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A structural equation model of reputational risk in South Africa

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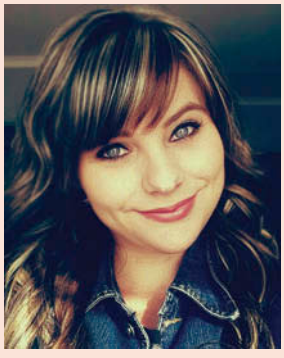
Abstract: The central function of a bank inherently exposes it to various financial risks where each of these risks has the possibility to influence stakeholders' perception. This perception, which is linked to the trustworthiness, credibility and performance of the bank, translates into the reputation of the bank. Depositors can be regarded as the main stakeholders of a bank and hence their behaviour can influence the reputational risk of the bank. With very limited research on reputational risk and depositor behaviour within the South African banking sector, the main purposes of this paper was to provide a meaningful contribution toward literature and empirical analysis. Primary data was collected from 417 depositors in Gauteng, South Africa, using a self-structured questionnaire. Statistical techniques such as correlation and structural equation modelling were used in the statistical analysis. The SEM identified three variables that uniquely influences reputational risk in banks. Operational risk events, behavioural finance biases and depositors level of risk tolerance were found to influence reputational risk. These empirical findings 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 i.e. a banks most valuable intangible asset. This will, in turn, enable banks to come up with better mitigation and management strategies for reputational risk.

Subjects: Corporate Finance; Banking; Business, Management and Accounting; Risk Management; Corporate Governance



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SJ Ferreira specialise in financial risk management having obtained her PhD in 2019. Her main focus area is in bank and financial risk management and the behaviour of these market participants. The researcher has already published several articles in accredited journals regarding this field of interest. Ephrem Redda, obtained his Phd in marketing management and specialise in market behaviour as well as in banking sector studies. Steve Henry Dunga, obtained his Phd in Economics and focus on methodological approaches. Both co-authors are established researchers in accredited journals.

PUBLIC INTEREST STATEMENT

A banks reputation is its most valuable intangible asset. Evolving globalisation has made 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. Banks are exposes it to operational risks where these risks have the possibility to influence depositors' perception. This perception, which is linked to the trustworthiness, credibility and performance of the bank, translates into the reputation of the bank. Depositors behaviour can influence the reputational risk of the bank where this may lead to bank runs. The South African banking industry is closely concentrated and dominated by a handful of banks where any adverse changes in the banking industry will affect the financial sector tremendously.

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Keywords: structural equation model; reputational risk; operational risk; behavioural finance; risk tolerance

JEL codes: G14; G21; C3

1. Introduction

The role 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 with in the past, present or future (Coetzee, 2016, p. 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, p. 3). More than 80% of global companies regards 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 (Chartered Institute of Purchasing & Supply (CIPS), 2014).

Depositors expect banks to perform financial intermediation to accumulate depositor savings and transfer it to borrowers (Mohr & Fourie, 2008, p. 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 financial loss. 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, p. 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 lending to customers, which ultimately leads to a more profitable bank (Chartered Institute of Purchasing & Supply (CIPS), 2014). Avoiding such unwanted scenarios that may lead to bank runs is not always an easy task due to the extensive risk exposure of banks (Deloitte, 2014, p. 5).

South African banks operate in a very volatile and competitive industry, facing financial risks such as operational risk and reputational risk every day (Coetzee, 2016, p. 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, p. 1; De Jonghe, 2010). These operational risk events are categorised by the Basel Committee on Banking Supervision (BCBS), (BCBS, 2009) 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 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 leads to a financial loss for a bank (Micocci, Masala, Cannas, & Flore, 2009, p. 2; Rajendran, 2012, p. 50). 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, 2015, p. 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, p. 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 (Ciborra, 2009). 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, p. 192).

BCBS (2009, p. 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 faced with the multidimensionality of reputational risk (BCBS, 2001, p. 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, p. 5).

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, p. 260) focuses 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, p. 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, Cicirettic, and Djordjevic (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% 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 distinctive 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% less likely to switch banks. However, depositors are 8% 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% of bank depositors decided to switch to another bank whereas, 27% added additional services from alternative banks. Reasons for the switch from one bank to another included bank performance, perception and trust.

Iyer, Ryan, and Puri (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. These customers were 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 of this study suggest that the fragility of a bank during solvency risk is influenced by the structure of the banks depositor base.

Boyle, Stover, Tiwana, and Zhylyevskyy (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.

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). 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.

2. Literature review

Banks are primarily regarded as risk-averse but not always fully risk aware (Vardy, 2015, p. 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, p. 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, p. 34).

The financial behaviour of depositors is fundamentally affected by numerous risk events, among these are operational risk events (Chernobai, Rachev, & Fabozzi, 2007, p. 14). Financial behavioural theories such as the rational choice theory (Scott, 2002, p. 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, p. 93). These irrational perceptions and decisions are influenced by psychological factors, which will eventually determine depositors' 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, Zindel, & Quirino, 2014, p. 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, p. 643). These biases are aimed at explaining the causation of depositors' financial decision-making behaviour. Nine behavioural biases exist that might influence depositors' behaviour; representativeness bias, overconfidence, anchoring, gamblers, availability, loss aversion, regret aversion, mental accounting, and the self-control bias (Bodie et al., 2013, p. 267). 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, p. 24). It is therefore vital that banks take depositor behaviour as key external stakeholder into account when constructing a risk management framework (Vardy, 2015, p. 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, p. 4). Therefore, future bank models may not be relevant in predicting stakeholder behaviour (Ferreira, 2015, p. 120).

Operational risk and reputational risk are closely correlated with depositors' subjective perception and behaviour (Zboron, 2006, p. 504). The everyday decisions and activities of the bank can lead to reputational risk where these activities are controversial to depositor expectations (Manjarin, 2012, p. 4). A positive bank reputation is formed where the perception of depositors is proven to be optimistic (Ferreira, 2015, p. 23). On the contrary, a negative bank reputation is formed where depositor perception is proven to be pessimistic (Eccles, Newquist, & Schatz, 2007, p. 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, p. 93). 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, p. 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

Previous research studies such as Perry and De Fontnouvelle (2005), Gillet, Hübner, and Plunus (2010) and Fiordelisi, Soana, and Schwizer (2013) have only focused on reputational risk by analysing the effect on the stock market after operational events. No previous researcher has focused on reputational risk by analysing participant behaviