore associated with the level of depositor uncertainty, which ultimately leads to irrational depositor behaviour (Williams & Noyes, 2007:67).

## 2.12 DEPOSITOR BEHAVIOUR

The most important role of private banks is to establish who their key stakeholders are and to prioritise responsibilities according to these stakeholder characteristics, needs, perceptions and behaviour (Louisot & Rayner, 2012:3). A few previous researchers have analysed depositor behaviour in terms of deposit insurance schemes, bank relationships, performance, perception, trust and bank switching costs.

Murata and Hori (2006:260) focus on the market discipline of depositors by analysing their change in deposit accounts between small deposit taking institutions in Japan during the year 1990. The study focussed mainly on establishing whether market discipline is affected by changes in the regulatory framework, such as changes in the deposit insurance schemes. Results from this study support the role of effective depositor market discipline. A valuable contribution of this study is the finding that individuals deposit smaller amounts of funds and require higher levels of interest at what they perceive as risky deposit institutions. Murata and Hori (2006:271) conclude that the level of sensitivity of depositors has changed over time in accordance with changes in regulation, more specifically, deposit insurance schemes.

Brunettia *et al.* (2016) analysed Italian household depositors and their respective banks over a period of time. Within this sample, the event of bank switching (moving from one bank to another) was quite prevalent, where 25 percent of depositors changed from one bank to another at least twice a year. The study indicated that bank switching is dependent on the bank relationship as well as the idiosyncratic characteristics of the depositors, as well as the bank. It was furthermore found that the number of banking services used and the extent of the services used also contribute to depositors' decisions to switch banks. Results indicated that if depositors are making use of more than one banking service at the current bank, they are 4 percent less likely to switch banks. However, depositors are 8 percent more likely to switch to other banks if they are making use of more than one bank. Similar results were found in an annual banking research study conducted by Accenture (2015) using a 15 000 global sample. Results indicated that 18 percent of bank depositors decided to switch to another bank whereas,

27 percent added additional services from alternative banks. Reasons for the switch from one bank to another included bank performance, perception and trust.

Iyer *et al.* (2016) examined the diversity in depositor responses in accordance with solvency risk during two different bank failure scenarios. The results showed significant findings that suggested that depositors paying off loans at a specific bank, depositors with older accounts as well as current staff members at the bank are less likely to withdraw their funds and switch banks during a minor solvency risk scenario. This group was also found to be highly likely to withdraw and switch banks during a major solvency risk scenario. Depositors without deposit insurance were found to be more sensitive to solvency risk. The results within this study suggest that the fragility of a bank during solvency risk is influenced by the structure of the banks depositor base.

Boyle *et al.* (2015) researched the levels of risk perception of depositors regarding a set of hypothetical banking failures and the role that deposit insurance plays towards risk mitigation during a banking failure. The study also considered the risk tolerance levels of 349 student depositors based in the United States, Europe and New Zealand, which indicated how much risk student depositors are willing to take concerning their country's deposit insurance schemes.

As mentioned in Section 2.3, depositors perform the central part in the intermediary function, since it provides the source of bank funds. South African depositors are even more important since South Africa does not make use of an explicit DIS (Coetzee & De Beer, 2016:91). Understanding how depositors make their financial decisions and how they form their risk perceptions will contribute towards managing banking risk (ACE, 2013:3). A better understanding of how depositors respond towards banking risk will allow banks to be better prepared and respond faster. Hence, the gap emerges for the South African banking industry to study depositor behaviour when faced with risk.

## 2.13 DEPOSITOR DECISION-MAKING BIASES

The financial decision-making behaviour of depositors is dependent on behavioural finance biases. Behavioural finance consists of three elements: firstly, knowledge of finance, secondly, knowledge of economics and lastly, the cognitive psychology when making financial decisions (Zindel *et al.*, 2014:11). Behavioural finance originated due to the irrational manner in which market participants make financial decisions. Behavioural finance biases emanate from

previous research that suggests that individual financial choices under uncertainty are contradictory to rational financial decisions (Thaler & Johnson, 1990:643). These biases are aimed at explaining the causation of depositors' financial decision-making behaviour.

The first bias is based on the theory of representativeness. Kannadhasan (2009:3) states that market participants base financial decisions on inaccurate perceptions and patterns. This group of participants may overreact in the market due to the perception of pattern repetition (Singh, 2012:120). Therefore, depositors, subject to the representativeness bias, base their financial decisions on the past performance of a bank. The two attributes of confidence and courage lead to the second behavioural finance bias of overconfidence (Bodie *et al.*, 2013:267). This theory is the result of market participants who have a tendency to overestimate their financial capabilities. As a result, these market participants tend to compete with the rest of the market in order to outperform (Singh, 2012:118). The depositor's level of confidence, in terms of their level of financial knowledge, usually drives their financial decisions.

The theory of anchoring assumes that market participants choose to base decisions on a single piece of information (past or current) despite the widespread information available (Kannadhasan, 2009:3). Due to the susceptibility of market participants such as depositors to rely on a particular piece of information, the change to new market information is rather slow. Depositors subject to the anchoring bias will tend to make decisions based on the information at hand and will fail to do sufficient market research about the current risky activities of their bank.

Gamblers fallacy is a theory based on market participants who inaccurately predict financial market movements by basing their decisions on future trends. These decisions normally lead to a loss and not a profit (Singh, 2012:118). Depositors subject to the gamblers fallacy bias will make decisions based on their expected future performance of the bank without having any substantial motivation. Availability bias describes financial decisions to be based on the latest accessible information only (Kannadhasan, 2009:5). Typically, these market participants lack historical information and are likely to interpret available information inaccurately. Due to the fact that financial decisions of depositors within this bias are based only on recent available information, it can possibly hamper financial ability, which can simultaneously reflect large losses. For instance, if the latest information reflects news regarding a bank's current low level of liquidity (despite previous good performance), depositors within this bias will be the first to withdraw their money or move to another bank.

Loss aversion is reflected by market participants where mentally a large financial loss is more significant than an equally large financial profit (Singh, 2012:120). Dissimilar emotions (i.e. joy, anxiety and excitement) are naturally experienced by these participants when profits and losses are made. Moreover, market participants tend to hold on to financial assets, yielding weak returns and will attempt to enhance returns by being more risk aggressive in terms of their financial decisions. Hence, it can be concluded from this bias that depositors, subject to this bias, will keep their deposits in the non-performing risk with the hope that this bank will yield greater returns in the future.

Self-control is a measure frequently implemented by market participants who are subjected towards the temptation of taking on bigger financial risks. The overriding objective of this bias is to avoid large financial losses to protect financial assets (Kannadhasan, 2009:6). Depositor's subject towards this bias will be extremely cautious when making financial decisions. Market participants also experience the regret aversion bias due to past bad judgement in terms of financial decisions (Quiggin, 1994:154). This bias is evident when participants regret making bad financial decisions due to those decisions not delivering the expected outcomes. These market participants may experience psychological soft factors such as regret, guilt and grief when their financial assets do not perform as expected due to bad judgement. According to Zeelenberg and Pieters (2007:4), depositors who are subject to the regret aversion bias will be more inclined to avoid risky financial decisions or risky banking activities in order to avoid the feeling of regret, guilt or grief.

With the mental accounting bias, market participants group information and financial decisions into separate mental compartments. However, information can vary depending on the specific events that may impact the market participant's behaviour more than the actual event itself (Jagongo & Mutswenje, 2014:92). For instance, if a depositor is faced with two separate types of bank accounts yielding two different interest rates, the one rate being relatively similar to the current inflation rate and the other rate relatively higher than the inflation rate, moving to the higher interest saving account would mean having to change deposit institutions. The depositor will generally compare the two scenarios and will avoid changing accounts. Table 2.9 highlights the behavioural finance biases in the context of depositors.

**Table 2.9: Behavioural finance biases of depositors**

| Theory | Description |
|---|---|
| Representativeness | Depositors base their financial decisions on their perception of the past performance of a bank. |
| Overconfidence and over optimism | Depositors base their financial decisions on their superior financial knowledge. |
| Frame dependence and anchoring | Depositors base their financial decisions on a single piece of information (past or present) in order to make financial decisions. |
| Gamblers fallacy | Depositors inaccurately predict financial market movements by basing decisions on future trends or performance of the bank. |
| Availability bias | Depositors make inaccurate financial decisions due to basing decisions on available or current information only. |
| Loss aversion | Depositors will tend to keep their deposits at their current bank instead of changing to another bank. |
| Regret aversion | Depositors base financial decisions on the past feelings of regret, guilt or grief. |
| Mental accounting | Depositors group information and financial decisions into separate mental compartments. |
| Self-control | Depositors exercise self-control when making financial decisions in order to avoid large financial losses. |

Source: Author compilation

One of the overriding empirical objectives of this study is to determine how South African depositors make financial decisions. Behavioural finance, therefore, makes a tremendous contribution to this in determining the biases to which depositors are subjected. Previous studies found that market participants who are subject to certain behavioural biases have a specific level of risk tolerance associated with them.

Pompian (2016) and Dickason *et al.* (2017:9550) found that market participants who are subject to the loss aversion bias, anchoring bias and mental accounting bias have a low risk tolerance level. Market participants who are subject towards the regret bias will have a medium risk tolerance level. Those subject towards the representativeness bias, availability bias, overconfidence and self-control will exert a high-risk tolerance level.

## 2.14 RISK TOLERANCE OF DEPOSITORS

Over the past three decades (1990-2018), global financial markets have endured tremendous banking failures (Iyer *et al.*, 2016:260). Therefore, within the personal, domestic and financial lives of depositors, the instinctive automatic response to risk is to be risk adverse (Hopkin,

2017:2). The willingness of a depositor to take on risk is called risk tolerance, thus, the amount of risk willing to be tolerated by an individual. Grable (2000:262) defines risk tolerance as the maximum amount of risk tolerance willing to be accepted when making financial decisions. Moreover, Hanna and Chen (1997) add to the risk tolerance definition the emotional acceptance, which can possibly influence volatility, the risk attitudes of depositors and also the readiness of these depositors to accept possible financial losses. Risk tolerance of depositors can be influenced by various factors such as demographics, employment, financial knowledge and household size as exemplified in Table 2.10 below.

**Table 2.10: Influential factors of risk tolerance**

| Individual characteristics | Assumed to be more tolerant |
|---|---|
| Age group | Young individuals |
| Level of education | Bachelor's degree or higher |
| Employment status | Employed full-time |
| Ethnicity | Non-Hispanic white |
| Level of financial knowledge | Extraordinary knowledge level |
| Financial satisfaction | Extraordinary satisfaction level |
| Gender | Male |
| Homeownership | Titleholder of home property |
| Household size | Great number of members |
| Income | High income level |
| Income type | Entrepreneur |
| Income changeability | Stable and predictable income |
| Locus of control | Internal locus |
| Marital status | Single |
| Marital/gender interaction | Single male |
| Mood | Happy |
| Net worth | High |
| Work | Professional |
| Personality type | Type A |
| Religion | Less religiosity |
| Level of self-esteem | Great self-esteem |
| Sensation level | Great sensation |

Source: Irwin (1993)

Since the focus of this study is to determine the risk tolerance levels of the South Africa depositor base, emphasis will be given to the demographical factors, which can be influential. The researcher, Cutler (1995:33) states that one of the influential factors of risk tolerance is age. Irwin (1993) did a study to determine whether young or old individuals are more risk tolerant. Grable (1997:14) concludes that older individuals do not have sufficient time to recover from incorrect financial decisions made and the accompanied losses.

Some of the first researchers to analyse the relationship between age and risk tolerance were (Wallach & Kogan, 1959:24). In their research, they found a cautiousness in older individuals' financial decision-making processes. It is believed by Gibson *et al.* (2013:34) that young individuals are willing to tolerate more risk as time is on their side and a good recovery can be made from losses due to incorrect financial decisions. Not all researchers have consensus regarding the relationship between age groups and level of risk tolerance. Some researchers (Botwinick, 1966:571; Vroom & Pahl, 1971:399; Baker & Haslem, 1974:469; Okun & DiVesta, 1976; Morin & Suarez, 1983:1201; Hawley & Fuji, 1993:197; Wang & Hanna, 1997:29; Grable, 2000:625; Van de Venter *et al.*, 2012:795; Dickason, 2017:198) conclude from their research that older individuals tolerate more risk than young individuals do. On the contrary, Sung and Hanna (1996b:13), Grable and Lytton (1999:56) and Anbar and Eker (2010:510) find that no significant relationship exists between age and the level of risk tolerance of individuals.

Contrary views exist as to whether gender is a significant factor that can influence the level of risk tolerance. Previous research studies conducted by Higbee and Lafferty (1972:249), Blume (1978), as well as Coet and McDermott (1979:1283) and Yip (2000:4) conclude that gender is a determining factor of the risk level an individual is willing tolerate. Researchers in the field of risk tolerance wanted to determine if males are more risk tolerant than females or vice versa. It can be established from the research performed by Roszkowski *et al.* (1993:200), Sung and Hanna (1996a:226), Sharma (2006) and Rahmawati *et al.* (2015:373) that males are higher risk tolerant than females. On the contrary, a relationship between gender and the level of risk tolerance was not found by Yip (2000:3).

As indicated in Table 2.10, it generally is believed that White individuals have higher levels of risk tolerance due to being more fortunate. This norm is drawn from the belief that White individuals have better access and more often access to banks, more opportunities to invest and are more focussed on what the future holds. MacCrimmon and Wehrung (1986:155) and Zhong

and Xiao (1995:108) state that due to non-Whites being less fortunate, a lack of confidence is displayed in their decision-making skills and analysis abilities. In contrast, Leigh (1986:17) find that non-Whites were willing to tolerate more risks than Whites.

The relationship between ethnicity and risk tolerance in South Africa was analysed by Metherell (2011) and Van Schalkwyk (2012). These research studies indicate that a significant difference exists between White and Indian individuals. Moreover, it was found that African individuals tolerate higher levels of risk than White individuals, making African individuals more risk tolerant.

Irwin (1993) states that it generally is accepted that individuals earning high annual incomes are willing to tolerate more risk than individuals earning lower annual incomes are. Moreover, Warren *et al.* (1990:74) state that high income earning males are more risk tolerant than high income earning females. This is based on the financial decisions made by males compared to females. Various researchers (Grable, 2000:625; Grable & Joo, 2004:73; Rahmawati *et al.*, 2015:376) find consensus in their research that individuals earning high annual incomes are more likely to take on risk. Irwin (1993) concludes that high levels of education could affect the risk tolerance of individuals. Hallahan *et al.* (2003:56) state that individuals with a bachelor's degree or higher are more risk tolerant. The relationship between risk tolerance and education has been investigated by various researchers (Baker & Haslem, 1974:469; MacCrimmon & Wehrung, 1986:200; Sung & Hanna, 1996b; Ardehali *et al.*, 2005:513). These researchers reached a consensus that higher education levels enable individuals to better assess risks and benefits than individuals with lower levels of education.

This study analyses depositor's levels of risk tolerance and whether the various demographic factors of age, income and education influence the risk tolerance level of depositors. The study aims to determine whether the risk tolerance of South African depositors is in line with previous studies or contradicts them. The established risk tolerance level associated with individuals will give the top five banks in South Africa a better indication of how much risk their customers are willing to tolerate when faced with risk. This could possibly contribute tremendously towards risk mitigation by accounting for irrational human behaviour.

## 2.15 SYNOPSIS

At the heart of a bank's role lies its intermediary function. Bank deposits form the central unit of a bank since it provides the source of bank funds from the surplus economic units known as depositors. Hence, depositors play a central role in the economic and monetary function of a country. As the banking sector evolves, depositor rationale and, hence, their expectations evolve. It may happen that their rationale and expectations can become contradictory of the banks rationale and performance. The leading South African banks are recognising the evolving stakeholder rationale and what is at risk − market share. In the past decade, the South African banking sector was dominated by the 'Big Four' banks, which included ABSA, Standard Bank, Nedbank and FNB. During 2017, the top five banks in terms of market share (largest customer data base) included: Standard Bank, ABSA, Capitec Bank, FNB and Nedbank, with Capitec Bank as the leader. The South African banking industry is closely concentrated and dominated by these five banks, hence, any adverse changes in the banking industry will affect the financial sector tremendously.

Banks could do more to comprehensively track and evaluate changing perceptions of depositors. South African depositors are even more important since South Africa does not make use of an explicit DIS. Without an explicit DIS South Africa face greater withdrawal risk where depositors will be more likely to withdraw larger amount of funds from their bank accounts when exposed to risk. Hence, South Africa also faces the challenges of maintaining depositor confidence regarding the safety of deposits and will most likely increase the probability of a bank run. The financial decision-making behaviour of depositors is dependent on behavioural finance biases. Behavioural finance biases emanate from previous research that suggests that individual financial choices under uncertainty are contradictory to rational financial decisions. These biases are aimed at explaining the causation of depositors' financial decision-making behaviour. Also. depositors' risk perception of a bank is imperative to the prosperity and profitability of a bank. A healthy risk perception will only occur if depositors are satisfied with the manner in which a bank manages the risk posed to depositors

Understanding how depositors form their perception of a bank and make their financial decisions will contribute towards managing banking risk. Only by doing this will banks be able to identify their vulnerabilities in such a fashion as to create opportunistic competitive advantage. A better understanding of the level of risk depositors are willing to tolerate in terms of their personal finance will allow banks to be better prepared and respond faster to banking

risk. This can be performed by establishing a risk tolerance level for a bank's depositor base. It is imperative for banks to recognise that the risk tolerance level, and behavioural biases they are subject towards. Hence, the gap emerges for the South African banking industry to study depositor behaviour when faced with risk.

Chapter 3 provides the last literature section by illuminating on the risk management of reputational risk, which is influenced primarily by depositor behaviour.

# CHAPTER 3: REPUTATIONAL RISK

*"Everything an organisation 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)*

## 3.1 INTRODUCTION

Before reputational risk can be discussed, it is imperative to first define what is meant by a reputation. A corporate reputation refers to the opinions held by stakeholders regarding a specific institution's performance or behaviour (Oxford English Dictionary, 2017a). Whenever these opinions by the stakeholders are controversial in nature, risk to the institution's reputation arises. Reputational risk is a major corporate threat since no standard definition for this risk exists. When reputational risk is not successfully identified and managed, it can be the most destructive type of risk any financial institution may be exposed to (Ross, 2005; Soprano *et al.*, 2009:159). The aim of Chapter 3 is to achieve the following theoretical objectives:

- Contextualise a definition for reputational risk based on theory;
- Provide a theoretical framework for reputational risk; and
- Explore the relationship between reputational and operational risk by giving emphasis to previous studies.

Therefore, the first section of this chapter defines reputation as well as the formed definition for reputational risk as used throughout this study. Even a cursory review of operational risk events reveals the severe consequences on the reputation of a bank (Cummins *et al.*, 2006:2606). However, in order to explain the origin of reputational risk the relationship between operational risk and reputational risk will be included in this chapter. Throughout the year 2000 to 2017, only a small number of operational risk events have been stated within the South African banking sector (2000 – 2017). These events have shaped regulator opinions regarding operational risk events and reputational risk. Among these were the internal fraud of Regal Treasury Bank (2000), the insider trading of Saambou Bank (2001), the curatorship of African Bank (2014) as well as the fines and penalties paid by Standard Bank (2015), Capitec Bank (2016) and ABSA Bank (2017). Depositors and their behaviour, as the focus of

stakeholders, played a significant role in each of these events. The role of reputational risk management among these banks also contributed towards their losses.

This chapter will focus on the role of the perception (reputational risk) of stakeholders (specifically depositors) after operational risk events where these events will be classified into seven event categories. The second section of this chapter elaborates on the origin of reputational risk and its relationship with operational risk. The chapter further goes on to explain how operational risk events result in reputational consequences as well as how managerial decisions affect reputational risk exposure (Soprano *et al.*, 2009:159). The last section of the chapter recommends additional strategies aimed at managing reputational risk.

## 3.2 WHAT IS A CORPORATE REPUTATION?

The concept of a corporate reputation has evolved throughout the ages (Spedding, 2014:2). The noun reputation stems from the Latin word *reputare*, which means to think over. According to the Oxford English Dictionary (2017a), reputation is defined as "the beliefs or opinions that are generally held about someone or something". Controversial perceptions also exist regarding the brand of a financial institution and its reputation (Louisot & Rayner, 2012:1). The central function of a bank inherently exposes it to various financial risks where each of these risks has the possibility to influence stakeholders' perception. This perception, which is linked to the trustworthiness, credibility and performance of the bank, translates into the reputation of the bank (Vardy, 2015:2), whereas a brand relates to a specific product or service of any institution (Louisot & Rayner, 2012:1). The importance or value placed on a corporate reputation has also evolved over time. Globalisation, social media, intangible assets and competitive markets have all contributed towards the importance of a reputation (Spedding, 2014:2)

## 3.3 WHY IS A CORPORATE REPUTATION IMPORTANT?

"*Who steals my purse steals my trash. But he that filches me my good name, robs me of that which not enriches him and makes me poor indeed*" (Shakespeare, 1622, 3.3:165).

From the quotation above it is clear that the value of a reputation is more important than any material object. Hence, a corporate reputation is important for two main reasons. First, a reputation represents the intrinsic current value of a bank and, secondly, it represents a bank's ability to create or erode future value (Louisot & Rayner, 2012:2). A reputation is an intangible asset since it cannot be physically accounted for on the balance sheet (Brady & Honey, 2007:6).

However, a reputation will represent the deviation between a bank's market capitalisation and book value (Low & Kalafut, 2002:259). Since intangible assets, ever so often, account for more than 75 percent of a bank's market value, a reputation might represent its greatest asset (Louisot & Rayner, 2012:2).

The significance of this intangible asset yields solid returns such as retained trust and confidence for both internal and external stakeholders, not to mention the competitive advantage in a close banking environment (Louisot & Rayner, 2012:2). A respectable reputation will inherently affect profitability, as it is the gatekeeper to generating new business relationships with depositors and for additional cash flows. A good reputation is also reflected within the share price of a bank as shareholders will be more encouraged to pay a higher price for the banks stock (Tonello, 2007:6). Banks with a better reputation have also been found to perform better and retain their share price during periods of high market volatility (Mazzola *et al.*, 2006:389).

A corporate reputation is a significant business differentiator, especially for the banking industry where the end product is intangible. The majority of stakeholders such as depositors make a decision regarding a bank service provider based on the banks reputation (i.e. perception regarding performance) in the market. On the other hand, a mediocre reputation can result in a loss in depositor confidence, dissatisfaction from shareholders, disloyal employees as well as irrevocable damage to a bank itself (Louisot & Rayner, 2012:2). A poor reputation will attract a lower share price resulting in fewer quality internal and external stakeholders (Tonello, 2007:6). Therefore, a reputation is most valuable to a bank since it is a primary determinant of future business success. The resilience of a corporate reputation, which is based on the banks reputational capital (reserve of goodwill) with its stakeholders (i.e. depositors), will determine if the possible damage to a reputation will translate into a reputational risk (Louisot & Rayner, 2012:6).

## 3.4 REPUTATIONAL RISK DEFINED

Reputational risk remains a corporate threat since no standard definition for this risk exists. Various institutions have attempted to define it, all with the same theme in mind (loss in reputation due to the negative perception by stakeholders), but not yet commonly shared by global risk managers (Soprano *et al.*, 2009:159). The absence of a globally accepted definition of reputational risk by banks indicates that each of these financial institutions perceive

reputational risk idiosyncratically (ACE, 2013:8). The question of how to define reputational risk remains. The following section defines reputational risk in terms of the main themes embedded within the concept:

- expectations;
- perception;
- stakeholders; and
- competition.

According to Schreiber (2011:92) and Honey (2012:3) reputational risk is concerned with the expectations of financial, operational and other related stakeholders regarding a bank's performance. From this definition, it is clear that stakeholders will expect some level of performance from a bank, which they believe they are entitled to receive (Schreiber, 2011:92). These stakeholders are also fully entitled to form any perception, negative or positive based on their current and future expectations regarding a bank. Expectations are not general, but rather stakeholder-specific, as these expectations will vary across internal and external stakeholders (Schreiber, 2011:93).

The second theme embedded in reputational risk is perception. Low and Kalafut (2002:260) and Aula (2010:44) regard reputational risk as the risk of losing reputation due to people's perception of the bank. Sweeting (2011:109) expands on these definitions by adding that negative perception in terms of publicity, whether true or untrue, has various consequences. Perception, whether positive or negative, has the possibility to erode or enhance a bank's reputation. These perceptions are held by various stakeholders especially depositors (Schreiber, 2011:91).

The third theme places the emphasis on stakeholders. BCBS (2009:19) regards reputational risk as the risk arising from various stakeholder perceptions (depositors, associates, investors, debt-holders or regulators) where these stakeholders and their perception, have the ability to affect a bank's capacity to preserve or produce new business relationships. Lange *et al.* (2011:154) goes so far to say that stakeholders will judge an institution critically or constructively over a period of time, where after these stakeholders will form a perception.

The fourth theme introduces competition into the concept of reputational risk. Schreiber (2011:92) extends his own definition by stating that reputational risk incorporates the expectations of stakeholders regarding a bank's performance, compared to the performance of other banks in the industry. This adds to the significance of sustaining a sound reputation,

where a bank has to live up to the expectations of numerous stakeholders, but has to do so while outperforming its competition. Therefore, within this theme, reputational risk is closely linked to past and present performance in terms of trustworthiness and level of satisfaction where this performance is measured against expectations and industry standards (Lange *et al.*, 2011:153).

For this study, all four themes of expectations, perception, stakeholders (primarily depositors) and competition are adopted for inclusivity. Reputational risk for this study is defined as "the risk arising from the negative perception of a bank, formed by its depositors due to the bank performing below the expectations of depositors in comparison with the banking industry".

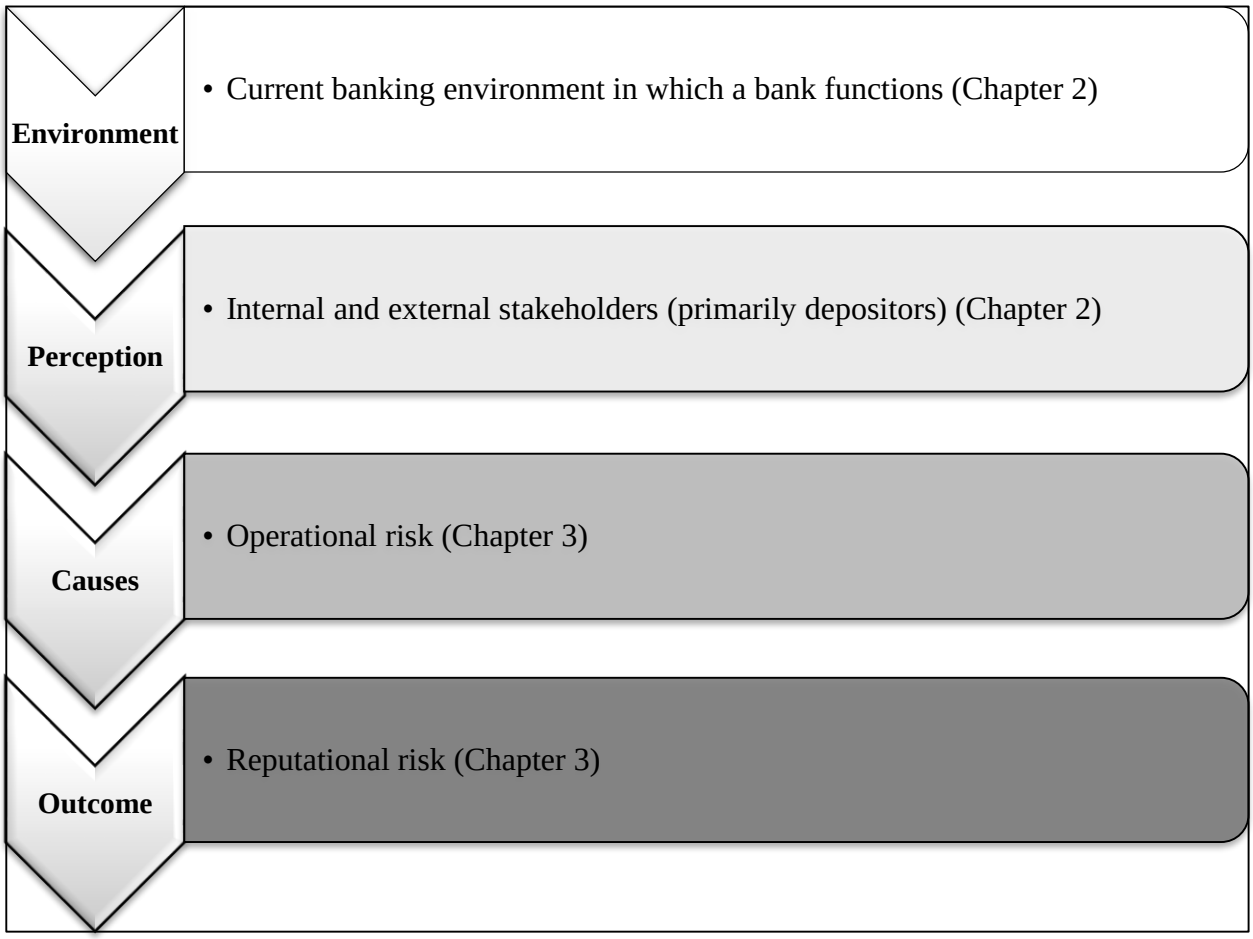
## 3.5 THE ORIGIN OF REPUTATIONAL RISK AS A PROCESS

Due to the various definitions of reputational risk, it may be beneficial to explain how this risk occurs by means of a process. Figure 3.1 illuminates the role that the internal banking environment and stakeholders (as described in Chapter 2) play with regards to the origin of reputational risk. Figure 3.1 goes on to illustrate the connection between operational and reputational risk and the consequences of these risks.

The assumption can be made that the risk tolerance level of banks for reputational risk is close to zero. Nevertheless, it may still be entirely impossible for any bank to completely avoid risks to its reputation (Ross, 2005). Evidence of such could be seen during 2017 wherein South Africa was experiencing periods of high financial stress as the economy grew weaker. During such weak economic conditions, banks are expected to deliver policy measures in order to help restore the financial stability in the market (Vardy, 2015:3). The performance of banks based on their past and current performance during these periods are judged by the perception of its internal and external stakeholders (Soprano *et al.*, 2009:159).

As mentioned in Chapter 2, various stakeholders, both internal and external, have an influence on a bank, more particularly on its reputation. Behind the image and brand of a bank lies the internal stakeholders such as the communication managers and operational managers who carry out a significant role in the reputation of a bank (Steyn *et al.*, 2004:79). Internal management has the power to influence the reputation of a bank but cannot change the perception of external stakeholders. Although employees, such as line management, are not always at the steer of reputation but just as external stakeholders, they also form a perception of the bank they are representing (Vardy, 2015:5).

**Figure 3.1: The origin of reputational risk**



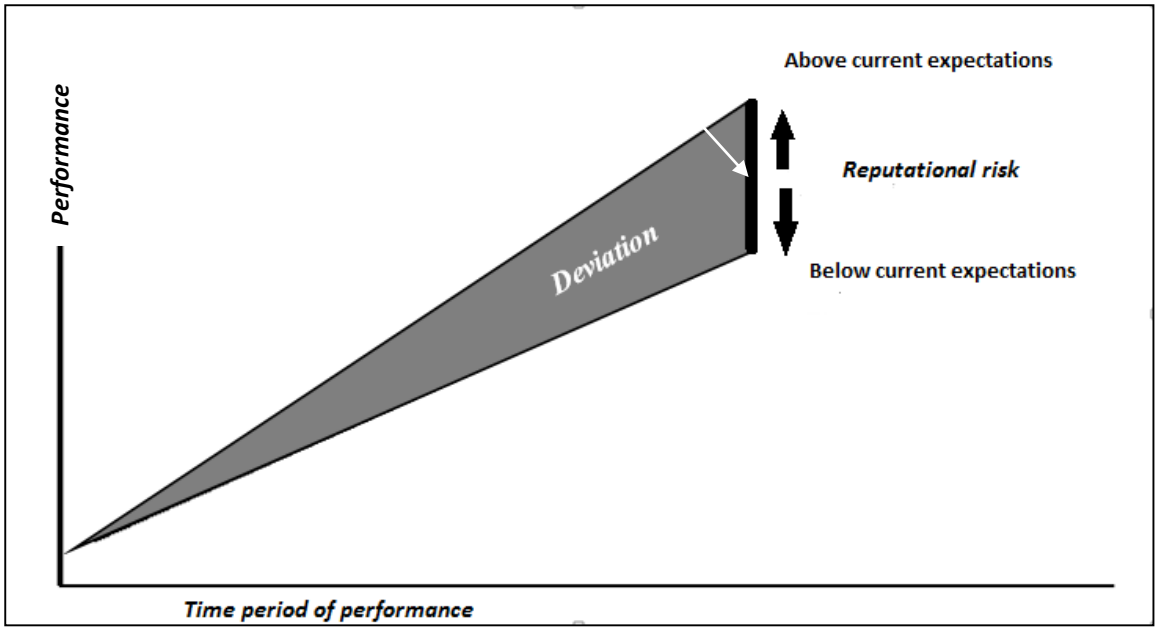

Source: (Ross, 2005; Soprano *et al.*, 2009; Vardy, 2015)

External stakeholders such as the government and credit rating agencies can influence the perception of banks; such evidence was obvious during 2017 when South Africa's banking industry was downgraded after the foreign currency sovereign rating was downgraded to non-investment grade status (Moody's Investors Service, 2017). Credit rating agencies (also external stakeholders) argued that banks could not perform according to expectations with a government that is performing below the expectations of stakeholders (le Cordeur, 2017). More important, external stakeholders are the general public in the form of depositors; those making use of bank services. These stakeholders base their perceptions (subjective in nature) of a bank on recent information (various sources of information) and have the power to ensure the continuity of a bank (Vardy, 2015:5).

According to Figure 3.2, reputational risk originates when a bank is performing below the expectations of the stakeholders (internal and external) (Deloitte, 2014:5; Ferreira, 2015:43), where performance is measured as current and past performance. For the purpose of this study,

however, the expectations of depositors will play the largest role in determining the reputational risk of a particular bank. Hence, the larger the deviation between the actual performance of the bank and the expectation of what the performance should be, the larger the exposure to reputational risk (Honey, 2012).

**Figure 3.2: The role of depositor expectations**



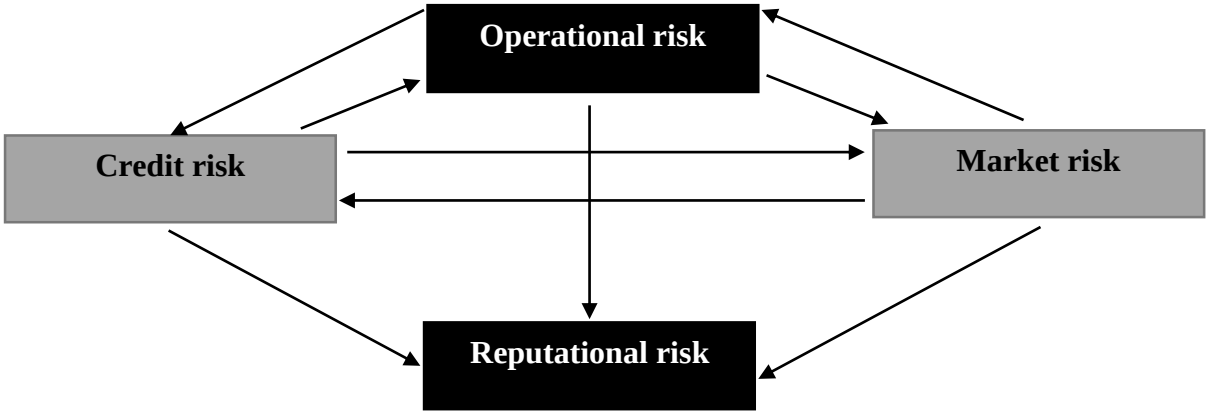

Source: Ferreira (2015:43)

The performance of top management and other key departments and the effectiveness of their communication strategy to the depositors determine whether reputation is eroded or preserved (Deloitte, 2014:5). Every action that a bank takes (what the bank does and what the bank says), as well as every decision that the bank makes has the likelihood of resulting in reputational risk. In the event that any activity or decision is perceived to be controversial by the depositors reputational risk will occur (Manjarin, 2012:3). A bank will gain a sound reputation where the perception amongst depositors is positive and where the bank is performing above current expectations (Eccles *et al.*, 2007:4). The level at which the bank performs – below or above expectations – depends on the risk to which the bank is exposed. The next section elaborates on the type of risk and events that give rise to reputational risk.

## 3.6 THE LINK BETWEEN REPUTATIONAL AND OTHER RISKS

Reputational risk dominates the South African financial market as well the banking industry (Deloitte, 2014). Contradictions exist regarding the existance of reputational risk as some banks regard reputational loss a result of pure reputational risks while the rest of the banks regard it as a consequence of other risks (secondary risk) (Ferreira, 2015:45). Hence, reputational risk can be associated with other financial risks including credit risk as well as market risk (Soprano *et al.*, 2009:160). Chapter 2 indicated that credit risk is the risk that a bank suffers due to a counterparty that fails to repay a loan i.e. fails to adhere to its debt commitments (Crouhy *et al.*, 2014:30). Often losses occur where banks are uncertain whether to classify a loss as credit or operational risk (Soprano *et al.*, 2009:14). South Africa's economy is market based, so the banking sector is exposed to considerable market risk. Market risk is the risk of loss in a banks off-balance sheet position due to adverse market price movements (Rose & Hudgins, 2013:184). Hence, market risk can also generate reputational risk exposure. Figure 3.3 illustrates how credit risk and market risk play a role towards reputational risk. This study discusses operational risk as a source of reputational risk.

**Figure 3.3: Operational risk as a leading cause of reputational risk**




Source: Adapted from Araújo and Vinhado (2016)

### 3.6.1 Operational risk defined

Despite the influences of credit risk and market risk, operational risk remains the fundamental cause of reputational risk (Deloitte, 2014). Operational risk lacked attention until the 1990s due to the large emphasis placed on credit risk and market risk (Soprano *et al.*, 2009:9). Financial institutions and local regulatory and financial rating agencies recognised the significance of operational risk, but struggled to define it until the BCBS (2001) defined operational risk during

its consultative report (Cummins *et al.*, 2006:2607). Previous studies such as Cummins *et al.* (2006) and Gillet *et al.* (2010) found reputational risk to be strictly correlated to the analysis of operational risk.

Before the link between operational risk and reputational risk can be established, it is important to explain what is meant by operational risk. The BCBS (2001:2) define operational risk as a risk of direct or indirect losses arising from inadequate or failed internal processes, people, systems or from external events. This definition of operational risk intentionally excludes reputational risk due to the purpose of a minimum regulatory capital charge for operational risk (Ferreira, 2015:24). The following section defines operational risk in terms of the main operative terms embedded within the concept:

- direct or indirect losses;
- people;
- process;
- systems; and
- external events.

According to the BCBS (2001:2) and Chernobai *et al.* (2007:18), direct or indirect losses can be described as the costs inherent with managing operational risk. Among these are the following loss categories:

- write-down of a bank's assets due to theft or internal fraud, including market or credit losses;
- loss of recourse where funds were released incorrectly and could not be recovered;
- restitution paid to stakeholders as compensation as a result of operational risk;
- legal costs paid to settle disputes as a result of operational risks;
- regulatory and compliance fines paid for not complying with relevant laws or regulations;
- losses or damage to physical assets as a result of natural disasters; and
- indirect losses in the form of opportunity costs inherent in managing operational risks.

The second operative term is people, where this refers to risk as a result of employee error, which may include a lack of expertise or competence, fraud, including a lack of compliance with existing procedures and policies. It can also include key employees leaving the bank or employee misdeeds such as harassment or discrimination (Sweeting, 2011:105).

The third operative term involves losses, which may be incurred due to operational process failures. This may include the inadequate processing of transactions or clients' data, failures in the communication process or other business processes leading to direct or indirect operational risks (Chernobai *et al.*, 2007:18). Operational system failure is often classified as technical and technological failures, which may involve inadequate tools to measure the level of operational risk. Such failures can include outdated software and inadequate information systems (Young, 2006:14).

External events are the last operative term embedded within the concept of operational risk. Because these events originate from an external source, such events tend to result in unexpected losses (Chernobai *et al.*, 2007:19). External events may include external fraud by third parties or natural disasters of which the bank has no control over and usually reduce the risk by sharing it through insurance.

### 3.6.2 Operational event types

All of the abovementioned operative terms can give rise to operational risk events. This shows the need to be explicit about exactly what is meant by operational risk events. The BCBS (2006), during the global convergence of capital measurements for operational risk, categorised operational risk events shown in Table 3.1.

#### 3.6.2.1 Internal fraud

Internal fraud takes place due to the deliberate embezzlement of bank assets, theft, insider trading or the evasion of laws by any internal party in the bank. Such operational events may include cases of unauthorised trading where transactions were intentionally not reported or unauthorised. Mismarking of a bank's position (i.e. the bank is not as financially sound as reported) is also classified among internal fraud and theft. According to the studies by Ruspantini and Sordi (2011) as well as Moosa and Li (2013), cases of internal fraud were found to be the most severe operational events experienced by banks.

#### 3.6.2.2 External fraud

External fraud includes a breach of system security due to the deliberate embezzlement of the bank's assets or by evading laws and regulations. It encompasses sub-categories such as theft of information or hacking. Hacking in the form of cyber-attacks as well as other technology-

driven crimes are considered as a form of fraud instead of information damages (Soprano *et al.*, 2009:17).

#### 3.6.2.3 Employment practice and workplace safety

Employment practice and workplace safety includes three sub categories of activities giving rise to operational risks, namely employee relations in the workplace, health and safety as well as any form of discrimination. The majority of studies regarding operational risk found this event category to be the least severe (Gillet *et al.*, 2010:225). The reason being that information regarding this event is usually internal and confidential and is seldom fully disclosed to the public (Soprano *et al.*, 2009:18).

#### 3.6.2.4 Clients, products and business practices

Clients, products and business practices are also seen as some of the most severe types of operational risk events (Soprano *et al.*, 2009:14). This event consists of both the intentional and unintentional failure to act in accordance with the obligations to bank clients, inadequate products or from the wrongful intent of a product. According to the BCBS (2006), five subcategories exist within this event category, the first being suitability, disclosure and fiduciary breaches. This may include any activities where a client's privacy was breached, disclosure or client guideline violations, aggressive loan extensions or severe cases of lender liability (Crouhy *et al.*, 2014:510). Improper bank or market practices may include insider trading, money laundering or any form of market manipulation by manipulating currencies or interest rates. A third sub-category includes product flaws such as model errors in how a bank structures a product. Selection, sponsorship and exposure are where a bank failed to investigate its clients per guidelines or exceeded the exposure level of a client. The last sub-category includes advisory activities related to disputes over performance advisory activities (BCBS, 2006:305).

#### 3.6.2.5 Damage to physical assets

Damage to physical bank assets encompasses losses due to natural disasters or due to human-made events such as terrorism or vandalism. The exposure level of this event is calculated by accounting for the aggregate real estate value of a bank. Such events may involve a single local branch or the headquarters of a bank (Crouhy *et al.*, 2014:510).

#### 3.6.2.6 Business disruptions and system failures

Business disruptions and system failures include losses due to the disruption in the normal course of business or due to system failures (Chernobai *et al.*, 2007:24). System failures may be due to the failure of hardware or software or due to power failures. The severity of this event is often challenging to quantify, as a firm-wide event may be associated with the failure of a single unit within the bank (i.e. power outage due to faulty wire on the ground floor).

#### 3.6.2.7 Execution delivery and process management

Execution delivery and process management encompasses the failures associated with transactions, monitoring and reporting processes, customer documentation and management as well as losses from traders, vendors and suppliers. The majority of these events occur at a high frequency with a lower severity level (i.e. miscommunication, data entries, accounting errors, missing documents). On the other hand, sub-categories such as monitoring and reporting, where a bank failed to comply with their mandatory reporting obligations, occur at a lower frequency, but at a higher severity level meaning larger losses (i.e. fines or penalties) (Cummins *et al.*, 2006).

**Table 3.1: Operational risk event types**

| Risk type category | Sub-category | Activity |
|---|---|---|
| **Internal fraud** | Unauthorised activity | Transactions not reported (intentional)<br>Transaction type unauthorised<br>Mismarking of position (intentional) |
| | Theft and fraud | Fraud, credit fraud, worthless deposits<br>Theft, extortion, embezzlement, robbery<br>Misappropriation of assets<br>Malicious destruction of assets<br>Forgery<br>Account take-over or impersonation<br>Tax non-compliance, evasion (wilful)<br>Bribes, kickbacks<br>Insider trading (not on firm's account) |
| **External fraud** | Theft and fraud | Theft/Robbery<br>Forgery<br>Check kiting |
| | Systems security | Hacking damage<br>Theft of information (monetary loss) |
| **Employment practice and workplace safety** | Employee relations | Compensation, benefit, termination issues<br>Organised labour activity |

| Risk type category | Sub-category | Activity |
|---|---|---|
| | Safe environment | General liability (slips and fall, etc.)<br>Employee health & safety rules events<br>Workers compensation |
| | Diversity and discrimination | Any level of discrimination towards employees (gender or race) |
| **Clients, products & business practices** | Suitability, disclosure and fiduciary | Fiduciary breaches, guideline violations<br>Suitability, disclosure issues (know your client principle)<br>Retail customer disclosure violations<br>Breach of clients' privacy<br>Aggressive sales (loans)<br>Account churning<br>Misuse of confidential information<br>Lender liability |
| | Improper business or market practices | Antitrust<br>Improper trade, market practices<br>Market manipulation (currency or interest rates)<br>Insider trading (on firm's account)<br>Unlicensed activity<br>Money laundering |
| | Product flaws | Product defects (unauthorised)<br>Model errors |
| | Selection, sponsorship and exposure | Investigate client per guidelines<br>Exceeding client exposure limits |
| | Advisory activities | Disputes over performance advisory activities |
| **Damage to physical assets** | Disasters and other events | Natural disaster losses<br>Human losses from external sources (terrorism, vandalism) |
| **Business disruptions & system failures** | Systems | Hardware and software<br>Telecommunications<br>Utility outage or disruptions |
| **Execution, delivery & process management** | Transaction capture, execution and maintenance | Miscommunication by bank<br>Data entry, maintenance or loading error<br>Missed deadline or responsibility<br>Model, system miss-operation<br>Accounting error, entity attribution error<br>Other task miss-performance<br>Delivery failure by bank<br>Collateral management failure<br>Reference data maintenance |
| | Monitoring and reporting | Failed mandatory reporting obligation<br>Inaccurate external report (loss incurred) |
| | Customer intake and documentation | Client permissions, disclaimers missing<br>Legal documents missing, incomplete |
| | Customer, client account management | Unapproved access given to accounts<br>Incorrect client records (loss incurred) |

| Risk type category | Sub-category | Activity |
|---|---|---|
| | | Negligent loss or damage of client assets |
| | Trade counterparties | Non-client counterparty<br>Mis-performance<br>Misc. non-client counterparty disputes |
| | Vendors and suppliers | Outsourcing of services<br>Vendor disputes or supplier disputes |

Source: BCBS (2006:305)

### 3.6.3 Operational risk events and reputational risk

Banks have always been exposed to operational risks, yet there is a strong reason to believe that the exposure to operational risk will only increase in future (De Jongh *et al.*, 2013:371). Operational events such as the ones mentioned above have predominantly increased due to improved transparency as required by regulators as well as the increased reliance on improved technological automation within banks (Cummins *et al.*, 2006:2606). The banking industry became more reliant on automation within banks due to technological advances and so, depositors became more reliant on enhanced transparency. Not only did this cycle expose banks to more eminent operational risks, but it also increased the level of reputational risk exposure. The information age, which erupted during the 1980s and 1990s, further contributed to the exposure by reducing the time it takes for information regarding operational risks within banks to reach external stakeholders (De Jongh *et al.*, 2013:371). Operational risk events attract major media attention, which in turn places bank operations under unexpected levels of media scrutiny concerning its actions or service. Operational risk events result in reputational consequences, hence, managerial decisions affect reputational risk exposure (Soprano *et al.*, 2009:159).

While including the four themes of reputational risk (expectations, perception, stakeholders and competition) it was deemed important to include its origin in the definition. For this study, reputational risk is defined as "the risk arising from the negative perception of a bank, formed by its depositors due to the bank performing below expectations in comparison to the banking industry, after the occurrence of operational events".

## 3.7 CONSEQUENCES OF REPUTATIONAL RISK

After the 2008 GFC regulators, government and private institutions were forced to acknowledge the consequences of reputational risk. Reputational risk was found to be perhaps the most destructive type of risk to which any financial institution may be exposed (Soprano *et al.*, 2009:159). The significance of the behaviour of depositors as well as other stakeholders is evident amongst all of these consequences listed below. The following section elaborates on these consequences.

- *Effects the brand, image and trust:* The value or perception of a financial institution's image or brand can change more rapidly than the value of any other tangible assets, which the bank might possess (Brady & Honey, 2007:12). Depositors banking decisions are based on the level of trust placed within a bank. Hence, reputational risk diminishes a bank's image and brand but more importantly the trust of depositors in terms of their financial assets (Soprano *et al.*, 2009:161). This is in contravention of one of the main functions of banks, which is to safeguard deposits (ACE, 2013). A loss in trust can also lead to a loss in other stakeholders.
- *Depreciation of share price:* Reputational exposure influences the ability to achieve high earnings or maintain current earnings (Zboron, 2006:506). Almost 50 percent of bank managers state that they experience a decline in share price earnings after reputational events (ACE, 2013). A decline in share prices can usually last for a relatively short time period or it may have a more enduring effect in the long term. The affected time frame will depend on the bank's own risk management process, risk responses and communication with regulatory authorities (Soprano *et al.*, 2009:161).
- *Decline in capital:* Exposure to reputational risk not only increases economic costs but leads to a decline in economic capital of a financial institution. The volatile levels of capital leads to volatile levels of reputation (Xifra & Ordeix, 2009:355). Furthermore, a decline in reputation will in turn affect the bank's ability to raise capital (Zboron, 2006:506). Reputational events may further reduce both present and future value expected cash flows since a banks' share price is equivalent to its discounted expected cash flows (Fiordelisi *et al.*, 2013:1360).
- *Loss in stakeholders:* This consequence is closely linked with a decline in trust. Once a bank is regarded as untrustworthy by its depositors as well as other related stakeholders,

these stakeholders may forfeit their support and refuse to engage in partnerships, or any type of business relationships (Zboron, 2006:505). In a case where the confidence in a bank is eroded, depositors might not be willing to fund the banks activities and may exit the business relationship making it difficult for the bank to win advisory mandates (Fiordelisi *et al.*, 2013:1361). A loss in bank confidence creates fear in the minds of depositors, which may result in a bank run (Ross, 2005:8) if higher costs are not incurred to regain market confidence (Soprano *et al.*, 2009:161).

- *Increased regulation:* Reputational risk due to severe operational events might pose greater regulatory and compliance burdens imposed by national regulators (ACE, 2013). Rating agencies might also play a significant role requiring more transparency in terms of disclosure. Greater compliance and transparency will require more internal control and input from employees.

- *Continuity of institution:* Trust, brand, depreciation of the share price, decline in capital, loss in depositors as stakeholders and an increase in regulation all have an influence of the lifespan or continuity of a bank and are the main consequences of the perception and behaviour of depositors (Soprano *et al.*, 2009:161).

## 3.8 PREVIOUS STUDIES ON REPUTATIONAL RISK

Table 3.2 provides an overview of previous research aimed at reputational risk. The focus of each study as well as the methodology used is indicated.

**Table 3.2: Previous research aimed at reputational risk**

| Research | Methodology | Aim |
|---|---|---|
| Steyn *et al.* (2004) | Literature review | Indicate the need for a heuristic public relationship model to prevent reputational risk. |
| Perry and De Fontnouvelle (2005) | Event study | Measured reputational losses as a result of changes in the stock prices of firms in Northern America, Japan, New Zealand and Europe. |
| Micocci *et al.* (2009) | Quantitative | Focused on measuring reputational risk for publicly traded financial companies. |
| Gillet *et al.* (2010) | Event study | Examined stock market reactions to operational risk announcements to determine reputational damage in the United States and European union. |

| Research | Methodology | Aim |
|---|---|---|
| Ruspantini and Sordi (2011) | Event study | Assessed the negative effects of internal fraud on the reputational of Unicredit Group Italian retail banking branches. |
| Fiordelisi *et al.* (2013) | Event study | Estimated the reputational risk for European banks based on profit, capital and the size of the banks. |
| Moosa and Li (2013) | Quantitative | Analyse 163 operational risk events based on internal fraud and whether these events led to reputational damage. Sampled all British firms. |
| Sturm (2013) | Event study | Analysed the stock market reaction to operational risks within several European companies (banks). Accounted for the effect of the nominal loss to allow for reputational damage caused by operational risk events. Made use of 136 operational risk events from a data base. |
| Fiordelisi *et al.* (2014) | Event study | Estimated the reputational risk for European banks and a large sample of American banks based on operational risk events. |
| Boyle *et al.* (2015) | Quantitative | Assessed depositor behaviour regarding deposit insurance and withdrawal risk. |
| Mukherjee *et al.* (2015) | Qualitative and quantitative | Explore definitions and management actions regarding reputational risk according to European bank risk managers. |
| Araújo and Vinhado (2016) | Quantitative | Investigated reputational risk measurement in Brazilian banks due to weak economic conditions. |
| Ferreira *et al.* (2015) | Event study | Focused on contributing results in terms of reputational risk to the South African banking sector. Focused on four loss events from 2000-2014. |
| Eckert and Gatzert (2017) | Quantitative | To extend current operational risk models by including reputational losses. |

Source: Author's compilation

The abovementioned studies all had one main theme in common, reputational risk. A portion of the researchers (Perry & De Fontnouvelle, 2005; Fiordelisi *et al.*, 2013; Fiordelisi *et al.*, 2014) empirically researched the effect of operational risks on the stock market value specifically in the banking sector. Micocci *et al.* (2009) instead focused on the insurance sector while Gillet *et al.* (2010) and Sturm (2013) considered the financial sector in general. The majority of the studies made use of event methodologies where certain events were analysed based in the United States and Europe. These studies were branded as the foundational research for reputational risk (Eckert & Gatzert, 2017:123).

Moosa and Li (2013) analysed 163 operational risk events based on British firms concerning all sectors during 1999-2008. This study made use of secondary data provided by Fitch Ratings. It was concluded that the reputational loss was not influenced by the firm size.

Boyle *et al.* (2015) conducted the only quantitative study making use of primary data collected from depositors themselves. The levels of risk were assessed based on the perception of depositors regarding a set of hypothetical banking failures and the level of deposit insurance. The study also considered the risk tolerance levels of 349 depositors based in the United States, Europe and New Zealand, which indicated how much risk depositors are willing to take on concerning their country's deposit insurance schemes.

Ferreira *et al.* (2016) were the first authors to measure reputational risk within the South African banking sector. Due to limited operational and reputational research in the South African market, this study aimed to shed light on the consequences of reputational risk after operational risk announcements. The study analysed four operational risk events (event methodology) announced by four South African banks from 2000 until 2014. The reason for the reduced number of events was a result of the sound banking sector. The most recent research includes that of Eckert and Gatzert (2017) where the researchers acknowledged reputational risk as a consequences of operational risk events. However, the study proposed three different models for measuring reputational risk, namely a deterministic, stochastic and an extensive stochastic approach.

These studies all regard reputational risk as one of the most destructive types of risk due to operational risk events (Eckert & Gatzert, 2017:123). However, the gap in both the literature and empirical studies can be identified. Previous research only attempted to analyse reputational risk after severe reputational damage had already occurred. The majority of the research was event methodologies or only considered secondary data generated from the institution itself. Previous sections of this chapter focused on the importance of the perceptions of stakeholders.

This study, therefore, focused on the perception (reputational risk) of stakeholders (specifically depositors) after hypothetical operational risk events. The objective is to analyse critically depositors' behaviour to such an extent as to intuitively predict to what extent depositors will react and withdraw their deposits. The greater the withdrawal risk, the greater will be the assumed reputational risk (negative perception). The idea of the level of risk that depositors

are willing to take was adopted from Boyle *et al.* (2015) to determine a risk tolerance level for South African depositors.

## 3.9 REPUTATIONAL RISK CASE STUDIES: SOUTH AFRICA

The following section includes several reputational risk events that originated within the South African banking sector from 2000 to 2016. These events were included to support the evidence of reputational risk within the South African banking sector.

### 3.9.1 Regal Treasury Bank (2000)

Regal Treasury Bank was one of the first banks to report an operational risk in the year 2000, more specifically, in the category of execution, delivery and process management (failed mandatory reporting). The bank's solid reputation was based on its sound past performance (Lange *et al.*, 2011:153), however, the bank suffered severe reputational damage after the external auditors withdrew their consent to publish Regal's financial statements for 2001. According to the external auditors the bank mismarked their position (i.e. made the bank look more financially sound) and failed to deliver its annual report on time (Makhubela, 2006:94). The operational risk announcement was made public by means of news reports and press releases. The consequences of reputational risk developed as depositors gained a negative perception of the bank and withdrew ZAR250mn within two days (Still, 2003). This was one of the most fundamental examples of a bank run in South Africa due to severe reputational damage and risk.

### 3.9.2 Saambou Bank (2002)

Saambou bank was under investigation by the Financial Service Board (FSB) for internal fraud in terms of insider trading during 2001 (Steyn *et al.*, 2004:76). The bank was exposed to unsuccessful employee management as well as fraudulent and unethical management. The CEO of the bank deliberately sold off shares directly before provisions for bad debt were reported. The bank was also accused of sales discrimination where different rates were charged to different races. Depositors regarded the bank as unfair and were concerned for the safety of their deposits, which resulted in ZAR1bn being withdrawn within two days (Joosub, 2006:159). The bank was further downgraded by Fitch Ratings since the bank was unable to honour its short-term obligations (Venter, 2008).

### 3.9.3 African Bank (2013)

During 2013 the National Credit Regulator (NCR) fined African Bank ZAR300mn for recklessly extending loans to those previously excluded from the financial system (Dirk, 2013). The charges included the manipulation of the banks affordability calculations (Ferreira, 2015: 113). The credit regulator started the investigation after there was a tremendous increase in consumers' bad debt ratings. This operational event was only one among many. African Bank's share price severely declined until shares were eventually suspended and the bank placed under curatorship. Hence, African Bank suffered severe reputational risk (Ferreira, 2015:72).

### 3.9.4 Standard Bank (2014)

During 2014, Standard Bank (South Africa's leading bank in 2017) was fined ZAR60mn for failing to implement adequate money-laundering controls, which hampered the bank's ability to combat terrorism. The operational risk event of Standard Bank can be classified under execution, delivery and process management (Manjarin, 2012:4). Further events of external fraud due to terrorism were also reported. The bank failed to investigate various clients as per guidelines and failed to report a number of transactions (larger than ZAR24 999 as per guidelines). As a consequence of the operational risk, the bank's share price depreciated at the announcement of the event, which was an indication of reputational damage (Micocci *et al.*, 2009:2).

### 3.9.5 Capitec Bank (2015) & Deutsche Bank South Africa (2015)

In 2015, Capitec Bank and Deutsche Bank South Africa were fined a combined amount of ZAR15mn for failures in systems to protect against money laundering and terrorism. Capitec Bank received a fine of ZAR5mn since they took responsibility for not reporting transactions larger than ZAR24 999 (Joffe, 2016). The Deutsche Bank was levied a fine worth ZAR10mn since the correct procedures were not in place to combat against money laundering and terrorism. Although the fines were extended, there were no actual evidence that the banks did assist any activity in money laundering or terrorism (Naidoo, 2016). As mentioned with Standard Bank above, the depreciation in the stock prices of these banks was a sign of reputational damage and risk to the banks as depositors may have perceived the banks to be risky (Micocci *et al.*, 2009:2).

### 3.9.6 ABSA Bank (2016)

ABSA Bank, along with 16 other global banks, was accused of fixing the South African currency (ZAR) exchange rate. This operational risk event can be classified under clients, products and business practices (Gaffey, 2017). More than 30 traders were responsible for the currency fixing while one specific trader at ABSA Bank admitted to being at fault (Bonorchis, 2017). During 2015, Barclays Africa was also investigated for fixing the interest rate. The past events as well as current events of 2017 have caused stakeholders to form a negative perception regarding ABSA Bank. Past behaviour has led the bank to be regarded as dishonest as it has been conducting unlicensed activities.

## 3.10 MEASURING REPUTATIONAL RISK

Controversial opinions still exist regarding capital reserves for mitigating reputational risk (Christiaens, 2008). However, in order to find the correct mitigating strategy for reputational risk, a quantitative risk measurement is required. To date (2018) the quantification of reputational risk has been challenging due to the lack of a generally acknowledged quantification methodology (Christiaens, 2008). Nonetheless, this does not advocate that the quantification of reputational risk is a waste of resources. The quantification of reputational risk significantly influences the quotidian tasks as well as the continuity of any bank (Rose & Hudgins, 2013:486). A bank that can identify its level of exposure to reputational risks through the measurement of this risk will achieve a competitive advantage above its competitors (Soprano *et al.*, 2009:164). Controversial opinions do not originate from the decision whether or not to quantify reputational risk, but rather from the exertion in forming the actual calculation for reputational risk (Ferreira, 2015:54). The quantification of reputational risk is similar to that of operational risk as the events of internal and external fraud, workplace practices and so forth could all bear a reputational impact (Soprano *et al.*, 2009:164).

### 3.10.1 Reputational risk as a function of share price volatility

As mentioned in Section 3.6, various studies have focused on measuring reputational risk after the announcement of operational risk events. The majority of these studies such as the studies of Gillet *et al.*, (2010), Sturm (2013), Ferreira *et al.*, (2016) as well as Eckert and Gatzert (2017) all measured reputational risk as a function of share price volatility. The general assumption among these studies was that reputational events (caused by operational risks) have a direct impact on a bank's market value (Soprano *et al.*, 2009:164). To quantify the historical market

behaviour, the average abnormal returns $AR\ (Rep)$ gained on the share prices of a financial institution were adjusted by adding in the historical operational risk amount as seen in (3.1) (Sturm, 2013:198). The operational risk ($Op\ Loss_i$) for the relevant financial institution was then divided by the market capitalisation (market value) ($Market\ Cap_i$) (Ferreira, 2015:89).

$$AR\ (Rep) = AR_{i0} + \frac{Op\ Loss_i}{Market\ Cap_i} \tag{3.1}$$

Equation 3.1 allowed the quantification of the reputational impact after operational risk events (Gillet *et al.*, 2010:226). During these studies, it was assumed that a correlation exists between a banks market capitalisation and its reputational risk. Hence, if a bank performs below the expectations of stakeholders, its ability to generate future cash flows decreases and so does the share price (Soprano *et al.*, 2009:164). It allowed for the reputational damage for each financial institution to be reflected by the decline in market capitalisation where that loss was larger than the announced operational risks (Sturm, 2013:198). All of these studies were purely quantitative event methodologies where a sample of historical operational events were taken to determine past market behaviour (Eckert & Gatzert, 2017:125). The main contribution of this study is to incorporate both a quantitative and qualitative methodology using a series of hypothetical operational risk events in order to predict future market behaviour. This, in turn, will contribute towards future mitigation strategies for banks.

### 3.10.2 Reputational risk using scenario analysis

Soprano *et al.* (2009:173) elucidated an alternative measure to quantify reputational risk by means of scenario assessment. This type of analysis takes place by interviewing experts and managers based on the internal risks the bank is currently facing and the view of current market conditions. Each scenario in terms of credit risk, market risk and operational risk is simulated to see whether risk controls, insurance and possible mitigation strategies are in place. This approach focusses solely on the internal controls within a bank but neglects to include physiological 'soft factors' such as the behaviour of depositors. Another measure found by Soprano *et al.* (2009) was to implement a score-card based model by using some form of a checklist or questionnaire to be filled in by various stakeholders (managers, employees or customers). However, this approach rendered several weaknesses, one being that various groups of stakeholders may view the identified risks differently, providing extremely complex results. The approach is also not event specific, meaning that the results might differ extremely,

in terms of the risk profile, each time this approach is applied (Eckert & Gatzert, 2017:127). Another weakness was that the results may not differ each time the approach is applied using the same sample where the results follow the same historical pattern. The last weakness was that a comprehensive scorecard may be too complex and too time consuming to complete, rendering skewed results (Soprano *et al.*, 2009:178).

An alternative to this approach might be to select one stakeholder group (in this case depositors in order to capture 'soft factors') to perform the measure on, in order to have understandable results where the approach is based on a scorecard or questionnaire. To gain an accurate risk profile the previous measure of measuring reputational risk using hypothetical events can be incorporated to make the approach event specific. Using the hypothetical events within this approach will avoid the homogenous results pattern.

## 3.11 MANAGING REPUTATIONAL RISK

With the set of challenges facing the South African banking sector, every decision a bank makes involves taking on risk, particularly in terms of the bank's reputation. At a strategic level this may involve adapting and reinventing current risk management models (Valsamakis *et al.*, 2010:87). South African banks, therefore, are mirroring the efforts of global financial institutions as they wrestle with the challenges of anticipating, mitigating and managing reputational risk (Vardy, 2015:3). According to Louisot and Rayner (2012:9), the following are reasons for the ineffective management of reputational risk:

- inability to recognise the true value of a corporate reputation as a major intangible asset;
- inability to recognise a corporate reputation as a major determinant of success and business continuity;
- inability to define reputational risk and to identify the sources of reputational risk;
- underestimating the severe consequences of reputational risk to a bank and its market capitalisation; and
- failing to exploit the reputational opportunity associated with the reputational risk.

Despite the importance of a banks reputation (Section 3.3), reputational risk management remains elusive. This is due to the difficulty in grasping the complexity of reputational risk's origin accompanied by the role of the various stakeholders (Ferreira, 2015:53). Previous attempts have been made by regulating bodies to incorporate reputational risk into their risk management frameworks. The secret might lie in managing reputational risk in tandem with

its origin (operational risk). The reasons for the ineffective management emphasises the need for research on reputational risk (Fiordelisi *et al.*, 2013:1359).

### 3.11.1 Managing reputational risk and regulation

The King I report mentioned that corporations should protect their assets as well as their reputation (King Committee on Corporate Governance, 2002). Although the report focused on an integrated approach for risk management, the economic conditions during the late 1990s required a modernised report. King II focussed on identifying operational-, human resource-, technological-, credit-, market- and compliance risk (King Committee on Corporate Governance, 2002). Within this report no emphasis was given for identifying reputational risk (Cliffe Decker, 2002). The report, however, acknowledges that risk management goes beyond financial risks where reputation and future survival were briefly mentioned (King Committee on Corporate Governance, 2002). King III, which was released during February 2009, noted in its 14$^{th}$ principle that a board should protect the reputational risk of an institution (King Committee on Corporate Governance, 2009). However, no guidelines on how to protect the reputational risk were given (Valsamakis *et al.*, 2010:86).

The BCBS published the Basel I Accord of 1998 focused solely on managing credit risk by means of a required minimum capital level (BCBS, 2006). After significant disruptions in the global financial markets, the focus moved from credit risk towards operational risk. This led to the establishment of the Basel II Accord, which sets out a comprehensive framework for managing operational risk, credit risk and market risk (BCBS, 2006; Rose & Hudgins, 2013:185). The BCBS yet again overlooked reputational risk as operational risk was defined such that legal and compliance risk are included in this definition, but reputational and strategic risk was omitted (BCBS, 2011). Although the BCBS (2009) took the first step in defining reputational risk as "the risk arising from negative perception of stakeholders and other relevant parties or regulators that can affect a bank's ability to preserve existing, or establish new business relationships" it excluded an inclusive discussion for managing reputational risk (Gillet *et al.*, 2010:224).

The Basel II Accord, however, acknowledges that banks should "enhance their current methodologies in order to capture the consequences of reputational risk and to escape the reputational damage by means of the credit risk, market risk and operational risk to which it may be exposed to" (BCBS, 2009). The Basel II Accord was enhanced later to acknowledge

the consequences of reputational risk on a bank's performance, earnings and liquidity position. Basel II also proposed that banks should identify the possible causes of reputational risk (BCBS, 2009). It was clear from the Basel II Accord that the BCBS expected banks to establish their own reputational risk framework without a set of distinct guidelines (Manjarin, 2012:3).

The Basel III Accord made enhancements to the capital requirements for banks, however, reputational risk was again omitted from these enhancements (BCBS, 2011). Although the Basel III Accord will only be fully implemented in 2019, the Basel IV Accord is already a work in progress. The Basel IV Accord has made adjustments to credit risk, market risk and operational risk, but the inclusion of reputational risk remains elusive (PWC, 2017b).

From a corporate governance perspective (King Committee) and from a regulatory perspective (the BCBS) the significance of reputational risk management remains neglected. As the theoretical framework for reputational risk indicates, and as past reputational risk events demonstrate, reputational risk management is based on the simple concept of stakeholder (i.e. depositor) perception due to operational events. Reputational risk management is, however, above all other risks, an art of execution (Louisot & Rayner, 2012:6). The following section elucidates upon some key elements to ensure the successful management of reputational risk or, at the very least, evade abysmal failure.

### 3.11.2 Managing reputational risk as an integrated process

Historical risk management models focussed on managing risks in a compartmentalised manner (Valsamakis *et al.*, 2010:87). This fragmented approach did not help banks to cope with the continually evolving risks caused by globalisation, automation in banking services (Low & Kalafut, 2002:259) as well as the increased reliance on intangible assets (i.e. reputation) (Mukherjee *et al.*, 2015:6).

The Committee of Sponsoring Organizations (COSO) was established in 1985 to provide leadership by developing comprehensive risk management frameworks concerning risk management, internal control and fraud. Guidance concerning such frameworks is aimed at progressing performance and governance by the institutions that employ these frameworks and to reduce the level of fraud (COSO, 2004). According to Valsamakis *et al.* (2010:46), risk in general (both internal and external) should be managed in an integrated manner within a financial institution. Managing risk in an integrated manner involves an enterprise risk management (ERM) approach that will systematically identify all sources of risk (including

reputational risk). The successful management of reputational risk begins with the understanding that reputational risk stems from other risks, mainly operational risk, which is based on the perception of depositors (Young & Hasler, 2010:45). This risk requires a distinct risk management framework and should not be managed in isolation, but in an integrated manner with the underlying risk (i.e. operational risk) (Eckert & Gatzert, 2017:124). It is, therefore, now considered timely to propose an integrated ERM approach for the management of reputational risk (Spedding, 2014:2). The ERM framework incorporates the following five components (Figure 3.4), which can be used to manage reputational risk.

**Figure 3.4: Enterprise risk management framework for reputational risk**


Source: COSO (2017)

- *Governance and culture*: In an industry where every experience is lived, felt and shared on social media, it is imperative that the correct internal risk environment is set. Strategic alignment is as important as cultural alignment due to the challenges that social media presents to a bank's corporate reputation (Spedding, 2014:2). Within this component ethics, integrity and corporate governance play a profound role in achieving strategic and financial objectives (Young & Hasler, 2010:37). Setting an appropriate risk management environment in terms of governance and culture starts at top management with board oversight, governance, ethics and setting an appropriate risk appetite level (Spedding, 2014:3). Hence, the internal environment lays the foundation for a banks resilience against any damage to its reputation.

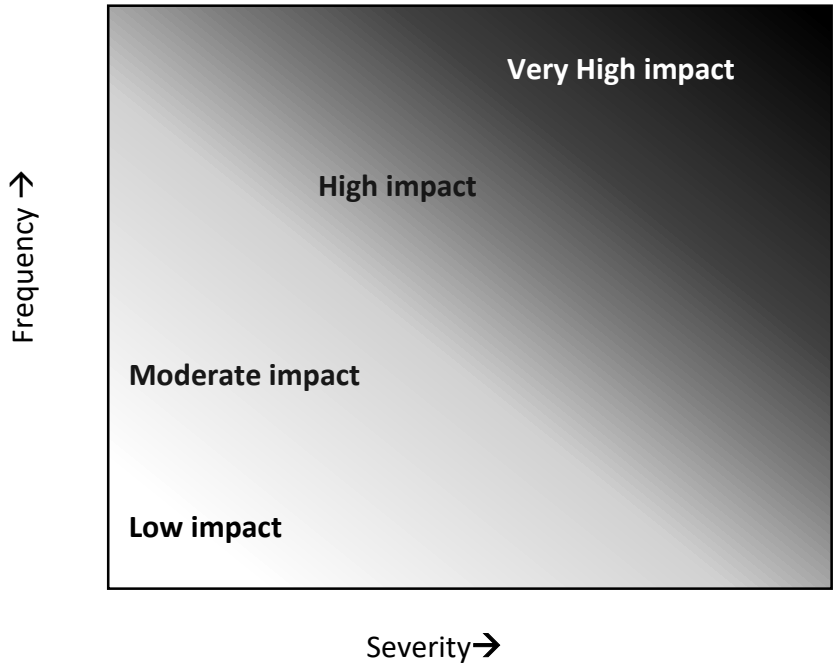
- *Strategy and objective setting*: Reputational risk may be generated as a result of risk sources that stem from internal operational risks within a bank. The source of the risk should be traced back to the seven operational risk event categories (Gaudenzi *et al.*, 2015:252). These loss events include fraud; employment practice; clients, products and business practices; damage to physical assets; business disruptions; and execution and delivery (BCBS, 2006). The successful identification of the source of risk will ultimately minimise major threats to a bank's reputation (Spedding, 2014:1).

- *Performance:* The level of reputational risk exposure is a pure reflection of a bank's effectiveness regarding its internal risk management process as well as the responses to external threats (Ferreira, 2015:45). An integrated approach which incorporates reputational risk will enable banks to create integrated responses for this risk (Valsamakis *et al.*, 2010:88). In the event of reputational damage, an appropriate risk response will depend on the source of the risk (i.e. operational risk event). Risk responses should be structured in such a way as to bridge the gap between depositor experience and expectations. Responses might also include action plans to enhance communication between the bank and various stakeholder groups (Louisot & Rayner, 2012:7). An assessment matrix, as illustrated in Figure 3.5, can be implemented to suggest the impact and frequency of operational risk events on the reputation of a bank. The possible impact on reputation can then be classified according to four levels, namely low, moderate, high and very high (Chernobai *et al.*, 2007:26).

A low impact will result in minimum impact in depositor confidence and will last less than a month. A moderate impact will have a larger impact and will last between one and three

months. An event with a high impact will reach national media coverage, attract attention from national regulator and the possible impact will last longer than three months. An event with a very high impact on reputation will gain international media coverage, will severely influence depositor's perception and will have a lasting impact of more than one year, which may lead to bankruptcy (Louisot & Rayner, 2012:7). Mitigation strategies should also be explored in order to reduce the frequency and impact of risk events (De Jongh *et al.*, 2013:369).

**Figure 3.5: Classification of reputational risk by frequency and severity**




Source: Louisot and Rayner (2012)

*Revision and review:* Once the sources of reputational risk have been identified and assessed, and once an appropriate risk response has been formulated, the reputational risk along with the sources should be monitored (Louisot & Rayner, 2012:8). Risk thresholds should be implemented to ensure that operational risk events are identified, controlled and monitored (De Jongh *et al.,* 2013:369). Ineffective reputational risk management or weak internal monitoring will not only result in worse results, but will also lead to severe reputational loss (Soprano *et al.*, 2009:8).

*Information and communication*: Inappropriate or inaccurate information has the potential to lead to a loss in public confidence and damage to a bank's reputation, making it challenging to recover from (Spedding, 2014:1). Accurate information needs to reach the responsible personnel in a timely manner for risks to be managed and to be used as an opportunity. Accurate

and timely reporting of reputational risk and its sources are often neglected, despite being an important element in the reputational risk management process (Louisot & Rayner, 2012:8).

Since reputational risk is regarded as a secondary risk due to operational risk events, the opportunity to manage reputational risk may be through the management of operational risks (Ferreira, 2015:145). The ideal approach would be a holistic and comprehensive approach where all risks are addressed qualitatively and quantitatively (Eckert & Gatzert, 2017:123).

## 3.12 SYNOPSIS

This chapter focused on the reputational risk that banks might face due to the negative perception of depositors after hypothetical operational risk events. Since no generally accepted definition for reputational risk exists, one of the theoretical objectives was achieved by forming a definition for reputational risk based on the relevant theory described within this chapter.

Another major theoretical objective was to analyse critically reputational risk where its origin took precedence within this chapter. Within this chapter, it was established that reputational risk originates from the banking environment in which it operates. The various stakeholders (internal and external), as elaborated upon in Chapter 2, play a vital role as their idiosyncratic expectations ultimately form the perception (negative or positive) of a bank; where these perceptions were based on a banks past and current performances during operational risk events. Operational risk events were classified as internal fraud, external fraud, employee practices, damage to physical assets, client practises, business disruptions, execution and delivery and pure reputational events. Operational risk events attract major media attention, which in turn places bank operations under unexpected levels of media scrutiny concerning its actions or services. Operational risk events result in reputational consequences, hence, managerial decisions affect reputational risk exposure. Hence, the role that the perception of depositors' play cannot be overlooked as it is the most vital link in the reputational risk process.

The South African case studies reflected that these previous operational events had an overriding reputational impact on the concerned banks. The reputational losses were often larger than the reported operational losses. Furthermore, this chapter elucidated upon the main consequences of reputational risk in relation to depositor behaviour. Severe reputational risk could affect a banks, brand and trust, cause a depreciation in its share price, a decline in capital, loss in key stakeholders, increase bank regulation and affect the continuity of a bank. These severe consequences could not be neglected since they provided the foundation for future

mitigation and management strategies for reputational risk. This risk requires a distinct risk management framework and should not be managed in isolation, but in an integrated manner with the underlying risk (i.e. operational risk). It is, therefore, now considered timely to propose an integrated ERM approach for the management of reputational risk

Previous attempts have been made by regulating bodies to incorporate reputational risk into their risk management frameworks. However, the secret might lie in managing reputational risk alongside its origin (operational risk) by taking into account depositors reaction to risk.

The following chapter provides the research design and methodology used for the empirical portion of the study in order to achieve both primary and empirical objectives.

# CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

*"Different ways of viewing the world shape different ways of researching the world."*

*(Crotty, 1998:66)*

## 4.1 INTRODUCTION

The fundamental purpose of the research design and methodology is to ensure high quality research that is applicable and sensible to others beyond the sample included. The aim of this chapter is to illuminate the research design and methodology used for the empirical portion of the study in order to achieve both primary and empirical objectives. The primary objective of this study was to analyse depositor behaviour during operational risk events to predict reputational risk. In accordance with the primary objective, the following empirical objectives were formulated:

- Identify the most significant operational risk events leading to reputational risk;
- Determine how demographical factors influence depositors' likelihood to withdraw;
- Determine how bank reputation influences depositor likelihood to withdraw;
- Identify the behavioural biases that drive depositor behaviour;
- Determining depositor behaviour, the regarding the source of information;
- Determine depositors level of risk tolerance; and
- Construct a forecasting model to identify reputational risk by profiling depositor behaviour.

To achieve the empirical objectives and, ultimately, the primary objective, a comprehensive research design and approach had to be structured. This chapter thus aims to describe the various sections of the research design and methodology:

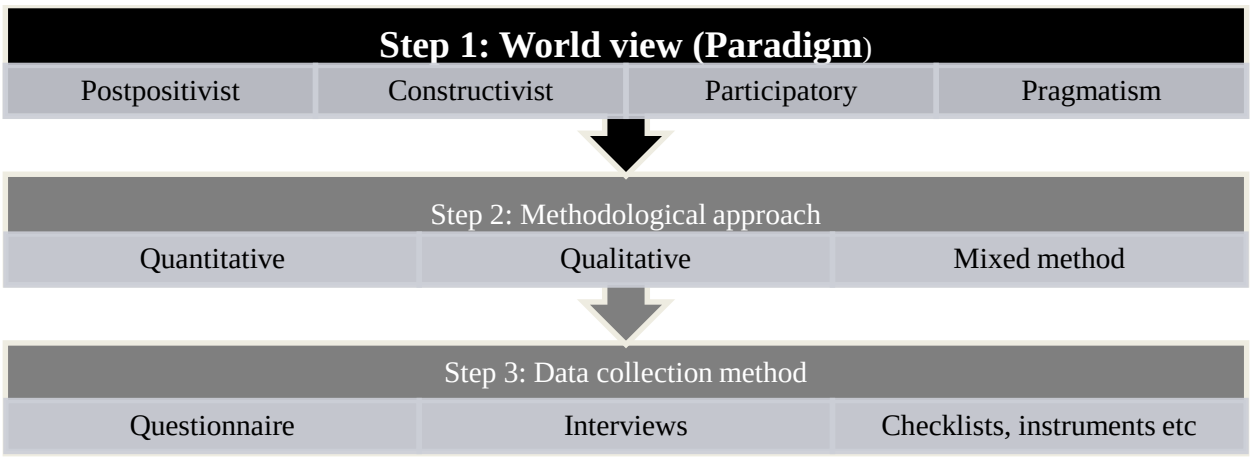
- Sections 4.2 describe the research design where the four world views namely, positivist, constructivist, participatory and pragmatist will be compared. The different methodological approaches are also compared and discussed under section 4.2.
- Section 4.3 further elaborates on the chosen research design and methodology approach for this study.
- The sampling procedure is described in Section 4.4, which is divided into the sample population, sample frame, sample size and method. The various sampling methods relating to probability and nonprobability sampling will be investigated to select the most appropriate sampling method for this study.

- Section 4.5 describes the measuring instrument and the data collection method. Within this section, the questionnaire design, format, layout, pre-testing and administration is discussed.
- The data analysis utilised in this study is discussed in Section 4.6, which outlines the procedure for data preparation, while Section 4.7 stipulates the various statistical procedures to be followed, namely descriptive statistics, factor analysis, validity and reliability and regression analysis.

## 4.2 RESEARCH DESIGN

Section 4.2, which focusses on the research design, is to be used in order to create a three-step, comprehensive plan to ensure the achievement of the primary objective as well as the empirical objectives. Figure 4.1 illustrates the three steps in research design that ensures the collection of evidence in order to address the research problem as soundly and unambiguously as possible (De Vaus, 2001:2). The first step in the research design is to contextualise the research paradigms, namely positivist, constructivist, participatory, pragmatism. Contextualisation of the paradigms is important to be able to select the most appropriate world view. The second step encompasses the two methodological approaches, namely quantitative and qualitative. A third methodological approach also exists where a combination of quantitative and qualitative approaches is used. The third and last step is to select an appropriate data collection method following either quantitative questionnaires or qualitative interviews (Creswell & Plano Clark, 2011:78).

**Figure 4.1: The three-step research design**




Source: Creswell and Plano Clark (2011:71).

### 4.2.1 Research paradigms

The first step in the research design involves adopting a world view. Researchers Guba and Lincoln (1994) as well as Creswell (1998) have described research paradigms as various world views that indicate ontological (theory of realism), epistemological (theory of knowledge), methodological (theory of inquiry) and axiological (theory of value) positions in a research study (Margarete, 2000:247). In this study, a world view or paradigm was adopted where a paradigm refers to a set of methodological beliefs (Guba & Lincoln, 1994:107) or research culture regarding the research topic. As seen in Figure 4.1 and Table 4.1, four paradigms exist. Table 4.1 elucidates upon the general characteristics of these four world views.

**Table 4.1: The four basic world paradigms**

| Positivist | Constructivist | Participatory | Pragmatist |
|---|---|---|---|
| Associated in quantitative studies | Associated in qualitative studies | Associated in mixed method studies, but mainly qualitative | Associated in mixed methods studies |
| Focus on the knowledge and causation, observation of variables and theory testing | Focus on meaning or understanding of a certain phenomenon formed by participants | Focused on political issues | Focused on the consequences of research |
| Top down approach | Bottom up approach | Participant approach | Question approach |
| Empirical testing, deductive where prior theory is tested | Inductive based on social and historical construction | Participatory, active participant engagement to form collaborative results | Combination of qualitative and quantitative measures and data |
| Unbiased values | Biased values | Biases are negotiated | Biased/unbiased values |
| Focus on verification of theory using formal writing | Focus on the generation of theory using informal writing | Focus on changing the social world for the better | Focus on real scenario practice using formal and informal writing |

Source: Goulding (2005:294); Creswell and Plano Clark (2011:73).

The positivist world view is generally found in quantitative studies (Straub *et al.*, 2005:221). In this paradigm, the study is based on the various expectations of knowledge, causation,

reductionism, the observation of control variables and challenging standing theories (Goulding, 2005:293; Creswell & Plano Clark, 2011:72). Positivists accept that reality is objectively given and that measurable properties can be outlined, which are independent of the research instruments (Ardalan, 2011:200; Myers, 2013). A common challenge faced by positivist researchers is to test theory and try to enhance the predictive understanding of the phenomena in question (McKinney, 1966:68; Myers, 2013). A major criticism of a positivistic approach is based on its substantial reliance on rationality (Schulze & Kamper, 2012:132), therefore, omits subjective knowledge concerning values, beliefs or norms (Muposhi, 2015:150).

Constructivism, which is used in qualitative studies, concentrate on the understanding of a participant based on a specific phenomenon (Myers, 2013). Constructivism make use of the individual viewpoints of a participant to create innovative theories (Goulding, 2005:294) and assumes that the participant is actively involved, which allows the research process to flow naturally (Schulze & Kamper, 2012:132). The focal point of constructivism is based on the understanding of humans during phenomena and is not dependant on set variables (Myers, 2013). Therefore, the principal objective of the constructivism research paradigm is to comprehend human behaviour rather than to predict it (Muposhi, 2015:151).

In a participatory paradigm, cultural beliefs are influenced by political issues (Creswell & Plano Clark, 2011:73). Within this approach, participants play an active role as the research is conducted in a qualitative approach where participants must comment on political issues. Different biases are negotiated with participants to encourage improving the social world (Myers, 2013). The principal objective of the participatory research paradigm is based on the disagreements in modern society and, therefore, attempts to alleviate the causation of alienation and domination (Ardalan, 2011:200).

The last paradigm, pragmatist world views, is associated with a type of mixed method studies where the qualitative and qualitative research is conducted during the same phase. During a pragmatist world view, research questions take importance above the overall research process (Straub *et al.*, 2005:222; Creswell & Plano Clark, 2011:74). Within this paradigm, knowledge is assumed to be socially constructed grounded on the lived realities of the participants (Schulze & Kamper, 2012:132; Muposhi, 2015:151). It adopts a value-oriented approach as biased as well as unbiased values are integrated in the approach (Johnson & Onwuegbuzie, 2004:18).

Because positivist, constructivist, participatory and pragmatic paradigms individually contain contradicting beliefs, a combination of these views is not realistic (Creswell, 2009:6). However, whenever one or more paradigms are used in a single research study, it is recommended that these paradigms are explicitly framed where each paradigm remain explicit form the other (Margarete, 2000:247).

### 4.2.2 Choosing a methodological research approach

The second step, as indicted in Figure 4.2, involves deciding upon a methodological approach. Two research methodologies exist, aimed at narrowing the centralised manner in which information is presented and the decentralised manner in which research is applicable to the real world (United for Sight, 2015). A third methodological approach also exists where a combination of the traditional approaches is used.

**Table 4.2: Methodological approaches**

| Quantitative approach | Mixed method | Qualitative approach |
|---|---|---|
| • Predetermined methods are used<br>• Questions are based on the instruments<br>• Data are measurable (numeric)<br>• Involves statistical analysis<br>• Involves statistical interpretation | • Both established and emerging methods<br>• Questions can be open and closed type of questions<br>• Two forms of data (quantitative and qualitative)<br>• Involves statistical and text analysis<br>• Interpret data from both data bases | • Emerging methods<br>• Open ended questions<br>• Data are in the form of interview answers, observations or audio<br>• Text and image analysis<br>• Data are interpreted through themes or patterns |
| **Advantages**<br>• Results can be generalised<br>• Allows quantitative predictions<br>• Eliminates the influence of irrelevant variables<br>• Data collection is fast<br>• Provisioning of accurate results (quantifiable)<br>• Results are independent of the researcher | **Advantages**<br>• Avoids the limitations of quantitative and qualitative data<br>• Individual information adds meaning to quantitative results<br>• New theories can be generated and tested<br>• Results inform the purpose<br>• Better quality data<br>• More accurate results<br>• Complete understanding of phenomena | **Advantages**<br>• Provides individual information<br>• Describe in rich detail human understanding of phenomena<br>• Data collected in a naturalistic setting<br>• Idiographic causation |

| Quantitative approach | Mixed method | Qualitative approach |
|---|---|---|
| Disadvantages<br>• Results may be to general<br>• Excludes variables not included in model | Disadvantages<br>• More expensive<br>• More time consuming<br>• Analysing data and results can be more complex<br>• Researcher should have a good understanding of both methodological approaches | Disadvantages<br>• Results may not always be generalised<br>• Quantitative predictions challenging<br>• Challenging to test hypothesis<br>• Data collection is time-consuming<br>• Results may be influenced by researcher |

Source: Creswell (1998); Johnson and Onwuegbuzie (2004:19); Creswell and Plano Clark (2011); Creswell (2014:15)

#### 4.2.2.1 Quantitative research approach

The first method, quantitative research, is defined as the statistical representation of results to describe the phenomena these observations reflect (Babbie, 2013:239). Quantitative research emerged as a result of its ability to generate quantifiable and trustworthy data, which can be used to generalise populations (Keele, 2011:38). Quantitative research can furthermore be described as an approach, which involves measuring the validity of existing theories using predetermined methods based on larger samples where results are measurable and then generalised (Creswell, 2014:15). According to Straub *et al.* (2005:221), quantitative research can be related to the research paradigm, positivism. The positivist epistemology paradigm depends on mathematical, statistical or scientific methods to produce numerical data.

As seen in Table 4.2 only a few disadvantages of a quantitative approach exist in comparison with a qualitative approach. Myers (2013) states that quantitative research has been criticised for decontextualising human behaviour, as well as for ignoring other variables excluded. However, a main advantage of quantitative data is that it allows for the predictions of the variables that are in fact included in the model. Quantitative research, furthermore, allows for the elimination of the influence of irrelevant variables in the quantification model (Johnson & Onwuegbuzie, 2004:19). The collection of quantitative data is also faster than the collection of qualitative data and accurate and quantifiable results are generated. These results are independent from the researcher and unbiased. In the end, the overriding advantage of a quantitative research approach above qualitative research is that the results, which are quantifiable, accurate and unbiased can be generalised across the research population (Creswell, 2014:16).

#### 4.2.2.2 Qualitative research approach

The second method, qualitative research, is a multi-method in focus, concerning an explanatory, naturalistic approach to subject manner. It includes research questions such as 'What?' 'Why?' 'How?' where these questions are then examined in the context of an individual's life (Creswell, 1998:15) which can be associated with the constructivist paradigm. Qualitative research might provide insight on specific topics using emerging methods where a small number of participants are being studied using text and image analysis to determine idiographic causation (Johnson & Onwuegbuzie, 2004:20). Table 4.2 elucidates the main advantages and disadvantages of each methodological approach. The drawback of using a qualitative research approach is that the results may not always be generalised to a population since a very small sample is used. Qualitative data also presents challenges when testing a hypothesis and cannot easily quantify results. A research study may also carry the risk that the results might be influenced by the researcher him/herself and become biased results (Creswell, 1998). A qualitative approach might also present limitations in terms of time and cost for interviews, transcriptions and coding of qualitative data (Johnson & Onwuegbuzie, 2004:20). Hence when comparing a quantitative and qualitative approach, the latter approach has far more limitations when the main aim of a researcher is to generalise and quantify results. A qualitative approach is more appropriate in studies with smaller sample sizes where the researcher is focused on an inductive approach forming new theories (Creswell, 2014:15). Due to some of the few disadvantages associated with a quantitative approach and the list of disadvantages associated with a qualitative approach, some researchers might prefer a mixed methodology approach (Creswell & Plano Clark, 2011:39). This approach is discussed in the section below.

#### 4.2.2.3 Mixed method approach

The mixed method approach permits certain limitations of the quantitative approach to be offset by the qualitative approach and *vice versa* by using a combination of the two approaches (Creswell & Plano Clark, 2011:39). The key advantages of incorporating a mixed method approach include its flexibility, its integrative nature, ability to offset the limitations of single methodological approaches and providing full inclusive data sets (Muposhi, 2015:155). There are six commonly used mixed method designs (Creswell, 2014:25) namely convergent parallel, explanatory sequential, exploratory sequential, embedded, transformative and the multiphase design. Each described briefly:

- Convergent parallel design involves the simultaneous implementation of both quantitative and qualitative methods whereby the results are later joined and interpreted.
- Explanatory sequential design involves two separate phases. The first phase involves the collection of quantitative data, which is followed thereafter by qualitative data.
- Exploratory sequential design, on the contrary, is opposite to the explanatory design. This design starts by collecting qualitative data, where after the quantitative phase is used to generalise the primary findings. It first explores and then explains the qualitative phases by the quantitative phase.
- Embedded design focusses on using both quantitative and qualitative data by adding a qualitative portion to the quantitative data or adding a quantitative portion to the qualitative data.
- Transformative design is characterised by the theoretical motivation embedded in this method. The theory supporting a transformative design will shape all decisions and timing of data.
- Multiphase design incorporates both qualitative and quantitative methods, over time, within a certain program.

Although some researchers might prefer a mixed methodology approach, several challenges can be present with this approach (Creswell & Plano Clark, 2011:39). A mixed methodological approach requires more time and costs involved for gathering and analysing of both quantitative and qualitative data (Creswell, 2009:94). Hence, this approach is more expensive and more time consuming and should be used only if time and funds are not a limitation. In order to be able to implement a mixed approach, the researchers also require comprehensive knowledge and understanding of both a quantitative and qualitative approach. A further challenge can lie in the complexity of analysing both quantitative and qualitative forms of data (Johnson & Onwuegbuzie, 2004:20). Hence, if the aim of a researcher is not to use a smaller sample, create new theories and have a lot of time and funding constraints, then a mixed method approach would not be appropriate.

## 4.3 CHOSEN RESEARCH DESIGN AND APPROACH

As mentioned earlier, the first step in a research design is to choose a research paradigm. Hence, the chosen research paradigm was a positivist approach. The positivist approach allowed the researcher to conduct deductive research to test existing theory, determine the causation of

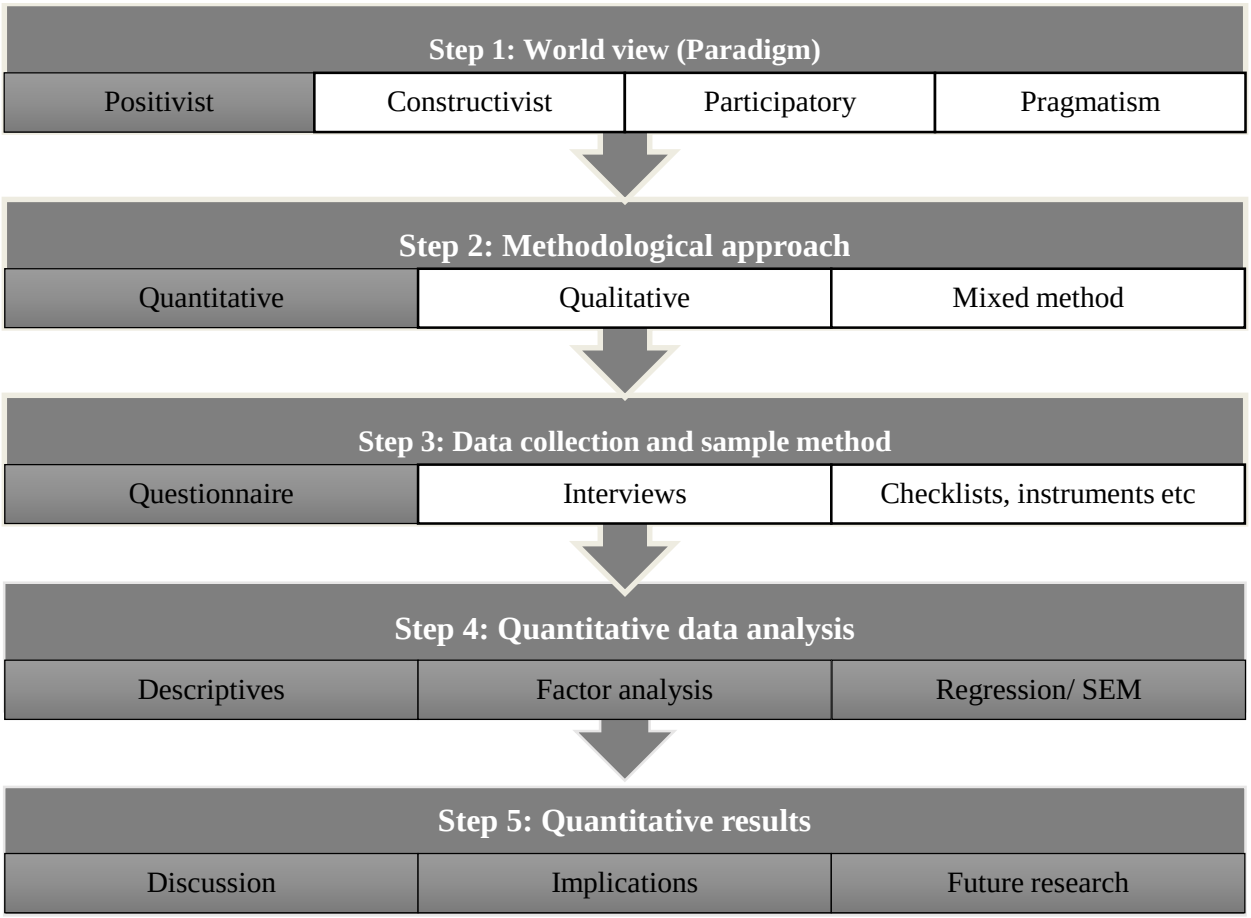
variables (Goulding, 2005:294). This approach often is referred to as the traditional notion of "the absolute truth of knowledge" (Henning *et al.*, 2004:17). The positivistic approach permitted the realistic events to be witnessed empirically and for comprehensible and rational analysis (Aliyu *et al.*, 2014:83).

The second step in the research design is selecting a research approach. Based on the comparison between quantitative, qualitative and mixed methodologies the following conclusions could be drawn. A qualitative approach would provide limitations since the main aim of a researcher is to generalise and quantify results. A qualitative approach would be more appropriate in studies with smaller sample sizes where the researcher is focused on an inductive approach forming new theories (Creswell, 2014:15). Considering a mixed methodology approach, this approach would require more time and cost involved with gathering and analysing of both quantitative and qualitative data (Creswell, 2009:94). Hence, this approach should be used only if time and funds are not a limitation (Johnson & Onwuegbuzie, 2004:20). Since, the aim of the researcher is not to use a smaller sample, create new theories, nor have a lot of time and funding available a mixed method approach would not be appropriate.

Since quantitative research can be related to the research paradigm, positivism, a quantitative approach was preferred. The positivist epistemology paradigm depends on mathematical, statistical or scientific methods to produce numerical data. Furthermore, a quantitative approach allowed for the predictions of the variables that are in fact included in the model as well as the elimination of the influence of irrelevant variables (Johnson & Onwuegbuzie, 2004:19). The collection of quantitative data provided faster results since time was a limitation. The main reason for using a quantitative research approach is that it provided results that were quantifiable, accurate and unbiased which could be generalised across the research population (Creswell, 2014:16).

The research procedural diagram is indicated in the Figure 2.2 below:

**Figure 4.2: Research procedural diagram**




Source: Author compilation

## 4.4 SAMPLING PROCEDURE

According to Onwuegbuzie and Collins (2007:281), sampling is defined as the method of selecting a segment that signifies the whole. Quinlan (2011:208) further extends the definition by defining the sampling procedure as all the items related to the research study. The sampling process assists in determining the target population, sample frame, sample size as well as the sample method (Stagnor, 2015:112). The sampling process is multifaceted, where research designs are sequential (Onwuegbuzie & Collins, 2007:281). The sections below explain how the target population, sample size and methods were decided for the study.

### 4.4.1 Defining the target population

A target population must be selected carefully since researchers make inferences regarding the whole population based on a selected sample. An incorrectly selected target population will lead

to skewed results as the true characteristics of that population will not be reflected (Stagnor, 2015:112). Upon selecting the target population, the population parameters need to be set (Quinlan, 2011:206). The target population for the study comprises all South African bank depositors. The target population parameters for this study, furthermore, required all South African bank depositors to be 18 years or older and earning a monthly salary, which is deposited into their bank account.

### 4.4.2 Selecting a sample frame

A sample frame is made up of a list of suitable characteristics within the target population.

According to the SARB (2017) as well as The Banking Association South Africa (BASA) (2017) 28 banks (excluding mutual banks and foreign representative branches) are registered within South Africa. The banks that are not deposit-taking institutions were eliminated from the sample frame. Table 4.3 below contains a list of all registered banks within South Africa, irrespective of whether these banks are locally- or foreign controlled.

**Table 4.3: Sample frame**

| List of banks | |
|---|---|
| Absa Bank Ltd (a member of Barclays Bank Group) | Habib Overseas Bank Ltd |
| African Bank Ltd | HBZ Bank Ltd (a subsidiary of Habib Bank) |
| Albaraka Bank Ltd | Bidvest Bank Ltd |
| BoE Private Clients (a division of Nedbank) | Mercantile Bank Ltd |
| Fairbairn Private Bank (a division of Nedbank) | Rand Merchant Bank (a division of FirstRand Bank) |
| Standard Bank of SA Ltd | Capitec Bank Ltd |
| FirstRand Bank Ltd | First National Bank (a division of FirstRand Bank) |
| Imperial Bank Ltd (a subsidiary of the Nedbank Group) | Rennies Bank Ltd (now a division of Bidvest Bank) |
| Investec Bank Ltd | RMB Private Bank (a division of FirstRand Bank) |

| List of banks | |
|---|---|
| Marriott Corporate Property Bank Ltd (a subsidiary of Marriott Holdings Ltd) | Sasfin Bank Ltd |
| MEEG Bank Ltd | South African Bank of Athens Ltd |
| Nedbank (a division of the Nedbank Group) | Go Banking (a division of Nedbank in association with Pick 'n Pay) |
| Nedbank Group Ltd | TEBA Bank Ltd |
| Old Mutual Bank (a division of Nedbank) | Wesbank (a division of FirstRand Bank) |

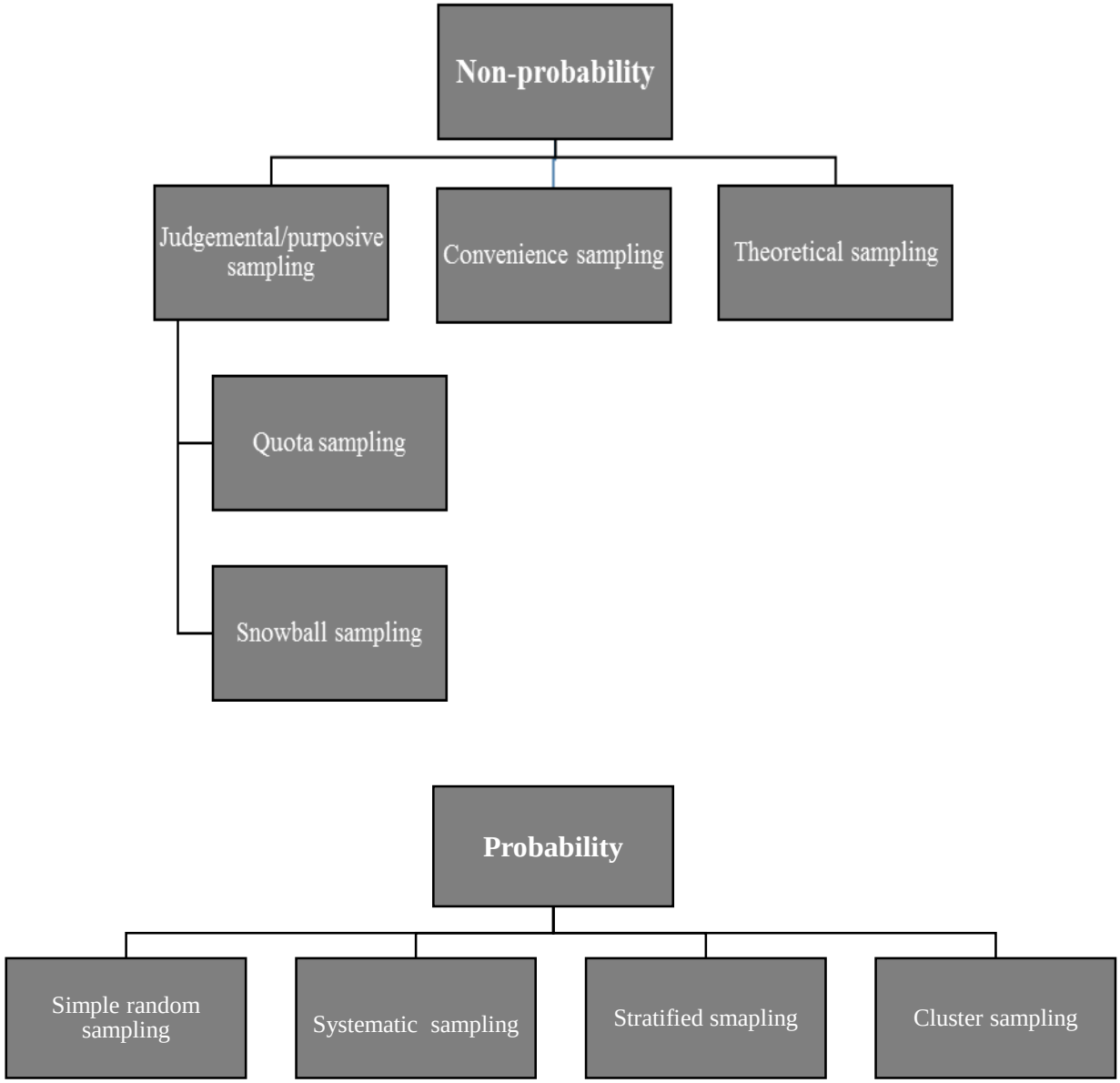
Source: SARB (2017)

Due to the extensive number of small, medium and large banks registered in South Africa, onl the top five banks as these represents most of the population. The top five banks in terms of market share (largest customer data base) include: Standard Bank, Absa Bank, Capitec Bank, First National Bank and Nedbank, with Capitec Bank as the leader (BusinessTech, 2016; Smith, 2017).

### 4.4.3 Sampling method

A sampling method is the technique used to draw a specific sample from a population group (Cant *et al.*, 2005:165; Diedericks, 2015:45). According to Quinlan (2011:208) sampling approaches can be characterised between probability sampling techniques and non-probability sampling techniques as seen in Figure 4.3.

**Figure 4.3: Probability and non-probability sampling techniques**




Source: Quinlan (2011:210)

#### 4.4.3.1 Probability sampling

Probability sampling is where every participant in the target population group has the same likelihood of being included in the sample (Quinlan, 2011:209). Probability sampling techniques include:

- simple random sampling includes a complete list of the members of a population where a sample is drawn at random and each participant has the same probability of being selected. When a participant can be selected again it is mentioned as random sampling with

replacement. On the other hand, if the same member of the population cannot be selected again, as random sampling without replacement (Barreiro & Albandoz, 2001:5);

- stratified sampling divides the sample frame into subdivisions where these divisions are considered homogeneous in terms of a list of characteristics (Onwuegbuzie & Collins, 2007:285) and where these characteristics are believed to have an influence on the research objective. Finally, a random sample is selected from each of the subdivisions to form the sample (Quinlan, 2011:210);
- systematic sampling can be used where all the participants in the sample frame are random. Participants are randomly selected from a list by choosing the kth participant each time (Onwuegbuzie & Collins, 2007:285). Thus, participants are selected by using a systematic order or interval (Quinlan, 2011:210); and
- cluster sampling can be used where all the participants to be used are found in clusters or groups and no set list of participants exists. During cluster sampling the population is divided into smaller groups (clusters) where some of the clusters are then randomly selected to be included in the selected sample (Stagnor, 2015:114).

#### 4.4.3.2 Non-probability sampling

Non-probability sampling can be utilised in both quantitative research and qualitative research (Marshall, 1996:523; Quinlan, 2011:214; Creswell, 2014:6):

- convenience sampling includes the most reachable participants to spare time and cost;
- judgement sampling/purposeful sampling includes the most productive sample to be involved in the research. Among these may be participants with specific reactions or experiences, who agree or disagree or conform to certain beliefs or attitudes. This may include quota sampling or snowball sampling where participants refer the researcher to likely participants. Snowball sampling is often used to find participants that are not easily reachable; and
- theoretical sampling includes theory-driven samples where new theories are created using current samples.

For this study non-probability purposeful sampling (snowball sampling) was used to filter those individual who meet the exclusion criteria of the sample; 18 years and older, more than five years banking experience, owns a deposit account at the top five banks in Gauteng.

### 4.4.4 Selecting a quantitative sample size

According to Stagnor (2015:117) a representative sample includes the same characteristics of that of the target population group. The correct selection of a sample is important since it is rarely possible, realistic, ethical or resourceful to study a complete population (Marshall, 1996:522). The aim of selecting the correct quantitative sample is to be able to generalise the results back to the selected target population. However, Barlett *et al.* (2001:43) indicated three major mistakes researchers make when selecting a quantitative sample size:

- First, researchers tend to forget about the importance of a standard sampling error term;
- Secondly, researchers disregard the expected response rate; and
- Lastly, the sample size does not necessarily have to be extremely large.

A comprehensive list is required to ensure a representative sample (Hair *et al.*, 2008:140). The list of characteristics for this sample frame includes the following participant characteristics:

- 18 years or older;
- a bank depositor for more than five years;
- earns a monthly salary which is deposited into a bank account;
- has some form of education; and
- lives within Gauteng and banks with one of the largest five banks in South Africa.

Previous researchers often base their sample size selection on the average sample size of similar research. Not much empirical work has been performed on reputational risk in the banking sector by sampling individual depositors. The majority of research studies on reputational risk in the banking sector used secondary market data (sampled banking institutions). Gillet *et al.* (2010), as well as Cummins *et al.* (2006) focussed mainly on the operational events themselves by making use of event methodologies and not by using market participants. Table 4.4 shows a record of the sample sizes of similar previous studies.

**Table 4.4: Sample size**

| Author | Research aim | Sample size |
|---|---|---|
| Mäenpää *et al.* (2008) | To measure the perceptions of consumers that used internet banking in Finland | 300 |
| Zhu and Chen (2012) | Aimed to explore the service fairness and customer satisfaction in internet banking with emphasis on trust and customer value | 331 |
| Zarvrsnik and Jerman (2012) | Reputation of banks in Slovenia | 201 |
| Vazifedoost *et al.* (2013) | How customer satisfaction changes behaviour using a case study in the banking industry. | 381 |
| Boyle *et al.,* (2015) | Measuring the impact of deposit insurance on depositor behaviour during a crisis | 349 |
| Ozkan-Tektas and Basgoze (2017) | Pre-recovery emotions and satisfaction measuring reputation in the banking sector | 366 |

Source: Author compilation

Other similar studies mentioned in Table 4.4 such as Mäenpää *et al.* (2008) used a sample of 300 to test consumer perception of internet banking in Finland. Zhu and Chen (2012) explored the mediating effects of bank customer trust and value using a sample of 331 bank customers. Zarvrsnik and Jerman (2012) also attempted to measure the reputation of Slovenian banks by surveying 201 bank customers. Vazifedoost *et al.* (2013) analysed changing bank customer behaviour regarding several bank services using a sample of 381 bank customers. Boyle *et al.*, (2015) was one of the few researchers who followed a similar approach to this study by focusing on primary data by sampling individual depositors. Boyle *et al.,* (2015) used a combined sample of 349 business students to determine depositors' perception of deposit insurance. Ozkan-Tektas and Basgoze (2017) investigated the role of banking reputation when bank customers (sample of 366) complain to third parties after they have experienced a banking service failure.

Another factor to consider is the cost and time constraints of gathering information from the selected sample size. Considering the time and cost available to the researcher, the sample size of this study will consist of 417 South African depositors. This figure is in line with sample used in similar studies of Mäenpää *et al.* (2008); Zhu and Chen (2012); Zarvrsnik and Jerman (2012);

Vazifedoost *et al.* (2013); Boyle *et al.*, (2015) and Ozkan-Tektas and Basgoze (2017). Most importantly, it sufficiently meets the requirements of the statistical analysis that will be applied to achieve the stated objectives of the study. In a study that employs factor analysis, Malhotra and Birks (1999:120) recommend that a sample with a ratio of at least five items per variable is required. For the same statistical analysis, Pallant (2013:185) recommends at least 150 sample size. In this study, the sample (417) yielded a ratio of eight items for each variable. Therefore, the sample size for this study included 417 South African depositors banking in Gauteng does in deed meet the requirement for the statistical analysis employed in the study.

## 4.5 MEASURING INSTRUMENT AND DATA COLLECTION METHOD

The overriding objective of any measuring instrument and data collection process is to accurately gather sufficient primary data to be able to answer the research question (Creswell & Plano Clark, 2011:205). The decision of which data collection technique to use is based on the primary research objective (Hair *et al*., 2008:140). Using a quantitative approach, data collection involves several components: distributing questionnaires, collecting the data and analysing the data.

### 4.5.1 Quantitative data collection method

*"The variables of quantification, 'something', 'nothing', 'everything', range over our whole ontology, whatever it may be; and we are convinced of a particular ontological presumption if, and only if, the alleged presumption has to be reckoned among the entities over which our variables range to render on of our affirmations true"* (Willard van Orman Quine)

When dealing with large population groups such as in this research study, using a survey methodology to analyse participant behaviour may be beneficial. The survey methodology is closely associated with positivism, is deductive in reasoning and is used primarily to collect quantitative data (Quinlan *et al.*, 2015:268). According to Stagnor (2015:110) a survey is a self-report measure administered through questionnaires or by interviewing the participant using a structured questionnaire. Quantitative data by means of questionnaires can be collected by means of post, telephone, online or face-to-face. A survey may thus be defined as a measure to collect primary data through communicating with a sample of participants (Quinlan *et al.*, 2015:268). The overriding advantage of using a survey methodology to collect quantitative data is that a tailored questionnaire can be generated to collect specific information, relevant to the primary objective of the study. This approach has preference due to its speed, effectiveness and function to collect specific and accurate information targeted at a sample (Malhotra *et al.*, 2012:326).

A questionnaire can be distributed by various means, post, email, online, or in an interview. The questionnaire can be either administered by the interviewer or the questionnaire can be self-administered. A questionnaire is self-administered when the participants receive the questionnaire and can complete it on their own in their own time without the attendance of the interviewer (Cant *et al.*, 2005:100). This method is often more accurate since the participant is more inclined to be truthful in the absence of the interviewer (Hair *et al.*, 2008:140). In this study, a self-administered questionnaire was distributed to participants by hand.

#### 4.5.1.1 Ethical considerations

The research study in terms of the data collection and data management conforms to the ethical standards of academic research as set by North-West University. The research study obtained ethical clearance from the Research Committee of the Faculty of Economic Sciences and Management Sciences with the relevant ethics clearance number ECONIT-2018-02 which can be found in Annexure 3. The ethical considerations of this research study included the following aspects:

- *Voluntary involvement of sample participants.* An imperative ethical concern was to inform participants that the study is completely voluntary and that they have the right to withdraw from the study at any point of time.
- *Guaranteed anonymity of sample participants.* Participants were instructed not to put any identifying marks on their questionnaires. Hence, anonymity was guaranteed since the researcher had no knowledge of the identity of the participant.
- *True reflection of information.* The information presented to the participants was a true reflection clear of any deception or any deliberate misrepresentation. All of the information presented to participants along with the research questions were formed to be as clear, accurate and as explicit as possible.
- *True representation of results.* The results of the research study will be published in the public domain in the form of a dissertation as well as academic articles. The published data and results will be a true reflection of the data gathered and analysed.
- *Data management.* The data of the research study will be kept for more or less five years.

#### 4.5.1.2 Questionnaire design

As stated by Stagnor (2015:110) a questionnaire is a set of fixed, self-reporting measures aimed at the research question. Hence, the design of the questionnaire is crucial to collecting accurate and meaningful results (Malhotra *et al.*, 2012:325). The design of the questionnaire can easily influence the participant's respective responses and willingness to complete the questionnaire accurately. A poorly constructed and presented questionnaire may create a mediocre image and take away significance of the research (Iacobucci & Churchill, 2010:221; Quinlan *et al.*, 2015:272).

The following guidelines were adhered to as proposed by Hair *et al.* (2008:174) and Quinlan *et al.* (2015:275) when designing a questionnaire:

- include a cover letter;
- introduce the research;
- give clear instructions;
- request participants' permission to participate in the research;
- keep questions short;
- avoid negative questions (such as I don't), vague questions, leading questions;
- avoid technical jargon;
- avoid no response error;
- should not exceed 100 items; and
- require limited time to complete.

According the design of a questionnaire should include a cover letter, which may include an introduction into the research and elaborate on the beneficence of the participation of the respondent. The cover letter should include a request for permission of the participant to be included in the research whereby confidentiality and anonymity is ensured (Berndt & Petzer, 2011:197). However, the cover page should not exceed one page. Furthermore, Cant *et al.* (2005:155) recommended that questions should be kept short and direct, not vague or ambiguous. When questions have an unclear meaning or more than one meaning, it could lead to respondent error. To prevent inaccurate results from being included in the sample, questions should not be negative or misleading. The use of questionnaires may include respondent error where no action was taken by the participant to answer a question (non-response error) (Quinlan *et al.*, 2015:270).

The questionnaire used in this study was designed so that any individual 18 years or older who earns a salary and has some form of formal education, can understand the purpose of the questionnaire. At the time of distribution (2018), a cover letter was attached for the attention of participants. The cover letter emphasised the importance and beneficence of the respondent's participation and requested the participant's permission. Technical jargon was avoided to ensure the questionnaire was clear and understandable. To ensure accuracy, negative, misleading or vague questions were excluded from the question set. Non-response error was avoided by restricting participants to move onto the next questions if a previous question was not fully answered. The questionnaire could be completed within 15 minutes and included 50 scaled items (Hinkin, 1998:109). The questionnaire is attached in Annexure 1.

#### 4.5.1.3 Questionnaire format

This study made use of a structured questionnaire. According to Stevens (1946:677), measurement is the assignment of numerical values to objects according to a specific set of rules. This function leads to different types of scales and different types of measurements, which can be used. Not all scales capture the richness of information in each measure.

The four types of scales include nominal scales, ordinal scales, interval scales and ratio level scales (Quinlan *et al.*, 2015:105).

- Nominal scales signify the most fundamental level of measurement where a value is assigned to an object for the purpose of classification. Despite this measure's elementariness it is often the most sufficient (measures what needs to be measured) and suitable (classification) measure to use (Quinlan, 2011:205).

- Ordinal scales allow objects to be ranked (ranking scale) based on the significance they may possess. Therefore, ordinal scales give importance to the position that an object lies in (i.e. very likely to generate a response, to least likely to generate a response) (Stevens, 1946:680).

- On the other hand, interval scales represent both properties of nominal and ordinal scales, since a value is still assigned to an object but the difference in the values can still be captured (Quinlan *et al.*, 2015:109).

- In addition to holding the qualities of nominal, ordinal as well as interval scales, a ratio scale includes an absolute zero value (value where none of the quality being measured exists) (Stevens, 1946:678).

The following scales and question types represented in Table 4.4 were used to collect the data:

**Table 4.5: Rating measures**

| Scale | Description | Advantages |
|---|---|---|
| Likert scale (Ordinal scale) | Participant indicates an aggregate response category. | Flexibility and usability of scale. |
| Numerical scale (Interval scale) | Uses numbers to indicate responses. | Easy to construct, easy to compare responses. |
| Ranking scale (Ordinal measure) | Participants rank responses according to preferences | Easy to construct, easy to compare responses. |

Source: Quinlan *et al.* (2015:296)

Table 4.6 elaborates more on the following scales and types of questions used in the questionnaire.

With the purpose of achieving the primary objective (Section 1.3.1) this study used two validated scales and various question types to gain the required data. The relevant scales and questions utilised were based on the literature reviews of Chapter 2 and Chapter 3. The relevant research questions were designed and formatted in accordance with the stipulated empirical objectives in Section 1.3.3.

#### 4.5.1.4 Questionnaire layout

Similar to the questionnaire design, the layout of the questionnaire will have a significant impact on the collected data. For the quantitative portion of the study, data were gathered using a self-administered structure questionnaire consisting of the following sections as demonstrated by Table 4.5. The questionnaire can be found in Annexure 1.

**Table 4.6: Layout of the questionnaire**

| Section | Source | Objective | Type of question and measure |
|---|---|---|---|
| Section A - Demographic information (A1-A6) | Derived from theory | Age, gender, race, education level, and annual income bracket. Objective is to determine if depositor behaviour is influenced by demographic factors. | Closed ended questions where relevant answers were provided to the participant. |
| Section B - Hypothetical operational risk events (B1-B24) | BCBS (2001); Boyle *et al.* (2015) | To determine depositor behaviour and their tendency to withdraw during operational risk events. | Six-point Likert scale was used (1) very unlikely, (2) unlikely, (3) somewhat unlikely, (4) somewhat likely, (5) likely and (6) very likely. |
| | BCBS (2001); Boyle *et al.* (2015) | To determine depositors' likelihood to withdraw. | Six-point Likert scale was used (1) very unlikely, (2) unlikely, (3) somewhat unlikely, (4) somewhat likely, (5) likely and (6) very likely. |
| Section C– Reputational risk (C25-C36) | BCBS (2001); Boyle *et al.* (2015) | To determine the most significant operational risk events leading to reputational risk. | Six-point numerical scale (interval scale) was used to indicate the level of percentage (%) that depositors will withdraw. Scale ranked from 0 to 100% |
| | Brady and Honey (2007); Honey (2012) | To determine how bank reputation influences depositors behaviour to withdraw. | Six-point Likert scale was used (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree and (6) strongly agree. |
| Section D - Behavioural finance biases (D1-D9) | Derived from theory and Dickason (2017) | To establish a link between depositors' withdrawal decision and behavioural finance. | Six-point Likert scale was used (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree and (6) strongly agree. |
| Sources of information (D10) | Derived from theory | To determine to which source of information depositors are most likely to react to. | Ranking question using a ranking scale. Chose top three options. |
| Section E - Survey of consumer finance (SCF) (E1) | Grable and Lytton (2001) | To measure risk tolerance aimed at investment choice attitude and experience. SCF is a single measure of risk tolerance. | Closed ended questions using a nominal scale. Participants had to select one of four options. |
| Section E – Risk tolerance (E2-E19) | Grable and Lytton (1999) | Multiple measure of risk tolerance. Measure the risk tolerance of depositors in terms of their finances. | Closed ended questions using a nominal scale. Participants had to select one applicable option. |

Source: Author compilation

#### 4.5.1.4.1 Section A: Demographic information

Section A included various demographic questions, which were placed after the introduction of the questionnaire to ascertain that the participant pertains to the necessary characteristic to be included in the study. The demographical questions included age, gender, race and the highest level of education. Participants were also asked to indicate their current annual income level according to the latest 2018 income tax brackets. Furthermore, participants were asked to indicate which one of the five major banks they are currently using. These characteristics were all part of the inclusion criteria for the selected sample. Demographic information was also included to determine whether any of these demographic factors play a role in the behaviour of depositors.

#### 4.5.1.4.2 Section B: Hypothetical operational risk events

Section B included self-structured questions based on the theoretical analysis of Chapter 2 and Chapter 3 of the BCBS. Boyle *et al.* (2015) followed the same question construct by asking depositors what amount they will withdraw based on the amount of deposit insurance provided by the participants' banks. This section comprised eight operational events as classified by BCBS (2001) to require depositors to make judgements regarding how likely they will withdraw their current deposits when faced with an operational event. A six-point Likert scale was used (1) very unlikely, (2) unlikely, (3) somewhat unlikely, (4) somewhat likely, (5) likely and (6) very likely. This approach had several advantages over a traditional survey (Boyle *et al.*, 2015:592). First, the hypothetical operational risk events ensured that the responses of depositors are less susceptible to social desirability and retrospection biases. Secondly, it allowed the researcher to examine what actions depositors will take in several different operational risk events to determine which events might be more severe.

#### 4.5.1.4.3 Section C: Reputational risk

Section C asked participants to indicate the percentage of their current deposits that they will withdraw after hearing of the operational event. Hence, the study made use of a six-point numerical scale (interval scale) to indicate the level of percentage (%) that depositors will withdraw. The six-point scale ranked from 0 to 100 percent, divided into five intervals of 20 percent. After each operational risk event, a follow-up question was asked where participants had to indicate whether the event will negatively influence their perception of the bank. A six-point Likert scale was used (1) very unlikely, (2) unlikely, (3) somewhat unlikely, (4)

somewhat likely, (5) likely and (6) very likely. Lastly, a few questions were added to determine whether participants base the reputation of a bank on the factors suggested by theory. A six-point Likert scale was used (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree and (6) strongly agree.

#### 4.5.1.4.4 Section D: Behavioural finance and information

Behavioural finance is based on an unconventional notion that market participants are subjected to behavioural biases that result in less rational financial decisions. Evidence of these biases stems from cognitive psychology literature as mentioned in Chapter 2 and applied within a financial context (Byrne & Brooks, 2008:1). A set of self-structured questions were used to determine depositor's behaviour during operational risk events to establish a link between depositors' withdrawal decision and behavioural finance. These statements were derived from behavioural finance theory and are inductive of nature (Hinkin, 1998:104). For this part of the study, a six-point Likert scale was used, which included options such as (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree and (6) strongly agree towards each of the statements. A seven-point Likert scale, which includes a neutral position that suggests uncertainty, was excluded to avoid respondent bias.

Table 4.7 represents the biases and their assumptions as described in detail in Chapter 2.

**Table 4.7: Behavioural finance biases and statements**

| Theory | Description | Statement |
|---|---|---|
| Representativeness | Market participants base their financial decisions on their perception of the past performance of a bank. | I base my financial decision on the past performance of the bank |
| Overconfidence and over optimism | Market participants tend to overestimate their financial capabilities. | My superior financial knowledge drives my decisions |
| Frame dependence and anchoring | Market participants base decisions on a single piece of information despite the amount of available information. | I rely on a single piece of information to make financial decisions |
| Gamblers fallacy | Market participants inaccurately predict financial market movements by basing decisions on future trends. | My financial decisions are based on future market predictions. |

| Theory | Description | Statement |
|---|---|---|
| Availability bias | Market participants inaccurately predict financial market movements by basing decisions on available or current information only. | My decisions are based on the most recent information. |
| Loss aversion | Market participants tend to keep non-performing financial assets with the hope that these assets will yield greater returns in the future. | I would rather take the risk to keep my money at my current bank than to move to another bank. |
| Regret aversion | Market participants avoid risky financial decision to avoid the feeling of regret, guilt of grief. | My previously incorrect financial decisions, which led to a financial loss, drive my decisions. |
| Mental accounting | Market participants group information and financial decisions into separate metal compartments. | I receive a good interest rate on my account and will rather leave my account as is to earn higher future interest rates. |
| Self-control | Market participants exercise self-control to avoid large financial losses. | I exercise self-control when making financial decisions |

Source: Kannadhasan (2009); Singh (2012); Bodie *et al.* (2013).

A ranking question (ordinal raking scale) was also used where participants ranked their top three preference of information sources to have achieved the second empirical objective (Section 1.3.3). The responses ranged from newspapers, television, social media, internet sources and word of mouth. The top three preferred sources of information had to be ranked from one to three. This question was asked to determine which source of information participants would most significantly respond to. These responses are easily comparable to each other (Quinlan *et al.*, 2015:303).

#### 4.5.1.4.5 Section E: Survey of Consumer Finance

In the last two sections, two validated measures of risk tolerance were used to capture the risk attitude of depositors. Section D included the Survey of Consumer Finances (SCF). The SCF does not fully incorporate all of the variables of financial risk tolerance but it is the only direct measure for investment choice attitudes and experience (Grable & Lytton, 2001:43). The majority of researchers use the following statements where the participants have to select the closest option towards the amount of financial risk that they are willing to take:

1. take substantial financial risk expecting to earn substantial returns;

2. take above average financial risk expecting to earn above average returns;
3. take average financial risk expecting to earn average returns; and
4. not willing to take any financial risk.

Grable and Lytton (2001) further carried out numerous reliability tests to conclude whether the SCF measure is a reliable measure of risk tolerance. The reliability tests indicated a reliability estimate ranging from .52 to .59 suggesting a lower level of reliability (Gilliam *et al.*, 2010:30). However, despite the relatively lower Cronbach alpha value for the SCF, the measure continues to be used by researchers, practitioners and regulators, since it is the only direct measure of risk attitude (Gilliam *et al.*, 2010:32). Validated scales were used to measure the level of risk tolerance of depositors. These include multiple choice questions regarding the individual financial risk tolerance of participants. Since financial risk tolerance is such a contributing variable to household financial decisions, Grable and Lytton developed a 13-item risk assessment instrument (Grable & Lytton, 1999). This scale was developed with the aim of being one of the few validated risk tolerance scales relevant to investors' financial decisions. Within this scale laid eight categories of interest:

1. guaranteed gambles and probable gambles;
2. overall risk choice;
3. decision between sure gain and sure loss;
4. risk experience;
5. risk as a level of comfort;
6. speculative risk;
7. prospect theory; and
8. investment risk.

Grable and Lytton (1999) then factored out the eight categories of interest to establish a final and comprehensive scale. The final scale of risk tolerance (GL-RTS) included only three main categories:

1. investment risk;
2. risk experience; and
3. speculative risk

The risk tolerance scale developed by Grable and Lytton (1999) is widely used throughout the global financial industry by more than 200 000 researchers (Grable & Joo, 2004:74). Hence,

for Section E participants risk tolerance was measured by GL-RTS. This information indicated whether depositors are predominantly risk adverse or risk aggressive when faced with operational risk events. The scale is aimed at measuring participant's willingness to take on risk in terms of financial risk, speculative risk and investment risk. The reliability of the scale was measured by means of a Cronbach α reflecting a value of 0.77. This was an indication of a high level of reliability.

After the questionnaire was designed, formatted and placed in a format it was subjected to pre-testing prior to being exposed to the selected sample. The following sections provide information regarding the pre-testing and administering of the questionnaire.

#### 4.5.1.5 Pre-testing and pilot study of the questionnaire

No matter the field of research, the prime objective of any researcher is to provide valid, reliable, complete and unbiased results that will contribute to the body of knowledge (Collins, 2003:229). Therefore, is it critical that a questionnaire is pre-tested to determine its performance in reality (Iacobucci & Churchill, 2010:222). According to Malhotra *et al.* (2012:340), various problems may become evident during a pre-test, such would involve the length, unclear instructions, language or grammatical errors and unclear or confusing questions.

As stated by Collins (2003:230), it is crucial that:

- all participants understand the questions presented in the same manner;
- participants have access and can retrieve the information to answers the relevant questions;
- the phraseology of the relevant questions enables participants to understand and are able to answer the questions; and
- participants can accurately answer all questions.

For this study, the questionnaire was pretested by 15 individuals. The sample of individuals was selected based on their knowledge, race, level of education and home language. Seven of the 15 individuals were experienced researchers in the field of risk management, marketing and economics to oversee any content or measurement errors. Three of the individuals were students to ensure that participants with some form of education can understand the questionnaire. The remaining five questionnaires were given to employed adults earning a salary but without a form of higher education. Among these 15 participants were three first-

language, English-speaking participants, 11 were second-language, English speakers and one participant was third-language, English speaking. To ascertain that all races from different cultures would understand the information in the same manner, the sample included, African, White, Coloured, Greek and Indian. Due to the multilingual culture of South Africa, due measures had to be taken to ensure that all participants fully understood the questionnaire (Malhotra *et al.*, 2012:327). Overall, the average time of completion between all 15 participants was 15 minutes, which is in line with the recommended time (Hinkin, 1998:109). Feedback was received and the relevant adjustments were made, which included a six-point Likert scale rather than a seven-point scale, factor loadings, adjustments to vocabulary, technical errors, refinement on the instructions for the ranking scale as well as grammatical and language errors. A pilot study was conducted which included a sample size of 120 participants (results can be found in Annexure B). After the corrections were made to the draft questionnaire, the final questionnaire, combined with the cover letter (see Annexure A), comprising 34 items, was distributed to participants.

#### 4.5.1.6 Administration of the questionnaire

After a successful pre-test was conducted during March 2018, the final questionnaire was distributed electronically during May 2018. The questionnaires were self-administered by the participants and the completion time did not exceed the maximum time of 20 minutes per questionnaire. Using a minimum sample of 620 and assuming a 65 percent response rate, a final sample size of 400 was used for this study. The sample size for the study included 400 South African depositors, selected by means of a non-probability purposeful snowball sampling (Quinlan, 2011:213). This sample correlates with the samples of previous studies. After the completed questionnaires were collected, the data were captured data analysis was conducted as explained in Section 4.6.

## 4.6 PRELIMINARY DATA ANALYSIS

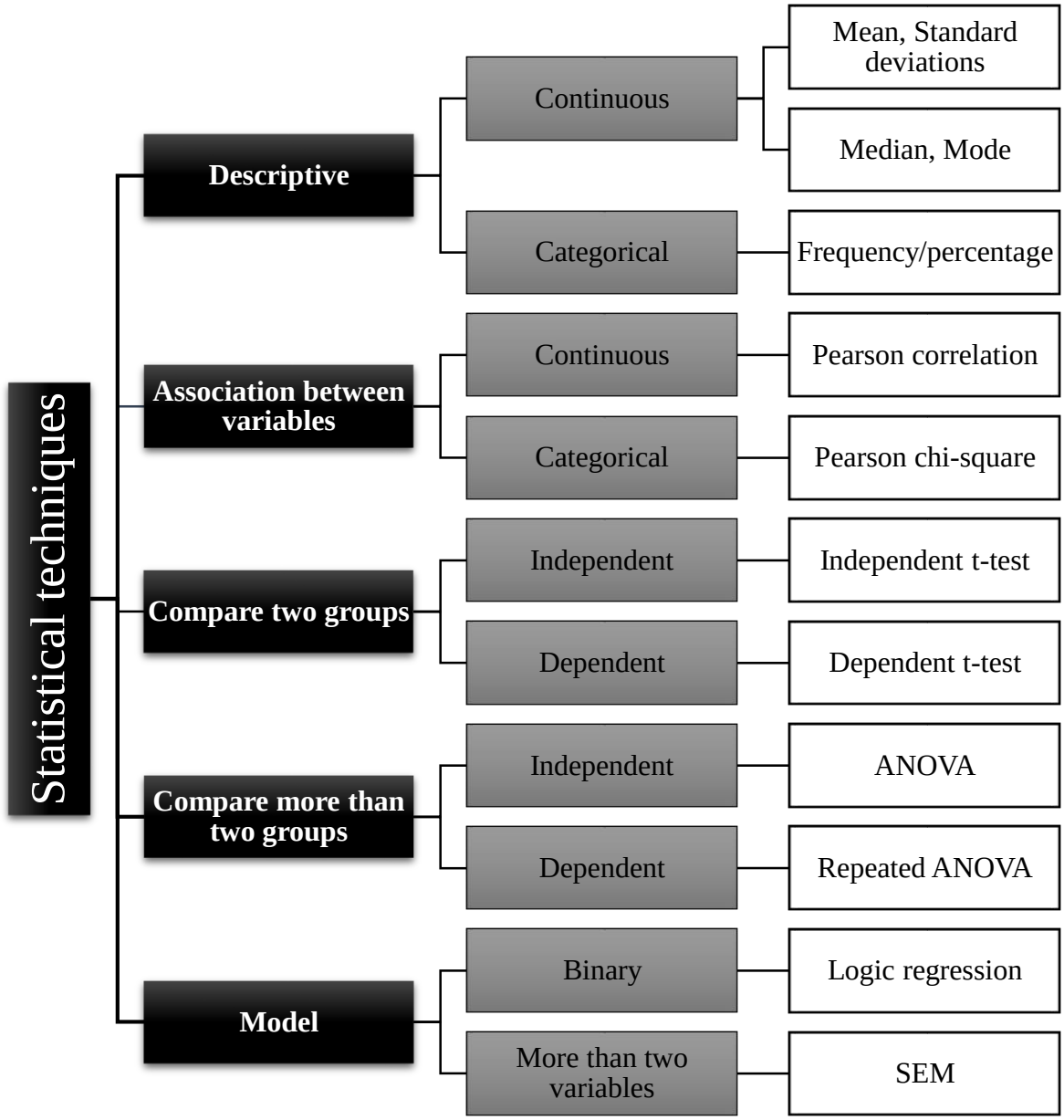
According to Creswell and Plano Clark (2011:240), data analysis can be performed in steps, starting with preparation of data (scoring), analysis of data and validation of data. Collected data are insignificant if not transformed and analysed in such a way as to answer the research question significantly (Iacobucci & Churchill, 2010:31). Preliminary data analysis is required to clean the data for them to be analysed statistically. This process involves editing, coding and tabulating the data (Cant *et al.*, 2005:188). Coding transforms the responses on the questionnaire into numbers, with the purpose of simplifying the process into a readily countable

format (see Annexure 2 for codebook). Minimal errors were detected since the data were captured and coded electronically.

## 4.7 STATISTICAL ANALYSIS OF QUANTITATIVE DATA

Quantitative data were analysed using the SPSS, version 25 for Microsoft Windows. Figure 4.4 outlines the statistical techniques, which can be used in an empirical study. The questionnaire and statistical analysis of this study was cleared by a statistician (Annexure 4).

**Figure 4.4: Statistical analysis of quantitative data**




Source: Cockeren (2017)

Random and systematic errors will always be present. Random errors affect the values of the measured variable, whereas with systematic errors, the measured variable is affected by other conceptual variables (Stagnor, 2015:90). To ensure the effective measurement of the various scales and questions used, the following statistical methods were used to analyse the captured data:

- descriptive analysis;
- factor analysis;
- significance tests;
- reliability;
- validity analysis;
- regression analysis; and
- structured equation modelling (SEM).

These statistical measures are described in the sections below.

### 4.7.1 Reliability of quantitative data

While no comprehensive measure to determine whether the measured variables are free from both random and systematic error exists, various techniques are available to determine whether measured variables accurately capture the conceptual variables (Stagnor, 2015:91). Reliability tests are one of the measures that can be taken to determine the extent to which variables are free from random error (coding errors or misinterpretation of questions) (Quinlan, 2011:306). Iacobucci and Churchill (2010:257) further defined reliability as the degree to which the same measures can be used repeatedly whilst obtaining the same results. A reliable measure will be one where no random error is found (Cant *et al.*, 2005:235).

Reliability can be assessed using one of the following three methods:

- test-retest reliability;
- equivalent forms reliability; and
- reliability as an internal consistency.

Test-retest reliability measures the correlation of two separate observations using the same measurement, administered at two different points in time (Stagnor, 2015:92). Where the two observations have the same result, random error does not exist and a high correlation can be found between the two observed variables. Where the two observations do not contain the same

results, random error is present and a lower correlation might be observed (Iacobucci & Churchill, 2010:259).

Equivalent-forms reliability is a more complex measure used to test reliability. This measure is centred on the same principles of test-retest reliability measure (Quinlan, 2011:306). Equivalent-forms reliability measures the correlation of two separate observations using two different measurements, which are administered at two different points in time (Stagnor, 2015:92). The internal consistency reliability measures the degree to which the results on a specific item on a scale correlate with each other (Stagnor, 2015:95). This method of reliability is based on measuring only the true results rather than the random error (Iacobucci & Churchill, 2010:259). The most commonly used and most accurate index for measuring internal consistency is the Cronbach alpha $\alpha$ where it measures the average correlation between all items on the scale and adds up to the reliability of the complete scale (Quinlan *et al.*, 2015:113). The reliability of a scale is determined by the value of $\alpha$, which varies from zero (complete random error) to one (contains no random error), whereby greater reliability is exemplified by a value closer to one (Quinlan, 2011:401).

### 4.7.2 Validity of quantitative data

Despite the fact that reliability measures the degree to which a measure is without random error, it omits whether the measure actually measures (Stagnor, 2015:96). Hence, the validity of measures should be determined since not all reliable scales can be regarded as valid (Hair *et al.*, 2008:150). Furthermore, the validity of a scale is the degree to which the scale is measuring the variable (conceptual) that it is expected to measure (Iacobucci & Churchill, 2010:256; Quinlan, 2011:43). In other words, validity can be regarded as the truthfulness of a scale (Neuman, 2011:217)

Validity can be assessed using one of the following two methods (see Table 4.8):

- construct validity; and
- criterion validity.

Construct validity measures the degree to which the measured variable accurately measures the conceptual variable based on the theoretical grounds to which the relevant scale adapts (Hair *et al.*, 2013:166). Hence, the results from the measure should be in close correlation with the theoretical grounds on which the scale is based (Quinlan, 2011:43). Construct validity

comprises of face validity, content validity, convergent validity and discriminant validity (Stagnor, 2015:97).

**Table 4.8: Validity measures and description**

| Validity measure | Explanation |
|---|---|
| **Construct** | Degree to which measured variables measures theoretical variables |
| Face | Degree to which measured variable performs to be a sufficient measure of theoretical variable as judged by scientific experts |
| Content | Degree to which measured variable sufficiently represented the full domain of theoretical variable |
| Convergent | Degree to which measured variable is correlated with other variables aimed at measuring the same theoretical variable |
| Discriminant | Degree to which measured variable is not correlated to other measured variables aimed at measuring the theoretical variable |
| **Criterion** | Degree to which self-report measures variables correlates with a behavioural measured variable |
| Predictive | Degree to with a self-report measure predicts a future behaviour |
| Concurrent | Degree to which a self-report measure relates to a certain behaviour measured simultaneously |

Source: Iacobucci and Churchill (2010:257); Quinlan (2011:43); Hair *et al.* (2013:166); Stagnor (2015:98)

Criterion validity considers how the results of a scale correlate with other related and measurable variables such as demographic, psychographic, attitudes and behavioural characteristics, among others and may form part of the additional criteria with which the scale scores need to be associated (Hair *et al.*, 2013:168). Criterion validity contains two sub-measures of validity, namely predictive validity and concurrent validity (Quinlan *et al.*, 2015:115). Concurrent validity refers to comparing the results of a relative new measure to a validated measure. If these measures aim to quantify the same construct then they should yield similar results (Neuman, 2011:213).

#### 4.7.2.1 Reliability and validity of this study

According to Neuman (2011:216) the process of achieving reliability goes hand in hand and is much easier to obtain than validity. In this study, the test-retest reliability measures were first employed to measure the correlation of two separate evaluations using the same set of questions. The reliability of the scales was measured using the internal consistency techniques

by utilising Cronbach's coefficient alpha donated as $\alpha$ (Cant *et al.*, 2005:235). Within this study, face validity was the first measure of validity to be exercised. The questionnaire was distributed to experienced researchers in both the field of study and quantitative measures before the distribution of the questionnaire took place. Content validity also took place to ensure that the measures in the questionnaire include all the theoretical variables (Neuman, 2011:214). This was especially exercised in Section B and Section C of the questionnaire, where measures were created based on theoretical variables. Strong convergent validity took place by correlating the results of two questions measuring the same theoretical construct (operational risk). The first question asked depositors how likely they are to withdraw their depositors after and operational events, which was followed by asking depositors how much of their deposits they will withdraw. The results of these two sections were highly correlated indicating strong convergent validity. Furthermore, overall the construct validity was utilised to determine the Cronbach $\alpha$ and inter-item correlations on the measures used. These are discussed in the results section in Chapter 5. In order to achieve a strong criterion validity, concurrent validity was utilised. Within this study, two measures of risk tolerance were used. The first measure, SCF risk tolerance was utilised as a simple measure of risk tolerance and compared to the more granular risk tolerance scale by Grable and Lytton (1999).

### 4.7.3 Descriptive statistics

According to Quinlan *et al.* (2015:359) descriptive statistics describes data such as age, gender, race, income by means of percentages, ratios, averages or standard deviation. The primary objective of descriptive statistics is to explain the collected data. Descriptive statistics can be classified into three categories (refer to Table 4.9):

- measures of central tendency;
- measures of dispersion; and
- measures of shape.

**Table 4.9: Categories of descriptive statistics**

| Descriptive statistics | | |
|---|---|---|
| **Measure of central tendency** | Mean | The sum of all values divided by the number of values |
| | Mode | Most frequently occurring value in a data set |
| | Median | Middle value in the data set |

| | | |
|---|---|---|
| **Measures of dispersion** | Range | The values between the minimum and maximum values in a data set |
| | Variance | The degree to which values differ from the arithmetic mean value |
| | Standard deviation | Measures how the data are spread around the arithmetic mean |
| **Measures of shape** | Kurtosis | Measure of flatness |
| | Skewness | Measure of asymmetry |

Source: Quinlan (2011:400)

Nominal and ordinal scales only allow certain descriptive statistics to be performed. The following describes the descriptive statistics to be used for each scale and its variables as mentioned in Section 4.5.1. For the nominal scales used in this study (i.e. gender, and race), the descriptive statistics included the frequency and mode of these variables (Quinlan *et al.*, 2015:107). The mode represented the most frequently occurring age, gender and race. The descriptive statistics for the ordinal scale (i.e. financial statements, sources of information, SCF and risk tolerance) considered frequency, mode, median and range (Stevens, 1946:677). For the interval scale measurement used (i.e. percentage deposit withdrawal and annual income) the same descriptive statistics were included as well as the mean, variance and standard deviation. The standard deviation is the measure used to indicate how the statistics are centred around the mean (Hoemmen, 2007).

### 4.7.4 Inferential statistics

Inferential statistics can be classified into these measures (refer to Table 4.10):

- t-test
- ANOVA
- correlation
- simple linear regression; and
- multiple linear regression.

**Table 4.10: Types of inferential statistics**

| Inferential statistics | |
|---|---|
| t-test | Tests whether two arithmetic means are statistically different from each other. |
| ANOVA | Tests whether many arithmetic means are statistically different from each other |
| Correlation | Single number used to describe the strength of a relationship between two variables and the direction of the relationship |
| Simple linear regression | Degree to which an independent variable predicts a dependent variable (whether there is a relationship between the two variables) |
| Multiple linear regression | Degree to which several independent variables predict the dependent variable (whether there is a relationship between the multiple variables) |

Source: Quinlan (2011:400)

### 4.7.5 Outline of statistical techniques employed

Table 4.11 below summarises the descriptive and inferential statistics employed in this study in order to have achieved the empirical objectives.

**Table 4.11: Summary of descriptive and inferential statistics employed**

| Objective | Methods |
|---|---|
| 1. Identify the most significant operational risk events and reputational loss events leading to reputational risk. | Descriptive<br>Factor analysis<br>Correlation<br>Linear regression |
| 2. Determine how demographical factors influence depositors likelihood to withdraw. | T-tests<br>ANOVA<br>Correlation |
| 3. Determine how bank perception influences depositor likelihood to withdraw from both operational risk events. | Correlation |
| 4. Identify the behavioural biases that drive depositor behaviour to withdraw and likeliness to withdraw. | Correlation<br>ANOVA |
| 5. Determining depositor behaviour to withdraw and likeliness to withdraw regarding the source of information. | Correlation<br>ANOVA |
| 6. Determine depositors' level of risk tolerance. | Descriptive<br>Correlation |
| 7. Construct a forecasting model to identify reputational risk by profiling depositor behaviour (risk tolerance, behavioural biases, demographics, likelihood to withdraw). | Correlation<br>SEM |

Source: Author compilation

#### 4.7.5.1 Descriptive statistics conducted

Concerning objective one: *Identify the most significant operational risk events and reputational loss events leading to reputational risk,* descriptive statistics was also implemented to determine the minimum, average and maximum amount that depositors withdrew when faced with operational risk events. This information contributed towards profiling depositor's withdrawal behaviour. Concerning objective two: *Determine how demographical factors influence depositors' likelihood to withdraw*, descriptive analysis was applied in order to determine the demographics of participants such as; age, gender, ethnicity, highest level of education and income level. Concerning objective five: *Determining depositor behaviour to withdraw and likeliness to withdraw regarding the source of information.* Descriptive statistics were used in order to determine depositor behaviour regarding the source of information, where these sources were television, electronic newspapers, internet, word of mouth and various social media platforms.

#### 4.7.5.2 Inferential statistics conducted

Concerning objective one: *Identify the most significant operational risk events and reputational events leading to reputational risk,* factor analysis (exploratory and confirmative) was conducted to identify the most significant operational risk events within the sample. This factored the most severe operational events to determine which of these events led to reputational risk. Correlation analysis was done to establish a relationship between the likelihood of depositors to withdraw and their level of risk tolerance. This is an important part of the analysis since it indicated which level of risk tolerance is associated with how likely depositors are to withdraw. Furthermore, linear regression analysis was also conducted to explore this relationship further.

Concerning objective two: *Determine how demographical factors influence depositors' likelihood to withdraw*, ANOVA was performed to tests whether the arithmetic means are statistically different from each other considering gender groups, age groups, income groups and between educational groups. Correlation analysis was used to test the strength of the relationship between the demographics of depositors and their likelihood to withdraw from their bank accounts.

Concerning objective three: *Determine how bank reputation influences depositor likelihood to withdraw from both operational risk and reputational risk,* correlation and regression analysis

was used. Regression analysis was used to test whether there is indeed a relationship between how depositors form their banks reputation and how they tend to withdraw. Correlation was used to test the actual strength of the relationship between how depositors form their perception of a bank and their likelihood to withdraw.

Concerning objective four: *Identify the behavioural biases that drive depositor behaviour to withdraw and likeliness to withdraw*. The behavioural biases that drive depositor behaviour were identified by means of correlation analysis to indicate the relationship among behavioural finance biases and depositor financial decision making. ANOVA was then used to test whether there was a difference between depositors' likelihood to withdraw based on the bias they are subject towards.

Concerning objective five: *Determining depositor behaviour to withdraw and likeliness to withdraw regarding the source of information.* Descriptive statistics were used in order to determine depositor behaviour regarding the source of information, where these sources were television, electronic newspapers, internet, word of mouth and various social media platforms. This gave an indication of the likelihood of depositors to react to certain information sources. ANOVA indicated the difference between depositors' withdrawal behaviour and the dependant sources of information.

Concerning objective six: *Determine depositors' level of risk tolerance.* Correlation was used to indicate whether there is a relationship between depositors' risk tolerance levels and their demographical characteristics such as age, level of education and income. This was necessary to see how much risk depositors are willing to take in terms of their personal finances. This was a significant contribution towards being able to obtain objective seven.

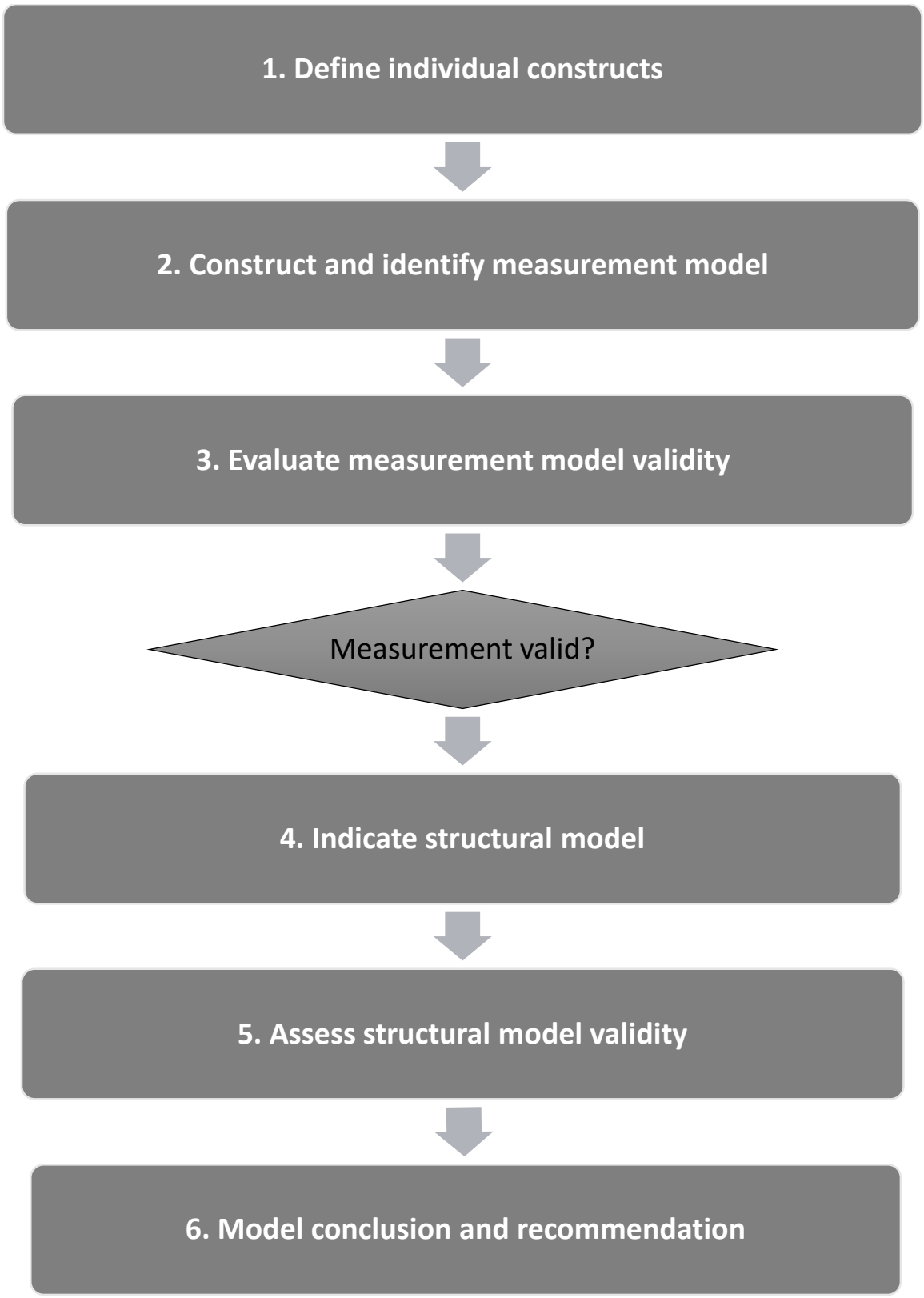
Concerning objective seven: *Construct a forecasting model to identify reputational risk by profiling depositor behaviour (risk tolerance, behavioural biases, demographics, likelihood to withdraw).* This study applied correlation analysis to test the strength and direction of reputational risk and risk tolerance, behavioural biases, demographics, likelihood to withdraw. Objective seven was further achieved by constructing a model in order to predict depositor behaviour in terms of reputational risk.

#### 4.7.5.3 Structural equation modelling (SEM)

The popular multivariate approach, structural equation modelling (SEM), was used to profile South African depositors. This approach was chosen due to the academically appealing

technique to test the existing theory of a phenomenon (Malhotra & Birks, 1999:150). SEM assisted the researcher in explaining the complete and simultaneous relationship amongst the multiple variables (Hair *et al.*, 2008:210). For instance, the SEM will only take the main operational events that factored out and which had a strong reputational impact and group them according to behavioural biases and risk tolerance level. Therefore, depositors will be profiled according to their likelihood to withdraw during operational risk events that led to reputational risk based on their demographics, risk tolerance levels and behavioural biases. Another advantage of SEM is that the relationship amongst these variables will be free from error, since the model allows for the removal of error, resulting in common variance among variables (Hardy & Bryman, 2004:434). According to Malhotra *et al.* (2012:870) six steps have been established in order to conduct structural equation modelling indicated in Figure 4.5 below:

**Figure 4.5: Conducting structural equation modelling**

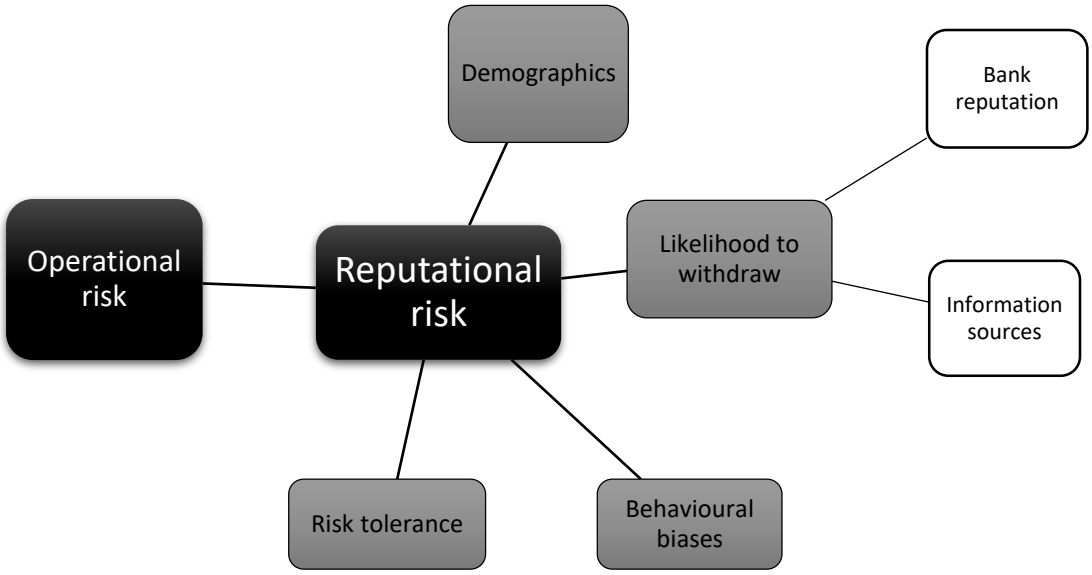



Source: Malhotra *et al.* (2012:870)

#### 4.7.5.3.1 Define multiple individual variables

A SEM is based on the theoretical relationships amongst multiple variables or constructs (Hardy & Bryman, 2004:436). The first step in SEM is to define these constructs based on theory, state how they will be measured and elaborate on the interrelationships amongst the multiple variables. Two theories have to be tested, the first (1) measurement theory and the second (2) structural theory. The measurement theory presents variables according to their characteristics while the structural theory elaborates on the merged relationships amongst the variables (Malhotra *et al.*, 2012:871). This step includes converting these structured relationships into hypotheses to be tested in the model. In this study, a theoretical relationship exists between depositors' demographical factors, their likelihood to withdraw, behavioural finance biases and their respective risk tolerance levels considering reputational risk as indicated by Figure 4.6 below.

**Figure 4.6: Theoretical relationship amongst variables**




Source: Author compilation

#### 4.7.5.3.2 Construct and identify measurement model

The second step in conducting SEM is to construct and identify the measurement model used (Kaplan, 2009:9). During the second step of SEM, each underlying variable is identified and assigned to the indicator variables. It is important to note that the underlying variables do not

always explain the indicator variables perfectly, therefore, error terms should be added for each underlying variable. Figure 4.8 below indicates four underlying variables (demographics, likelihood to withdraw, behavioural biases with four error terms and one between-construct correlation between operational risk and reputational risk. Considering the complexity of the measurement behind a SEM model, the most appropriate sample size should be considered (Hardy & Bryman, 2004:253). Table 4.12 below indicates the proposed minimum sample sizes for using SEM. The sample sizes depend on the complexity of the model, number of variables and latent or underlying variables as well as the communality. Communality can be referred to as the variance of the latent/underlying variable that is explained by its specific construct (Malhotra *et al.*, 2012:873).

**Table 4.12: Proposed minimum sample sizes for SEM**

| Minimum sample size | Model specifications |
|---|---|
| 200 | Five or less constructs with more than three underlying variables. Communalities greater than 0.5. |
| 300 | Five or less constructs with less than three underlying variables. Communalities lower than 0.5. |
| 400 | Large number of variables with less than three underlying variables. Communalities lower than 0.5. |

Source: Malhotra *et al.* (2012:873)

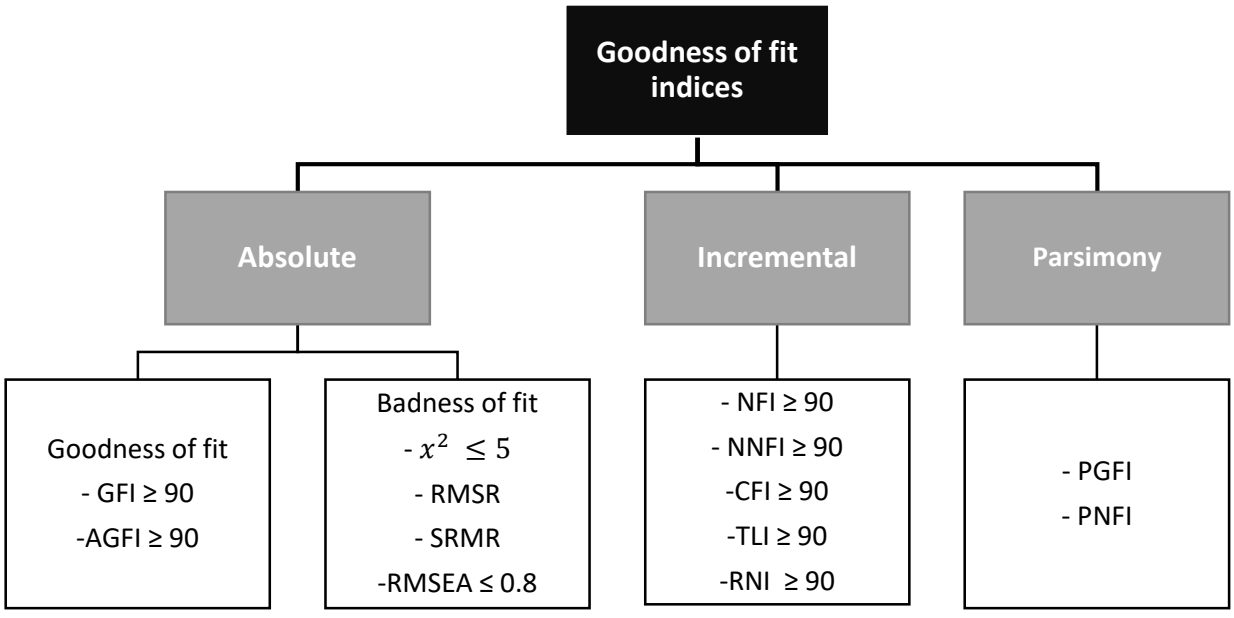
#### 4.7.5.3.3 Evaluate measurement model validity

According to Kaplan (2009:10) the most important step in conducting SEM is the evaluation of the validity of the measurement model. This step answers the overriding questions of "Is the measurement model fit?" Therefore the measurement model validity is dependent on a number of goodness-of-fit indices and validating model validity (Hardy & Bryman, 2004:445). Three types of goodness-of-fit indices, namely absolute, incremental and parsimony are required in order to evaluate how well the data fits the hypothesised model. The first goodness-of-fit index, the absolute goodness-of-fit index, specifies how well the empirical data fit the hypothesised measurement model. This model makes a distinction between goodness of fit indices and badness-of-fit indices. The absolute goodness-of-fit index (GFI) and the adjusted-goodness-of-fit index (AGFI) require values larger than 0.9 to be acceptable. The absolute badness-of-fit index requires values that are lower since these measures measure error or deviation, for example the chi-square test $x^2$, the root mean square residuals (RMSR), the standardised root

mean square residuals (SRMSR) and the root mean square error of approximation (RMSEA) (Malhotra *et al.*, 2012:874).

The second type of goodness-of-fit indices include incremental indices where these indices evaluate how well the measurement model is supported by the data compared to a base model which assumes that all variables are uncorrelated (Malhotra *et al.*, 2012:875). Incremental indices include normal fit index (NFI), non-normal fit index (NNFI), comparative fit index (CFI), Tucker Lewis index (TLI) and relative non-centrality index (RNI). Values for these indices range from zero to one where values greater than 0.9 are deemed a good model fit. The parsimony fit indices are used for comparing complex models rather than single models. Parsimony goodness-of-fit index (PGFI) and parsimony normal fit index (PNFI) require higher values for model fitness and parsimony. These measures should only be used in a relative sense in order to compare alternative models (Hardy & Bryman, 2004:445). Figure 4.7 below indicated the relative measures along with the acceptable fit values.

**Figure 4.7: Goodness-of-fit indices**

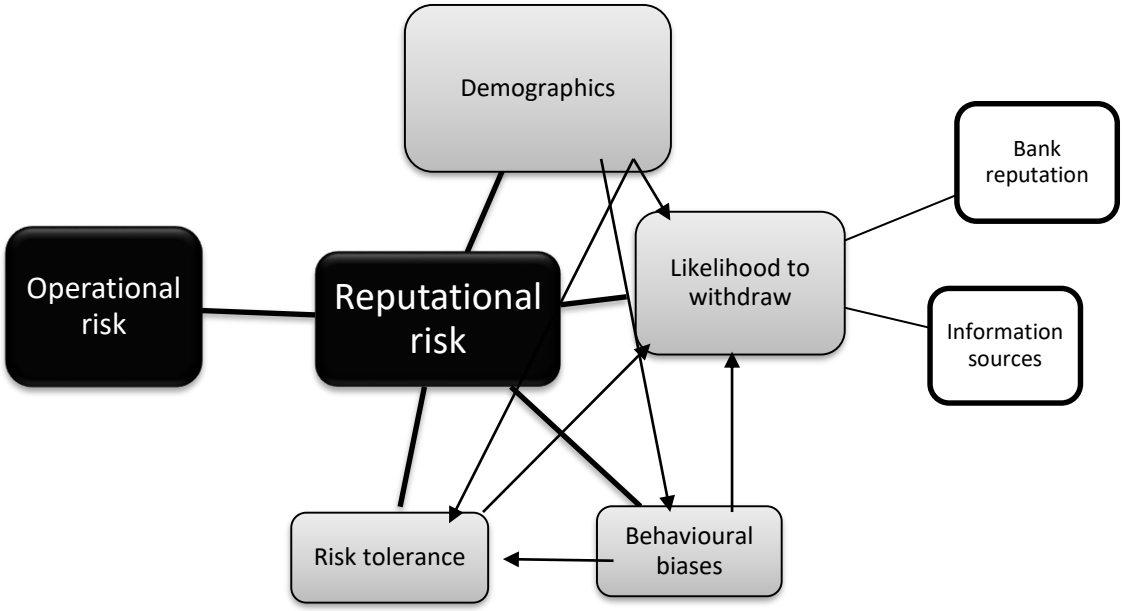



Source: Malhotra *et al.* (2012:878)

#### 4.7.5.3.4 Indicate structural model

After the validity of the measurement model have been completed and found satisfactory, the structured model can be indicated and laid out for specification (Hardy & Bryman, 2004:452). At this step, the model that was defined in step one is altered by focussing on the magnitude of the relationships of the underlying variables, thus creating dependency relationships. Dependency relationships suggests that one independent variable might be dependent on one of the other independent variables (Malhotra *et al.*, 2012:878). Figure 4.8 indicates the dependency relationships present in this study according to theory.

**Figure 4.8: Dependency relationship amongst variables**




Source: Author compilation

#### 4.7.5.3.5 Assess structural model validity

The second last step conducting SEM includes the assessment of the structural model validity. The aim of this step is to confirm the validity of the structured model and the concurring theoretical relationship of the multiple variables (Kaplan, 2009:9). Assessing the structured model validity comprises of three stages:

1. structural model fitness
2. comparison of structured model with contending models: and
3. confirming hypothesised theoretical relationships

After the structural model's validity have been assessed and is deemed satisfactory, conclusions and recommendations may be provided regarding the measurement of constructs (Malhotra *et al.*, 2012:880).

#### 4.7.5.3.6 Model conclusion and recommendations

The last step in conducting SEM comprises of valuable conclusions and recommendations on the structured model for future research. The SEM model provided a tremendous contribution to the field of study since no researcher to this date have constructed a depositor behaviour model to assist in managing reputational risk in banks by modelling depositor behaviour based on depositors' demographics, likelihood to withdraw, behavioural biases and risk tolerance levels.

## 4.8 SYNOPSIS

This chapter illuminated the research design and methodology used for the empirical portion of the study. Both the design and methodology were constructed to achieve the empirical objectives set out in Chapter 1. This chapter included a discussion on the paradigm, positivist, which shaped the view of the research question. Since a mixed methodological approach would require too much time and cost and a single qualitative approach would be insufficient, a purely quantitative research approach was followed. This allowed the elimination of time and cost constraints. The sampling procedure, data collection and data analysis were discussed. The study made use of non-probability snowball sampling to reach the required participants. Data were collected by means of a survey where a structured questionnaire using self-administered questions and validated scales were used. It is recommended that a sample with a ratio of at least five items per variable is required and at least a 150 sample size. In this study, the sample (417) yielded a ratio of eight items for each variable. Therefore, the sample size for this study included 417 South African depositors banking in Gauteng does in deed meet the requirement for the statistical analysis employed in the study. Within this study, face validity was exercised. The questionnaire was distributed to experienced researchers in both the field of study and quantitative measures before the distribution of the questionnaire took place.

The data analysis formed a significant part of the research methodology. A range of statistical measures was used to analyse the quantitative data. Among these were reliability, validity and descriptive analysis, significance tests, correlation and SEM. The popular multivariate approach, SEM was used to profile South African depositors. This approach was chosen due

to the academically appealing technique to test the existing theory of a phenomenon. SEM assisted the researcher in explaining the complete and simultaneous relationship amongst the multiple variables. For instance, SEM took the main operational events that factored out and which had a strong reputational impact and group them according to behavioural biases and risk tolerance level.

This chapter formed the foundation from which Chapter 5 emanates. The representation of the data analysis discussed here is presented in Chapter 5 and a conclusion is drawn in Chapter 6.

# CHAPTER 5: ANALYSIS AND INTERPRETATION OF EMPIRICAL RESULTS

*It takes 20 years to build a reputation and five minutes to ruin it. If you think about that, you'll do things differently. (Warren Buffet, 2008)*

## 5.1 INTRODUCTION

The fundamental purpose of this chapter is to report on the results and findings of the empirical study conducted. The primary objective of this study was to analyse depositor behaviour during operational risk events to predict reputational risk. This chapter lays out the results in accordance with the empirical objectives as set out in Chapter 1:

- Identify the most significant operational risk events leading to reputational risk
- Determine how demographical factors influence depositors' likelihood to withdraw;
- Determine depositors' level of risk tolerance;
- Determine how bank reputation influences depositor likelihood to withdraw;
- Identify the behavioural biases that drive depositor behaviour;
- Determining depositor behaviour regarding the source of information; and
- Construct a forecasting model to identify reputational risk by profiling depositor behaviour.

To achieve the empirical objectives and, ultimately, the primary objective, a comprehensive presentation of the results had to be structured. This chapter thus aims to describe the various sections of the analysis and interpretation:

- Sections 5.2 commences with a discussion of the pilot test, which was conducted before the final data gathering process.
- Section 5.3 describes the preliminary data analysis process, which includes the coding of the data and the data gathering process.
- Section 5.4 and Section 5.5 further elaborates on the descriptive analysis of the demographics of the sample of South African depositors within Gauteng.
- The chapter further describes the exploratory factor analysis conducted on the operational risk event categories in Section 5.6.
- Section 5.7 discusses the hypothesis testing of all empirical objectives.
- Exploratory factor analysis was conducted in Section 5.8.

- Section 5.9 explains how demographical factors can influence the behaviour of depositors by representing the analysis of depositors' likelihood to withdraw. Within this section, the analysis indicated the sample t-tests used and correlation analysis.
- The analysis relating to each empirical objective is discussed in Section 5.10, leaving Section 5.14 to the achievement of the very last empirical objective using Structural equation modelling (SEM).

## 5.2 RESULTS OF THE PILOT STUDY

Prior to the execution of the pilot study, the questionnaire was pre-tested by a few specialists in the field of study. The purpose of the pre-testing was to ensure face and content validity to identify any possible challenges for the participants. The valuable feedback from the pre-test was incorporated in the questionnaire, which was then submitted to the pilot test. The purpose of conducting a pilot test was to ascertain the internal consistency of the scales used in the questionnaire. To ensure reliability the sample of participants included in the pilot test was not included in the final sample. The pilot test included 128 Gauteng bank depositors where the participants had to fill in an online questionnaire out of their own free will. Since the response rate using the electronic questionnaire was low and did not include data fit for factor analysis the final study made use of hard copy questionnaires. The following Section 5.3 describes the preliminary data analysis that was conducted.

## 5.3 PRELIMINARY DATA ANALYSIS

As recommended by Malhotra *et al.* (2012), for the purpose of data integrity, a preliminary data analysis process was conducted. The process included data gathering, coding of data and the tabulation of variables. As a result, the subsections of Section 5.3 describe the steps in the preliminary data analysis.

### 5.3.1 Data gathering process

In accordance with the data gathering process set out in Chapter 4 a total number of 600 self-administered questionnaires were distributed where a final amount of 417 were included in the final sample. The significance of the research study was explained in the cover letter of the questionnaire where the researcher also indicated that participants complete the questionnaire out of own free will.

As recommended by Malhotra *et al.* (2012) error checks were continuously conducted while the data were being gathered during the data collection stage. Reasons for excluding certain questionnaires included:

- Large sections of the questionnaire were incomplete for example the demographic section;
- Response pattern indicated that the participant did not understand the question or instruction or did not read the question;
- An absence of variance was detected for example where a three was continuously selected for all questions using a seven point Likert scale;
- The returned questionnaire is missing one or more pages;
- Completed questionnaire was received after the cut off-date; and
- The participant does not meet the inclusion criteria (age, bank account for more than five years, some level of education, banks at one of the top five banks in South Africa).

Any questionnaires completed that did not satisfy the error checks were not included in the final sample. A total number of 417 questionnaires (out of the 600 that were distributed), which passed the data integrity process, were included in the sample. This represents an actual response rate of 69.5 percent. The following section describes the coding of the variables obtained in the data.

### 5.3.2 Coding

Field (2009) defines coding as the assignment of a code in numerical form to each possible response to each question in the questionnaire. Annexure 2 indicates the coding Section A throughout Section E. Section A includes nine questions regarding the demographic information of the participants. Amongst these questions were age, gender, income, race and annual income. Section B contains 24 items on a six–point Likert scale with the purpose of obtaining information relating to the participants' willingness to withdraw money from their bank accounts, based on hypothetical events. Section C consists of 16 questions, aimed at obtaining information to determine how much the participants' will withdraw and whether the operational event will likely influence their perception of the bank negatively. Section D comprises nine items relating to behavioural finance where the participants had to select which statement drives their financial decision making. The last section, Section E, obtained information regarding the participants' level of risk tolerance. Annexure 2 indicates codes used for each question and the value assigned to each possible response.

## 5.4 DESCRIPTIVE INFORMATION OF DEMOGRAPHICS

Table 5.1 below illuminates the descriptive analysis of the biographical information of the final sample included in this study. The sections below also elaborate on the results presented in Table 5.1.

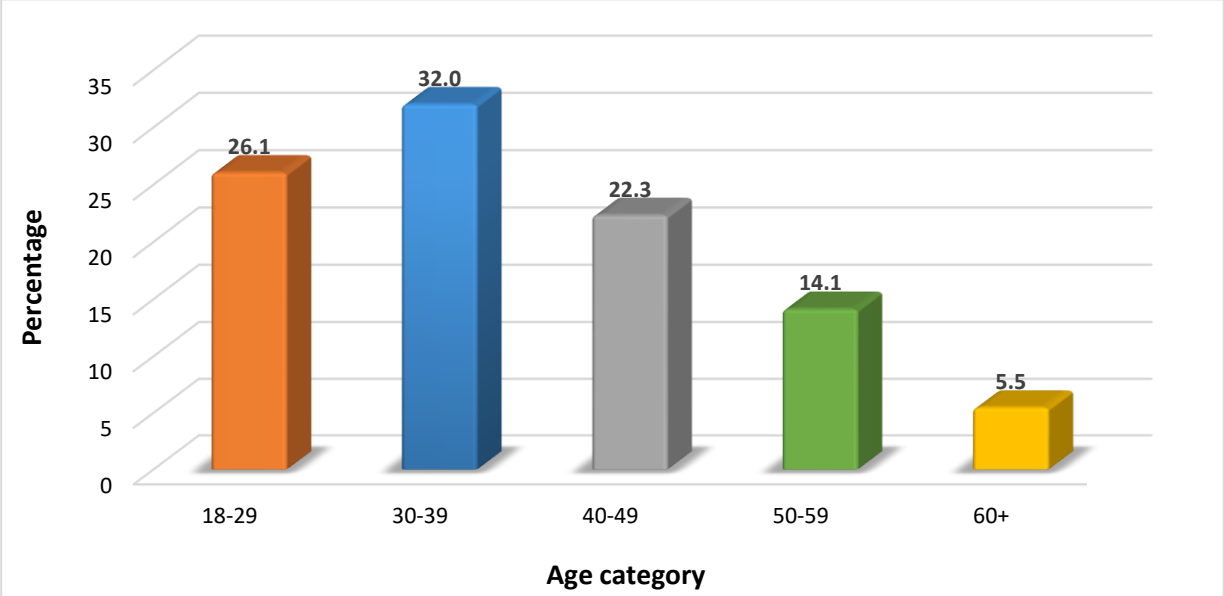
**Table 5.1: Descriptive analysis of sample**

| Score Item | Demographic variable | Category | Frequency | Valid Percent |
|---|---|---|---|---|
| A1 | Age | 18-29 | 105 | 26.1 |
| | | 30-39 | 129 | 32.0 |
| | | 40-49 | 90 | 22.3 |
| | | 50-59 | 57 | 14.1 |
| | | 60+ | 22 | 5.5 |
| A2 | Gender | Male | 188 | 45.1 |
| | | Female | 229 | 54.9 |
| A3 | Race | African | 96 | 23.3 |
| | | White | 296 | 71.8 |
| | | Coloured | 15 | 3.6 |
| | | Indian | 5 | 1.2 |
| A4 | Education | High school education | 85 | 20.4 |
| | | Further training | 54 | 13.0 |
| | | Diploma | 69 | 16.6 |
| | | Undergraduate degree | 65 | 15.6 |
| | | Honours degree | 102 | 24.5 |
| | | Master's degree | 28 | 6.7 |
| | | Doctoral degree | 9 | 2.2 |
| | | Other | 4 | 1.0 |
| A5 | Income | Below R100 000 | 114 | 27.9 |
| | | R100 000-R200 000 | 68 | 16.6 |
| | | R200 001-R400 000 | 124 | 30.3 |
| | | R400 001-R550 000 | 50 | 12.2 |
| | | R550 001-R700 000 | 22 | 5.4 |
| | | R700 001-R1500 000 | 28 | 6.8 |
| | | R1500 001 and above | 3 | 0.7 |

### 5.4.1 Age distribution

The first question in the questionnaire required participants to indicate their age in terms of five age categories, which included 18-29 years, 30-39 years, 40-49 years, 50-59 years and 60 years of age. From Figure 5.1, it can be observed that 30 percent of the participants were between the ages of 30 and 39 followed by age category 18 to 29 years, which represented 26.1 percent of the sample. Age category 40 to 49 represented almost a quarter of the sample (22.3%) while the remaining participants were older than 50 years of age (19.6%).

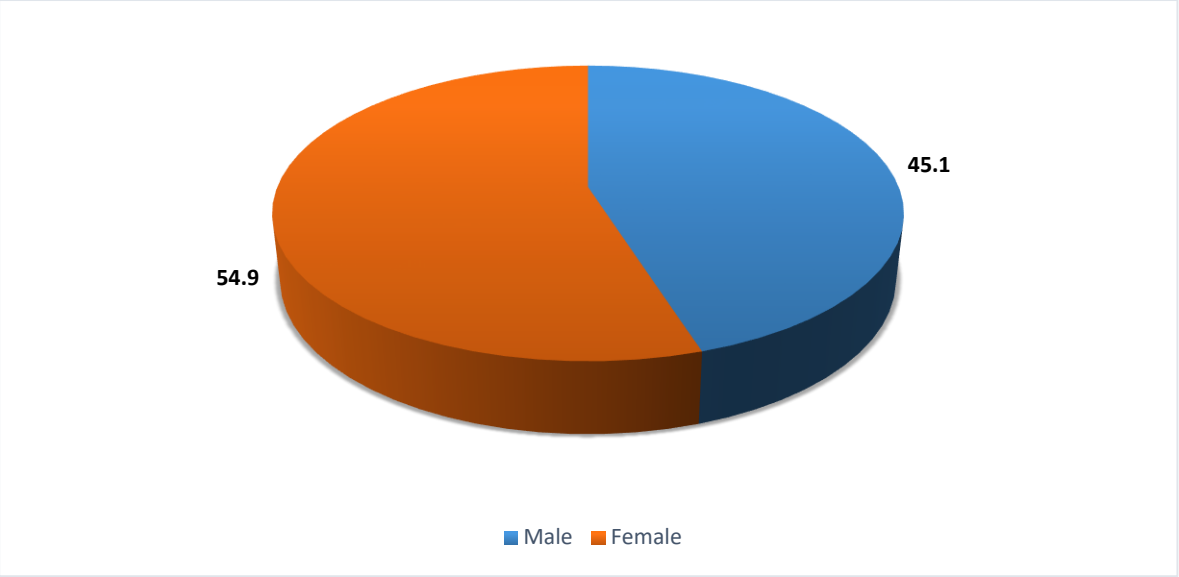
**Figure 5.1: Age distribution of sample**




### 5.4.2 Gender composition

As indicated in Table 5.1 and Figure 5.2, the sample included 54.9 percent female bank depositors and 45.1 percent male bank depositors.

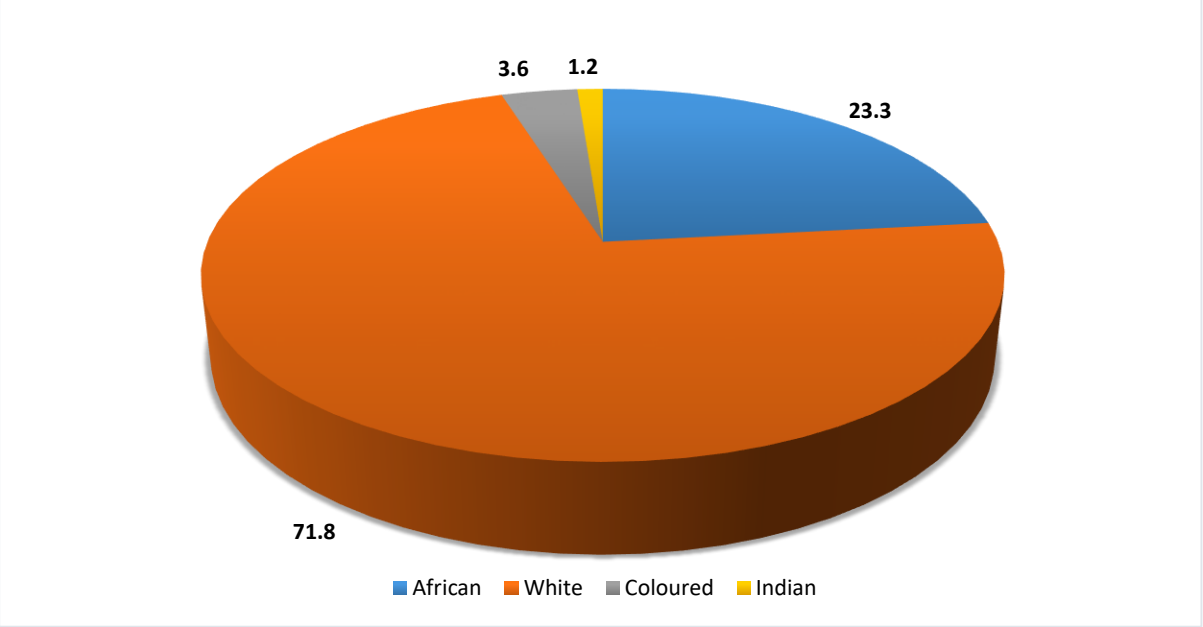
**Figure 5.2: Gender composition of the sample**




### 5.4.3 Racial composition

As shown in Figure 5.3, the majority of participants (71.8%) in the sample represented White depositors, followed by African (23.3%) depositors. Coloured participants only accounted for a small portion (3.6%) of the sample, which was followed by Indian participants (1.2%).

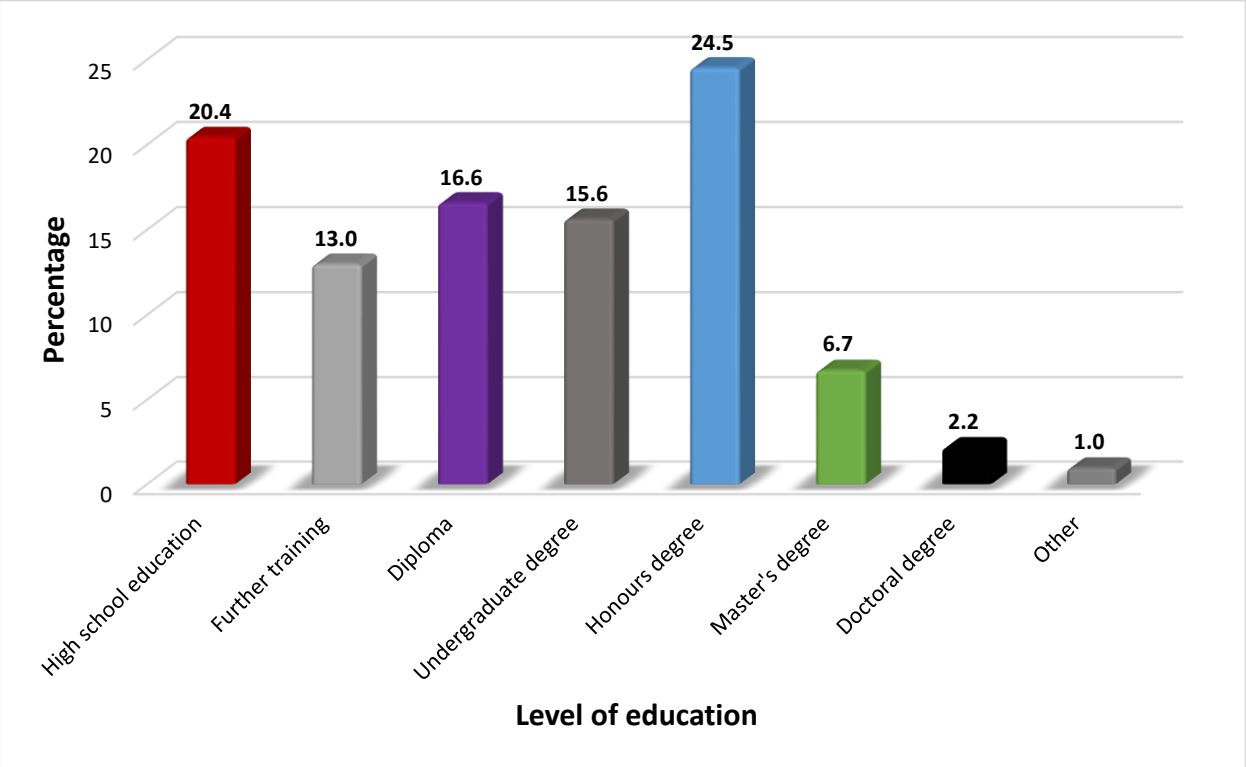
**Figure 5.3: Racial composition of the sample**



### 5.4.4 Level of education

As seen in Figure 5.4 below the sample had a relatively wide spread of different levels of formal education. The largest portion of the sample (24.5%) indicated that their highest level of education is an honours degree. This was followed by 20.4 percent of the participants who had high school education. Almost 30 percent indicated that they had some form of further formal training or had a diploma. As Figure 5.4 indicates, 15.6 percent of the participants had an undergraduate degree while almost 9 percent of the sample had higher forms of formal education such as a master's degree or doctorate (PhD) degree.

**Figure 5.4: Sample level of education**

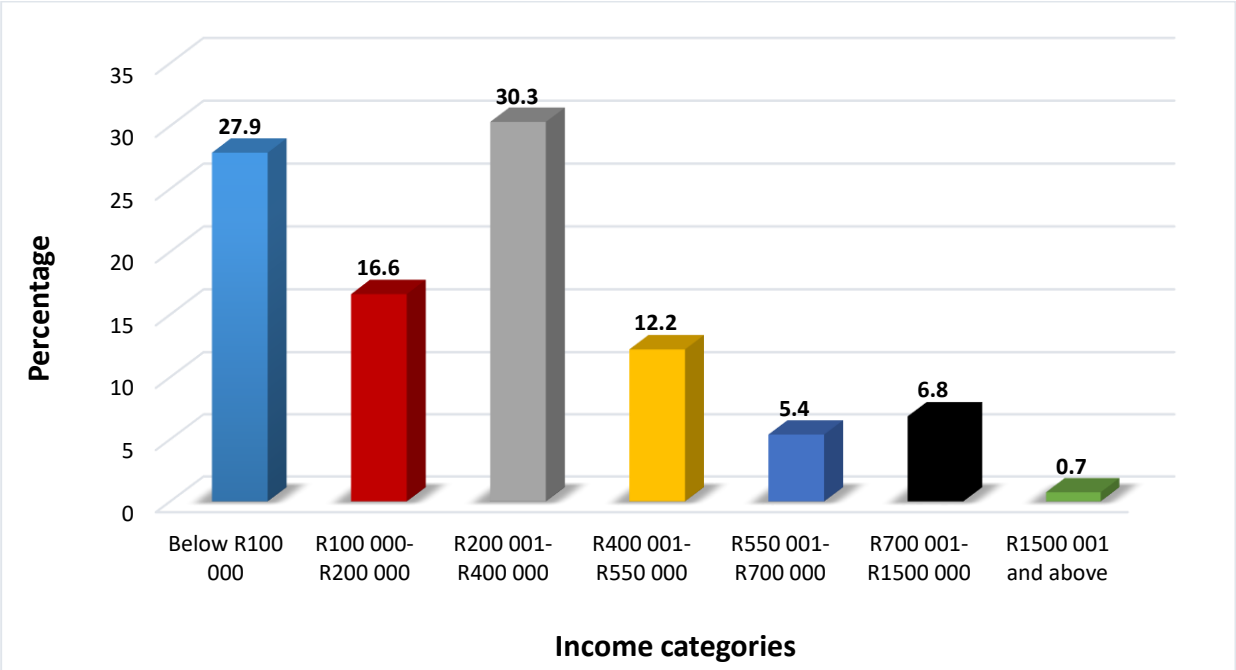



### 5.4.5 Annual income

Considering the annual income distribution, income categories were chosen according to the South African tax brackets set out in 2018. Almost 75 percent of the sample earn <R400 000 per annum. This roughly indicates that the majority of depositors in this sample earn a salary of between R1-R33 000 per month. The largest income category (30.3%) was R200 000 - R400 001 per annum followed by the income category of <R100 000 (27.9%). A total of 25.1 percent of the sample earn

>R400 0001 per annum. A total of 12.2 percent earn between R400 001 and R550 000 per annum. Less than 1 percent earn >R1.5 million per year.

**Figure 5.5: Income distribution of sample**




## 5.5 DESCRIPTIVE ANALYSIS

This section highlights the descriptive statistics of the questionnaire items. The purpose of descriptive statistics is to showcase systematic and objective information collected from the research sample based on the questionnaire that was distributed (Creswell & Plano Clark, 2011:30). Table 5.2 below indicates the descriptive analysis of Section B. A total number of 416 observations were recorded for this section. Section B asked participants to indicate how likely they will withdraw their funds from their bank account based on seven operational risk events and a pure reputational risk event. Each event is followed by three questions to be able to conduct factor analysis later. Participants answered on a six-point Likert scale ranging from very unlikely to very likely. Table 5.2 also indicates the mean value for each operational risk event as well as the standard deviation.

**Table 5.2: Descriptive analysis of Section B – Operational risk events**

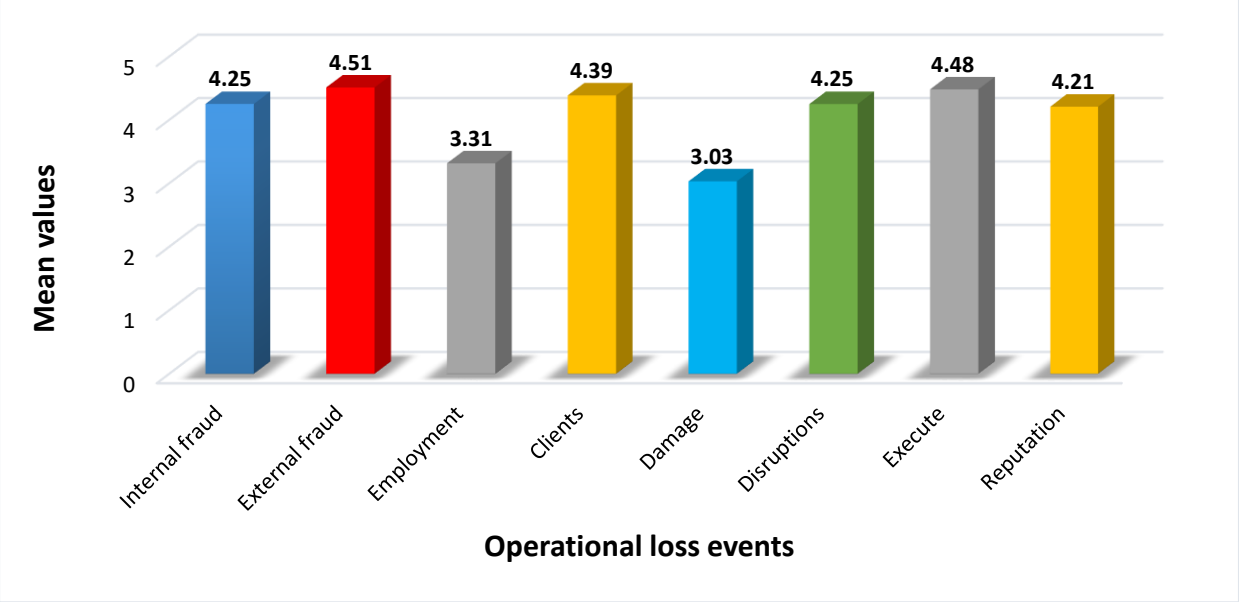
| Operational risk event | Item | Very Unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely | N | Mean | Std. |
|---|---|---|---|---|---|---|---|---|---|---|
| Internal Fraud | B3 | 5.3 | 22.2 | 12.0 | 16.9 | 23.6 | 20.0 | 416 | 4.25 | 1.214 |
| | B4 | 2.4 | 10.3 | 13.5 | 20.4 | 26.0 | 27.4 | | | |
| | B7 | 2.9 | 9.2 | 12.4 | 18.5 | 27.5 | 29.4 | | | |
| External fraud | B1 | 4.3 | 12.0 | 15.2 | 17.3 | 22.4 | 28.7 | 416 | 4.51 | 1.138 |
| | B6 | 3.8 | 6.5 | 8.4 | 13.7 | 23.3 | 44.2 | | | |
| | B11 | 22.2 | 10.8 | 10.3 | 19.4 | 28.2 | 29.2 | | | |
| Employment practice | B2 | 6.5 | 29.9 | 19.8 | 17.8 | 14.2 | 11.8 | 416 | 3.31 | 1.268 |
| | B10 | 12.3 | 22.5 | 20.3 | 19.6 | 12.1 | 13.1 | | | |
| | B8 | 10.2 | 29.3 | 20.1 | 20.3 | 10.7 | 9.4 | | | |
| Clients, products and business practice | B5 | 4.1 | 8.7 | 10.0 | 19.4 | 26.2 | 31.6 | 416 | 4.39 | 1.111 |
| | B9 | 1.7 | 11.6 | 20.3 | 22.8 | 25.4 | 18.2 | | | |
| | B22 | 1.9 | 6.8 | 12.9 | 18.9 | 30.8 | 28.6 | | | |
| Damage to physical assets | B14 | 15.8 | 31.4 | 20.9 | 12.4 | 12.4 | 7.1 | 416 | 3.03 | 1.361 |
| | B20 | 18.0 | 29.4 | 22.6 | 10.9 | 10.4 | 8.7 | | | |
| | B23 | 15.4 | 26.0 | 19.5 | 12.5 | 15.2 | 11.3 | | | |
| Business disruptions | B24 | 3.4 | 7.9 | 11.3 | 15.6 | 33.9 | 27.9 | 416 | 4.25 | 1.163 |
| | B17 | 5.6 | 17.5 | 19.7 | 20.4 | 23.4 | 13.4 | | | |
| | B16 | 2.7 | 7.8 | 13.0 | 20.3 | 31.3 | 24.9 | | | |
| Execution & Delivery | B13 | 27.0 | 10.4 | 11.8 | 23.6 | 30.8 | 20.7 | 416 | 4.48 | 1.098 |
| | B19 | 2.4 | 7.1 | 10.5 | 19.0 | 28.0 | 32.9 | | | |
| | B21 | 2.2 | 6.1 | 12.4 | 22.1 | 32.0 | 25.2 | | | |
| Reputational | B12 | 2.7 | 4.4 | 10.4 | 16.3 | 36.4 | 29.9 | 416 | 4.21 | 1.053 |
| | B15 | 41.1 | 17.2 | 23.5 | 23.8 | 21.4 | 10.0 | | | |
| | B18 | 2.0 | 10.1 | 13.1 | 28.6 | 27.6 | 19.7 | | | |

As seen in Table 5.2 as well as in Figure 5.6, external fraud as an operational risk event had the highest mean score (4.51) indicating that the majority of depositors will likely withdraw their funds when exposed to external fraud. External fraud events may include a breach in bank accounts by external parties, where bank customers are at risk of losing their funds, forging of cheques, as well as credit and debit card fraud (BCBS, 2001). The second highest mean value (4.48) was found for execution and delivery, which may include events such as the bank failing to deliver accurate annual reports, misleading information regarding bank losses or losses in client funds. This

indicates that bank depositors will be somewhat likely or likely to withdraw their funds from the bank.

Clients, products and business practices obtained a mean value of 4.39, which indicates that depositors will be somewhat likely or likely to withdraw their funds from the bank. This is true in the event that the bank might be exposed to liquidity risk, credit risk and bankruptcy due to high loan volumes and exceeding customer limits. This category also includes market manipulation on the banks' account such as currency fixing or interest rate fixing (Chernobai *et al.*, 2007:35). Business disruptions which include operational events such as frequent disruptions in banking applications (internet banking and mobile banking), outdated software, or frequent utility outage also obtained a high mean value (4.25) indicating that depositors will be somewhat likely to likely to withdraw their funds from the bank. Hence, if bank customers experience frequent downtime on banking applications, they will be likely to withdraw their money from the bank. Internal fraud also presents similar results where this operational event also obtained a mean value of 4.25. As mentioned in Chapter 3, events that are classified as internal fraud are such as the mismarking of the banks' position (where the bank is reported to be more financially sound than in reality), credit card fraud committed by bank employees, insider trading, or a loss in customer funds due to employee misconduct (BCBS, 2011).

**Figure 5.6: Mean scores of operational risk events**



Lowest mean scores were recorded for damage to physical assets (3.03) in the event of a natural disaster, terrorism attack or vandalism meaning that depositors will be somewhat unlikely to withdraw their money. Inadequate employment practices as an operational event also had a low mean value (3.31) indicating that this event will also cause depositors to be somewhat unlikely to somewhat likely to withdraw their funds. Bad employment practices may include unfair terminations of employees, discrimination in all forms, or any health and safety issues in the working environment (BCBS, 2001).

The last event related to reputational risk, where the participants were asked to indicate how likely they will be withdrawing their money in the case of three reputational events. Amongst these included when the bank's performance is not meeting the depositors' expectations and financial desires, does not handle public matters according to expectations and when the banks' activities are not creating a good reputation in the mind of the depositor. A total mean score for a pure reputational event of 4.21 was obtained indicating that depositors will also cause depositors to be somewhat unlikely to withdraw their funds. This information can be very significant for depository institutions since it will give banks an idea of how likely depositors are to withdraw their funds in the event of operational risk as well as reputational risk.

Since an indication of how likely depositors are to withdraw their funds after an operational event were given, it is also important to establish how much of their funds they will withdraw. This information can give banks an indication for possible liquidity challenges or possible bank runs. Section C of the questionnaire asked participants how much percentage they will withdraw in the event of an operational risk. It was not possible to ask the specific amount since it will depend on the depositors' annual income level. The following section indicates the percentage that depositors will withdraw. Table 5.3 indicates the descriptive analysis of Section C, which includes the total number of responses, the mean and the standard deviation.

**Table 5.3: Descriptive of Section C: Percentage withdrawn**

| Operational event | N | 0% | 1-19% | 20-39% | 40-59% | 60-79% | 80-100% | Mean | Std. |
|---|---|---|---|---|---|---|---|---|---|
| Internal fraud | 392 | 2.8 | 5.1 | 8.9 | 19.4 | 23.0 | 40.8 | 4.77 | 1.349 |
| External fraud | 394 | 2.0 | 3.0 | 6.1 | 15.7 | 20.1 | 53.0 | 5.08 | 1.236 |

| Operational event | N | 0% | 1-19% | 20-39% | 40-59% | 60-79% | 80-100% | Mean | Std. |
|---|---|---|---|---|---|---|---|---|---|
| Employment practices | 391 | 18.2 | 10.5 | 16.9 | 21.7 | 19.9 | 12.8 | 3.53 | 1.650 |
| Clients, products and business practices | 396 | 5.6 | 5.3 | 11.6 | 18.9 | 28.8 | 29.8 | 4.49 | 1.438 |
| Damage to physical assets | 393 | 21.4 | 16.8 | 18.1 | 16.0 | 14.8 | 13.0 | 3.25 | 1.699 |
| Business disruptions | 391 | 3.1 | 9.5 | 7.9 | 16.4 | 28.4 | 34.8 | 4.62 | 1.425 |
| Execution and delivery | 391 | 1.3 | 4.1 | 9.0 | 13.3 | 22.5 | 49.9 | 5.01 | 1.252 |
| Reputation | 394 | 4.6 | 5.3 | 10.4 | 17.0 | 25.6 | 37.1 | 4.65 | 1.432 |

In Table 5.3, the mean scores for all operational events were captured. Those events that had a mean score higher than the median score of 3.5 were considered severe events. Seven out of the eight events, therefore, were considered severe in terms of the percentage that depositors will withdraw.

Figure 5.7 below indicates the percentage that depositors will withdraw from their bank accounts in the event of an operational risk. Figure 5.7 also included the percentage that depositors will withdraw in the event of a pure reputational risk (not induced by any operational risks). As seen in Figure 5.7, depositors were very willing to withdraw large amount of their funds safeguarded by their bank. Six out of the eight events indicated very high levels of deposit withdrawals, where two of the events indicated slightly less percentage withdrawals. Considering internal fraud, 40.8 percent of depositors indicated that they are likely to withdraw 80-100 percent of their deposits. Another 23 percent indicated that they are willing to withdraw 60-79 percent of their deposit value. These values already indicate that 63.8 percent of depositors will withdraw more than 60 percent of their funds in the event of internal fraud. External fraud indicated more severe results as 53 percent of depositors are likely to withdraw more than 80 percent of their funds. A further 20.1 percent are likely to withdraw between 60-79 percent of their funds in the event of external fraud. The highest mean score was recorded for external fraud with a mean score of 5.08 indicating an average percentage withdrawn of between 60 and 79 percent. This indicates that 70.1 percent of depositors will likely withdraw more than 60 percent of their deposits in the event of external fraud.

Business disruptions indicated that 34.8 percent of depositors will likely withdraw more than 80 percent of funds while a further 28.4 percent will withdraw between 60-79 percent of their funds.

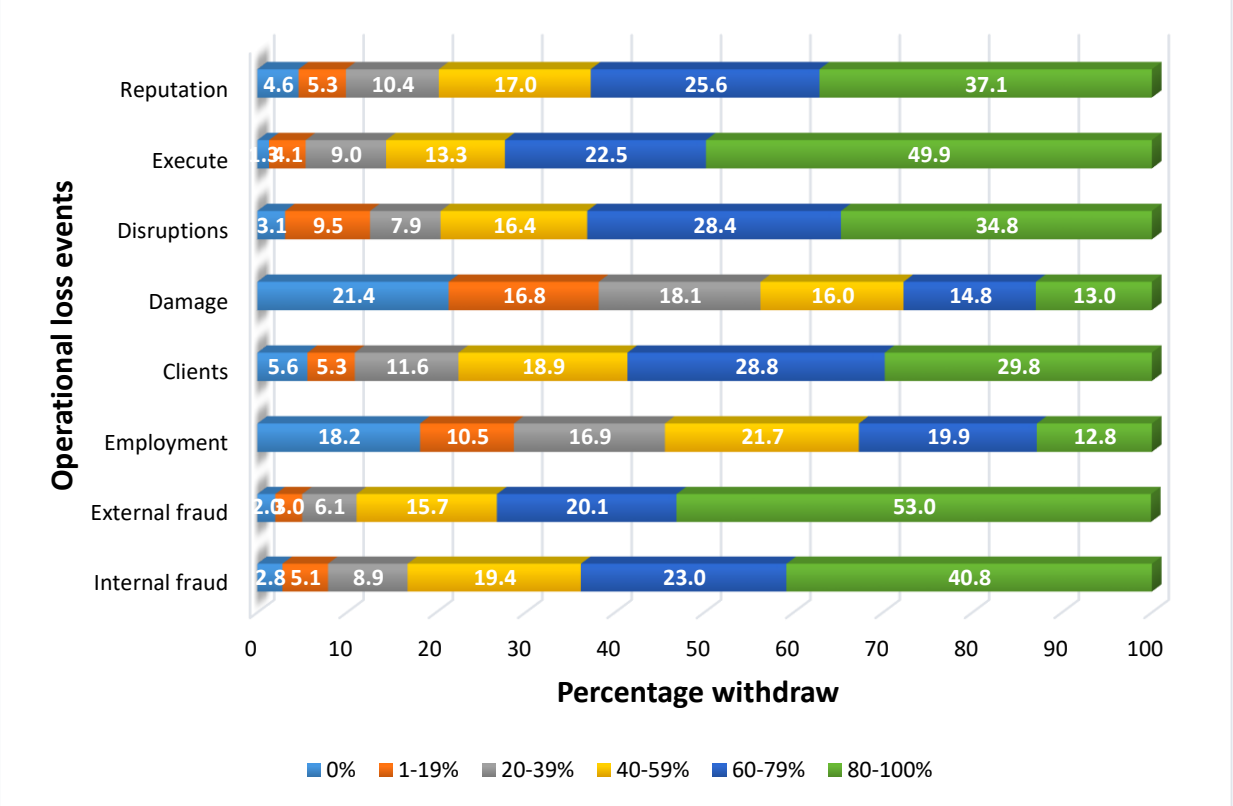
This equates to more than 63 percent of depositors that will likely withdraw more than 60 percent of their funds due to business disruptions. Execution and delivery also had extreme results, indicating that almost 50 percent of depositors will withdraw more than 80 percent of their funds while another 22.5 will withdraw more than 60 percent. This results in 72.4 percent of depositors that will withdraw more than 60 percent of their deposits.

Some operational events were less severe, such as damage to physical assets, employee practices and clients, products and business practices, which obtained lower mean score as reflected in Table 5.3. Depositors were not as keen to withdraw large amounts in the event of a natural disaster or terrorist attack considering the mean score of 3.25. This can be expected, as such events are completely external and are not created by the bank itself. Only 13 percent of depositors were likely to withdraw more than 80 percent, while another 14.8 percent were willing to withdraw between 60 percent and 79 percent. Furthermore, 16 percent were likely to withdraw 40 to 59 percent of their deposits. Although these percentages are substantially lower compared to the other events, it still indicates that 43.8 percent of depositors are willing to withdraw more than 40 percent of their funds. This could still have significant effects on a banks' liquidity. Employment practices had similar results with a lower mean value of 3.53 where only 12.8 percent were likely to withdraw more than 80 percent. Nevertheless, 54.4 percent of deposits were likely to withdraw more than 40 percent of their funds. This would leave a bank with only half of the depositors who would only have 60 percent and less left in the bank.

Clients, products and business practices indicated that almost 30 percent of depositors would withdraw more than 80 percent of the funds. Another 28.8 percent would withdraw more than 60 percent of their funds. This indicates that almost 60 percent of depositors will withdraw more than 60 percent of their funds due to clients, products and business practice failures. In terms of a pure reputational event, 37.1 percent of depositors indicated that they will be likely to withdraw more than 80 percent of the deposits. Furthermore, 25.6 percent indicated that they will withdraw between 60 and 79 percent of their deposits. Another 17 percent of depositors were willing to withdraw between 40 and 59 percent. This equates to a devastating total of almost 80 percent of depositors that will withdraw more than 40 percent of their deposits. These results are similar to that of previous studies. Iyer *et al.* (2016:15) found that for banks who has explicit deposit insurance schemes implemented, only 4 percent of deposits liquidate their accounts and the majority only withdrew 19 percent of their money. South Africa on the other hand has an implicit deposit insurance scheme and results indicated more significant withdrawal by depositors. This is

similar to Boyle *et al.* (2015) who indicated that countries without an explicit DIS face greater withdrawal risk (deposits being largely withdrawn from bank accounts).

**Figure 5.7: Percentage depositors are likely to withdraw**

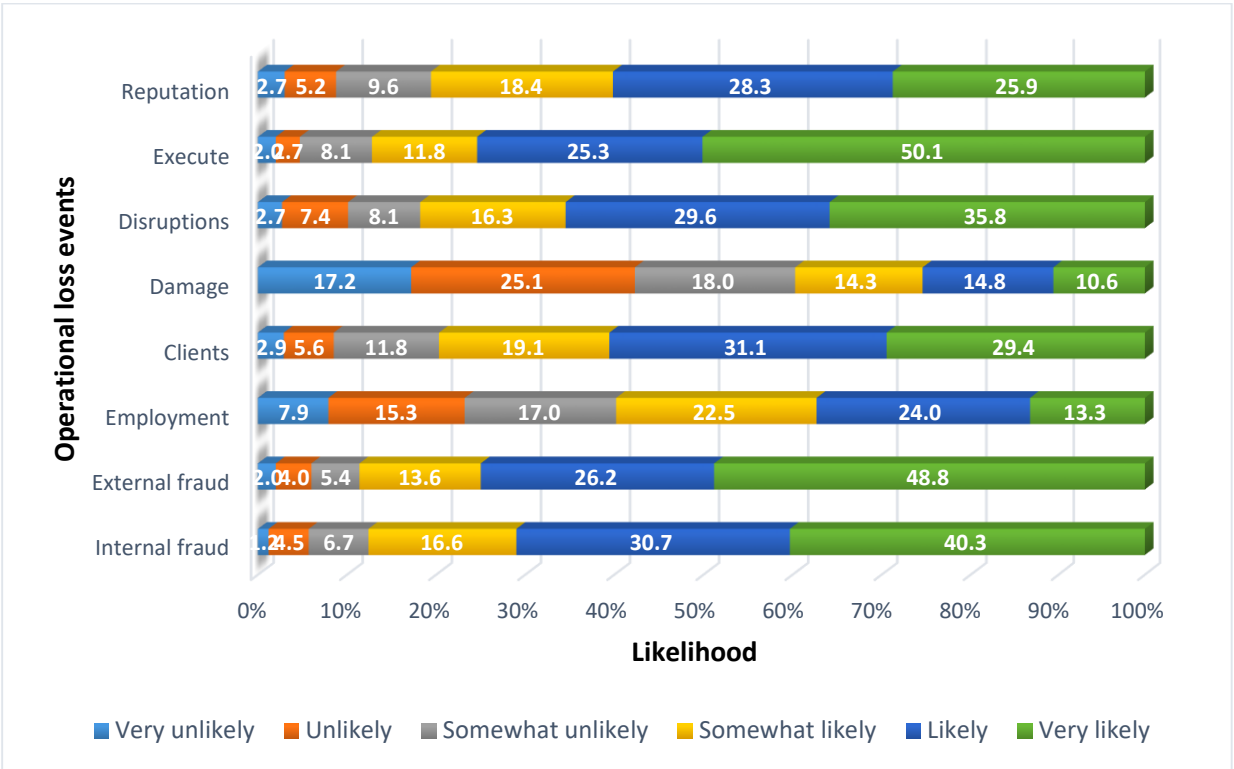



In Table 5.4, the mean scores for all operational events were captured where depositors were asked to indicate whether these events would negatively influence their perception of the bank. From Chapter 3 previous research by Low and Kalafut (2002:260) and Aula (2010:44) indicates that reputational risk as the risk of losing reputation due to people's perception of the bank. Hence, a negative perception has the possibility to erode or enhance a bank's reputation (Schreiber, 2011:91). Events that had a mean score higher than the median score of 3.5 were considered indicative of severe reputational risk for a bank. Seven out of the eight events, therefore, were considered severe in terms of the mean perception of the bank.

**Table 5.4: Mean scores for negative perception after operational event**

| Operational event | N | Very unlikely | Unlikely | Somewhat unlikely | Somewhat likely | Likely | Very likely | Mean | Std. |
|---|---|---|---|---|---|---|---|---|---|
| Internal fraud | 404 | 1.2 | 4.5 | 6.7 | 16.6 | 30.7 | 40.3 | 4.92 | 1.197 |
| External fraud | 404 | 2.0 | 4.0 | 5.4 | 13.6 | 26.2 | 48.8 | 5.04 | 1.232 |
| Employment practices | 405 | 7.9 | 15.3 | 17.0 | 22.5 | 24.0 | 13.3 | 3.79 | 1.493 |
| Clients, products and business practices | 408 | 2.9 | 5.6 | 11.8 | 19.1 | 31.1 | 29.4 | 4.58 | 1.328 |
| Damage to physical assets | 406 | 17.2 | 25.1 | 18.0 | 14.3 | 14.8 | 10.6 | 3.16 | 1.615 |
| Business disruptions | 405 | 2.7 | 7.4 | 8.1 | 16.3 | 29.6 | 35.8 | 4.70 | 1.365 |
| Execution and delivery | 407 | 2.0 | 2.7 | 8.1 | 11.8 | 25.3 | 50.1 | 5.06 | 1.225 |
| Reputation | 407 | 2.7 | 5.2 | 9.6 | 18.4 | 28.3 | 25.9 | 4.72 | 1.322 |

**Figure 5.8: Negative perception after operational event**



Considering internal fraud, 40.3 percent of depositors indicated that an internal fraud event will very likely influence their perception of the bank negatively. Another 30 percent also indicated that internal fraud will likely lead to a negative perception. Hence, without taking those into account who indicated somewhat likely, this already equates to 71 percent of depositors who indicated that internal fraud will cause a negative perception of the bank. A mean value of 4.92 was obtained for internal fraud events higher than 3.5, which is indicative of reputational risk. External fraud showed similar descriptive statistics. Almost 50 percent of depositors indicated that external fraud will lead to a negative perception of the bank in the eyes of its most important stakeholders. Another 26.2 percent and 13.6 percent of depositors indicated that this event will likely and somewhat likely cause a negative perception.

The second highest mean value of 5.04 which is much higher than 3.5 was obtained for external fraud. Employment practice had a mean value of 3.79, which was just slightly higher than the median of 3.5. More than 50 percent of the depositors indicated that bad employment practices will still lead to a negative perception. Clients, products and business practices, had a higher mean value of 4.58 with almost 30 percent of depositors indicating that a negative perception will likely be created due to poor business practices. Another 31.1 percent indicated likely while 19.1 percent indicated somewhat likely. This equates to 80 percent of the responses on the positive side of the continuum.

Damage to physical assets was the only operational event with a mean value (3.16) below 3.5. Only 10 percent of depositors indicated that damage to physical assets will lead to a negative perception. Almost 82 percent of depositors indicated that business disruptions will cause a negative perception and hence reputational risk for a bank since a 4.70 mean value was obtained. Execution and delivery had the highest mean value of 5.06 with 50.1 percent of the depositors indicating that this operational event will very likely lead to a reputational risk.

**Table 5.5: Section C - Bank perception**

| Item | N | Strongly disagree | Disagree | Somewhat disagree | Somewhat agree | Agree | Strongly agree | Mean | Std. Dev |
|---|---|---|---|---|---|---|---|---|---|
| My perception of the bank is based on the level of confidence I have in the bank | 415 | 0.5 | 1.0 | 4.1 | 12.3 | 46.5 | 35.7 | 5.10 | 0.894 |
| My perception of the bank is based on how its performance meets my expectations | 415 | 0.0 | 0.5 | 2.7 | 10.1 | 40.5 | 46.3 | 5.29 | 0.793 |
| My perception of the bank is based on the level of trust I have in the bank | 412 | 0.0 | 0.5 | 3.6 | 9.0 | 42.0 | 44.9 | 5.27 | 0.810 |
| My perception of the bank is based on the level of satisfaction regarding the services from the bank | 414 | 0.0 | 0.2 | 3.1 | 7.2 | 36.0 | 53.4 | 5.39 | 0.776 |

This section of the questionnaire aimed to explore how depositors form the reputation of a bank based on their own perception. The questions were constructed based on the literature review of reputational risk in Chapter 3. The number of responses collected are indicated for each statement in Table 5.5. Most of the responses were on the positive side of the continuum with mean scores >5.1. Very low standard deviations were also obtained indicating a very high level of agreement from the participants. These results indicate that depositors base their perception of the bank on the level of confidence, trust, satisfaction and performance expectations.

**Table 5.6: Section D – Behavioural finance biases**

| Behavioural bias | N | Strongly disagree | Disagree | Somewhat disagree | Somewhat agree | Agree | Strongly agree | Mean | Std. Dev |
|---|---|---|---|---|---|---|---|---|---|
| Representativeness | 414 | 1.9 | 5.6 | 7.0 | 18.8 | 47.6 | 19.1 | 4.62 | 1.152 |
| Overconfidence | 409 | 2.7 | 4.9 | 14.7 | 31.8 | 33.7 | 12.2 | 4.26 | 1.161 |
| Anchoring | 413 | 12.1 | 28.1 | 22.8 | 20.1 | 13.3 | 3.6 | 3.05 | 1.352 |
| Gambler's fallacy | 413 | 2.7 | 8.0 | 14.0 | 36.3 | 30.8 | 8.2 | 4.09 | 1.154 |
| Availability bias | 407 | 1.7 | 4.4 | 8.8 | 30.5 | 43.0 | 11.5 | 4.43 | 1.062 |
| Loss aversion | 412 | 6.1 | 10.9 | 13.3 | 28.2 | 29.1 | 12.4 | 4.00 | 1.381 |
| Regret aversion | 410 | 6.6 | 12.2 | 14.9 | 28.5 | 25.4 | 12.4 | 3.91 | 1.406 |
| Mental accounting | 409 | 2.9 | 5.1 | 12.0 | 25.4 | 26.2 | 18.3 | 4.42 | 1.230 |
| Self-control | 412 | 1.9 | 1.2 | 6.6 | 19.4 | 42.5 | 28.4 | 4.84 | 1.067 |

Table 5.6, participants had to indicate which of the above behavioural finance biases drives their financial decisions. A single statement was given for each of the nine behavioural finance biases and - participants had to indicate the extent to which they agree or disagree. Not very low standard deviations were expected here as each person may have one or more bias that drives their decisions. The lowest mean values however, were obtained for the anchoring bias (3.05) and the regret aversions bias (3.91). Amongst the highest mean values were for the self-control bias, representativeness bias and the availability bias. Table 5.7 indicated the frequencies for the sources of information that participants are most likely to react to most in the case an operational event. The top three sources of information that participants will react to most when making financial decisions were televisions broadcasts (77.6%), local newspapers (53.7%) as well as electronic newspapers (47%).

**Table 5.7: Tabulation of ranking scale items**

| Form of communication | Frequency | Percentage (%) |
|---|---|---|
| Televisions news broadcast | 322 | 77.6 |
| Local newspaper (hard copy) | 223 | 53.7 |
| Electronic news paper | 195 | 47 |
| Word of mouth | 191 | 46 |
| Email | 173 | 41.7 |
| Facebook | 88 | 21.2 |
| Twitter | 23 | 5.5 |

**Table 5.8: Risk tolerance self- report measure (SCF)**

| SCF – Risk tolerance | N | Percentage |
|---|---|---|
| Take substantial financial risk | 43 | 10.4 |
| Take above average risk | 101 | 24.5 |
| Take average financial risk | 168 | 40.8 |
| Not willing to take any financial risk | 100 | 24.3 |
| Total | 412 | 100.0 |

From Table 5.8 above, the frequencies for each risk tolerance statement frequency and percentage is shown. The majority (40.8%) of the participants indicated that they are willing to take average financial risk in expectance to earn average financial returns. On the lower risk tolerance side 100 participants out of the 412 (24.3%) indicated that they are not willing to take on any financial risk. On the higher level of the risk tolerance spectrum, 24.5 percent indicate that they are willing to take above average financial risk in the hope of making above average financial return. Just >10

percent indicated that they are willing to take substantial financial risk expecting to earn substantial returns.

**Table 5:9: Risk tolerance test question**

| | Strongly agree | Disagree | Agree | Strongly agree | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| It's hard for me to win a bargain/argument | 19.5 | 58.5 | 20 | 2.1 | 2.05 | 0.690 |
| When travelling, I like to take new routes | 6.1 | 26.2 | 48.9 | 18.8 | 2.80 | 0.811 |
| I like to try new foods, new places and totally new experiences | 2 | 12 | 50.5 | 35.5 | 3.19 | 0.721 |
| When driving a car, I would always obey the traffic rule and avoid dangerous situation | 1.5 | 13.4 | 46.8 | 38.4 | 3.22 | 0.728 |

Table 5.9 represents the financial risk tolerance test question which was used in conjunction with the Grable and Lytton (1999) risk tolerance scale. For the first statement, a mean score of 2.05 was obtained which indicated that participants disagree. The low standard deviation (0.690) also indicates a high level of agreement on this statement. For the second statement, a mean score of 2.8 was obtained where the majority (48.9%) of participants agreed with this statement. However, responses were slightly more spread out that the first statement with a higher standard deviation of 0.811. With the third statement a higher mean score (3.19) was obtained as the majority of the participants responded on the positive side of the continuum. A total of 50.5 percent agreed with the statement while another 35.5 percent strongly agreed. Considering the last statement, the highest mean score of 3.22 was obtained with a low standard deviation (0.728) where >70 percent of the participants answered agree or strongly agree.

**Table 5.10: Risk tolerance – Financial, speculative and investment risk**

| Risk tolerance | N | Mean |
|---|---|---|
| Financial risk | 414 | 2.23 |
| Speculative risk | 415 | 2.03 |
| Investment risk | 414 | 2.39 |

The last section of the questionnaire included an adjusted version of the original Grable and Lytton (1999) scale where questions were more adapted for the South African context. Table 5.10 represents the highest mean score (2.39) was found for the construct investment risk which was followed by financial risk (2.23). Speculative risk had the lowest mean score (2.03) which is

indicative of a lower risk tolerance level. The following Section elaborates on the exploratory factor (EFA) analysis which was conducted on the scale sections of the questionnaire.

## 5.6 EXPLORATORY FACTOR ANALYSIS (EFA)

Factor analysis (FA) involves the analysis of numerous procedures for the purpose of reducing and summarising data (Field, 2009:431). EFA reduces these data by analysing the relationships between interrelated variables by grouping them into a few underlying factors (Malhotra *et al.*, 2012:774).

### 5.6.1 Exploratory factor analysis: Section B

In Section B, EFA was used to identify the operational risk events that will influence depositors' likelihood to withdraw funds from their bank accounts. EFA was performed on seven operational risk events and one reputational risk event. The eight items included:

- Internal fraud;
- External fraud;
- Employment practice;
- Clients, products and business practice;
- Damage to physical assets;
- Business disruptions;
- Execution and delivery; and
- Reputation event.

Before EFA could be piloted, a few key statistics associated with FA had to be conducted. The Kaiser-Myer-Olkin (KMO) and the Bartlett's test of sphericity was run to determine how suitable the data were as a prerequisite for conducting factor analysis. In terms of sampling adequacy, the KMO test gives value between one and zero where higher values (0.5 to 1) indicates that the sample is adequate for factor analysis. Lower values (0 to 0.4) would imply that the sample size is not adequate for factor analysis (Malhotra *et al.*, 2012:776). In addition to Malhotra *et al.* (2012), Field (2009:659) as well as Kaiser (1994:32) found that KMO values have five ranges namely inadequate (>0.5), average (0.5 to 0.7), good (0.7 to 0.8), great (0.8 to 0.9) and superb (larger than 0.9). For adequate sample size Malhotra and Birks (1999:120) recommend that a sample with a ratio of at least five items per variable is required. For the same statistical analysis, Pallant (2013:185) recommends at least 150 sample size. In this study, the sample (417) yielded a ratio of

eight items for each variable. Referring to Table 5.11, Section B - operational events obtained a KMO value (0.920) which is higher than the minimum requirement (0.5) as recommended by Kaiser (1994:31) and falls in the superb category (larger than 0.9) (Field, 2009:659). This is an indication that the data of the sample were a good fit for FA.

Bartlett's test of sphericity was used as an identity matrix to examine if each variable correlates with itself but does not correlate with any of the other variables (null-hypothesis) (Malhotra *et al.*, 2012:775). In order for FA to be appropriate the Bartlett's test of sphericity should be significant ($p < 0.05$) (Field, 2009:660). In this case the null-hypothesis for the Bartlett's test of sphericity was significant where p-values for Section B was >0.05. This indicated that the variables are related and strongly signifying the suitability of the data in Section B (operational events) for FA. In terms of factor extraction (analysis of eigenvectors), this research study made use of principal component analysis (PCA) with Oblimin with Kaiser normalisation. Three items per factor were grouped where each factor had an absolute value greater than 0.4.

**Table 5.11: KMO and Bartlett's test of sphericity for Section B**

| **KMO and Bartlett's test of sphericity** | | **Section B: Operational events** |
|---|---|---|
| Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) | | 0.920 |
| Bartlett's test of sphericity | Chi-square | 5152.052 |
| | Degree of freedom (df) | 276 |
| | Significance (Sig) | 0.000 |

#### 5.6.1.1 Naming and interpretation of the dimensions

The eight factors accounted for 74.08 percent of the variance. A total of eight factors were extracted for the purpose of FA in Table 5.12.

***Factor one:*** comprised of five variables relating to a pure reputational event (all three variables) and to a bank execution and delivery event (two out of the three variables). This variable will be labelled bank execution and reputation since it relates to how the bank execute activities and deliver their services to bank customers which may also include factors affecting the reputation of a bank. The variables accounted for 38.32 percent of the variance and obtained an eigenvalue of 9.20.

***Factor two:*** comprised solely out of damage to physical assets where all three variables grouped well together into the second factor. As stated in Chapter 3, this factor relates to damage to a banks

physical assets such as vandalism, natural disasters or terrorist attacks (Crouhy *et al.*, 2014:510). The variables accounted for 10.86 percent of the variance and obtained an eigenvalue of 2.61. The finding of this variable confirms this factor in the operational risk framework set out by (BCBS, 2001).

***Factor three*:** comprised solely out of business disruptions where all three variables grouped well together into the third factor. This factor relates to the disruptions in the normal course of business for a bank such as power outages that may hamper business trading. The variables accounted for 7.57 percent of the variance and obtained an eigenvalue of 1.82. The finding of this variable confirms this factor in the operational risk framework set out by (BCBS, 2001).

***Factor four:*** comprised of two variables relating to an internal fraud event and one variable relating to a banks clients' products and business practices. This variable will be labelled internal fraud and business practices since it still relates to how the bank conducts its business and fraud events. The variables accounted for 4.26 percent of the variance and obtained an eigenvalue of 1.02.

***Factor five*:** comprised of two variables relating to an employment practice event and one variable relating to a banks clients' products and business practices. This variable will be labelled employment and business practices since it still relates to the employment and business practice of a bank. The variables accounted for 3.92 percent of the variance and obtained an eigenvalue of 0.94. The finding of this variable confirms this factor in the operational risk framework set out by (BCBS, 2001).

***Factor six*:** comprised of one variable of employment practice and one variable of external fraud. Hence, this factor will be labelled employee fraud. The variables accounted for 3.27 percent of the variance and obtained an eigenvalue of 0.79.

***Factor seven*:** comprised of two variables relating to an external fraud event and one variable relating to an internal fraud event. This variable will be labelled bank fraud since it still relates to the external and internal fraud of a bank. The variables accounted for 3.13 percent of the variance and obtained an eigenvalue of 0.75. The finding of this variable confirms this factor in the operational risk framework set out by (BCBS, 2001).

***Factor eight*:** comprised of two variables relating to an execution and delivery event and one variable relating to clients, products and business practices. This variable will be labelled business execution since it still relates to the business practices of a bank. The variables accounted for 2.75 percent of the variance and obtained an eigenvalue of 0.66.

#### 5.6.1.2 Internal reliability of scale: Section B

To validate the internal reliability consistency of this scale, Cronbach alpha values for all eight factors were calculated. According to Cronbach (1951:297) the reliability of a scale is dependent on the number of items in a scale, hence value around 0.7 are acceptable in terms of internal reliability consistency. Internal fraud (0.763), employment practice and workplace safety (0.795), clients' products and business practices (0.73), business disruptions (0.776), execution and delivery (0.771) and lastly reputational events (0.713) all had Cronbach alpha values higher than 0.7. External fraud was the only factor that had a Cronbach alpha value slightly below 0.7 (0.681). Damage to physical assets had the highest Cronbach alpha value of 0.855. Since the factors grouped well together and had high Cronbach alpha values >0.6, it can be assumed that all eight of the initial factors are reliable. Table 5.13 below indicates the inter-factor correlation for the operational risk factors. Since no multicollinearity was experienced, it was decided that no item would be removed. The section below indicates the multicollinearity between the variables.

**Table 5.12: Pattern matrix of operational risk factors**

| Variables | Item | Component | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Reputational event | B12 | 0.71 | | | | | | | |
| Execution and delivery | B13 | 068 | | | | | | | |
| Execution and delivery | B19 | 0.65 | | | | | | | |
| Reputational event | B18 | 0.55 | | | | | | | |
| Reputational event | B15 | 0.49 | | | | | | | - |
| Damage to physical assets | B20 | | 0.90 | | | | | | |
| Damage to physical assets | B23 | | 0.85 | | | | | | |
| Damage to physical assets | B14 | | 0.67 | | | | | | |
| Business disruptions | B17 | | | 0.83 | | | | | |
| Business disruptions | B24 | | | 0.81 | | | | | |
| Business disruptions | B16 | | | 0.75 | | | | | |
| Internal fraud | B4 | | | | 0.81 | | | | |
| Clients, products and business practice | B5 | | | | 0.69 | | | | |
| Internal fraud | B3 | | | | 0.46 | | | | |
| Employment practices | B8 | | | | | -0.75 | | | |
| Employment practices | B10 | | | | | -0.75 | | | |
| Clients, products and business practice | B9 | | | | | -0.51 | | - | |
| External fraud | B1 | | | | | | 0.75 | | |
| Employment practices | B2 | | | | | | 0.54 | | |
| External fraud | B6 | | | | | | | -0.86 | |
| Internal fraud | B7 | | | | | | | -0.66 | |

| Variables | Item | Component | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| External fraud | B11 | | | | | | | -0.62 | |
| Clients, products and business practice | B22 | | | | | | | | 0.49 |
| Execution and delivery | B21 | | | | | | | | 0.41 |

### 5.6.2 Inter-factor correlation of operational risk events

**Table 5.13: Inter factor correlation**

| Factors | Internal fraud | External fraud | Employment practice and workplace safety | Clients, products and business practice | Damage to physical assets | Business disruptions and system failures | Execution, delivery and process management | Reputational risk |
|---|---|---|---|---|---|---|---|---|
| **Internal fraud** | 1 | | | | | | | |
| **External fraud** | 0.690** | 1 | | | | | | |
| **Employment practice and workplace safety** | 0.586** | 0.416** | 1 | | | | | |
| **Clients, products and business practice** | 0.728** | 0.639** | 0.472** | 1 | | | | |
| **Damage to physical assets** | 0.369** | 0.271** | 0.577** | 0.394** | 1 | | | |
| **Business disruptions and system failures** | 0.359** | 0.383** | 0.265** | 0.489** | 0.309** | 1 | | |
| **Execution, delivery and process management** | 0.615** | 0.628** | 0.414** | 0.719** | 0.329** | 0.508** | 1 | |
| **Reputational risk** | 0.502** | 0.544** | 0.367** | 0.593** | 0.363** | 0.604** | 0.708** | 1 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | | |

To test for multicollinearity amongst the factors, correlation analysis had to be performed. Multicollinearity exists when two independent variables are highly correlated with each other (Field, 2009). This high correlation presents challenges when assessing the relative importance of the independent variables in determining the dependent variable. Multicollinearity is therefore present where the correlation coefficients between the independent variables are higher than 0.9 (Blalock, 1963:234). The greater the correlation coefficients between the independent variables, the greater the sampling error of the partials will be. Results were represented using two-tailed significance level at 1 percent ($p < 0.01$). The effect of the relationship between the factors can be outlined as follows (Gravetter & Wallnau, 2014:453):

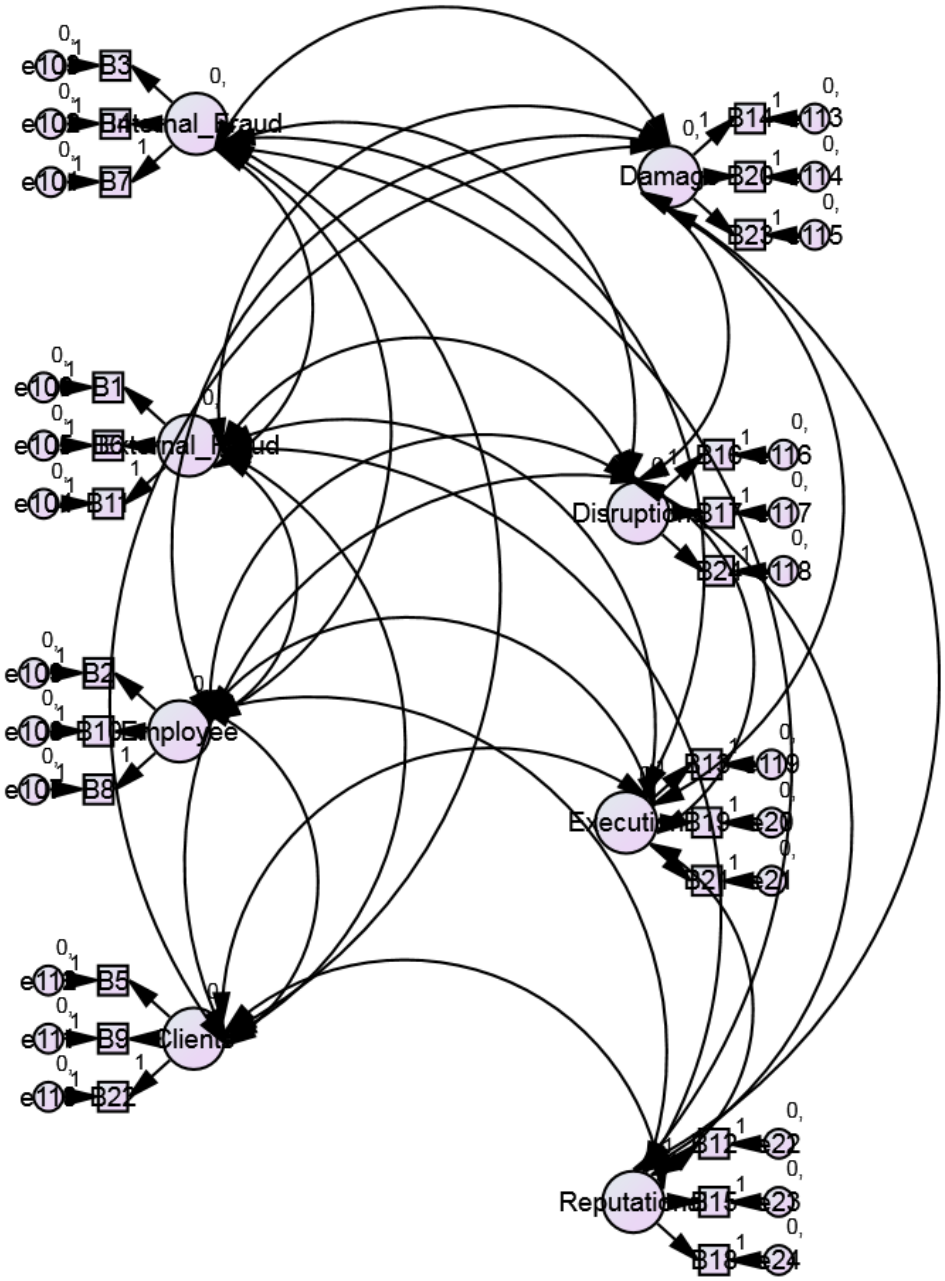
- $r$ =0.10-0.29 = Small effect
- $r$ =0.30-0.49 = Medium effect
- $r$ =0.50-1.00 = Strong effect

The Pearson correlation was used to determine the relationship between the operational risk factors. Table 5.13 indicates that each variable correlates perfectly with itself which is represented by $r$ =0.50 (Field, 2009:178). When inspecting the correlation between all of the factors, the Pearson correlation coefficient was significant at 1 percent ($p < 0.01$). These results are indicative of a positive linear association between all of the operational risk factors which further suggests nomological validity (Hair *et al.*, 2013:610). The correlations between the factors ranged from a small to a strong effect. However, since none of the factors exhibited correlation coefficients higher than 0.9, the likelihood of multicollinearity can be excluded (Malhotra *et al.*, 2012:322).

### 5.6.3 Measurement model specification

After the EFA was piloted, and a few key statistics (KMO and Bartlett's test of sphericity) associated with FA was conducted, confirmatory factor analysis (CFA) had to be performed. (Malhotra *et al.* 2012:776). CFA is conducted for two reasons, the first being to obtain the estimates or factor loadings, correlation, covariance and residual errors of the parameters in the model. The second reason is to estimate whether the model itself is a good fit for the data (Hox & Becher, 1998:356). Figure 5.9 below indicates the specified measurement model for the eight operational risk events.

**Figure 5.9: Specified measurement model**



#### 5.6.3.1 Reliability and validity of measurement model

As seen in Table 5.14 all eight factors indicated factor loadings >0.05 and these loadings were significant ($p < 0.01$) for all eight variables, which indicates that the data are a good fit for SEM. Since the operational events were created from theory exploratory factor analysis were first conducted to explore these factors. Since these factors all loaded into eight factors and had high reliability >0.7 it can now be determined whether they fit the specified model. Figure 5.9 indicates the hypothesis regarding the factor structure of the model.

**Table 5.14: Standardised regression weights**

| Operational risk event | Estimate | p-value |
|---|---|---|
| Internal Fraud | 0.788 | *** |
| External fraud | 0.750 | *** |
| Employment practice | 0.575 | *** |
| Clients, products and business practice | 0.853 | *** |
| Damage to physical assets | 0.474 | *** |
| Business disruptions | 0.586 | *** |
| Execution & delivery | 0.838 | *** |
| Reputational event | 0.752 | *** |

#### 5.6.3.2 Assessment of goodness-of-fit indices

Three types of goodness of fit indices, namely absolute, incremental and parsimony are required to evaluate how well the data fit the hypothesised model. The first goodness-of-fit index, absolute index specifies how well the empirical data fit the hypothesised measurement model. This model makes a distinction between goodness-of-fit and badness-of-fit indices. The CFI was also performed where a value of 0.87 was obtained. This was followed by the incremental fit index (IFI) and the TLI where values of 0.87 and 0.83 were obtained. Values that are closer to one indicate a better fit; whereas, those closer to zero indicate that the data do not fit the model (Malhotra *et al.*, 2012:230). The values close to 0.9 indicate a marginal goodness-of-fit (Mueller, 1996:204).

Absolute badness-of-fit indices require values that are lower since these measures measure error or deviation, for example the chi-square test $X^2$, the RMSR, the SRMSR and the RMSEA (Malhotra *et al.*, 2012:874). The chi-square value was obtained by dividing the minimum sample discrepancy with the degrees of freedom (CMIN/DF). Mueller (1996:204) argues that ratios between three and five are still acceptable as a good model fit. In this case, a value of

3.96 was obtained where this value is still acceptable indicating a goodness-of-fit. A RMSEA of 0.08 was found. The model is regarded as a good fit where RMSEA is <0.05. An adequate model is regarded where values are <0.08 (Blunch, 2008). On the other hand, according to Blunch (2008) values > 0.10 should not be accepted.

### 5.6.4 Exploratory factor analysis: Section C – Bank reputation

In Section C EFA was utilised to identify the factors that depositors include when forming their own perception and hence reputation of a bank. The four items were constructed based on the theoretical foundation of bank reputation. These four items included the level of confidence in the bank, bank performance according to expectations, level of trust, level of satisfaction (Schreiber, 2011:92; Honey, 2012:3). In order for factor analysis to be appropriate the Bartlett's test of sphericity should be significant ($p < 0.05$) (Field, 2009:660). In this case, the null-hypothesis for the Bartlett's test of sphericity was significant where p-values for bank perception was > 0.05 as presented in Table 5.15. This indicated that the variables are related and strongly signifying the suitability of the data in Section C (Bank reputation) for factor analysis. In terms of factor extraction (analysis of eigenvectors), this research study made use of principal component analysis (CPA) with Oblimin with Kaiser normalisation.

**Table 5.15: KMO and Bartlett's test of sphericity for Section C**

| **KMO and Bartlett's test of sphericity** | | **Section C: Bank reputation** |
|---|---|---|
| Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) | | 0.810 |
| Bartlett's test of sphericity | Chi-square | 670.278 |
| | Degree of freedom (df) | 6 |
| | Significance (Sig) | 0.000 |

For Section C, bank reputation obtained a KMO value (0.810) which fell in the great (0.8 to 0.9) category indicated that the data were greatly adequate for conducting FA.

Table 5.16: Total variance explained – Section C

| **Items** | **Factor loadings** | **Eigenvalue** | **% of variance** | **Cumulative %** | **Cronbach alpha** |
|---|---|---|---|---|---|
| C33 | 2.716 | 2.716 | 67.906 | 67.906 | 0.845 |
| C34 | 0.556 | | | | |
| C35 | 0.390 | | | | |
| C36 | 0.338 | | | | |

As seen in Table 5.16 the desired results were obtained as all four items came out as a single factor (bank perception) where these four factors explained 68 percent of the variance in bank perception. A very high Cronbach alpha (0.845) was also observed making this a reliable scale for measuring how depositors form their perception and ultimately the reputation of a bank.

In Section C, EFA was further utilised to identify whether a negative perception form reputational risk for a bank. Participants were asked whether operational risk events will negatively influence their perception of a bank and whether they will withdraw more than 40 percent of their deposits (Schreiber, 2011:92; Honey, 2012:3). In order for factor analysis to be appropriate the Bartlett‘s test of sphericity should be significant ($p < 0.05$) (Field, 2009:660). In this case the null-hypothesis for the Bartlett‘s test of sphericity was significant where p-values for bank reputational risk was larger than 0.05. This indicated that the variables are related and strongly signifying the suitability of the data in Section C (Reputational risk) for factor analysis. In terms of factor extraction (analysis of eigenvectors), this research study made use of principal component analysis (CPA) with Oblimin with Kaiser normalisation.

**Table 5.17: KMO and Bartlett’s test of sphericity for Section C (Bank perception)**

| **KMO and Bartlett’s test of sphericity** | | **Section C: Bank perception** |
|---|---|---|
| Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) | | 0.74 |
| Bartlett’s test of sphericity | Chi-square | 5454.72 |
| | Degree of freedom (df) | 120 |
| | Significance (Sig) | 0.000 |

Malhotra *et al.* (2012), Field (2009:659) as well as Kaiser (1994:32) found that KMO values have five ranges namely inadequate (< 0.5), average (0.5 - 0.7), good (0.7 - 0.8), great (0.8 - 0.9) and superb (> 0.9). For Section C – in Table 5.17 bank perception obtained a KMO value (0.74) which fell in the good (0.7 - 0.8), category indicated that the data were well adequate for conducting FA.

**Table 5.18: Total variance explained – Section C (Reputational risk)**

| **Items** | **Factor loadings** |
|---|---|
| C25A | 0.701 |
| C26A | 0.670 |
| C27A | 0.611 |
| C28A | 0.716 |
| C29A | 0.432 |

| | |
|---|---|
| C30A | 0.643 |
| C31A | 0.713 |
| C32A | 0.686 |
| C25B | 0.716 |
| C26B | 0.693 |
| C27B | 0.661 |
| C28B | 0.758 |
| C29B | 0.455 |
| C30B | 0.649 |
| C31B | 0.745 |
| C32B | 0.716 |
| Cumulative percentage 72.34, Cronbach alpha 0.90 | |

The desired results were obtained as bank reputational risk came out as a single factor where these variables explained 72.34 percent of the variance in reputational risk, represented in Table 5.18. A high Cronbach alpha (0.9) was also observed making this a reliable scale for measuring how depositors form their perception and ultimately the reputation of a bank. The next section presents the factor analysis for Section E of the questionnaire.

### 5.6.5 Exploratory factor analysis: Section E

This section measured the objective risk tolerance of depositors compared to the single subjective risk tolerance scale. Although this was a validated scale developed by Grable (1997), for the purpose and context of this study factor analysis and reliability had to be performed.

**Table 5.19: KMO and Bartlett's test of sphericity for Section E (Risk Tolerance-Grable)**

| **KMO and Bartlett's test of sphericity** | | **Section E Grable Risk Tolerance** |
|---|---|---|
| Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) | | 0.74 |
| Bartlett's test of sphericity | $X^2$ | 419.86 |
| | Degree of freedom (df) | 78 |
| | Significance (Sig) | 0.000 |

Malhotra *et al.* (2012), Field (2009:659) as well as Kaiser (1994:32) found that KMO values have five ranges namely inadequate (< 0.5), average (0.5 - 0.7), good (0.7 - 0.8), great (0.8 - 0.9) and superb (> 0.9). For Section E – in Table 5.19 risk tolerance obtained a KMO value (0.74) which fell in the good (0.7 - 0.8), category indicated that the data were well adequate for conducting factor analysis. However, the pattern matrix for the risk tolerance section did not indicate meaningful results.

#### 5.6.5.1 Internal reliability of Section E – Grable risk tolerance

The original risk tolerance scale developed by Grable (1997) gave individuals a total risk tolerance score of 47 (Grable, 2000). However, after conducting the factor analysis, which did not indicate meaningful results, internal reliability analysis had to be conducted. Items that correlated below 0.2 were removed from the original scale (E8, E10, E12, E15, E16). The new adjusted scale, which excluded the removed factors that correlated below 0.2 to enhance the reliability of the scale, gave depositors a total risk tolerance score out of 30. According to Moss *et al.* (1998:178) and Hilton *et al.* (2004:363) argues that the reliability of Cronbach alpha values may differ according to the field of study. However, when using human responses a benchmark value of 0.6 may be used where values smaller 0.6 indicate low internal reliability (Malhotra *et al.*, 2012:320). For Section E – in Table 5.20 Risk tolerance, a Cronbach alpha value 0.67 were obtained for the adjusted scale which indicated low to moderate internal reliability (Hilton *et al.*, 2004:363).

**Table 5.20: internal reliability of risk tolerance**

| Items | Scale mean if item deleted | Scale variance if item deleted | Corrected item-total correlation | Squared multiple correlation | Cronbach's alpha if item deleted |
|---|---|---|---|---|---|
| E7 | 26.54 | 21.71 | 0.31 | 0.19 | 0.57 |
| E8 | 26.36 | 21.75 | 0.16 | 0.07 | 0.60 |
| E9 | 26.92 | 20.90 | 0.40 | 0.20 | 0.55 |
| E10 | 27.08 | 24.29 | -0.02 | 0.07 | 0.63 |
| E11 | 27.07 | 22.12 | 0.28 | 0.12 | 0.57 |
| E12 | 27.00 | 23.16 | 0.16 | 0.07 | 0.59 |
| E13 | 26.62 | 20.25 | 0.36 | 0.18 | 0.55 |
| E14 | 27.03 | 20.90 | 0.34 | 0.23 | 0.56 |
| E15 | 27.31 | 24.64 | 0.00 | 0.06 | 0.61 |
| E16 | 25.82 | 22.60 | 0.18 | 0.09 | 0.59 |
| E17 | 27.13 | 21.88 | 0.43 | 0.24 | 0.56 |
| E18 | 26.97 | 22.50 | 0.31 | 0.10 | 0.57 |
| E19 | 25.58 | 19.12 | 0.34 | 0.16 | 0.56 |

## 5.7 HYPOTHESES TESTING

The following hypotheses were stated to test the empirical objectives of this study:

Null hypothesis ($H_{01}$): There is no relationship between operational events and reputational risk.

Alternative hypothesis ($H_{a1}$): There is a relationship between operational events and reputational risk.

Null hypothesis ($H_{02}$): Depositors' behaviour to withdraw during operational risk events does not influence reputational risk.

Alternative hypothesis ($H_{a2}$): Depositors' behaviour to withdraw during operational risk events does influence reputational risk.

Null hypothesis ($H_{03}$): There is no relationship between demographical factors and depositors' behaviour to withdraw.

Alternative hypothesis ($H_{a3}$): There is a relationship between demographical factors and depositors' behaviour to withdraw.

Null hypothesis ($H_{04}$): There is no relationship between bank perception and depositors' behaviour to withdraw.

Alternative hypothesis ($H_{a4}$): There is a relationship between bank perception and depositors' behaviour to withdraw.

Null hypothesis ($H_{05}$): There is no relationship between depositors' behaviour to withdraw and behavioural finance bias.

Alternative hypothesis ($H_{a5}$): There is a relationship between depositors' behaviour to withdraw and behavioural finance bias.

Null hypothesis ($H_{06}$): There is no relationship between depositors' behaviour to withdraw and the sources of information.

Alternative hypothesis ($H_{a6}$): There is a relationship between depositors' behaviour to withdraw and sources of information.

Null hypothesis ($H_{07}$): Depositors level of risk tolerance does not influence depositors' behaviour to withdraw.

Alternative hypothesis ($H_{a7}$): Depositors level of risk tolerance does influence depositors' behaviour to withdraw.

Null hypothesis ($H_{08}$): Depositors demographic factors do not influence their risk tolerance level.

Alternative hypothesis ($H_{a8}$): Depositors demographic factors do influence their risk tolerance level.

The following sections illuminate on the empirical objectives of the study and how they were achieved using the above stated hypotheses.

## 5.8 IDENTIFY THE MOST SIGNIFICANT OPERATIONAL EVENTS LEADING TO REPUTATIONAL RISK

The following section elaborates on the influence of depositor behaviour during operational risk events on the reputational risk of a bank. The first step was to establish an association between the amount that depositors are willing to withdraw during operational risk events (Section C question A) and reputational risk (Section C Question B) using non-parametric Spearman correlation. Secondly, to see how depositor behaviour during operational risk events influences the reputational risk of a bank by means of regression analysis. Note that when a negative perception of a bank is formed and depositors are willing to withdraw more than 40 percent of their funds, reputational risk exist (Honey, 2012; Boyle *et al.* 2015).

### 5.8.1 Non-parametric correlation of bank perception

A non-parametric Spearman correlation was used since both the variables again were measured using an ordinal scale (How much will you with draw? How likely will the event negatively influence your perception of the bank?). Table 5.21 below indicates the non-parametric correlation between the behaviour of depositors during operational risk event and the reputational risk of a bank. A two-tailed significance level can be assumed at a 1 percent significance level.

The correlation coefficients amongst the amount that depositors are willing to withdraw during an internal fraud event and reputational risk indicated a large positive linear association ($r$ = 0.780), where significant results ($p < 0.01$) were found at the 1 percent significance level. The Spearman correlation further indicated that a strong association exists between depositors' behaviour during external fraud and reputational risk. A positive coefficient ($r$ = 0.787), was

observed which was indicative of a strong effect significant at 1 percent significance level ($p < 0.01$).

**Table 5.21: Non-parametric correlation of bank perception**

| Operational event factor | Spearman correlation | Reputational risk | Mean |
|---|---|---|---|
| Internal fraud | Correlation coefficient | 0.780 | 4.92 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 392 | |
| External fraud | Correlation coefficient | 0.787 | 5.04 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 394 | |
| Employment practice and workplace safety | Correlation coefficient | 0.827 | 3.79 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 391 | |
| Clients, products and business practice | Correlation coefficient | 0.815 | 4.58 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 396 | |
| Damage to physical assets | Correlation coefficient | 0.873 | 3.16 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 393 | |
| Business disruptions and system failure | Correlation coefficient | 0.799 | 4.70 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 391 | |
| Execution and delivery | Correlation coefficient | 0.827 | 5.06 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 391 | |
| Reputational event | Correlation coefficient | 0.883 | 4.72 |
| | Sig. (2-tailed) | 0.000** | |
| | N | 394 | |
| **Correlation is significant at 0.01 level (2-tailed) | | | |

Depositor behaviour during employment practice and workplace safety had a strong positive association ($r = 0.827$) with reputational risk which was also significant ($p < 0.01$). Clients, products and business practices also had a strong positive association ($r = 0.815$) which was indicative of a significant positive linear relationship at the 1 percent significance level ($p < 0.01$). Damage to physical assets also resembled similar results to the previous events by indicating a positive linear relationship ($r = 0.873$) significant at 1 percent ($p < 0.01$). Business

disruptions and system failures yet again indicated a positive linear association ($r$ = 0.799) between how depositors behave during this event and reputational risk. Execution and delivery had obtained a positive linear association ($r$ = 0.827) between reputational risk and the amount which depositors are willing to withdraw. The result was followed by a significance at 1 percent ($p < 0.01$) which further supports the relationship. A pure reputational event (characterised by rumours, true or false, which could impact the reputation of a bank) (Honey, 2012:13) achieved the highest linear association ($r$ = 0.883) between the amount that depositors are willing to withdraw during a reputational event and reputational risk. The result was significant at 1 percent ($p < 0.01$).

A strong effect exists between the behaviour of depositors during operational events (in terms of the amount that they are willing to withdraw) and the reputation of a bank since $r$ = 0.50-1.00 was obtained for all operational risk events. This indicates that the higher amount of money that depositors are likely to withdraw the more a banks reputation will be negatively influenced. These results are also contrary to that of previous studies. Iyer *et al.* (2016:15) found that for banks who has explicit deposit insurance schemes implemented, only 4 percent of deposits liquidate their accounts and the majority only withdrew 19 percent of their money. South Africa, on the other hand, has an implicit deposit insurance scheme and results indicated more significant withdrawals by depositors. This is similar to Boyle *et al.* (2015) who indicated that countries without an explicit DIS face greater withdrawal risk (deposits being largely withdrawn from bank accounts). Overall, these results concur with other international research. Murata and Hori (2006) also found depositors to withdraw their funds from a bank if there is any doubt in the bank's operations or soundness. Therefore, the null hypothesis ($H_{01}$) stating that there is no relationship between operational events and reputational risk can be rejected and the alternative hypothesis ($H_{a1}$) stating that there is a relationship between operational events and reputational risk can be concluded. It is therefore, important to establish whether operational risk events will influence reputational risk in a regression analysis.

### 5.8.2 Linear regression analysis on reputational risk

To determine whether depositor behaviour during each operational event negatively influenced the reputation of a bank, a linear regression analysis was performed. Each operational event (scale variable which ranged from 1 to 18) was regressed with the reputational risk question (section C, question B) (scale variable which ranged from 1 to 6) for each event. Participants had to indicate for each operational event, whether the event would negatively influence the

participants' perception of the bank (Reputational risk). Since banks categorise, identify and manage each operational event on its own, the influence of each event on a banks' reputation had to be determined individually.

**Table 5.22: Model summary of independent variables**

| Variables | Mean | $R^2$ | F | p-value | Standardised beta coefficient |
|---|---|---|---|---|---|
| Internal fraud | 4.92 | 0.608 | 587.434 | 0.000*** | 0.780 |
| External fraud | 5.04 | 0.619 | 617.329 | 0.000*** | 0.787 |
| Employment practice | 3.79 | 0.684 | 821.211 | 0.000*** | 0.827 |
| Clients, products and business practices | 4.58 | 0.664 | 763.021 | 0.000*** | 0.815 |
| Damage to physical assets | 3.16 | 0.762 | 1223.378 | 0.000*** | 0.873 |
| Business disruptions and system failures | 4.70 | 0.638 | 667.401 | 0.000*** | 0.799 |
| Execution, delivery and process management | 5.06 | 0.684 | 823.505 | 0.000*** | 0.827 |
| Reputational event | 4.72 | 0.780 | 1359.855 | 0.000*** | 0.883 |

***Significant at 0.1 level

Table 5.22 indicates how well each of the independent variables (operational risk events) predict the dependent variable, reputational risk of a bank. The $R^2$ explains the variation in the dependent variable due to the change in the independent variable (Hardy & Bryman, 2004:209). The significant F-ratio for all models infers that operational risk factors predict reputational risk significantly well. The results above indicate that all of the independent variables significantly influence the reputation of a bank. Each of the independent variables had beta coefficients which were larger than 0.78. Taking the mean values into account, all mean values were higher than 3 indicating a higher likelihood to influence the perception of a bank negatively, leading to reputational risk. Execution and delivery ($M$ =5.06) had the highest mean value, followed by external fraud ($M$ =5.04), internal fraud ($M$ =4.92) and reputational events ($M$ =4.72). These events will have the highest influence on the reputational risk of a bank.

#### 5.8.2.1 Internal fraud

The $R^2$ value for the model internal fraud suggests that depositors' behaviour during an internal fraud event explains 60.8 percent of the variance in reputational risk for a bank. Internal fraud had a mean value of 4.92, which indicates that such an event will likely influence the perception

of a bank negatively. The significant F-ratio ($p < 0.01$) of internal fraud suggests that depositors' behaviour during this event influence reputational risk significantly well. The high beta coefficient of 0.780 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.780 change in the scale variable of reputational risk. These results are contrary to those found by Perry & De Fontnouvelle, (2005:30) in a market analysis study where a larger market response was found for in internal fraud compared to external fraud.

#### 5.8.2.2 External fraud

Depositors' behaviour during an external fraud event explains 62 percent of the variance in reputational risk for a bank. External fraud had a mean value of 5.02, which indicates that such an event will likely influence the perception of a bank negatively. The significant F-ratio ($p < 0.01$) for external fraud suggests that depositors' behaviour during this event predicts reputational risk significantly well. The high beta coefficient of 0.787 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.787 change in the scale variable of reputational risk. External fraud thus had a higher beta coefficient than internal fraud.

#### 5.8.2.3 Employment practice and workplace safety

Employment practice suggests that 68.4 percent of the reputational risk of a bank is explained by depositors' willingness to withdraw during employment practice and workplace safety. Employment practice had a mean value of 3.79, which indicates that such an event will somewhat likely influence the perception of a bank negatively. The significant F-ratio ($p < 0.01$) for employment practice and workplace safety suggests that depositors' behaviour during this event influences reputational risk significantly well. The high beta coefficient of 0.827 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.827 change in the scale variable of reputational risk.

#### 5.8.2.4 Clients, products and business practice

Depositor behaviour during clients, products and business practice suggests that an external fraud event explains 66.4 percent of the variance in reputational risk for a bank. The significant F-ratio ($p < 0.01$) for clients, products and business practice suggests that depositors' behaviour during this event predicts reputational risk significantly well. The high beta coefficient of 0.815 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.815 change in the scale variable of reputational risk.

#### 5.8.2.5 Damage to physical assets

Damage to physical assets explains the highest (76.2%) variance in the reputational risk for a bank. Damage to physical assets had a mean value of 4.92, which indicates that such an event will somewhat likely influence the perception of a bank negatively. The significant F-ratio ($p < 0.01$) for damage to physical assets suggests that depositors' behaviour during this event predicts reputational risk significantly well. Damage to physical assets will make the strongest contribution due to the highest beta coefficient (0.873) towards explaining depositors' behaviour towards the reputation of a bank. These results are contrary to those found by Perry & De Fontnouvelle, (2005:30) in a market analysis study where a larger market response was found for in internal fraud compared to all other operational events.

#### 5.8.2.6 Business disruptions and system failure

Depositors' behaviour during business disruptions and system failure explains 63.8 percent of the variance in reputational risk for a bank. Business disruptions and system failure had a mean value of 4.70, which indicates that such an event will likely influence the perception of a bank negatively. The significant F-ratio ($p < 0.01$) for business disruptions and system failure suggests that depositors' behaviour during this event predicts reputational risk significantly well. The high beta coefficient of 0.799 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.799 change in the scale variable of reputational risk.

#### 5.8.2.7 Execution and delivery

Execution and delivery as an operational risk event will explain 68.4 percent of the variance in the reputational risk for a bank. Execution and delivery had the highest mean value of 5.06, which indicates that such an event will likely influence the perception of a bank negatively. Execution and delivery also achieved a significant F-ratio ($p < 0.01$), which suggests that this operational risk event predicts reputational risk for a bank significantly well. The high beta coefficient of 0.827 indicates that a unit change in depositors' likelihood to withdraw will lead to a 0.827 change in the scale variable of reputational risk.

#### 5.8.2.8 Reputational event

A pure reputational event such as rumours or allegations regarding the financial soundness of a bank also explains 78 percent of the variance in a banks reputation. The significant F-ratio ($p < 0.01$) for business disruptions and system failure suggests that depositors' behaviour during

this event predicts reputational risk significantly well. Pure reputational events will make the strongest contribution due to the second highest beta coefficient (0.883) towards explaining depositors' behaviour towards the reputation of a bank.

#### 5.8.2.9 Reputational risk remarks

To conclude, all of the operational risk events were significant, therefore, it can be concluded that depositor behaviour during all operational risk events will influence the reputation of a bank. Hence, the null hypothesis ($H_{02}$) stating that depositors' behaviour to withdraw during operational risk events does not influence reputational risk will be rejected. The alternative hypothesis ($H_{a2}$) stating that depositors' behaviour to withdraw during operational risk events does indeed influence reputational risk. Previous studies such as Boyle *et al.* (2015), Accenture (2015), Brunettia *et al.* (2016) and Iyer *et al.* (2016) all examined depositor behaviour and withdrawal risk when exposed to various banking risks. However, none of these studies linked the behaviour of depositors with reputational risk. Hence, the association between depositor behaviour in terms of their likelihood to withdraw during operational risk and reputational risk is a significant contribution of this study. The findings have managerial implications for banks, as these events are classified by BCBS (2008). As seen from the above results execution and delivery will require intensive identification, mitigation and management as depositors were more likely to withdraw their money from the bank and form a negative perception of the bank afterwards. It is also seen from the pure reputational event that false rumours or allegations that have no substantial grounds will still cause depositors to withdraw their money and form a negative perception of the bank. These results are contrary to those found by Perry & De Fontnouvelle, (2005:30) in a market analysis study where a larger market response was found for in internal fraud compared to any other operational event. The second empirical objective of this study was to determine whether demographic variables influence the behaviour of depositors in terms of how likely they are to withdraw during operational risk events. Section 5.9 below investigates this influence by means of non-parametric correlations and analysis of variance (ANOVA).

## 5.9 DEMOGRAPHICAL VARIABLES INFLUENCE ON DEPOSITOR BEHAVIOUR

According to Branca (2008:237), demographical variables can have a direct and indirect influence on banking behaviour. The main objective for this section is to determine whether

demographic variables have an influence on the behaviour of depositors. Since the sample includes depositors older than 18, some form of education and earns a salary that is deposited into their bank account, the following demographics were chosen for this section:

- Age;
- Level of education; and
- Income level.

### 5.9.1 Non-parametric correlation between demographics and depositor behaviour

A non-parametric Spearman correlation was used to test the relationship between demographic characteristics of depositors and their likelihood to withdraw during operational risk events. A two-tailed significance level can be assumed at a 1 percent significance level. The correlations amongst the variables ranged from small (r = 0.10 – 0.29) to medium (r = 0.30 – 0.49).

#### 5.9.1.1 Age groups

From Table 5.23 below it can be seen that four out of the eight operational events had a negative relationship with age while the other four events had a positive relationship with age. However, none of these relationships showed a statistical significance at the 1 percent confidence interval (p > 0.01) and had small effect sizes ( $r$ = 0.10 – 0.29). Therefore, age did not have a significant relationship with depositors' likelihood to withdraw after operational risk events. These results are contrary to previous market related studies that found a significant relationship between how different age groups behave when faced with risk (Botwinick, 1966:571; Vroom & Pahl, 1971:399; Baker & Haslem, 1974:469; Okun & DiVesta, 1976; Morin & Suarez, 1983:1201; Hawley & Fuji, 1993:197; Wang & Hanna, 1997:29; Grable, 2000:625; Van de Venter *et al.*, 2012:795; Dickason, 2017:198). On the contrary these results are similar to Sung and Hanna (1996b:13), Grable and Lytton (1999:56) and Anbar and Eker (2010:510) who did also found that no significant relationship exist between age participants behaviour when faced with risk.

#### 5.9.1.2 Level of education

The correlation among internal fraud and the level of education indicated significant results ( = -0.137) and a negative small linear association ($r$ = 0.10 – 0.29).The results for internal fraud was significant at the 1 percent significance level (p < 0.01). Similar results were found for employment practices and workplace safety since a ($r$ = -0.156) negative small linear

association significant at the 1 percent significance level ($p < 0.01$) was found. Damage to physical assets also indicated ($r = -0.156$) a small negative association between the level of education and depositors' likelihood to withdraw which was significant at the 1 percent significance level ($p < 0.01$). Clients, products and business practice also indicated ($r = -0.102$) a small negative association between the level of education and depositors' likelihood to withdraw which was significant at the 1 percent significance level ($p < 0.01$). For these four events, the correlation coefficients suggest that the higher the level of education, the less likely depositors will be to withdraw. Concerning the other four events (external fraud; business disruptions; execution and delivery; and reputational event), no significant association was found which was combined with very small effect sizes ($r < 0.10$-$0.29$). Therefore, the level of education did not have a significant relationship with depositors' likelihood to withdraw after these four operational risk events.

#### 5.9.1.3 Income level

From Table 5.23 below it can be seen that three out of the eight operational events had a negative relationship with the level of income while the other five events had a positive relationship with income. However, seven of these relationships showed no statistical significance at the 1 percent confidence interval ($p > 0.01$) and had very small effect sizes ($r <$ 0.10-0.29). Therefore, the level of income did not have a significant relationship with depositors' likelihood to withdraw after operational risk events. Damage to physical assets was the only event that indicated a correlation significant at 0.05 confidence level ($p < 0.05$) with a negative and small effect size ($r = -0.124$). For this event it is noteworthy to mention that a negative association exists indicating that a higher income level is associated with a lower likelihood to withdraw during damage to a bank's assets. Therefore, the null hypothesis ($H_{03}$) stating that there is no relationship between demographic variables and depositors' behaviour to withdraw will be rejected for level of education an income. The alternative hypothesis ($H_{a3}$), stating that there is in fact a relationship between demographic variables (education and income) and depositors' behaviour to withdraw will be concluded.

### 5.9.2 ANOVA of demographic factors

This section made use of a one-way between group analysis of variance to determine the impact of demographical factors on depositors' likelihood to withdraw during operational risk events.

The effect sizes were also calculated and interpreted using the guidelines provided by Cohen (1988:284):

- 0.01 indicates a small effect;
- 0.06 indicates a moderate effect; and
- 0.14 indicated a large effect.

#### 5.9.2.1 Age groups

ANOVA was suitable since one continues dependent variable was used (operational events) and one categorical independent variable (age groups) (Pallant, 2013:259). Participants were divided into five age categories according to their last birthday where these categories represented:

- 18 to 29 years;
- 30 to 39 years;
- 40 to 49 years;
- 50 to 59 years; and
- Over 60 years of age.

**Table 5.23: Relationship between demographics and likelihood to withdraw**

| Operational event factor | Spearman correlation | Age | Education level | Income level |
|---|---|---|---|---|
| Internal fraud | Correlation coefficient | -0.030 | -.137** | -0.011 |
| | Sig. (2-tailed) | 0.544 | 0.006 | 0.817 |
| | N | 402 | 411 | 408 |
| External fraud | Correlation coefficient | -0.059 | -0.073 | 0.013 |
| | Sig. (2-tailed) | 0.237 | 0.142 | 0.788 |
| | N | 402 | 411 | 408 |
| Employment practice and workplace safety | Correlation coefficient | 0.021 | -.156** | -0.026 |
| | Sig. (2-tailed) | 0.669 | 0.002 | 0.606 |
| | N | 402 | 411 | 408 |
| Clients, products and business practice | Correlation coefficient | 0.063 | -.102* | 0.059 |
| | Sig. (2-tailed) | 0.205 | 0.038 | 0.231 |
| | N | 402 | 411 | 408 |
| Damage to physical assets | Correlation coefficient | -0.021 | -.236** | -.124* |
| | Sig. (2-tailed) | 0.673 | 0.000 | 0.012 |
| | N | 402 | 411 | 408 |
| Business disruptions and system failure | Correlation coefficient | -0.014 | -0.030 | 0.087 |
| | Sig. (2-tailed) | 0.787 | 0.544 | 0.081 |
| | N | 402 | 411 | 408 |
| Execution and delivery | Correlation coefficient | 0.066 | -0.096 | 0.021 |
| | Sig. (2-tailed) | 0.187 | 0.051 | 0.674 |
| | N | 402 | 411 | 408 |
| Reputational event | Correlation coefficient | 0.044 | -0.095 | 0.066 |
| | Sig. (2-tailed) | 0.374 | 0.054 | 0.182 |
| | N | 402 | 411 | 408 |
| **Correlation is significant at 0.01 level (2-tailed); *Correlation is significant at 0.05 level (2-tailed) | | | | |

**Table 5.24: Analysis of variance for age and depositor likelihood to withdraw during operational risk events**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Internal fraud | Between Groups | 6.346 | 4 | 1.587 | 1.081 | 0.365 |
| | Within Groups | 582.561 | 397 | 1.467 | | |
| | Total | 588.907 | 401 | | | |
| External fraud | Between Groups | 8.306 | 4 | 2.076 | 1.614 | 0.170 |
| | Within Groups | 510.878 | 397 | 1.287 | | |
| | Total | 519.184 | 401 | | | |
| Employment practice and workplace safety | Between Groups | 4.897 | 4 | 1.224 | 0.781 | 0.538 |
| | Within Groups | 622.456 | 397 | 1.568 | | |
| | Total | 627.353 | 401 | | | |
| Clients, products and business practice | Between Groups | 3.991 | 4 | 0.998 | 0.810 | 0.519 |
| | Within Groups | 489.060 | 397 | 1.232 | | |
| | Total | 493.050 | 401 | | | |
| Damage to physical assets | Between Groups | 17.125 | 4 | 4.281 | 2.434 | 0.047* |
| | Within Groups | 698.281 | 397 | 1.759 | | |
| | Total | 715.406 | 401 | | | |
| Business disruptions and system failure | Between Groups | 2.400 | 4 | 0.600 | 0.437 | 0.782 |
| | Within Groups | 545.023 | 397 | 1.373 | | |
| | Total | 547.423 | 401 | | | |
| Execution and delivery | Between Groups | 2.694 | 4 | 0.673 | 0.555 | 0.695 |
| | Within Groups | 481.321 | 397 | 1.212 | | |
| | Total | 484.015 | 401 | | | |
| Reputational event | Between Groups | 1.250 | 4 | 0.313 | 0.280 | 0.891 |
| | Within Groups | 443.895 | 397 | 1.118 | | |
| | Total | 445.145 | 401 | | | |

*Significant at 0.05 level

The majority of age groups indicated no statistical significant difference between how likely depositors will be to withdraw during these operational risk events. However, one statistical significant difference was found in Table 5.24 between the age groups for damage to physical assets ($f$ = 2.434, p = 0.047). The higher mean value for age group 40 to 49 suggests that these depositors will be more likely to withdraw after damage to a bank's physical assets than age group 30 to 39. Despite reaching statistical significance, the mean difference value was found in Table 5.25 to be very small since the mean score for age group 30 to 39 was ($M$ = 2.80, $SD$

= 1.27) compared to age group 40 to 49 (*M* = 3.32, *SD* = 1.42). The effect size was also calculated using the eta squared and was found to be relatively small (0.02).

**Table 5.25: Mean value for depositors' likelihood to withdraw according to age**

| Operational risk event | Age group | Mean | Std. | Std. Error |
|---|---|---|---|---|
| Damage to physical assets | 18-29 | 3.04 | 1.24 | 0.12147 |
| | 30-39 | 2.80 | 1.27 | 0.11228 |
| | 40-49 | 3.32 | 1.42 | 0.14981 |
| | 50-59 | 2.89 | 1.43 | 0.19025 |
| | 60 + | 2.67 | 1.32 | 0.28257 |
| | Total | 2.99 | 1.33 | 0.06662 |

These results are contrary to previous market related studies that found a significant relationship between how different age groups behave when faced with risk (Botwinick, 1966:571; Vroom & Pahl, 1971:399; Baker & Haslem, 1974:469; Okun & DiVesta, 1976; Morin & Suarez, 1983:1201; Hawley & Fuji, 1993:197; Wang & Hanna, 1997:29; Grable, 2000:625; Van de Venter *et al.*, 2012:795; Dickason, 2017:198). On the contrary these results are similar to Sung and Hanna (1996b:13), Grable and Lytton (1999:56) and Anbar and Eker (2010:510) who did also found that no significant relationship exist between age participants behaviour when faced with risk. The following section describes the analysis of variance order to determine the impact of the level of education on depositors' likelihood to withdraw during operational risk events.

#### 5.9.2.2 Education level

ANOVA was yet again suitable since one continues dependent variable was used (operational events) and one categorical independent variable (level of education) (Pallant, 2013:259). It is important to note that analysis of variance within the groups only indicates inherent variation (King & Minium, 2008:338) Participants were divided into their highest level of education to date where these categories represented:

- High school education;
- Further training;
- Diploma;
- Undergraduate degree;
- Honours degree;

- Master's degree; and
- Doctoral degree.

The following table, Table 5.26 highlights the analysis of variance for depositors' likelihood to withdraw during operational events within different levels of education.

**Table 5.26: Analysis of variance for education levels and depositor likelihood to withdraw during operational risk events**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Internal fraud | Between Groups | 15.308 | 6 | 2.551 | 1.746 | 0.109 |
| | Within Groups | 590.213 | 404 | 1.461 | | |
| | Total | 605.521 | 410 | | | |
| External fraud | Between Groups | 12.805 | 6 | 2.134 | 1.657 | 0.130 |
| | Within Groups | 520.298 | 404 | 1.288 | | |
| | Total | 533.103 | 410 | | | |
| Employment practice and workplace safety | Between Groups | 19.980 | 6 | 3.330 | 2.089 | 0.053 |
| | Within Groups | 643.889 | 404 | 1.594 | | |
| | Total | 663.869 | 410 | | | |
| Clients, products and business practice | Between Groups | 7.800 | 6 | 1.300 | 1.061 | 0.386 |
| | Within Groups | 495.170 | 404 | 1.226 | | |
| | Total | 502.971 | 410 | | | |
| Damage to physical assets | Between Groups | 54.991 | 6 | 9.165 | 5.261 | 0.000 |
| | Within Groups | 703.761 | 404 | 1.742 | | |
| | Total | 758.751 | 410 | | | |
| Business disruptions and system failure | Between Groups | 3.751 | 6 | 0.625 | 0.459 | 0.839 |
| | Within Groups | 550.548 | 404 | 1.363 | | |
| | Total | 554.298 | 410 | | | |
| Execution and delivery | Between Groups | 5.121 | 6 | 0.853 | 0.701 | 0.649 |
| | Within Groups | 491.827 | 404 | 1.217 | | |
| | Total | 496.947 | 410 | | | |
| Reputational event | Between Groups | 2.824 | 6 | 0.471 | 0.420 | 0.866 |
| | Within Groups | 453.192 | 404 | 1.122 | | |
| | Total | 456.016 | 410 | | | |

**Significant at 0.01 level

Table 5.26 above indicates no statistical significant difference between how likely depositors will be to withdraw during seven operational risk events, based on their level of education. However, one statistical significant difference was found in Table 5.27 between the education

level and depositors' likelihood to withdraw during damage to physical assets ($f = 5.261$, $p < 0.01$). The mean values for high school, diploma, undergraduate and honours were not homogeneous. The higher mean value ($M = 3.51$, $SD = 1.48$) for the high school education category suggests that these depositors will be more likely to withdraw after damage to a banks' physical assets than depositors with an undergraduate ($M = 2.80$, $SD = 1.06$) or honours degree ($M = 2.63$, $SD = 1.06$). The responses for depositors with a diploma and depositors with an honours degree also indicated a significant difference. Depositors with a diploma will be more likely to withdraw ($M = 3.31$, $SD = 1.41$) than those with an honours degree ($M = 2.63$, $SD = 1.21$). The effect size was also calculated using the eta squared and was found to have a medium effect (0.07).

**Table 5.27: Mean value for depositors' likelihood to withdraw according to level of education**

| Operational risk event | Education level | Mean | Std. | Std. Error |
|---|---|---|---|---|
| Damage to physical assets | High school | 3.51 | 1.48 | 0.16075 |
| | Further training | 3.22 | 1.41 | 0.19221 |
| | Diploma | 3.31 | 1.41 | 0.17017 |
| | Undergraduate degree | 2.80 | 1.06 | 0.13181 |
| | Honours degree | 2.63 | 1.21 | 0.12038 |
| | Master's degree | 2.84 | 1.36 | 0.25630 |
| | Doctoral degree | 2.14 | 1.08 | 0.36052 |

Previous research analysed the behaviour of participants when exposed to risk based on their level of education (Baker & Haslem, 1974:469; MacCrimmon & Wehrung, 1986:200; Sung & Hanna, 1996b; Ardehali *et al.*, 2005:513). These researchers reached a consensus that higher education levels enable individuals to better assess risks and benefits than individuals with lower levels of education. Therefore, as seen in Table 5.27 above, depositors with higher levels of education were able to better assess damage to a banks physical assets and therefore, less likely to withdraw. The following section describes the analysis of variance order to determine the impact of the level of income on depositors' likelihood to withdraw during operational risk events.

#### 5.9.2.3 Income level

Participants were divided into seven income groups based on their annual income tax bracket to date where these categories represented:

- Below R100 000;
- R100 000 to R200 000;
- R200 001 to R400 000;
- R400 001 to R550 000;
- R550 001 to R700 000;
- R700 001 to R1500 000; and
- R1500 001 and above.

The following table, Table 5.28 highlights the analysis of variance for depositors' likelihood to withdraw during operational events within different annual income levels.

**Table 5.28: Analysis of variance for annual income levels and depositor likelihood to withdraw during operational risk events**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Internal fraud | Between Groups | 16.200 | 6 | 2.700 | 1.845 | 0.089 |
| | Within Groups | 586.834 | 401 | 1.463 | | |
| | Total | 603.033 | 407 | | | |
| External fraud | Between Groups | 13.269 | 6 | 2.212 | 1.724 | 0.114 |
| | Within Groups | 514.420 | 401 | 1.283 | | |
| | Total | 527.689 | 407 | | | |
| Employment practice and workplace safety | Between Groups | 4.419 | 6 | 0.736 | 0.458 | 0.839 |
| | Within Groups | 644.950 | 401 | 1.608 | | |
| | Total | 649.369 | 407 | | | |
| Clients, products and business practice | Between Groups | 10.749 | 6 | 1.791 | 1.452 | 0.193 |
| | Within Groups | 494.636 | 401 | 1.234 | | |
| | Total | 505.385 | 407 | | | |
| Damage to physical assets | Between Groups | 20.238 | 6 | 3.373 | 1.836 | 0.091 |
| | Within Groups | 736.900 | 401 | 1.838 | | |
| | Total | 757.138 | 407 | | | |
| Business disruptions and system failure | Between Groups | 15.282 | 6 | 2.547 | 1.900 | 0.080 |
| | Within Groups | 537.604 | 401 | 1.341 | | |
| | Total | 552.886 | 407 | | | |
| Execution and delivery | Between Groups | 4.246 | 6 | 0.708 | 0.589 | 0.739 |
| | Within Groups | 481.501 | 401 | 1.201 | | |
| | Total | 485.747 | 407 | | | |
| Reputational event | Between Groups | 8.674 | 6 | 1.446 | 1.314 | 0.249 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Within Groups | 441.103 | 401 | 1.100 | | |
| | Total | 449.777 | 407 | | | |

**Significant at 0.01 level

Table 5.28 above indicates no statistically significant difference between how likely depositors will be to withdraw during seven operational risk events, based on their annual income level as all values were not significant ($p > 0.01$). These results are contrary to previous research since Irwin (1993) stated that it is generally accepted that individuals earning high annual incomes are able to handle more risk exposure than individuals earning lower annual incomes are. Moreover, various researchers (Grable, 2000:625; Grable & Joo, 2004:73; Rahmawati *et al.*, 2015:376) found consensus in their research that individuals earning high annual incomes are not as cautious as those with lower income are, when exposed to risk. The third empirical objective was to determine how bank reputation influences depositors' behaviour in terms of how likely they are to withdraw during operational risk events. The following Section 5.10 therefore goes further to determine how depositors form the reputation of a bank in their minds and how it influences their likelihood to withdraw.

## 5.10 DETERMINE HOW BANK REPUTATION INFLUENCES DEPOSITOR LIKELIHOOD TO WITHDRAW

According to Schreiber (2011:92) a banks reputation is based on depositors perception regarding a banks' performance (whether it meets expectations or not), the level of confidence and trust in a bank as well as the level of satisfaction experienced (Eccles *et al.*, 2007:105). Hence, this definition of a bank reputation in the mind of depositors was put to the test to see whether there is an association between how depositors form a banks reputation and depositors' withdrawal behaviour (how likely they are to withdraw).

A non-parametric Spearman correlation was used since both the variables were measured using an ordinal scale (How likely are you to withdraw? How likely are you to agree with the following statements regarding your perception of a bank?). Spearman correlation can used as a valuable alternative to the Pearson correlation even in the event that some of the raw data are on an interval or ratio scale (Gravetter & Wallnau, 2014:472). Table 5.29 below illustrates the relationship between how depositors define a banks' reputation (form their perception of a bank) and how likely they will be to withdraw in the event of an operational risk event. A two-

tailed significance level can be assumed at a 1 percent significance level. The correlations amongst the variables ranged from small ($r$ = 0.10 – 0.29) to medium ($r$ = 0.30 – 0.49). All of the relationships between the observed variables had positive correlation coefficients, which is indicative of a positive linear relationship.

The correlation between internal fraud and bank reputation indicated significant results (r = 0.312) and a positive strong linear association ($r$ = 0.30 – 0.49). The results for internal fraud were significant at the 1 percent significance level ($p < 0.01$). The Spearman correlation between external fraud and bank perception showed similar results to internal fraud as a positive linear association ($r$ = 0.411) was observed significant at 1 percent significance level ($p < 0.01$). Employment practice and workplace safety had a small positive association ($r$ = 0.230) with bank perception which was also significant. Clients, products and business practices had a medium effect ($r$ = 0.406) which was indicative of a significant positive linear association at the 1 percent significance level ($p < 0.01$). From all the operational events, damage to physical assets had the smallest effect ($r$ = 0.134) but still indicated a significance at 1 percent ($p < 0.01$). Business disruptions and system failures indicated a small positive linear association ($r$ = 0.241) between this event and how depositors form the perception of a bank. A pure reputational event had also obtained a positive linear association ($r$ = 0.382) between bank perception and depositors likelihood to withdraw which was followed by a significance at 1 percent ($p<0.01$) which further supports the relationship.

The strongest positive association was found between execution and delivery where a medium effect of ($r$ = 0.448) was observed which was indicative of a medium linear relationship. It is also noteworthy to indicate that all the correlation coefficients were significant at 1 percent ($p < 0.01$). This indicates that there is a relationship between how depositors regard the reputation of a bank based on their own perception and how likely they will be to withdraw their money during operational events. In other words, how likely depositors are to withdraw money from their accounts after these operational events is positively associated with how their form their perception of a bank.

**Table 5.29: The relationship between bank perception and depositors' behaviour**

| Operational event factor | Spearman correlation | Bank perception |
|---|---|---|
| Internal fraud | Correlation coefficient | 0.312** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| External fraud | Correlation coefficient | 0.411** |
| | Sig. (2-tailed) | 0.000 |

| Operational event factor | Spearman correlation | Bank perception |
|---|---|---|
| | N | 414 |
| Employment practice and workplace safety | Correlation coefficient | 0.230** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Clients, products and business practice | Correlation coefficient | 0.406** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Damage to physical assets | Correlation coefficient | 0.134** |
| | Sig. (2-tailed) | 0.006 |
| | N | 414 |
| Business disruptions and system failure | Correlation coefficient | 0.241** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Execution and delivery | Correlation coefficient | 0.448** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Reputational event | Correlation coefficient | 0.382** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| **Correlation is significant at 0.01 level (2-tailed) | | |

Therefore, the null hypothesis ($H_{04}$) stating that there is no relationship between bank perception and depositors' behaviour to withdraw will be rejected. The alternative hypothesis ($H_{a4}$), stating that there is in fact a relationship between bank reputation and depositors' behaviour to withdraw will be concluded. These results are similar to Mazzola *et al.* (2006) who found that financial market participants make use of various cues that ultimately form their perception of a bank and can influence how these individuals respond financially (Louisot & Rayner, 2012:4). Mostert and Lotz (2010:9) found depositors' risk perception of banks to be significant to the bank's profitability. A healthy risk perception will only occur if depositors are satisfied with the manner in which a bank manages the risk posed to depositors. Finucane (2002:237) found that depositors' perception of a bank significantly influences their financial decisions. Williams and Noyes (2007:67) also found an association between bank perception and depositor uncertainty, which ultimately leads to irrational depositor behaviour. Not only is it imperative to establish a relationship between how depositors form the reputation of a bank and how they behave in terms of their withdrawal patterns, but it is also important to establish a relationship between these operational risk events and its effect on the reputational risk of a bank. The fourth empirical objective was to determine how behavioural biases influences depositors' behaviour in terms of how likely they are to withdraw during operational risk events. The following Section 5.10 examines the influence of behavioural finance biases on the likelihood to withdraw.

## 5.11 IDENTIFY THE BEHAVIOURAL FINANCE BIASES THAT DRIVE DEPOSITOR BEHAVIOUR

The financial decision-making behaviour of depositors is dependent on behavioural finance biases. Behavioural finance consists of three elements: firstly, knowledge of finance, secondly, knowledge of economics and lastly, the cognitive psychology when making financial decisions (Zindel *et al.*, 2014:11). Behavioural finance originated due to the irrational manner in which market participants make financial decisions. Behavioural finance biases emanate from previous research that suggests that individual financial choices under uncertainty are contradictory to rational financial decisions (Thaler & Johnson, 1990:643). Behavioural finance biases are aimed at explaining the relationship of depositors' financial decision-making behaviour. Moss *et al.* (1998:178) and Hilton *et al.* (2004:363) argues that the reliability of Cronbach alpha values may differ according to the field of study. However when using human responses a benchmark value of 0.6 may be used where values below 0.6 indicates low internal reliability (Malhotra *et al.*, 2012:320). Since this was a self-constructed scale based on literature, the internal consistency reliability had to be performed. The behavioural bias scale obtained a Cronbach alpha value of 0.61.

### 5.11.1 Correlation between behavioural finance and depositor behaviour

One of the empirical objectives of this study is to determine how South African depositors in Gauteng, South Africa make financial decisions. Behavioural finance, therefore, makes a tremendous contribution to this in determining whether there is a relationship between the behaviour of depositors during operational risk events and behavioural finance. To establish this relationship a non-parametric Spearman correlation was used. Table 5.30 below indicates the non-parametric correlation between the behaviour of depositors during operational risk event and behavioural biases. A two-tailed significance level can again be assumed at a 1 percent significance level.

**Table 5.30: Non-parametric correlation between operational risk events and behavioural bias**

| Operational event factor | Spearman correlation | Behavioural finance |
|---|---|---|
| Internal fraud | Correlation coefficient | 0.156** |
| | Sig. (2-tailed) | 0.001 |
| | N | 414 |
| External fraud | Correlation coefficient | 0.173** |
| | Sig. (2-tailed) | 0.000 |

| Operational event factor | Spearman correlation | Behavioural finance |
|---|---|---|
| | N | 414 |
| Employment practice and workplace safety | Correlation coefficient | 0.261** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Clients, products and business practice | Correlation coefficient | 0.247** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Damage to physical assets | Correlation coefficient | 0.364** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Business disruptions and system failure | Correlation coefficient | 0.191** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Execution and delivery | Correlation coefficient | 0.237** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| Reputational event | Correlation coefficient | 0.232** |
| | Sig. (2-tailed) | 0.000 |
| | N | 414 |
| **Correlation is significant at 0.01 level (2-tailed) | | |

The correlation coefficients amongst depositors willingness to withdraw during an internal fraud and external fraud events and behavioural bias indicated small positive linear associations ($r = 0.156$, $r = 0.173$) () respectively. The results for internal and external fraud ($p < 0.01$) were found at the 1 percent significance level. The Spearman correlation further indicated that a positive association ($r = 0.261$) exists between depositors' behaviour during employment practice and workplace safety which was also significant ($p < 0.01$). Clients, products and business practices also had a positive association ($r = 0.247$) which was indicative of a small effect significant at the 1 percent significance level ($p < 0.01$). Damage to physical assets resembled a medium effect by indicating a positive linear relationship ($r = 0.364$) significant at 1 percent ($p < 0.01$). Business disruptions and system failures yet again indicated a positive linear association ($r = 0.191$) between how depositors behave during this event and behavioural finance bias which was significant ($p < 0.01$). Execution and delivery had obtained a positive linear association ($r = 0.237$) which was followed by a significance at 1 percent ($p < 0.01$) which further supports the relationship. A pure reputational event (characterised by rumours, true or false, which could impact the reputation of a bank) (Honey, 2012:13) also achieved a linear association ($r = 0.232$) between depositors' behaviour to withdraw during a reputational event and behavioural biases. The result was significant at 1 percent ($p < 0.01$). Therefore, the null hypothesis ($H_{05}$) stating that there is no relationship between depositors' behaviour to withdraw and behavioural finance biases can be rejected. The alternative hypothesis ($H_{a5}$)

stating that there is a relationship between depositors' behaviour to withdraw and behavioural finance biases, therefore, can be concluded.

### 5.11.2 Independent t-test – behavioural finance

The financial decision-making behaviour of depositors is dependent on behavioural finance biases (Zindel *et al.,* 2014:11). Table 5.31 below represents the top three behavioural biases that depositors are subject to. Depositors could be subject to one of more of these biases. The results indicated that 85.50 percent of depositors were subject to the representativeness bias. Kannadhasan (2009:3) states that these depositors will base financial decisions on inaccurate perceptions and patterns. This group of depositors may overreact in the market due to the perception of pattern repetition (Singh, 2012:120). Therefore, depositors, subject to the representativeness bias, will base their financial decisions on the past performance of a bank. The availability bias indicated that 85 percent of depositors are also subject to this bias. Availability bias describes financial decisions to be based on the latest available information only (Kannadhasan, 2009:5). Depositors subject to this bias will lack historical information and are likely to interpret available information incorrectly. Because financial decisions of depositors within this bias are based only on recent available information, it can possibly hamper financial ability, which can simultaneously reflect large losses. For instance, if the latest information reflects news regarding a bank's current low level of liquidity (despite previous good performance), depositors within this bias will be the first to withdraw their money or move to another bank. Most depositors (90.30%) were subject to the self-control bias. Self-control is a measure frequently implemented by market participants who are subjected towards the temptation of taking on bigger financial risks. The overriding objective of this bias is to avoid large financial losses to protect financial assets (Kannadhasan, 2009:6). Depositors' subject to this bias will be extremely cautious when making financial decisions.

**Table 5.31: Top three behavioural biases of depositors**

| ***Behavioural bias*** | **N** | **Percentage** | **Mean** | **Std. Dev** |
|---|---|---|---|---|
| Representativeness | 414 | 85.50% | 4.62 | 1.152 |
| Availability bias | 407 | 85.00% | 4.43 | 1.062 |
| Self-control | 412 | 90.30% | 4.84 | 1.067 |

The section below indicates the independent t-tests for depositors' likelihood to withdraw during operational risk events based on the top three behavioural bias theories. The main aim

of this objective is to determine whether depositors' withdrawal behaviour is different based on the certain behavioural biases to which they are subject towards.

#### 5.11.2.1 Representativeness

Table 5.32 presents the mean values of depositors' likelihood to withdraw considering that they are subject to the representativeness bias. This behavioural bias suggests that depositors base their financial decisions on their perception of the past performance of a bank (Kannadhasan, 2009:3). A higher mean value indicates a stronger likelihood to withdraw for these investors and a lower mean value indicates a lower likelihood to withdraw (Gravetter & Wallnau, 2014:281). The Levene's test (Levene, 1960:292) assumes that variances are equal (homogeneity of variance). The independent sample t-test assumes that the mean values for both groups are the same. In this case, the null-hypothesis ($H_{06}$) states that the means values for depositors' likelihood to withdraw irrespective of the bias they are subject to will be the same. The alternative hypothesis states that the means values for depositors' likelihood to withdraw will differ based on the bias they are subject to. Effect sizes were calculated to determine the magnitude difference between the mean groups for each significant operational event based on their behavioural biases. The effect sizes were calculated and interpreted using the guidelines provided by Cohen (1988:284):

- 0.2 indicates a small effect;
- 0.5 indicates a medium effect; and
- 0.8 indicates a large effect.

When investigating the results found in Table 5.32, it can be assumed that depositors who are subject to the representativeness bias had a higher likelihood to withdraw during an internal fraud event ($M$ = 4.31) compared to those not subject towards this bias ($M$ = 3.88). Looking at the significance value for the Levene's test, the value greater than 0.05 indicated that the variability of the scores were relatively the same (Levene, 1960:292). The t-test of independence on the other hand, had a significance at 5 percent (p = 0.012) which indicated that the null-hypothesis stating that mean values are the same could be rejected. Hence, depositors who are subject to the representativeness bias will react differently to internal fraud event than depositors who are not subject towards this bias. When calculating the effect size a small effect was found ( $r$ = 0.35) (Cohen, 1988:284).

The mean values for external fraud were very similar ($M$ = 4.58, $M$ = 4.14) where depositors who are subject to the representativeness bias had a higher likelihood to withdraw during an external fraud event. The independent t-test for equality of means showed statistical significance along with a small effect size ($r$ = 0.36). Therefore, in the case of an external fraud event, depositors who are subject to the representativeness bias will be more likely to withdraw their money than those who are not subject towards this bias. Similar results were found for depositors' likelihood to withdraw during bad employment practice and workplace safety. The mean to withdraw was higher for those depositors' subject towards the representativeness bias ($M$ = 3.40) than for depositors who are not subject to this bias ($M$ = 2.75). The independent t-test for equality of means showed a significant difference (p > 0.05). Therefore, in the case of an employment practice and workplace safety, depositors who are subject towards the representativeness bias will be more likely to withdraw. A medium-sized effect was also found ($r$ = 0.53).

Depositors who are subject to the representativeness bias showed a high likelihood to withdraw ($M$ = 4.48) during clients, products and business practice event. Furthermore, looking at the independent t-test for equality of means a statistical significance was found at the 5 percent level (p > 0.05) which presented a medium effect size ($r$ = 0.58). For an operational risk event such as damage to physical assets, more interesting results were found. The lower mean values suggest that depositors would be less likely to withdraw money from their accounts during such an event. However, the higher mean value ($M$ = 3.10) for the representativeness bias suggests that depositors are more likely to withdraw their money from their bank account than those not subject to this bias ($M$ = 2.56). The independent t-test for equality of means found a significance at the 5 percent level (p < 0.05) as well a small-sized effect ($r$ = 0.40).

For business disruptions the mean values for depositors' subject to the representativeness bias ($M$ = 4.29) was similar to those not subject towards the bias ($M$ = 4.02). However, the Levene's test was significant (p =0.007) while the independent t-test for equality of means (p =0.106) suggested no statistically significant difference (p > 0.05) between the mean values. This suggests that depositors will be likely to withdraw their money from their accounts irrespective whether they are subject towards the representativeness bias or not. For execution and delivery depositors who are subject towards the representativeness bias indicated higher mean values ($M$ = 4.57) than those who are not subject to this bias ($M$ = 3.96). The independent t-test for equality of means found a statistically significant difference at the 5 percent level (p < 0.05).

Hence, depositors who are subject towards the representativeness bias will more likely react to an execution and delivery failure than those who are not subject to this bias. When calculating the effect size, a medium effect was found ($r = 0.56$).

Depositors who are subject to the representativeness bias also had high mean values ($M = 4.27$) for a pure reputational event which indicated a high likelihood of depositors withdrawing. The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$, $p = 0.006$). Hence depositors who are subject to the representativeness bias will more likely react to a reputational event (such as a rumours or allegations regarding a bank) than those who are not subject to this bias. When calculating the effect size, a small effect was found ($r = 0.37$).

For the representativeness bias the null-hypothesis ($H_{06}$) which states that the means values for depositors' likelihood to withdraw irrespective of the bias they are subject to will be the same was rejected. The alternative hypothesis ($H_{a6}$) that the means values for depositors' likelihood to withdraw will differ based on the bias they are subject to, therefore, was concluded. These results were similar to those found by Dickason-Koekemoer and Ferreira (2018:10) where the representativeness bias was also the leading financial behavioural bias for investors in the South African context.

**Table 5.32: Independent t-test of representativeness bias**

| Representativeness bias | | Levene's test for equality of variances | | T-test for equality of means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 0.084 | 0.772 | -2.527 | 411 | 0.01* | -0.43 | 3.88 | 0.17 |
| | Equal variances not assumed | | | -2.606 | 80.53 | 0.01 | | 4.31 | 0.16 |
| External fraud | Equal variances assumed | 1.580 | 0.210 | -2.778 | 411 | 0.01* | -0.44 | 4.14 | 0.16 |
| | Equal variances not assumed | | | -2.619 | 75.30 | 0.01 | | 4.58 | 0.17 |
| Employment practice and workplace safety | Equal variances assumed | 0.093 | 0.760 | -3.774 | 411 | 0.00* | -0.66 | 2.75 | 0.17 |
| | Equal variances not assumed | | | -3.942 | 81.41 | 0.00 | | 3.41 | 0.17 |
| Clients, products and business practice | Equal variances assumed | 0.013 | 0.909 | -4.162 | 411 | 0.00* | -0.64 | 3.84 | 0.15 |
| | Equal variances not assumed | | | -4.187 | 78.94 | 0.00* | | 4.48 | 0.15 |
| Damage to physical assets | Equal variances assumed | 2.516 | 0.113 | -2.888 | 411 | 0.00* | -0.55 | 2.56 | 0.19 |
| | Equal variances not assumed | | | -3.155 | 84.77 | 0.00 | | 3.11 | 0.17 |
| Business disruptions and system failure | Equal variances assumed | 0.007 | 0.934 | -1.620 | 411 | 0.11 | -0.27 | 4.03 | 0.16 |
| | Equal variances not assumed | | | -1.669 | 80.46 | 0.10 | | 4.29 | 0.16 |
| Execution and delivery | Equal variances assumed | 0.047 | 0.829 | -3.984 | 411 | 0.00 | -0.60 | 3.96 | 0.15 |
| | Equal variances not assumed | | | -4.051 | 79.63 | 0.00* | | 4.57 | 0.15 |
| Reputational event | Equal variances assumed | 2.975 | 0.085 | -2.760 | 411 | 0.01* | -0.41 | 3.86 | 0.15 |
| | Equal variances not assumed | | | -2.625 | 75.75 | 0.01 | | 4.27 | 0.15 |
| *Significant at 0.01 level (2-tailed) | | | | | | | | | |

#### 5.11.2.2 Availability bias

Table 5.33 presents the mean values of depositors' likelihood to withdraw considering that they are subject to the availability bias. This behavioural bias suggests that depositors base their financial decisions on the most recent piece of information that they have available (Kannadhasan, 2009:3). A higher mean value indicates a stronger likelihood to withdraw for these investors and a lower mean value indicates a lower likelihood to withdraw (Gravetter & Wallnau, 2014:281). The Levene's test (Levene, 1960:292) assumes that variances are equal (homogeneity of variance). The independent sample t-test assumes that the mean values for both groups are the same (Pallant, 2013:255). In this case, the null-hypothesis ($H_{06}$) states that the means values for depositors' likelihood to withdraw irrespective of the bias they are subject to will be the same. The alternative hypothesis ($H_{a6}$) that the means values for depositors' likelihood to withdraw will differ based on the bias they are subject to. Effect sizes were then also calculated to determine the magnitude difference between the mean groups for each significant operational event based on the availability behavioural bias.

Table 5.37, indicates that depositors who are subject to the availability bias had a higher likelihood to withdraw during an internal fraud event ($M = 4.31$) compared to those not subject to this bias ($M = 3.88$). Looking at the significance value for the Levene's test, the value greater than 0.05 indicated that the variability of the scores were relatively the same (Levene, 1960:292). The t-test of independence on the other hand, had a significance at 5 percent ($p = 0.012$) which indicated that the null-hypothesis stating that mean values are the same could be rejected. Hence, depositors who are subject to the availability bias will react differently to internal fraud event than depositors who are not subject to this bias. When calculating the effect size a small effect was found ($r = 0.32$) (Cohen, 1988:284).

The mean values for external fraud were very similar ($M = 4.58$, $M = 4.08$) where depositors who are subject to the availability bias had a higher likelihood to withdraw during an external fraud event. The independent t-test for equality of means showed statistical significance ($p < 0.01$, $p = 0.005$) along with a small to medium effect size ($r = 0.40$). Therefore, in the case of an external fraud event, depositors who are subject to the availability bias will be more likely to withdraw their money than those who are not subject to this bias. Contrary results were found for depositors' likelihood to withdraw during bad employment practice and workplace safety. The mean to withdraw was slightly higher for those depositors' subject to the

availability bias ($M$ = 3.35) than for depositors who are not subject to this bias ($M$ = 3.01). The independent t-test for equality of means showed no significant difference ($p > 0.05$) along with a small effect size ($r$ = 0.22). Therefore, in the case of an employment practice and workplace safety, depositors who are subject to the availability bias will not act differently than those not subject to this bias.

Depositors who are subject to the availability bias showed a high likelihood to withdraw ($M$ = 4.47) during clients, products and business practice event compared to those who are not subject to this bias ($M$ = 3.86). Furthermore, looking at the independent t-test for equality of means a statistical significance was found at the 5 percent level ($p > 0.05$) which presented a small to medium effect size ($r$ = 0.48). For an operational risk event such as damage to physical assets similar results were found. The higher mean value ($M$ = 3.08) for the availability bias suggests that depositors are more likely to withdraw their money from their bank account than those not subject to this bias ($M$ = 2.61). The independent t-test for equality of means found a significance at the 5 percent level ($p > 0.05$) as well a small-sized effect ($r$ = 0.35).

For business disruptions the mean values for depositors' subject to the availability bias ($M$ = 4.34) was different to those not subject to the bias ($M$ = 3.77). However, the Levene's test was not significant while the independent t-test for equality of means ($p <0.05$) suggested a statistically significant between the mean values. A small to medium-sized effect ($r$ = 0.43) was also found. This suggests that depositors will be more likely to withdraw their money from their accounts if they are subject to the availability bias. For execution and delivery depositors who are subject to the availability bias indicated higher mean values ($M$ = 4.54) than those who are not subject to this bias ($M$ = 4.08). The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$, $p = 0.002$). Hence, depositors who are subject to the availability bias will more likely react to an execution and delivery failure than those who are not subject to this bias. When calculating the effect size, a small effect was found ($r$ = 0.39).

Depositors who are subject to the availability bias also had high mean values ($M$ = 4.26) for a pure reputational event which indicated a high likelihood of depositors withdrawing. The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$, $p = 0.01$). Hence depositors who are subject to the availability bias will more likely react to a reputational event (such as a rumours or allegations regarding a bank)

than those who are not subject to this bias. When calculating the effect size, a small effect was found ($r = 0.29$).

For the availability bias the null-hypothesis ($H_{06}$) which states that the means values for depositors' likelihood to withdraw irrespective of the bias they are subject to will be the same can be rejected. The alternative hypothesis ($H_{a6}$) which states that the means values for depositors' likelihood to withdraw will differ based on the bias they are subject to was concluded. Considering international research Cremer *et al.* (2012:117) found that behavioural finance bias does have an influence on the financial decisions of individuals. Not much has been done in terms of behavioural finance on South African market participants. However, the results for behavioural finance is very similar to previous market research conducted in the South African context by Dickason *et al.* (2017:9556). These authors found that the leading behavioural finance biases that investors are subject to is the representativeness bias (46.0%), self-control (30.0%) and the availability bias (7.0%). These results were also confirmed by Dickason-Koekemoer and Ferreira (2018:10).

**Table 5.33: Independent t-test availability bias**

| Availability bias | | Levene's test for equality of variances | | T-test for equality of means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 2.750 | 0.098 | -2.522 | 404.00 | 0.01* | -0.42 | 3.88 | 0.17 |
| | Equal variances not assumed | | | -2.354 | 78.39 | 0.02 | | 4.31 | 0.18 |
| External fraud | Equal variances assumed | 4.376 | 0.037 | -3.217 | 404.00 | 0.00 | -0.50 | 4.08 | 0.16 |
| | Equal variances not assumed | | | -2.912 | 76.77 | 0.00* | | 4.58 | 0.17 |
| Employment practice and workplace safety | Equal variances assumed | 0.249 | 0.618 | -1.666 | 404.00 | 0.10 | -0.29 | 3.07 | 0.18 |
| | Equal variances not assumed | | | -1.602 | 80.13 | 0.11 | | 3.36 | 0.18 |
| Clients, products and business practice | Equal variances assumed | 8.657 | 0.003 | -4.122 | 404.00 | 0.00 | -0.62 | 3.86 | 0.15 |
| | Equal variances not assumed | | | -3.544 | 74.36 | 0.00* | | 4.48 | 0.18 |
| Damage to physical assets | Equal variances assumed | 0.855 | 0.356 | -2.525 | 404.00 | 0.01* | -0.47 | 2.61 | 0.19 |
| | Equal variances not assumed | | | -2.618 | 85.23 | 0.01 | | 3.08 | 0.18 |
| Business disruptions and system failure | Equal variances assumed | 4.237 | 0.040 | -3.526 | 404.00 | 0.00 | -0.56 | 3.78 | 0.16 |
| | Equal variances not assumed | | | -3.186 | 76.69 | 0.00* | | 4.34 | 0.18 |
| Execution and delivery | Equal variances assumed | 4.050 | 0.045 | -3.056 | 404.00 | 0.00 | -0.46 | 4.08 | 0.15 |
| | Equal variances not assumed | | | -2.848 | 78.32 | 0.01* | | 4.54 | 0.16 |
| Reputational event | Equal variances assumed | 13.681 | 0.000 | -2.603 | 404.00 | 0.01 | -0.38 | 3.88 | 0.14 |
| | Equal variances not assumed | | | -2.172 | 73.11 | 0.03* | | 4.26 | 0.17 |

*Significant at 0.01 level (2-tailed)

#### 5.11.2.3 Self-control bias

Table 5.34 presents the mean values of depositors' likelihood to withdraw considering that they are subject to the self-control bias. The results indicate that depositors who are subject to the self-control bias had a similar likelihood to withdraw during an internal fraud event ($M = 4.28$) compared to those not subject to this bias ($M = 3.95$). Furthermore, the t-test of independence showed no significant difference at 5 percent ($p = 0.09$) which indicated that the null-hypothesis stating that mean values are the same could be concluded. Hence, depositors who are subject to the self-control bias will not react differently to an internal fraud event than depositors who are not subject to this bias. When calculating the effect size a small effect was found ($r = 0.28$) (Cohen, 1988:284). The mean values for external fraud were very similar ($M = 4.55$, $M = 4.16$) where depositors who are subject to the self-control bias had a slightly higher likelihood to withdraw during an external fraud event. The independent t-test for equality of means showed statistical significance ($p < 0.05$, $p = 0.039$) along with a small effect size ($r = 0.29$). Therefore, in the case of an external fraud event, depositors who are subject to the self-control bias will be more likely to withdraw their money than those who are not subject to this bias.

Similar results were found for depositors' likelihood to withdraw during bad employment practice and workplace safety. The mean value to withdraw was higher for those depositors' subject to the self-control bias ($M = 3.36$) than for depositors who are not subject to this bias ($M = 2.94$). The independent t-test for equality of means showed a significant difference ($p < 0.05$, $p = 0.047$) along with a small effect size ($r = 0.21$). Therefore, in the case of an employment practice and workplace safety, depositors who are subject to the self-control bias will act differently than those not subject to this bias. Depositors who are subject to the self-control bias showed a high likelihood to withdraw ($M = 4.45$) during clients, products and business practice event compared to those who are not subject to this bias ($M = 3.78$). Furthermore, looking at the independent t-test for equality of means a statistical significance was found at the 5 percent level ($p < 0.05$) which presented a medium effect size ($r = 0.54$). For an operational risk event such as damage to physical assets similar results were found. The higher mean value ($M = 3.09$) for the self-control bias suggests that depositors are more likely to withdraw their money from their bank account than those not subject to this bias ($M = 2.48$). The independent t-test for equality of means found a significance at the 5 percent level ($p < 0.05$) as well a small-sized effect ($r = 0.35$).

For business disruptions the mean values for depositors' subject to the self-control bias ($M$ = 4.34) was different to those not subject to the bias ($M$ = 3.77). However, the Levene's test was not significant while the independent t-test for equality of means ($p < 0.05$) suggested a statistically significant between the mean values. A small to medium-sized effect ($r$ = 0.44) was also found. This suggests that depositors will be more likely to withdraw their money from their accounts if they are subject to the self-control bias. For execution and delivery depositors who are subject to the self-control bias indicated higher mean values ($M$ = 4.54) than those who are not subject to this bias ($M$ = 3.95). The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$). Hence, depositors who are subject to the self-control bias will more likely react to an execution and delivery failure than those who are not subject to this bias. When calculating the effect size, a small to medium effect was found ($r$ = 0.49).

Depositors who are subject to the self-control bias also had high mean values ($M$ = 4.28) for a pure reputational event which indicated a high likelihood of depositors withdrawing. The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$). Hence depositors who are subject to the self-control bias will more likely react to a reputational event (such as a rumours or allegations regarding a bank) than those who are not subject to this bias. When calculating the effect size, a medium effect was found ($r$ = 0.57). For the self-control bias the null-hypothesis, which states that the means values for depositors' likelihood to withdraw irrespective of the bias they are subject to will be the same, can be rejected. The alternative hypothesis, which states that the means values for depositors' likelihood to withdraw will differ based on the bias they are subject to was not rejected. Hence, it could be concluded that the means values for depositors' likelihood to withdraw will differ based on the bias the certain bias they are subject to.

Considering international research Cremer *et al.* (2012:117) found that behavioural finance bias does have an influence on the financial decisions of individuals. Not much has been done in terms of behavioural finance on South African market participants. However, the results for behavioural finance is very similar to previous market research conducted in the South African context by Dickason *et al.* (2017:9556). These authors found that the leading behavioural finance biases that investors are subject to is the representativeness bias (46.0%), self-control (30.0%) and the availability bias (7.0%). These results were also confirmed by Dickason-Koekemoer and Ferreira (2018:10).

**Table 5.34: Independent t-test self-control bias**

| Self-control | | Levene's Test for equality of variances | | T-test for equality of means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 0.389 | 0.533 | -1.667 | 409.00 | 0.10 | -0.34 | 3.95 | 0.20 |
| | Equal variances not assumed | | | -1.700 | 48.26 | 0.10 | | 4.28 | 0.20 |
| External fraud | Equal variances assumed | 6.101 | 0.014 | -2.073 | 409.00 | 0.04 | -0.39 | 4.16 | 0.19 |
| | Equal variances not assumed | | | -1.797 | 45.09 | 0.08 | | 4.55 | 0.22 |
| Employment practice and workplace safety | Equal variances assumed | 3.866 | 0.050 | -1.993 | 409.00 | 0.05 | -0.42 | 2.94 | 0.21 |
| | Equal variances not assumed | | | -2.471 | 54.53 | 0.02* | | 3.36 | 0.17 |
| Clients, products and business practice | Equal variances assumed | 3.274 | 0.071 | -3.761 | 409.00 | 0.00* | -0.69 | 3.77 | 0.18 |
| | Equal variances not assumed | | | -3.313 | 45.35 | 0.00 | | 4.45 | 0.21 |
| Damage to physical assets | Equal variances assumed | 3.232 | 0.073 | -2.698 | 409.00 | 0.01* | -0.61 | 2.48 | 0.23 |
| | Equal variances not assumed | | | -3.166 | 52.38 | 0.00 | | 3.09 | 0.19 |
| Business disruptions and system failure | Equal variances assumed | 1.963 | 0.162 | -3.705 | 409.00 | 0.00* | -0.71 | 3.62 | 0.19 |
| | Equal variances not assumed | | | -3.491 | 46.55 | 0.00 | | 4.33 | 0.20 |
| Execution and delivery | Equal variances assumed | 3.764 | 0.053 | -3.263 | 409.00 | 0.00* | -0.59 | 3.95 | 0.18 |
| | Equal variances not assumed | | | -2.985 | 45.99 | 0.00 | | 4.54 | 0.20 |
| Reputational event | Equal variances assumed | 4.140 | 0.043 | -3.998 | 409.00 | 0.00 | -0.69 | 3.59 | 0.17 |
| | Equal variances not assumed | | | -3.474 | 45.13 | 0.00* | | 4.28 | 0.20 |

*Significant at 0.01 level (2-tailed)

## 5.12 DETERMINING DEPOSITOR BEHAVIOUR REGARDING SOURCES OF INFORMATION

Table 5.35 indicates the top three sources of information that participants are most likely to react to in the case an operational risk event. The top three sources of information that participants will react to most when making financial decisions were televisions broadcasts (77.6%), local newspapers (53.7%) as well as electronic newspapers (47.0%). This section indicates depositors' likelihood to withdraw during operational risk events based on whether they heard the information from a television news broadcast, local newspaper or electronic newspaper. The objective is to see whether depositors' willingness to withdraw differs based on the source of information.

**Table 5.35: Top three sources of information**

| Form of communication | Frequency | Percentage (%) |
|---|---|---|
| Televisions news broadcast | 322 | 77.60 |
| Local newspaper (hard copy) | 223 | 53.70 |
| Electronic news paper | 195 | 47.00 |

Table 5.36 below indicates the independent t-tests for depositors' likelihood to withdraw during operational risk events based on whether they heard the information from a local newspaper or from another source of information. Table 5.36 presents the mean values of depositors' likelihood to withdraw based on whether they heard the information from a local newspaper or not. A higher mean value indicates a stronger likelihood to withdraw and a lower mean value indicates a lower likelihood to withdraw. The Levene's test (Levene, 1960:292) assumes that variances are equal (homogeneity of variance). The independent sample t-test assumes that the mean values for both groups are the same. In this case, the null-hypothesis ($H_{05}$) states that the means values for depositors' likelihood to withdraw irrespective of the source of information used, will be the same. The alternative hypothesis ($H_{a5}$) indicates that there is a relationship between depositors' behaviour to withdraw and the source of information. Effect sizes were calculated to determine the magnitude difference between the mean groups for each significant operational event based on their behavioural biases. The effect sizes were calculated and interpreted using the guidelines provided by Cohen (1988:284).

### 5.12.1 Local newspaper

When investigating the results found in Table 5.36, it can be assumed that depositors had a higher likelihood to withdraw during an internal fraud event when hearing from a local

newspaper ($M$ = 4.37) compared to hearing about the event from another source of information ($M$ = 4.12). Looking at the significance value for the Levene's test, the value greater than 0.05 indicated that the variability of the scores were relatively the same (Levene, 1960:292). The t-test of independence on the other hand, had a significance at 5 percent ($p < 0.05$) which indicated that the null-hypothesis stating that mean values are the same could be rejected. Hence, depositors react differently when hearing about an internal fraud event from the local newspaper than hearing about it from another source of information. When calculating effect size a small effect was found ($r$ = 0.20) (Cohen, 1988:284).

The mean values for external fraud were very similar ($M$ = 4.59, $M$ = 4.41) with a very small mean difference value (0.17). The Levene's test indicated that the variability of the scores were relatively the same ($p > 0.05$). The independent t-test for equality of means showed no significance. Therefore, in the case of an external fraud event, depositors will react the same irrespective of the source of information. When calculating effect size, a small effect was found ($r$ = 0.15) indicating very little practical significance.

Similar results were found for depositors' likelihood to withdraw during bad employment practice and workplace safety. The mean values for this event was considerably lower ($M$ = 3.38), ($M$ = 3.25) than for the other events which is indicative of a lower likelihood to withdraw. Furthermore, mean difference value (0.12) was also relatively small. The Levene's test as well as the independent t-test for equality of means showed no significance ($p > 0.05$). Therefore, in the case of an employment practice and workplace safety, depositors will react the same irrespective of the source of information. Clients, products and business practice indicated high mean values suggesting that depositors are very likely to withdraw their money in such an event. However, looking at the independent t-test for equality of means no statistical significance was found at the 5 percent level ($p > 0.05$). For an operational risk event such as damage to physical assets, more interesting results were found. The lower mean values suggest that depositors would be less likely to withdraw money from their accounts during such an event. The higher mean value for a local newspaper as a source of information suggests that depositors are more likely to withdraw their money from their bank account when hearing about damage to a banks physical assets from the local newspaper ($M$ = 3.16), than hearing from another source of information ($M$ = 2.88). However, the independent t-test for equality of means found a significance at the 5 percent level ($p < 0.05$). Hence, depositors react differently when hearing about damage to a bank's physical assets (such as a natural disaster of terrorism)

from the local newspaper than hearing it from another source of information. When calculating the effect size a small effect was found ($r = 0.20$) (Cohen, 1988:284).

For business disruptions ($M = 4.28$) and execution and delivery ($M = 4.37$) very high mean values were found which indicated that depositors are likely to withdraw money from their accounts during these events. However, the Levene's test as well as the independent t-test for equality of means ($p = 0.613$) ($p = 0.058$) both suggested no statistically significant difference ($p > 0.05$) between the mean values for both events. This suggests that depositors will be likely to withdraw their money from their accounts irrespective whether they heard about these events from the local newspaper or any other source of information. A pure reputational event also had high mean values based on whether depositors hear about this event from a local newspaper ($M = 4.31$) or from another source of information ($M = 4.09$) which indicated a high likelihood of depositors withdrawing. The independent t-test for equality of means found a statistically significant difference at the 5 percent level ($p < 0.05$, $p = 0.032$). Hence, depositors will more likely react when hearing about a reputational event (such as a rumours or allegations regarding a bank) from the local newspaper than hearing it from another source of information. When calculating the effect size a small effect was found ($r = 0.20$) for a reputational event (Cohen, 1988:284).

For local newspaper as a source of information the null hypothesis ($H_{06}$) stating that there is no relationship between depositors' behaviour to withdraw and the sources of information could be rejected. The alternative hypothesis ($H_{a6}$) stating that there is a relationship between depositors' behaviour to withdraw and the source of information could be concluded.

**Table 5.36: Independent t-test for local newspaper**

| Operational events | | Levene's test for equality of variances | | T-test for equality of means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 1.773 | 0.184 | 2.059 | 412 | 0.04* | 0.25 | 4.37 | 0.12 |
| | Equal variances not assumed | | | 2.051 | 395.766 | 0.04 | | 4.12 | 0.12 |
| External fraud | Equal variances assumed | 3.085 | 0.080 | 1.551 | 412 | 0.12 | 0.17 | 4.59 | 0.11 |
| | Equal variances not assumed | | | 1.544 | 393.836 | 0.12 | | 4.42 | 0.11 |
| Employment practice and workplace safety | Equal variances assumed | 1.459 | 0.228 | 0.972 | 412 | 0.33 | 0.12 | 3.38 | 0.12 |
| | Equal variances not assumed | | | 0.978 | 409.511 | 0.33 | | 3.25 | 0.12 |
| Clients, products and business practice | Equal variances assumed | 0.300 | 0.584 | 1.953 | 412 | 0.05* | 0.21 | 4.49 | 0.11 |
| | Equal variances not assumed | | | 1.948 | 397.856 | 0.05 | | 4.27 | 0.11 |
| Damage to physical assets | Equal variances assumed | 2.129 | 0.145 | 2.122 | 412 | 0.03* | 0.28 | 3.16 | 0.13 |
| | Equal variances not assumed | | | 2.137 | 410.275 | 0.03 | | 2.88 | 0.13 |
| Business disruptions and system failure | Equal variances assumed | 0.114 | 0.736 | 0.506 | 412 | 0.61 | 0.06 | 4.28 | 0.11 |
| | Equal variances not assumed | | | 0.505 | 399.897 | 0.61 | | 4.22 | 0.12 |
| Execution and delivery | Equal variances assumed | 1.206 | 0.273 | 1.912 | 412 | 0.06 | 0.21 | 4.58 | 0.11 |
| | Equal variances not assumed | | | 1.904 | 394.981 | 0.06 | | 4.37 | 0.11 |
| Reputational event | Equal variances assumed | 0.174 | 0.677 | 2.157 | 412 | 0.03* | 0.22 | 4.31 | 0.10 |
| | Equal variances not assumed | | | 2.161 | 405.513 | 0.03 | | 4.09 | 0.10 |

*Significant at 0.01 level (2-tailed)

### 5.12.2 Television broadcast

Table 5.37 indicates the results found for depositors' likelihood to withdraw during an operational risk event, when hearing the information from a television broadcast. When investigating the mean values, it can be assumed that depositors did not have a higher likelihood to withdraw during any operational event when hearing from a television broadcast compared to hearing about the event from another source of information. Looking at internal fraud the significance value for the Levene's test, the value greater than 0.05 indicated that the variability of the scores were relatively the same (Levene, 1960:292). The t-test of independence also did not show any statistically significance difference between depositors' likelihood to withdraw. Hence, the null-hypothesis stating that mean values are the same could be concluded. This indicates that depositors do not react differently when hearing about an internal fraud event from a television broadcast than hearing it from another source of information. The mean values for external fraud were very comparable ($M$ = 4.52, $M$ = 4.48) with a slight mean difference value (0.04). The Levene's test indicated that the variability of the scores were relatively the same ($p > 0.05$). The independent t-test for equality of means showed no significance (Pallant, 2013:249). Therefore, in the case of an external fraud event, depositors will react the same irrespective of the source of information.

The mean values for employment practice and workplace safety had considerably lower mean values ($M$ = 3.29), ($M$ = 3.42) than for the other events which is indicative of a lower likelihood to withdraw. The Levene's test for equality of variance showed no significance ($p > 0.05$), indicating unequal variances; furthermore, the t-test for equality of means also indicated no statistically significant difference. Therefore, in the case of an employment practice and workplace safety, depositors will react the same irrespective of the source of information. Clients, products and business practice indicated high mean values ($M$ = 4.41), ($M$ = 4.32) suggesting that depositors are very likely to withdraw their money in such an event. However, looking at the independent t-test for equality of means no significance was found at the 5 percent level ($p > 0.05$). Damage to physical assets also indicated lower mean values ($M$ = 3.03), ($M$ = 3.04) than for the other events which is indicative of a lower likelihood to withdraw. The independent t-test for equality of means indicated no statistically significant difference at the 5 percent level ($p > 0.05$) Hence, depositors will not react differently when hearing about damage to a banks physical assets (such as a natural disaster of terrorism) from a television broadcast than hearing it from another source of information.

For business disruptions ($M$ = 4.29) and execution and delivery ($M$ = 4.49) very high mean values were found which indicated that depositors are likely to withdraw money from their accounts when hearing from about these events from a television broadcast. However, the Leven's Test as well as the independent t-test for equality of means both suggested no statistically significant difference ($p > 0.05$) between the mean values for both events. This suggests that depositors will be likely to withdraw their money from their accounts irrespective whether they heard about these events from a television news broadcast or any other source of information. A pure reputational event also had high mean values based on whether depositors hear about this event from a local newspaper ($M$ = 4.25) or from another source of information ($M$ = 4.04) which indicated a high likelihood of depositors withdrawing. Again, the independent t-test for equality of means did not find a statistically significant difference at the 5 percent level ($p > 0.05$). Hence, depositors are not more likely to withdraw when hearing about a reputational event (such as a rumours or allegations regarding a bank) from a television news broadcast than hearing about it from another source of information. For this source of information, effect sizes smaller than 0.1 was found which indicates small to no effect on depositors' likelihood to withdraw. For television broadcast as a source of information the null hypothesis, stating that there is no relationship between depositors' behaviour to withdraw and the sources of information could be concluded for all operational risk events.

Barakat *et al.* (2014) found that information asymmetry plays an important role after the announcement of operational risk events. The results from this study indicate that information asymmetry increases after the announcement of operational risks, independent from the source of information. The results from this study were similar where only one source of information (local newspaper) was found to have an influence on depositors' behaviour after operational risk events.

**Table 5.37: Independent t-test for television broadcast**

| Operational events | | Levene's test for equality of variances | | T-test for equality of means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 0.787 | 0.376 | -0.113 | 412 | 0.91 | -0.02 | 4.25 | 0.14 |
| | Equal variances not assumed | | | -0.114 | 149.766 | 0.91 | | 4.27 | 0.14 |
| External fraud | Equal variances assumed | 1.018 | 0.314 | 0.299 | 412 | 0.77 | 0.04 | 4.52 | 0.13 |
| | Equal variances not assumed | | | 0.293 | 145.471 | 0.77 | | 4.48 | 0.14 |
| Employment practice and workplace safety | Equal variances assumed | 0.048 | 0.826 | -0.866 | 412 | 0.39 | -0.13 | 3.29 | 0.15 |
| | Equal variances not assumed | | | -0.838 | 142.688 | 0.40 | | 3.42 | 0.15 |
| Clients, products and business practice | Equal variances assumed | 2.849 | 0.092 | 0.680 | 412 | 0.50 | 0.09 | 4.41 | 0.13 |
| | Equal variances not assumed | | | 0.651 | 140.601 | 0.52 | | 4.32 | 0.14 |
| Damage to physical assets | Equal variances assumed | 0.113 | 0.737 | -0.034 | 412 | 0.97 | -0.01 | 3.03 | 0.16 |
| | Equal variances not assumed | | | -0.033 | 146.256 | 0.97 | | 3.04 | 0.16 |
| Business disruptions and system failure | Equal variances assumed | 1.436 | 0.232 | 1.302 | 412 | 0.19 | 0.18 | 4.29 | 0.14 |
| | Equal variances not assumed | | | 1.266 | 143.727 | 0.21 | | 4.11 | 0.14 |
| Execution and delivery | Equal variances assumed | 3.495 | 0.062 | 0.446 | 412 | 0.66 | 0.06 | 4.49 | 0.13 |
| | Equal variances not assumed | | | 0.422 | 138.409 | 0.67 | | 4.44 | 0.14 |
| Reputational event | Equal variances assumed | 0.463 | 0.497 | 1.675 | 412 | 0.10 | 0.21 | 4.25 | 0.12 |
| | Equal variances not assumed | | | 1.655 | 146.859 | 0.10 | | 4.05 | 0.13 |

*Significant at 0.01 level (2-tailed)

### 5.12.3 Electronic news paper

Table 5.38 indicates the results found for depositors' likelihood to withdraw during an operational risk event, when hearing the information from an electronic newspaper. When investigating the mean values, it can be assumed that depositors did not have a higher likelihood to withdraw during any operational event when hearing from an electronic newspaper compared to hearing about the events from any other source of information. Internal fraud indicated that the variability of the scores were relatively the same where the significance value for the Levene's test was greater than 0.05. The t-test of independence also did not show any statistically significance difference between depositors' likelihood to withdraw ($p > 0.05$). Hence, the null-hypothesis stating that mean values are the same could be concluded. This indicates that depositors do not react differently when hearing about an internal fraud event from an electronic newspaper than hearing it from another source of information. For external fraud, the mean values were very comparable ($M = 4.52$, $M = 4.51$) with no mean difference value (0.00). The independent t-test for equality of means showed no significance. Therefore, in the case of an external fraud event, depositors will react the same irrespective of the source of information.

In the case of an employment practice and workplace safety, depositors will react the same irrespective of the source of information. The Levene's test for equality of variance showed no significance ($p > 0.05$) indicating unequal variances, while the t-test for equality of means indicated no statistically significant difference ($p > 0.05$) (Pallant, 2013:249). Looking at the independent t-test for clients, products and business practice no significance was found at the 5 percent level ($p > 0.05$). Damage to physical assets also indicated lower mean values ($M = 3.03$), ($M = 3.04$) than for the other events which is indicative of a lower likelihood to withdraw using an electronic newspaper as source of information. The independent t-test for equality of means indicated no statistically significant difference at the 5 percent level ($p > 0.05$). Hence, depositors will not react differently when hearing about damage to a bank's physical assets (such as a natural disaster of terrorism) from an electronic newspaper than hearing about it from another source of information.

For business disruptions ($M = 4.29$) and execution and delivery ($M = 4.52$) very high mean values were found which indicated that depositors are likely to withdraw money from their accounts when hearing from about these events from an electronic newspaper. However, the Levene's test as well as the independent t-test for equality of means both suggested no

statistically significant difference ($p > 0.05$) between the mean values for both events. This suggests that depositors will be likely to withdraw their money from their accounts irrespective whether they heard about these events from an electronic newspaper or any other source of information. A pure reputational event also had high mean values based on whether depositors hear about this event from an electronic newspaper ($M = 4.27$) or from another source of information ($M = 4.15$) which indicated a high likelihood of depositors withdrawing. Again, the independent t-test for equality of means did not find a statistically significant difference at the 5 percent level ($p > 0.05$). Hence, depositors are not more likely to withdraw when hearing about a reputational event (such as a rumours or allegations regarding a bank) from an electronic newspaper than hearing about it from another source of information. For this source of information, effect sizes smaller than 0.1 was found which indicates small to no effect on depositors' likelihood to withdraw. For electronic newspaper as a source of information, the null hypothesis stating that there is no relationship between depositors' behaviour to withdraw and the sources of information could be concluded for all operational risk events.

Flemming (2013) also found a local newspaper, television broadcast and electronic newspaper as the top reliable sources of information for market participants. According to Tanacković *et al.* (2014) participants surveyed still prefer a printed newspaper over an electronic newspaper as a reliable source of information. Hence, these results are similar to this study where depositors mainly chose a printed newspaper and reacted differently when hearing about information from a local printed newspaper compared to hearing about it from another source of information. Nozato (2002) found that participants find the credibility of an electronic newspaper the same as for a printed newspaper and will not act differently when receiving information from these two sources. Considering a printed newspaper, the results for this study did indicate that depositors will react differently when hearing about an event from a local newspaper compared to any other source of information. On the contrary similar results was found where no difference is seen in the reaction between an electronic newspaper and other sources (Nozato, 2002). Considering television broadcast as a source of information, Mehrabi *et al.* (2009) found that a television broadcast is more reliable than an electronic media source. Hence this study's results confers with the findings of Mehrabi *et al.* (2009).

Section 5.13 below achieves the fifth empirical objective by establishing depositors risk tolerance level.

**Table 5.38: Independent t-test for electronic newspaper**

| Operational events | | Levene's test for equality of variances | | T-test for equality of Means | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Mean | Std. Error Difference |
| Internal fraud | Equal variances assumed | 0.000 | 0.985 | 1.025 | 412 | 0.306 | 0.12 | 4.32 | 0.12 |
| | Equal variances not assumed | | | 1.026 | 406.993 | 0.305 | | 4.20 | 0.12 |
| External fraud | Equal variances assumed | 6.602 | 0.011 | 0.010 | 412 | 0.992 | 0.00 | 4.52 | 0.11 |
| | Equal variances not assumed | | | 0.009 | 390.399 | 0.992 | | 4.51 | 0.11 |
| Employment practice and workplace safety | Equal variances assumed | 0.887 | 0.347 | 0.407 | 412 | 0.684 | 0.05 | 3.35 | 0.13 |
| | Equal variances not assumed | | | 0.406 | 400.316 | 0.685 | | 3.30 | 0.13 |
| Clients, products and business practice | Equal variances assumed | 2.962 | 0.086 | -0.247 | 412 | 0.805 | -0.03 | 4.37 | 0.11 |
| | Equal variances not assumed | | | -0.245 | 392.870 | 0.806 | | 4.40 | 0.11 |
| Damage to physical assets | Equal variances assumed | 1.712 | 0.191 | -0.083 | 412 | 0.934 | -0.01 | 3.03 | 0.13 |
| | Equal variances not assumed | | | -0.083 | 409.995 | 0.934 | | 3.04 | 0.13 |
| Business disruptions and system failure | Equal variances assumed | 0.013 | 0.908 | 0.614 | 412 | 0.540 | 0.07 | 4.29 | 0.11 |
| | Equal variances not assumed | | | 0.614 | 405.532 | 0.540 | | 4.22 | 0.11 |
| Execution and delivery | Equal variances assumed | 0.949 | 0.331 | 0.642 | 412 | 0.521 | 0.07 | 4.52 | 0.11 |
| | Equal variances not assumed | | | 0.639 | 398.481 | 0.523 | | 4.45 | 0.11 |
| Reputational event | Equal variances assumed | 0.046 | 0.830 | 1.083 | 412 | 0.279 | 0.11 | 4.27 | 0.10 |
| | Equal variances not assumed | | | 1.085 | 407.585 | 0.279 | | 4.15 | 0.10 |

*Significant at 0.01 level (2-tailed)

## 5.13 DETERMINE DEPOSITORS LEVEL OF RISK TOLERANCE

This study adopts the definition of Grable (2000:262) who defined risk tolerance as the maximum amount of risk that depositors are willing to be accepted when making financial decisions. Over the past three decades (1990-2018), global financial markets have endured tremendous banking failures (Iyer *et al.*, 2016:260). Therefore, within the personal, domestic and financial lives of depositors, the instinctive automatic response to risk is to be risk adverse (Hopkin, 2017:2). Therefore, it is important to determine the level of risk that depositors in Gauteng, South Africa are willing to accept in the banking sector.

**Table 5.39: Risk tolerance self- report measure (SCF)**

| SCF – Risk tolerance | N | Percentage (%) |
|---|---|---|
| Take substantial financial risk | 43 | 10.40 |
| Take above average financial risk | 101 | 24.50 |
| Take average financial risk | 168 | 40.80 |
| Not willing to take any financial risk | 100 | 24.30 |
| Total | 412 | 100.0 |

Table 5.39 indicates that the majority of depositors are willing to take average financial risk in the hope of making average financial return. On the lower risk side, a quarter of the participants (24.30%) indicated that they are not willing to take any financial risk. Only one tenth (10.40%) of the sample were willing to take substantial financial risk.

### 5.13.1 Depositors risk tolerance and willingness to withdraw

A theoretical inverse relationship exist between depositors risk tolerance level and their willingness to withdraw (Boyle *et al.*, 2015).

#### 5.13.1.1 Correlation between risk tolerance and depositors' willingness to withdraw

As seen in Table 5.40, the correlation amongst depositors' willingness to withdraw internal fraud and SCF risk tolerance indicated significant results ($r$ =-0.174) and a negative small linear association. The results for internal fraud were significant at the 1 percent significance level ($p < 0.01$). Similar results were found for depositors' willingness to withdraw during external fraud since a ($r$ =-0.129) negative small linear association significant at the 1 percent significance level ($p < 0.01$) was found. For employment practice and workplace safety, no

relationship was found between depositors' willingness to withdraw and their subjective risk tolerance level. Damage to physical assets also indicated ($r$ =-0.111) a small negative association between the level of subjective risk tolerance and depositors' likelihood to withdraw which was significant at the 5 percent significance level ($p < 0.05$). Clients, products and business practice also indicated ($r$ =-0.131) a small negative association between the level of risk tolerance and depositors' likelihood to withdraw which was significant at the 1 percent significance level ($p < 0.01$). For these four events, the correlation coefficients suggest that the higher the level of risk tolerance, the less likely depositors will be to withdraw and hence the null hypothesis could be rejected. For business disruptions and a pure reputational event, no relationship was found between depositors' willingness to withdraw and their subjective risk tolerance level. No significant association was found which was combined with very small effect sizes. Therefore, the level of subjective risk tolerance did not have a significant relationship with depositors' likelihood to withdraw after these events. Null hypothesis ($H_{07}$) stating that there is no relationship between depositors' behaviour to withdraw and their risk tolerance could not be rejected for the last events.

Boyle *et al.* (2015) researched the levels of risk perception of depositors regarding a set of hypothetical banking failures and the role that deposit insurance plays towards risk mitigation during a banking failure. The study also considered the risk tolerance levels of 349 student depositors based in the United States, Europe and New Zealand, which indicated how much risk student depositors are willing to take concerning their country's deposit insurance schemes. Those countries who did not implement an explicit deposit insurance scheme indicated a higher withdraw risk and lower levels or risk tolerance. Hence, the results of this study is similar to those of Boyle *et al.* (2015) since South Africa makes use of an implicit deposit insurance scheme.

The following Section 5.13.2 explores the relationship between demographic factors and risk tolerance.

**Table 5.40: Non-parametric correlation of depositors' risk tolerance**

| Operational event factor | Spearman correlation | SCF-Risk tolerance | Grable risk tolerance |
|---|---|---|---|
| Internal fraud | Correlation coefficient | -0.174** | -0.036 |
| | Sig. (2-tailed) | 0.000 | 0.466 |
| | N | 411 | 414 |
| External fraud | Correlation coefficient | -0.129** | -0.027 |
| | Sig. (2-tailed) | 0.009 | 0.578 |
| | N | 411 | 414 |
| Employment practice and workplace safety | Correlation coefficient | -0.043 | 0.037 |
| | Sig. (2-tailed) | 0.383 | 0.458 |
| | N | 411 | 414 |
| Clients, products and business practice | Correlation coefficient | -.131** | -0.018 |
| | Sig. (2-tailed) | 0.008 | 0.717 |
| | N | 411 | 414 |
| Damage to physical assets | Correlation coefficient | -0.111* | -0.104* |
| | Sig. (2-tailed) | 0.025 | 0.034 |
| | N | 411 | 414 |
| Business disruptions and system failure | Correlation coefficient | -0.081 | -0.024 |
| | Sig. (2-tailed) | 0.102 | 0.633 |
| | N | 411 | 414 |
| Execution and delivery | Correlation coefficient | -0.094 | -0.027 |
| | Sig. (2-tailed) | 0.058 | 0.578 |
| | N | 411 | 414 |
| Reputational event | Correlation coefficient | -0.074 | 0.009 |
| | Sig. (2-tailed) | 0.135 | 0.862 |
| | N | 411 | 414 |
| **Correlation is significant at 0.01 level (2-tailed) | | | |

### 5.13.2 Depositors risk tolerance and demographics

Since the focus of this study is to determine the risk tolerance levels of the South Africa depositor base, emphasis will be given to the demographical factors, which can be influential.

#### 5.13.2.1 Correlation between risk tolerance and demographic factors

A non-parametric Spearman correlation was used to test the relationship between demographic characteristics of depositors and their risk tolerance level. A two-tailed significance level can be assumed at a 1 percent significance level. The correlations amongst the variables ranged from small ($r$ =0.10-0.29) to medium ($r$ = 0.3-0.49). Table 5.41 below indicated the linear relationship between age, level of education and income level of depositors with their risk tolerance level.

**Table 5.41: Non-parametric correlation- SCF risk tolerance and demographics**

| **Spearman correlation** | | **Age** | **Education** | **Income** | **SCF** |
|---|---|---|---|---|---|
| **Age** | Correlation Coefficient | 1.000 | -0.078 | 0.202*** | -0.127** |
| | Sig. (2-tailed) | | 0.120 | 0.000 | 0.011 |
| | N | 403 | 402 | 395 | 398 |
| **Education** | Correlation Coefficient | -0.078 | 1.000 | 0.450*** | 0.154*** |
| | Sig. (2-tailed) | 0.120 | | 0.000 | 0.002 |
| | N | 402 | 416 | 408 | 411 |
| **Income** | Correlation Coefficient | 0.202** | 0.450** | 1.000 | 0.147*** |
| | Sig. (2-tailed) | 0.000 | 0.000 | | 0.003 |
| | N | 395 | 408 | 409 | 404 |
| **SCF** | Correlation Coefficient | -0.127** | 0.154** | 0.147*** | 1.000 |
| | Sig. (2-tailed) | 0.011 | 0.002 | 0.003 | |
| | N | 398 | 411 | 404 | 412 |

**Significant at 0.05 level, ***Significant at 0.01 level

##### 5.13.2.1.1 Age

From Table 5.41 above it can be seen that risk tolerance had a negative relationship with age which is in-line with the lifecycle of investors and other market participants (Dickason-Koekemoer & Ferreira, 2018). Furthermore, the relationship also showed a statistical significance at the 1 percent confidence interval ($p < 0.01$) and had very small effect sizes ($r <$ 0.29) showing a small practical significant relationship. Therefore, age did have a significant relationship with depositors' risk tolerance level. These results are similar to previous market

related studies that found a significant relationship between different age and risk tolerance (Botwinick, 1966:571; Vroom & Pahl, 1971:399; Baker & Haslem, 1974:469; Okun & DiVesta, 1976; Morin & Suarez, 1983:1201; Hawley & Fuji, 1993:197; Wang & Hanna, 1997:29; Grable, 2000:625; Van de Venter *et al.*, 2012:795; Dickason, 2017:198). Since the relationship is negative, it indicates that the older depositors get the less risk they are willing to tolerate in terms of their financials. Hence, they will be unhappy if banks expose them to additional risk. Previous research by Wallach and Kogan (1959:24) also indicated a cautiousness in older individuals' financial decision-making processes. Gibson *et al.* (2013:34) also found that young individuals are willing to tolerate more risk exposure. Therefore, the alternative hypothesis ($H_{a8}$) which states that there is a relationship between depositors' demographic factors and their risk tolerance level can be concluded.

#### 5.13.2.1.2 Level of education

The correlation among risk tolerance and the level of education indicated a significant result ($r$ =-0.154) and a positive small linear association. Therefore, the level of education did have a significant relationship with depositors' risk tolerance level. These results confer with previous research as Irwin (1993) concluded that high levels of education could affect the risk tolerance of individuals. Hallahan *et al.* (2003:56) also state that individuals with a bachelor's degree or higher are more risk tolerant. The relationship between risk tolerance and education has been investigated by various researchers (Baker & Haslem, 1974:469; MacCrimmon & Wehrung, 1986:200; Sung & Hanna, 1996b; Ardehali *et al.*, 2005:513) who also reached the consensus that higher education levels enable individuals to better assess risks and benefits than individuals with lower levels of education.

#### 5.13.2.1.3 Income level

From Table 5.41 above it can be seen that the level of income had a positive linear relationship with the level of risk tolerance ($p < 0.01$) and had very small effect sizes. Therefore, the level of income did have a significant relationship with depositors' risk tolerance level. These results are similar to Irwin (1993) who found that individuals earning high annual incomes are willing to tolerate more risk than individuals earning lower annual incomes are. Moreover, Warren *et al.* (1990:74) also stated that high income earning males are more risk tolerant than high income earning females. Various researchers (Grable, 2000:625; Grable & Joo, 2004:73; Rahmawati

*et al.*, 2015:376) find consensus in their research that individuals earning high annual incomes are more likely to take on risk.

## 5.14 STRUCTURAL EQUATION MODELLING

A SEM is based on the theoretical relationships amongst multiple variables or constructs (Hardy & Bryman, 2004:436). The first step in SEM is to define these constructs based on theory, state how they will be measured and elaborate on the interrelationships amongst the multiple variables. Two theories have to be tested, the first (1) measurement theory and the second (2) structural theory. The measurement theory presents variables according to their characteristics while the structural theory elaborates on the merged relationships amongst the variables (Malhotra *et al.*, 2012:871). This step includes converting these structured relationships into hypotheses to be tested in the model. In this study, a theoretical relationship exists between depositors' demographical factors, their likelihood to withdraw, behavioural finance biases and their respective risk tolerance levels considering reputational risk.

Due to its versatility when applied to social, behavioural and management sciences, structural equation modelling (SEM) has witnessed an exponential growth in its contribution towards these field of study (Fan, 2007:41). One of the advantages of using SEM stems from the fact that it incorporates statistical methods from multivariate statistics, econometrics psychometrics and sociometrics to create a single unified or integrated model (Hardy & Bryman, 2004:431; Fan, 2007:40). SEM also incorporates various statistical techniques, which are thought-out as special cases of the unified model. These techniques may include, exploratory and confirmatory factor analysis, correlation and covariance analysis, multiple regression analysis and lastly, path analysis (Hardy & Bryman, 2004:435). Considering the sample size, convention indicates that sample sizes of 200 is sufficient for multivariate normal data while sample sizes of at least 400 are required for non-normal datasets. The sample size of 417 was therefore adequate for conducting SEM (Hox & Becher, 1998:357). SEM was implemented based on all the responses with the help of AMOS 25. The overriding empirical objective of this section was to construct a forecasting model to identify reputational risk by profiling depositor behaviour. To achieve this a two-step approach was followed. Firstly, the measurement model had to be specified (in Figure 5.9), where after its validity and reliability had to be validated by means of confirmatory factor analysis (CFA). The second step encompassed the full structural model to ascertain the nomological validity where all the

significant variables were included (operational risk, reputational risk, bank perception, behavioural finance and risk tolerance).

### 5.14.1 Indicate structural model

After the validity of the measurement model have been completed and found satisfactory, the structured model can be indicated and laid out for specification (Hardy & Bryman, 2004:452). Figure 5.10 indicates the structural model, which indicates the influence of operational events, bank perception, behavioural finance and risk tolerance on reputational risk.

### 5.14.2 Assess structural model validity

The second last step conducting SEM includes the assessment of the structural model validity. The aim of this step is to confirm the validity of the structured model and the concurring theoretical relationship of the multiple variables (Kaplan, 2009:9). Internal consistency reliability was also tested for the variable reputational risk where this variable was constructed out of Section C. a Cronbach alpha value of 0.93 was obtained make this reputational risk scale highly reliable.

**Table 5.42: Standardised weights: Reputational risk, operational risk, bank perception, behavioural finance and risk tolerance**

| Constructs | | | Estimate | P-value |
|---|---|---|---|---|
| **Reputational risk** | <--- | Bank perception | 0.078 | 0.116 |
| | <--- | Operational events | 0.677 | *** |
| | <--- | D1- Representativeness | 0.023 | 0.552 |
| | <--- | D2- Overconfidence | 0.045 | 0.268 |
| | <--- | D3- Anchoring | -0.032 | 0.405 |
| | <--- | D5- Availability bias | 0.074 | 0.058* |
| | <--- | D6- Loss aversion | -0.050 | 0.200 |
| | <--- | D7- Regret aversion | 0.064 | 0.099* |
| | <--- | D8- Mental accounting | -0.014 | 0.716 |
| | <--- | D9- Self-control | 0.034 | 0.406 |
| | <--- | E1- SCF Risk tolerance | -0.068 | 0.070* |
| | <--- | D4- Gamblers fallacy | -0.057 | 0.151 |

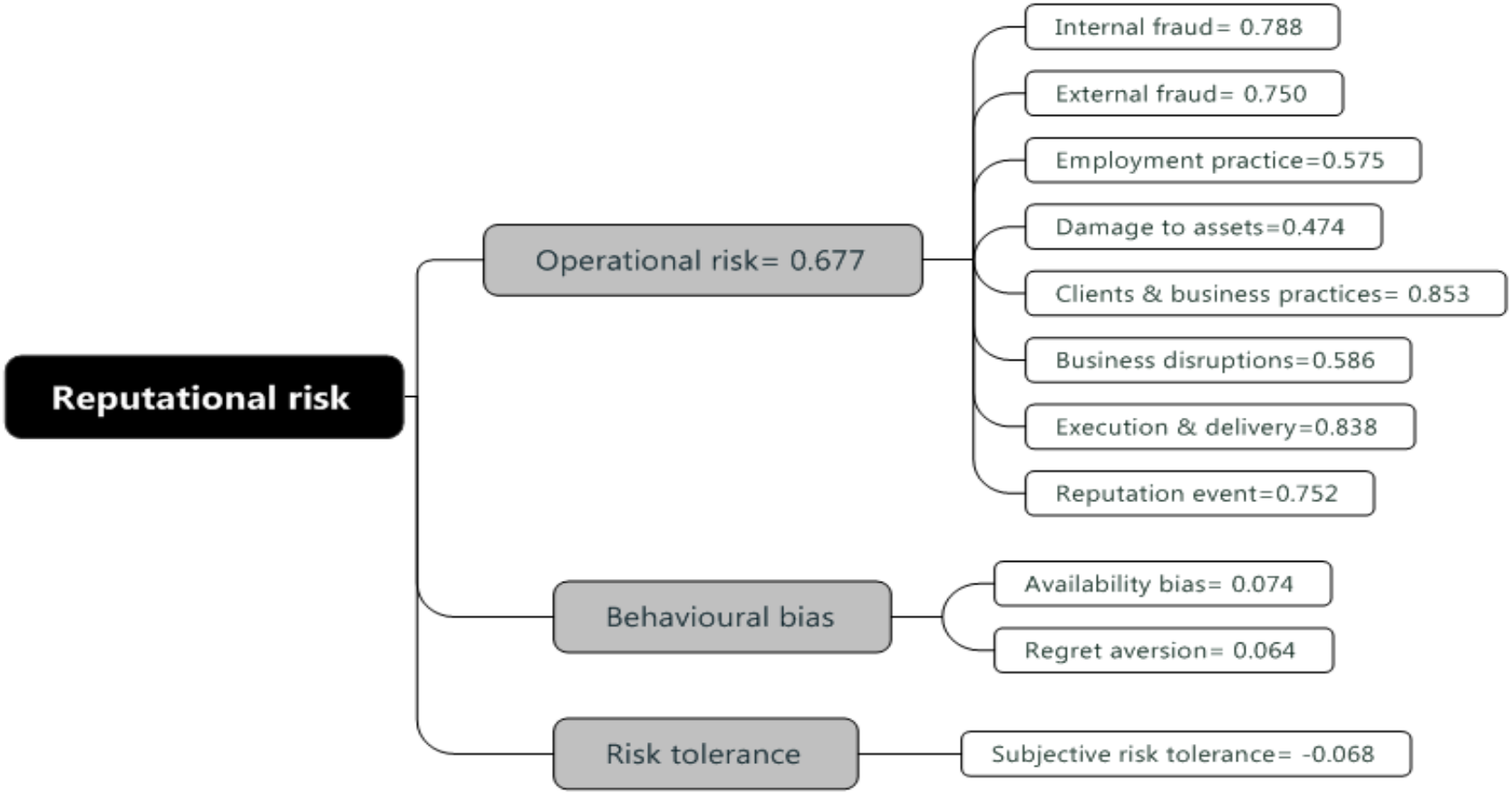
***Significant at 0.01 level; *Significant at 0.1 level

Considering bank perception in Table 5.42, this variable did not significantly contribute towards predicting reputational risk (standardised coefficient =0.078), ($p > 0.10$). Operational risk events did significantly influence ($p < 0.01$) reputational risk to a strong degree as the

squared multiple correlation (SMC) was significant (standardised coefficient =0.677). The availability bias did also significantly influence ($p < 0.1$) reputational risk to a small degree (standardised coefficient =0.074). The regret aversion bias did also significantly influence ($p < 0.1$) reputational risk to a small degree (standardised coefficient =0.064). Since a negative relationship exist between reputational risk and risk tolerance, the subjective risk tolerance negatively (standardised coefficient = -0.068) influenced reputational risk ($p < 0.1$). Considering the representativeness, overconfidence, anchoring, loss aversion, mental accounting, self-control and gamblers fallacy bias this variable did not significantly contribute towards predicting reputational risk ($p < 0.01$).

The CFI was also performed where a value of 0.89 was obtained. This was followed by the IFI and the TLI where values of 0.90 and 0.83 were obtained. Values that are closer to one indicates a better fit whereas those closer to zero indicated that the data do not fit the model (Malhotra *et al.*, 2012:230). The values close to 0.9 indicates a marginal goodness-of-fit (Mueller, 1996:204). Absolute badness-of-fit indices requires values that are lower since these measures measure error or deviation, for example the chi-square test $X^2$, the RMSR, the SRMSR and the RMSEA (Malhotra *et al.*, 2012:874). The chi-square value was obtained by dividing the minimum sample discrepancy with the degrees of freedom (CMIN/DF).

**Figure 5.10: Structural model of reputational risk**



Mueller (1996:204) argues that ratios between three and five are still acceptable as a good model fit. In this case, a value of 3.21 was obtained where this value is still acceptable indicating a goodness-of-fit. A RMSEA of 0.073 was found at the 90 percent confidence interval [0.07; 0.09] percent. The model is regarded as a good fit where the RMSEA is 0.05 or less. An adequate model is regarded where values < 0.08 (Blunch, 2008). On the other hand, according to Blunch (2008) values > 0.10 should not be accepted.

### 5.14.3 Forecasting model conclusion and recommendations

The last step in conducting SEM comprises of valuable conclusions and recommendations on the structured model for future research (Malhotra *et al.*, 2012:880). The Table 5.43 below indicates a summary of all the variables that may have influenced depositor behaviour in terms of their likelihood to withdraw during eight operational risk events.

**Table 5.43: Model summary of significance**

| Depositor behaviour | Construct | Variable | Positive/ Negative |
|---|---|---|---|
| **Internal fraud** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness Availability | Positive |
| | Information | Local newspaper | Positive |
| | Risk tolerance | SCF | Negative |
| **External fraud** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness Availability Self-control | Positive |
| | Risk tolerance | SCF | Negative |
| **Employment practice** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness Self-control | Positive |
| **Clients, products and business practice** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness Availability Self-control | Positive |
| | Information | Local newspaper | Positive |
| | Risk tolerance | SCF | Negative |
| **Damage to physical assets** | Demographics | Education | Negative |
| | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness Availability | Positive |

| | | | |
|---|---|---|---|
| | | Self-control | |
| | Information | Local newspaper | Positive |
| | Risk tolerance | SCF<br>Grable | Negative |
| **Business disruptions** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Availability<br>Self-control | Positive |
| **Execution and delivery** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness<br>Availability<br>Self-control | Positive |
| | Information | Local newspaper | Positive |
| **Reputational event** | Bank perception | Reputation | Positive |
| | Reputational risk | Reputational risk | Positive |
| | Behavioural finance | Representativeness<br>Availability<br>Self-control | Positive |
| | Information | Local newspaper | Positive |

Table 5.44 indicates that the SEM model concluded that reputational risk is significantly influenced by operational risk events (all eight), risk tolerance (SCF) and certain behavioural finance biases (availability bias, regret aversion bias).

**Table 5.44: Model summary of SEM**

| **Reputational risk** | **Factor** | **Variable** | **Positive/Negative influence** | **Significant** |
|---|---|---|---|---|
| | Operational risk | All eight risk events | Positive | (p <0.01)*** |
| | Bank perception | All four variables | Positive | Non-significant |
| | Behavioural finance | Availability bias<br>Regret aversion | Positive | (p <0.1)* |
| | Subjective risk tolerance | All four variables | Negative | (p <0.1)* |

The SEM model provided a tremendous contribution to the field of study since no researcher to this date have constructed a model to assist in identifying which variables uniquely influences reputational risk in banks by modelling depositor behaviour based on likelihood to withdraw during operational risk events, bank perception, behavioural biases and risk tolerance levels.

## 5.15 SYNOPSIS

The purpose of this chapter was to report on the empirical findings of the study. The analysis and explanation of the findings were presented in such a manner as to elucidate how all seven of the empirical objectives in the study were achieved. The chapter presented the results of the descriptive statistics and demographic information of the sample.

Exploratory factor analysis was conducted where eight factors were extracted which represented operational risk events as per the guidelines by BCBS. The internal consistency reliability was also tested and found these factors to be highly reliable. These factors included internal and external fraud, employment practice, damage to physical assets, clients and business practices, business disruptions, execution and delivery and reputational events. The Pearson's correlation coefficient between each of the eight factors were >0.6 which was indicative of practical significance ($p < 0.01$). To ascertain whether demographical factors influence depositor behaviour t-tests and non-parametric correlations were computed. It was found that age, income and education levels do not significantly influence depositor behaviour during most operational risk events. Non-parametric correlation was used to determine whether bank perception play a role in depositor behaviour. Depositors' behaviour based on how depositors form their perception of bank did indeed positively influence the behaviour of depositors.

In terms of operational risk, all events were found to contribute significantly towards reputational risk. Hence, operational risk events will most likely lead to reputational risk. Depositors were very likely to withdraw in the event of any operational risk, however, employment practice and damage to physical assets had a lower influence of depositors. In terms of behavioural finance, depositors were highly subject to the representativeness bias, availability bias and self-control bias. However, the SEM also found the regret bias to have a significantly unique influence on reputational risk. Depositors also seemed to react most to operational risk events when they hear about the event from the local newspaper. The other sources of information did not have a significant influence on the behaviour of depositors.

Furthermore, a structural equation modelling (SEM) was performed to test the hypothesised theoretical model and the various relationships amongst the multiple variables. The reliability of the measurement model and structural model was also confirmed and was found to be moderately to highly reliable. Additionally, the application of goodness of fit models also represented very good results. Ultimately, three out of the four factors were identified to have a statistically unique contribution towards reputational risk. These results were in line with the hypothesised research model.

Chapter 6 will present a synthesis of the results found in Chapter 5. It will give a breakdown of the achievement of all theoretical and empirical objectives as set out in Chapter 1. The main purpose of Chapter 6 is to highlight the contribution to the body of knowledge. However, with

every contribution come certain limitations and recommendations. Chapter 6 will thus discuss those limitations and give recommendations to future studies.

# CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

*Success in management requires learning as the world is changing.*

*Warren Bennis (1985)*

## 6.1 INTRODUCTION

Chapter 6 provides a synopsis of the study, as well as an overview of the achievement of both theoretical and empirical objectives. The main findings of the empirical objectives are discussed in order to highlight the main contributions of the research study. Subsequently, Chapter 6 offers recommendations derived from the research findings. Furthermore, the chapter discusses the limitations of the study and makes recommendations towards future research endeavours. Lastly, Chapter 6 ends by providing concluding remarks of the research journey.

## 6.2 OVERVIEW OF THE STUDY

As mentioned in Chapter 1, banks are unintentionally exposed to various financial risks due to their economic and monetary role. Banks must furthermore compete with irreversible changes in banking regulations and risk management, automation of banking systems (non-traditional sources) and consumerism, all of which can be attributed to changing depositor behaviour. Banks also fear that changing depositor and financial behaviour in the banking environment will influence global financial markets so rapidly that the aggregate risk in the industry will ultimately increase. The financial behaviour of depositors is fundamentally affected by operational risk events. Chapter 1 provided an introduction and background into the study and provided the research problem statement. The need to develop a forecasting model for reputational risk by profiling depositor behaviour was stated and motivated. After the problem statement was motivated, a primary objective, theoretical objectives and empirical objectives were formulated to achieve the research purpose of this study.

The primary objective of this study was to model depositor behaviour during operational risk events to predict reputational risk.

### 6.2.1 Theoretical objectives

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

I. Contextualise the banking sector within South Africa;
II. Elucidate upon the various stakeholders within the banking sector with emphasis placed on their financial behaviour;
III. Provide a theoretical framework for reputational risk;
IV. Contextualise a definition for reputational risk based on theory;
V. Explore the relationship between reputational and operational risk by giving emphasis to previous studies;
VI. Elucidate upon the main consequences of reputational risk in relation to depositor behaviour; and
VII. Contextualise current theoretical reputational risk mitigation models.

Chapter 2 aimed to achieve **theoretical objectives I and II** as laid out in Chapter 1. Chapter 2 commenced with the contextualisation of the nature of banks, the types of risk that banks face and the current regulation of South African banks. The chapter also makes mention of deposit insurance, as previous studies reported interesting results regarding different deposit insurance schemes. The chapter, furthermore, discussed the operating environment of South African banks, which includes the main stakeholders in the industry as well as their behaviour. Depositors were discussed as the primary stakeholders of a bank including the behaviour biases that might drive their financial decisions as well as their risk tolerance levels. The chapter ended with supporting evidence from previous studies that was based on depositor behaviour.

Chapter 3 focused on achieving **theoretical objectives III throughout VII.** Chapter 3 commenced with the origin of reputational risk by establishing a link between reputational risk and operational risk. Since reputational risk stems from operational risk events, it was deemed important to define these operation risk event types. These events later form the basis for the hypothetical events that were created in order to measure depositor responses. Based on the context of reputational risk within this study, a reputational risk definition was created in order to support the empirical objectives. The known theoretical consequences of reputational risk were also listed and discussed in order to emphasise the importance in recognising, mitigating and managing reputational risk. Previous examples of reputational risk events in South Africa were also highlighted. The chapter ended with focus on current mitigation models for reputational risk.

Chapter 4 focused on highlighting the research design and methodology followed in gathering and analysing the data for the empirical portion of this study. Chapter 4 provided supporting

arguments for using the research approach, the sampling design and sample size as well as the research instrument used. For the purpose of summation, this study made use of a quantitative research approach using a positivist research paradigm. The sample of 417 was sufficient for factor analysis and considering the exclusion criteria applied in this study. Participants had to be older than 18 years, employed, have some form of education and bank at one of the top five banks in South Africa. A self-structured questionnaire was used. According to previous research studies, the selected sample was adequate for structural equation modelling (SEM).

Chapter 5 provided a detailed report of the quantitative analysis performed in this study. The chapter commenced with the descriptive analysis of the results, which was followed by the demographical information of the sample. The hypothesis was stated in order to ascertain the achievement of the empirical objectives. The findings of the empirical analysis are summarised below in the next section. The section is laid out in accordance with the empirical objectives that were set out in Chapter 1.

## 6.3 FINDINGS OF THE STUDY

The primary objective of this study was to model depositor behaviour during operational risk events to predict reputational risk. In order to achieve the primary objective, the following empirical objectives were formulated and achieved.

### 6.3.1 Empirical objective 1: Identify the most significant operational risk events leading to reputational risk

This objective was achieved in Section 5.6 and Section 5.8. Exploratory factor analysis (EFA) was performed in Section 5.6 to identify the risk events within operational risk. Eight dimensions were extracted as determinants that influence electronic banking services. All eight operational risk events were reliable and used as factors. An association between the amount that depositors are willing to withdraw during operational risk events and reputational risk was performed using non-parametric Spearman correlation. Strong positive linear relationships were found for all eight operational risk events and reputational risk as. Secondly, the influence of depositor behaviour during operational risk events on the reputational risk of a bank, by means of regression analysis was conducted. The linear regression analysis also indicated that each operational risk event significantly contributed to the reputational risk of a bank.

### 6.3.2 Empirical objective 2: Determine how demographical factors influence depositors' likelihood to withdraw

This objective was achieved in Section 5.9. Non-parametric Spearman correlation and ANOVA was used to test the relationship between demographical factors and depositors' likelihood to withdraw. For age, a combination of positive and negative relationships existed. There was no difference between the likelihood to withdraw between the different age groups except for the operational event- damage to physical assets. Concerning the level of education, a negative relationship exists between the level of education and depositors' likelihood to withdraw. There was no difference between the likelihood to withdraw between the different levels of education except for the operational event; damage to physical assets. A negative relationship also existed between the income level and depositors' likelihood to withdraw. However, there was no significant difference between the income levels and depositors' likelihood to withdraw.

### 6.3.3 Empirical objective 3: Determine how bank reputation influences depositor likelihood to withdraw

This objective was achieved in Section 5.10. A bank's reputation is based on depositors' perception regarding a banks' performance (whether it meets expectations or not), the level of confidence and trust in a bank as well as the level of satisfaction experienced. Hence, this definition of a bank reputation in the mind of depositors was put to the test to see whether there is an association between bank reputation and depositors' withdrawal behaviour (how likely they are to withdraw). A non-parametric Spearman correlation was used since both the variables were measured using an ordinal scale. All the correlation coefficients were significant at 1 percent ($p < 0.01$). This indicates that there is a relationship between how depositors regard the reputation of a bank based on their own perception and how likely they will be to withdraw their money during operational events. In other words, how likely depositors are to withdraw money from their accounts after these operational events is positively associated with how they form their perception of a bank.

### 6.3.4 Empirical objective 4: Identify the behavioural biases that drive depositor behaviour

Since this was a self-constructed scale based on the literature, the internal consistency reliability had to be performed. The behavioural bias scale obtained a Cronbach alpha value of 0.61. A non-parametric correlation was performed where a small significant positive

correlation was found between behavioural finance and depositors' likelihood to withdraw. The top three behavioural biases as selected by depositors were selected and independent t-tests were performed based on whether depositors chose this bias or not. The representativeness bias was significant for all operational risk events except for business disruptions and system failure. Therefore, depositors who are subject towards this bias will be more likely to withdraw than those who are not subject to this bias. The availability bias was significant for all operational risk events except for employment practice and workplace safety. Therefore, depositors who are subject towards this bias will be more likely to withdraw than those who are not subject to this bias. The self-control bias was significant for all operational risk events except for internal fraud. Therefore, depositors who are subject towards this bias will be more likely to withdraw than those who are not subject to this bias. Hence, behavioural finance biases influence depositors' likelihood to withdraw during operational risk events.

### 6.3.5 Empirical objective 5: Determining depositor behaviour, the regarding the source of information

The top three sources of information as chosen by depositors were television broadcast, local newspaper and electronic newspaper. The independent t-tests were performed based on whether depositors chose this source of information or not. Depositors will react differently (more likely to withdraw) when hearing about internal fraud; clients, products and business practices; damage to physical assets and reputational events from a local newspaper compared to other sources of information. Concerning depositors' behaviour during operational risk events, depositors will not act any different when hearing about these events from a television broadcast or electronic newspaper.

### 6.3.6 Empirical objective 6: Determine depositors level of risk tolerance

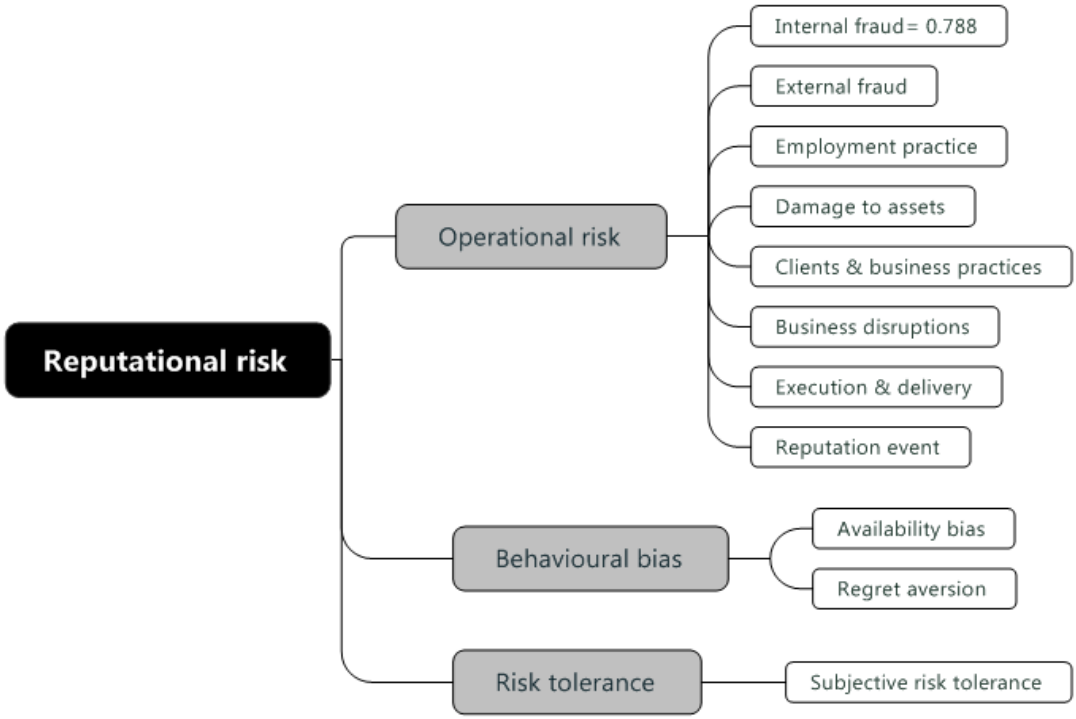
An inverse relationship exists between depositors' risk tolerance and their willingness to withdraw. Negative correlation coefficients were found for all operational risk events and their risk tolerance level. Hence, depositors will be less likely to withdraw the higher their risk tolerance level and more likely to withdraw the lower their risk tolerance level. It was also important to determine depositors risk tolerance level based on their demographics. Risk tolerance had a negative relationship with age, which is in line with the lifecycle of investors and other market participants. Furthermore, the relationship also showed a statistical significance at the 1 percent confidence interval ($p < 0.01$) and had very small effect sizes

showing a small practical significant relationship. Therefore, age had a significant relationship with depositors' risk tolerance level. The correlation between risk tolerance and the level of education indicated a significant result and a positive small linear association. Therefore, the level of education had a significant relationship with depositors' risk tolerance level. The level of income had a positive linear relationship with the level of risk tolerance ($p < 0.01$). Therefore, the level of income also had a significant relationship with depositors' risk tolerance level.

## 6.4 CONTRIBUTION OF THE STUDY

Before the researcher could create a forecasting a model for reputational risk a definition of reputational risk within the South African context was created. This was a significant contribution to the South African banking industry since no uniform definition exists. However, the main contribution of the study lies in the achievement of the very last empirical objective seven: *constructing a forecasting model to identify reputational risk by profiling depositor behaviour*. In order to achieve this objective, the scale was validated through exploratory and confirmatory factor analysis. These casual relationships were further tested through a SEM in order to create a model to identify reputational risk and the depositor behaviour during operational events leading to reputational risk (behavioural biases and risk tolerance level). Eight dimensions of operational risk have also been identified to influence reputational risk significantly. Figure 6.1 proposes the variables that uniquely influence reputational risk.

**Figure 6.1: Modelling reputational risk**




## 6.5 GENERAL CONCLUSION

Although the financial markets reaction to operational risk events have been researched widely, very few researchers have explored its effects on reputational risk. During this research endeavour, the researcher made use of a complex process, which involved theoretical analysis and meticulous statistical analysis. Various statistical analysis such as EFA, CFA and SEM was utilised in order to create a forecasting model to identify reputational risk after operational risk events specifically in Gauteng, South Africa. The forecasting model that has been developed and validated will provide banks with a tool to predict reputational risk and its extent after operational risk events. By being able to predict reputational risk and the factors that lead to this risk, banks will be able to more accurately identify, mitigate and manage reputational risk. By minimising the exposure to reputational risk, banks will be able to take competitive advantage of the opportunities that the ambitious banking industry offers. The structural equation model has determined a relationship between reputational risk, depositors' behaviour to withdraw during operational risk events, bank perception, behavioural finance biases and depositors risk tolerance.

## 6.6 RECOMMENDATIONS, LIMITATIONS AND FUTURE RESEARCH

Considering the theoretical and empirical findings of this study, a few managerial implications and recommendations can be offered. The empirical analysis revealed that although all eight operational risk events were significant, depositors were less likely to withdraw during damage to physical assets and employment practice and workplace safety. Hence, the following recommendations for risk managers can be made:

- Focus on reducing reputational risk stemming from internal and external fraud, clients, products and business practice, execution and delivery and pure reputational events by investing in the robustness of their operations.
- This risk requires a distinct risk management framework and should not be managed in isolation, but in an integrated manner with the underlying risk (i.e. operational risk).
- Manage reputational risks through the five steps of ERM (governance and structure, strategy and objective setting, performance, review, information and communication.

Much like any research endeavour, this research study had limitations of its own. Building on the foundation of this study, future researchers are recommended to use a bigger sample size and extend the region of the sample (to not only use Gauteng but also the other provinces). Since it was found that individuals do not always apply their minds when answering a questionnaire, it is also recommended that the level of financial knowledge of depositors should be investigated. The scope of the study can also be expanded to see whether a relationship between reputational risk and brand loyalty and trust exist in the banking sector. It may also be worthwhile to apply the forecasting model to other related internal and external stakeholders to see whether the factors that significantly contribute to reputational risk differed between these various stakeholders.

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# ANNEXURE 1: QUESTIONNAIRE

**Reputational risk: depositor behaviour in South Africa**

**Please do not put your name, surname, or any identifying marks on your questionnaire.** You are being invited to take part in a research project that forms part of a PhD study. The purpose of this study is to predict reputational risk by analysing bank depositors' behaviour after operational risk events. This study will focus on the behaviour of depositors and the level of risk they are willing to tolerate in terms of their bank deposits.

Please complete if you meet the following criteria:

- **Older than 18 years;**
- **Owns a bank account for longer than 5 years**
- **Bank at either Standard Bank, Absa Bank, Capitec Bank, FNB Bank or Nedbank;**
- **Has some level of education; and**

Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. The data will be **confidential** and your results will be reported in aggregate (as part of the whole sample) and not individually. The questionnaire should take, on average, 15 minutes to complete.

**SECTION A**

A1.

| **Age** | 18-29 | 30-39 | 40-49 | 50-59 | 60+ |
|---|---|---|---|---|---|

A2.

| | | |
|---|---|---|
| **Gender** | Male | 1 |
| | Female | 2 |

A3.

| | | |
|---|---|---|
| **Ethnicity** | African | 1 |
| | White | 2 |
| | Coloured | 3 |
| | Asian/Indian | 4 |

Other (5):_____

A4.

| | | |
|---|---|---|
| **Highest level of education** | High school education | 1 |
| | Further training | 2 |
| | Diploma | 3 |
| | Undergraduate degree | 4 |
| | Honours degree | 5 |
| | Master's degree | 6 |
| | Doctoral degree | 7 |

Other (8):_____

A5.

| | | |
|---|---|---|
| **What is your annual income that is deposited into your bank account?** | Below R100 000 | 1 |
| | R100 000-R200 000 | 2 |
| | R200 001-R400 000 | 3 |
| | R400 001-R550 000 | 4 |
| | R550 001-R700 000 | 5 |
| | R700 001-R1500 000 | 6 |
| | R1500 001 and above | 7 |

## Section B: Hypothetical events

Upon hearing about the following events within your bank, **how likely are you to immediately withdraw your money from your account?**

| Operational risk | | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
|---|---|---|---|---|---|---|---|
| B1 | Hackers have stolen valuable client information leading to financial losses to customers, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B2 | Your bank is under investigation for the unfair employee benefits and unfair termination of some of the employees, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B3 | Your bank is under investigation for credit card fraud committed by someone within the bank, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B4 | Your bank is under investigation for evading laws due to mismarking of their position (i.e. the bank is not as financially strong as reported), how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B5 | Your bank has been accused of reckless lending by extending high volumes of loans exposing the bank to liquidity problems, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B6 | An external party from outside the bank has managed to forge a cheque and withdraw large amounts of money from your account, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B7 | Bank employees are under investigation for stealing depositors money, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B8 | Your bank is under investigation for having health and safety issue regarding employee workplace safety, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B9 | Your bank is under investigation for the market manipulation of interest rates and the South African currency, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B10 | Your bank has been accused of discrimination in terms of gender, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B11 | External parties have managed to steal millions by means of credit card and debit card fraud, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B12 | Your bank's performance is not meeting your expectations and financial desires, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B13 | External auditors have accused your bank of failing to deliver accurate annual reports (losses were hidden from customers), how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B14 | Your bank has sustained damage to physical assets due to vandalism, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B15 | The manner in which your bank handles public matters are not according to your expectations, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B16 | Your bank has frequent disruptions in business due to system failures as a result of outdated software, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B17 | Your bank has frequent disruption in the normal course of business due to power outage, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B18 | Your banks activities are not creating a good reputation in your mind, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |

| Operational risk | | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
|---|---|---|---|---|---|---|---|
| B19 | The bank have been providing misleading information resulting in financial losses, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B20 | Your bank has sustained damage to physical assets by means of natural disaster (loss resulting in destruction of institution or affecting it), how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B21 | Your bank have been accused of financial losses in client funds and assets, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B22 | Your bank has been accused of extending loans to people who cannot afford it, exposing the bank to possible bankruptcy, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B23 | Your bank have sustained damage to physical assets due to a terrorist attack, how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |
| B24 | Your bank has frequent disruptions in banking applications (such as the unavailability of mobile and internet banking), how likely are you to withdraw? | 1 | 2 | 3 | 4 | 5 | 6 |

## Section C: Reputational risk after operational events (Bank perception)

**Upon hearing about the following events within your bank, what percentage (%) of your money are you likely to immediately withdraw? Also state how likely the event will negatively influence your perception of the bank.**

| C25. Internal fraud | | | | | | |
|---|---|---|---|---|---|---|
| a) Your bank is under investigation for evading laws and regulations due to mismarking of their position (i.e. the bank is not as financially sound as reported). | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C26. External fraud** | | | | | | |
| a) Over the last year external fraud within your bank has increased. Hackers have stolen millions from bank customers by means of credit card and debit card fraud. | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C27. Employment practice and workplace safety** | | | | | | |
| a) Your bank is under investigation with relation to employee affairs (unfair compensation or benefits, unfair termination), (all types of discrimination) health and safety (general liability such as slip and fall). | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C28. Clients, products and business practices** | | | | | | |
| a) Your bank is under investigation for the market manipulation of interest rates and the South African currency. The bank has also been accused of reckless lending by | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |

| | | | | | | |
|---|---|---|---|---|---|---|
| extending loans to people who cannot afford it. | | | | | | |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C29. Damage to physical assets** | | | | | | |
| a) Your bank have sustained damage to physical assets by means of natural disasters (Natural disaster loss, human made losses such as terrorism or vandalism on the institution or affecting the institution) | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C30. Business disruptions and system failures** | | | | | | |
| Your bank has frequent or major disruption in the normal course of business due to system failures (such as software errors and unavailability of banking applications (such as mobile and internet banking or other banking activities). | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C31. Execution, delivery and process management** | | | | | | |
| A large number of failures regarding client transactions have been reported at your bank resulting in financial losses for many of the clients. | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |
| **C32. Reputational risk** | | | | | | |
| Allegations have been circulating the market concerning your banks poor performance and possible low cash flow levels. However, your bank has not yet made any formal announcements. The safety of your life savings is uncertain. | 0 | 1%-19% | 20%-39% | 40%-59% | 60%-79% | 80%-100% |
| b) State how likely this event will negatively influence your perception of the bank | Very unlikely | Unlikely | Some-what unlikely | Some-what likely | Likely | Very likely |

### Assume your bank had one or more of the above mentioned events answers the following statements:

| **Bank reputation** | | **Strongly disagree** | **Disagree** | **Somewhat disagree** | **Somewhat agree** | **Agree** | **Strongly agree** |
|---|---|---|---|---|---|---|---|
| C33 | My perception of a bank is based on the level of confidence that I have in the bank. | 1 | 2 | 3 | 4 | 5 | 6 |
| C34 | My perception of a bank is based on how its performance meets my expectations. | 1 | 2 | 3 | 4 | 5 | 6 |
| C35 | My perception of a bank is based on the level of trust I have in the bank. | 1 | 2 | 3 | 4 | 5 | 6 |
| C36 | My perception of a bank is based on the level of satisfaction regarding the service from the bank. | 1 | 2 | 3 | 4 | 5 | 6 |

## Section D: Behavioural finance

**Indicate to what extent the following statements drive your financial decisions:**

| Behavioural biases | | Strongly disagree | Disagree | Somewhat disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| D1 | I base my financial decision on the past performance of the bank | 1 | 2 | 3 | 4 | 5 | 6 |
| D2 | My superior financial knowledge drives my decisions | 1 | 2 | 3 | 4 | 5 | 6 |
| D3 | I rely only on a single piece of information (past or current information) to make financial decisions | 1 | 2 | 3 | 4 | 5 | 6 |
| D4 | My financial decisions are based on future market predictions | 1 | 2 | 3 | 4 | 5 | 6 |
| D5 | My decision are based on the most recent information | 1 | 2 | 3 | 4 | 5 | 6 |
| D6 | I would rather take the risk to keep my money at my current bank than to switch to another bank | 1 | 2 | 3 | 4 | 5 | 6 |
| D7 | My previously incorrect financial decisions which led to a financial loss drives my decisions | 1 | 2 | 3 | 4 | 5 | 6 |
| D8 | I receive a good interest rate on my account and will rather leave my account as is to earn higher future interest rates | 1 | 2 | 3 | 4 | 5 | 6 |
| D9 | I exercise self-control when making financial decisions | 1 | 2 | 3 | 4 | 5 | 6 |

**Please select the top 3 forms of communication you react to most when making financial decisions.**

| D10 | Operational risk events | x |
|---|---|---|
| | Local newspaper (hard copy) | |
| | Television news broadcast | |
| | Facebook | |
| | Twitter | |
| | Email | |
| | Word of mouth | |
| | Electronic news paper | |

## Section E: Risk tolerance

| **E1. Which of the following statements comes closest to the amount of financial risk that you are willing to take when making a deposit? (Choose 1 option)** | | **Mark with an X** |
|---|---|---|
| A | Take substantial financial risks expecting to earn substantial returns | 1 |
| B | Take above average financial risks expecting to earn above average returns | 2 |
| C | Take average financial risks expecting to earn average returns | 3 |
| d | Not willing to take any financial risks | 4 |

| ***Indicate the degree to which you agree or disagree with these statement*** | | | | | |
|---|---|---|---|---|---|
| | | **Strongly disagree** | **Disagree** | **Agree** | **Strongly agree** |
| E2 | It's hard for me to win an argument | 1 | 2 | 3 | 4 |
| E3 | When travelling, I like to take new routes | 1 | 2 | 3 | 4 |
| E4 | I like to try new foods, new places and totally new experiences. | 1 | 2 | 3 | 4 |
| E5 | When driving a car, I would always obey the traffic rules and avoid dangerous situation | 1 | 2 | 3 | 4 |
| **FINANCIAL RISK** | | | | | |
| E6 | When you hear "financial risk", what do you think of? | **Loss** | **Uncertainty** | **Opportunity** | **Adventure** |

| **E7. How would you describe yourself as a financial risk taker? (E.g. Gambling, investing, saving etc.) (Choose 1 option only)** | |
|---|---|
| Willing to take as much risk as possible to get desired profit | 1 |
| Willing to take calculated risks | 2 |
| Cautious | 3 |
| Avoid loss as much as possible | 4 |
| **E8. What influences your financial decisions such as saving, spending, investing or loaning money to a friend? (Choose 1 option only)** | |
| Personal preferences/comfort/pleasure | 1 |
| Financial return/profit associated with the decision | 2 |
| Financial risk (loss) associated with the decision | 3 |
| Both risk and return | 4 |
| **E9. Which situation would make you the happiest? (Choose 1 option only)** | |
| You win R 5 000 in a competition | 1 |
| You inherit R 5 000 from a rich relative | 2 |
| You earn R 5 000 by risking R 1 000 in an investment | 3 |
| **E10. Assume you are to buy a car in the near future, which of the following financing options would you choose? (Choose 1 option only)** | |
| Save money and buy an affordable pre-owned car for cash (second hand car) | 1 |
| Borrow money from a friend or relative to buy a good new affordable car **(Note: you can negotiate repayment terms)** | 2 |
| Ask for a loan from a bank or financial institution and pay monthly instalments as long as you buy the car of your dreams **(Note: Repayment terms set by bank)** | 3 |
| **SPECULATIVE RISK** | |
| **E11. Suppose a relative left you an inheritance to the value of R 300 000, however you are required to choose a way in which this inheritance is to be presented to you. Given the following options, which would you choose? (Choose 1 option only)** | |
| R300 000 cash | 1 |
| A house worth R300 000 | 2 |

| | |
|---|---|
| Shares to the value of R 300 000 at a company which is very close to your heart | 3 |
| **E12. You have just taken a job at a small fast growing company. After your first year you are offered the following options, which one would you choose? (Choose 1 option only)** | |
| A once off bonus of R 300 000 | 1 |
| A 3 year employment contract earning R10 000 a month (i.e. It will be R360 000 in 3 years) | 2 |
| Shares in the company to the value of R300 000 with the hope of selling them later at a larger profit | 3 |
| **E13. Assume you are in a TV game show or any other game show offering different options, which of the following options would you choose? (Choose 1 option only)** | |
| R1 000 in cash | 1 |
| A 50% chance to win R5 000 | 2 |
| A 25% chance to win R10 000 | 3 |
| A 5% chance to win R100 000 | 4 |
| **E14. Suppose a company you invested R 30 000 in is about to close down. They offer you the following options (each with 2 possible outcomes) and you can only choose one option, which would you choose? (Choose 1 option only)** | |
| Take your R30 000 and loose R0 | 1 |
| Possibility of gaining R50 000 or losing R10 000 | 2 |
| Possibility of gaining R80 000 or losing R20 000 | 3 |
| Possibility of gaining R120 000 or losing all your R30 000 | 4 |
| **INVESTMENT RISK** | |
| **E15. Should you decide to invest, which of the following options regarding the management of investments would you choose? (Choose 1 option only)** | |
| Hire a manager | 1 |
| Manage them yourself | 2 |
| Ask a friend | 3 |
| **E16. Assuming you are unemployed, should you get employed today on a permanent basis with a stable salary, how much % of your monthly income (after paying for all expenses) would you be interested to invest/save? (Choose 1 option only)** | |
| Nothing (0%) | 1 |
| Less than 10% | 2 |
| 10%-20% | 3 |
| 25%-35% | 4 |
| More than 40% | 5 |
| **E17. Which of the following investment opportunities do you find appealing? (Choose 1 option only)** | |
| 60% in low risk with low return, 30% in medium risk with medium return, 10% in high risk with high return | 1 |
| 30% in low risk with low return, 40% in medium risk with medium return, 30% in high risk with high return | 2 |
| 10% in low risk with low return, 40% in medium risk with medium return, 50% in high risk with high return | 3 |
| **E18. If you unexpectedly received R20 000 to INVEST, what would you do? (Choose 1 option only)** | |
| Deposit it into a bank account | 1 |
| Invest in fixed income investments where you will get low constant returns with minimal risk of loss | 2 |
| Invest in shares where it will be exposed to high risk of loss but with high return possibilities | 3 |
| **E19. Investing comes with risks of losing your money. Suppose that you have R 50 000 invested, what % of loss would make you feel uncomfortable to an extent that you end up withdrawing your money? (Choose 1 option only)** | |
| Nothing (0%) | 1 |
| Less than 5% | 2 |
| 5%-15% | 3 |
| 15%-25% | 4 |

| | |
|---|---|
| 25%-40% | 5 |
| More than 40% | 6 |

**THANK YOU!**

# ANNEXURE 2: CODE BOOK

| Section A | | | |
|---|---|---|---|
| **Question** | **Code** | **Construct measured** | **Value** |
| Question 1 | A1 | Age | 16-24 (1), 25-34 (2), 35-49 (3), 50+ (4) |
| Question 2 | A2 | Gender | Male (1), Female (2) |
| Question 3 | A3 | Ethnicity | African (1), White (2), Coloured (3), Asian (4), Other (5) |
| Question 4 | A4 | Highest level of education | High school graduate (1), Further training (2), Diploma (3), Undergraduate degree (4), Honours degree (5), Master's degree (6), Doctoral degree (7), Other (8) |
| Question 5 | A5 | Annual income deposited into bank account | Below R100 000 (1), R100 001-R200 000 (2), R200 001-R400 000 (3), R400 001-R550 000 (4), R550 001-R700 000 (5), R700 001-R1500 000 (6), R1500 001 and above |
| **Section B** | | | |
| **Item** | **Code** | **Construct measured** | **Value** |
| Item 1 | B1 | Operational risk | Very unlikely (1), Unlikely (2), Somewhat unlikely (3), Somewhat likely (4), Likely (5), Very likely (6) |
| Item 2 | B2 | | |
| Item 3 | B3 | | |
| Item 4 | B4 | | |
| Item 5 | B5 | | |
| Item 6 | B6 | | |
| Item 7 | B7 | | |
| Item 8 | B8 | | |
| Item 9 | B9 | | |
| Item 10 | B10 | | |
| Item 11 | B11 | | |
| Item 12 | B12 | | |
| Item 13 | B13 | | |
| Item 14 | B14 | | |
| Item 15 | B15 | | |
| Item 16 | B16 | | |
| Item 17 | B17 | | |
| Item 18 | B18 | | |
| Item 19 | B19 | | |
| Item 20 | B20 | | |
| Item 21 | B21 | | |
| Item 22 | B22 | | |
| Item 23 | B23 | | |
| Item 24 | B24 | | |

| Section C | | | |
|---|---|---|---|
| **Item** | **Code** | **Construct measured** | **Value** |
| Item 1<br>Item 2<br>Item 3<br>Item 4<br>Item 5<br>Item 6<br>Item 7<br>Item 8 | C1<br>C2<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 | Reputational risk after operational events | a) 0 (1), 1%-19% (2), 20%-39% (3), 40%-59% (4), 60%-79% (5), 80%-100% (6)<br>b) Very unlikely (1), Unlikely (2), Somewhat unlikely (3), Somewhat likely (4), Likely (5), Very likely (6) |
| Item 9<br>Item 10<br>Item 11<br>Item 12 | C9<br>C10<br>C11<br>C12 | Reputational risk | Strongly disagree (1), Disagree (2), Somewhat disagree (3), Somewhat agree (4), Agree (5), Strongly agree (6) |
| **Section D** | | | |
| **Item** | **Code** | **Construct measured** | **Value** |
| Item 1<br>Item 2<br>Item 3<br>Item 4<br>Item 5<br>Item 6<br>Item 7<br>Item 8<br>Item 9 | D1<br>D2<br>D3<br>D4<br>D5<br>D6<br>D7<br>D8<br>D9 | Behavioural finance | Strongly disagree (1), Disagree (2), Neither agree nor disagree (3) Agree (4), Strongly agree (5) |
| Item 10 | D10 | Sources of information | Ranking question:<br>• Local newspaper (hard copy) (1),<br>• Television news broadcast (2),<br>• Facebook (3),<br>• Twitter (4),<br>• Email (5),<br>• Word of mouth (6),<br>• Electronic newspaper (7) |
| **Section E** | | | |
| **Question** | **Code** | **Construct measured** | **Value** |
| Question 1 | E1 | Survey of consumer finances | Take substantial financial risks expecting to earn substantial returns (1), Take above average financial risks expecting to earn above average returns (2), Take average financial risks expecting to earn average returns (3), Not willing to take any financial risks (4) |
| Question 2 | E2<br>E3<br>E4<br>E5 | Self-report | Strongly disagree (1), Disagree (2), Agree (3), Strongly agree (4). |
| | E6 | Financial risk | Loss (1), Uncertainty (2), Opportunity (3), Adventure (4) |

| | | | |
|---|---|---|---|
| Question 3 | E7 | | Willing to take as much risk as possible (1), Willing to take calculated risks (2), Cautious (3), Avoid loss as much as possible (4) |
| Question 4 | E8 | | Personal preferences/comfort/pleasure (1), Financial return/profit associated with the decision (2), Financial risk (loss) associated with the decision (3), Both risk and return (4) |
| Question 5 | E9 | | You win R5 000 in a competition (1), You inherit R5 000 from a rich relative (2), You earn R5 000 by risking R1 000 in an investment (3) |
| Question 6 | E10 | | Save money and buy an affordable pre-owned car for cash – second hand car (1), Borrow money from a friend or relative to buy a good new affordable car – negotiable repayment terms (2), Ask for a loan from a bank or financial institution and pay monthly instalments as long as you buy the car of your dreams – repayment terms set by bank (3) |
| Question 7 | E11 | Speculative risk | R300 000 cash (1), A house worth R300 000 (2), Shares to the value of R300 000 at a company which is very close to your heart (3) |
| Question 8 | E12 | | A once off bonus of R300 000 (1), A 3 year employment contract earning R10 000 a month – i.e. it will be R360 000 in 3 years (2), Shares in the company to the value of R300 000 with the hope of selling them later at a larger profit (3) |
| Question 9 | E13 | | R1 000 in cash (1), A 50% chance to win R5 000 (2), A 25% chance to win R10 000 (3), A 5% chance to win R100 000 (4) |
| Question 10 | E14 | | Take your R3 000 and lose R0 (1), Possibility of gaining R5 000 or losing R1 000 (2), Possibility of gaining R8 000 or losing R2 000 (3), Possibility of gaining R12 000 or losing all your R3 000 (4) |
| Question 11 | E15 | Investment risk | Manage them yourself (1), Hire a manager (2), Ask a friend (3) |
| Question 12 | E16 | | Nothing – 0% (1), <10% (2), 10%-20% (3), 25%-35% (4), >40% (5) |
| Question 13 | E17 | | 60% in low risk with low return, 30% in medium risk with medium return, 10% in high risk with high return (1), 30% in low risk with low return, 40% in medium risk with medium return, 30% in high risk with high return (2), 10% in low risk with low return, 40% in medium risk with medium return, 50% in high risk with high return (3) |
| Question 14 | E18 | | Deposit it into a bank account (1), Invest in fixed income investments where you will get low constant returns with minimal risk of loss (2), Invest in shares where it will be exposed to high risk of loss but with high return possibilities (3) |
| Question 15 | E19 | | Nothing - 0% (1), <5% (2), 5%-15% (3), 15%-25% (4), 25%-40% (5), >40% (6) |

# ANNEXURE 3: ETHICAL CLEARANCE

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Research Ethics Regulatory Committee
Tel: +27 18 299 4849
Email : Ethics@nwu.ac.za

**ETHICAL CLEARANCE LETTER OF STUDY**

Based on the approval by the Economic and Management Sciences Research Ethics Committee (EMS-REC) on 26/01/2018, the North-West University Research Ethics Regulatory Committee (NWU-RERC) hereby **approves** your project as indicated below. This implies that the NWU-RERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

**Project title: Reputational risk: depositor behaviour in South Africa.**

**Project Leader/Supervisor: Prof S. Dunga & Dr E. Redda**
**Student: S.J. Ferreira**

**Ethics number:** E C O N I T - 2 0 1 8 - 0 2
(Institution - Project Number - Year - Status)

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

**Application Type:**

**Commencement date**: 2018-01-26 **Expiry date**: 2019-01-25 **Risk:** Low

**Special conditions of the approval (if applicable):**

**General conditions:**

*While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:*

- *The project leader (principle investigator) must report in the prescribed format to the EMS-REC:*
  - *annually (or as otherwise requested) on the progress of the project, and upon completion of the project*
  - *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project; and*
  - *Annually a number of projects may be randomly selected for an external audit.*
- *The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the EMS-REC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-RERC via EMS-REC and new approval received before or on the expiry date.*
- *In the interest of ethical responsibility, the NWU-RERC and EMS-REC reserves the right to:*
  - *request access to any information or data at any time during the course or after completion of the project;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the project are revealed or suspected;*
    - *it becomes apparent that any relevant information was withheld from the EMS-REC or that information has been false or misrepresented;*
    - *the required annual report and reporting of adverse events was not done timely and accurately; and/ or*
    - *new institutional rules, national legislation or international conventions deem it necessary.*

The EMSREC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the NWU-RERC or EMS-REC for any further enquiries or requests for assistance.

Yours sincerely

**Prof D Viljoen**
*Chair NWU Economic and Management Sciences Research Ethics Committee*

## ANNEXURE 4: STATISTICAL CLEARANCE

# NWU Ethics Application

| Project Leader (Title, Initials & Surname) | Project Title (see § 3.1) |
|---|---|
| Dr Ephrem Redda | Reputational risk: analysing depositor behaviour in South Africa |

**NWU Ethics Number**

| N | W | U | - | | | | | | - | | | - | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Institution — Project Number — Year — Status

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

*(for office use only)*

### Sec 8e: Statistical Consultation Service

The statistician of the Statistical Consultation Service of the North-West University completes this section (where applicable).

*More information*

*Prior consultation with Statistical Consultation Service can eliminate many problems, simplify and expedite the evaluation and also prevent applications from being returned due to poor project planning and/or statistical justifiability. Where the project leader has sufficient statistical expertise at his disposal, this is, however, not compulsory.*

**The Ethics Committee relies completely on the professional judgement of the statistician.**

Have you ascertained the experimental design of the study and is it statistically justifiable according to your judgement?
*(Please mark with* **X** *in the appropriate box and provide details)*

| Yes | No | Remarks |
|---|---|---|
| ☒ x | ☐ | |

| Name (Title, Full Names & Surname) | Qualifications |
|---|---|
| Prof Susanna Maria Ellis (Pr Sci Nat) | PhD (Statistics) |

| Signature | Date |
|---|---|
| SM Ellis | 2018 - 03 - 16 (ccyy - mm - dd) |

**Remember to save your document regularly as you complete it!**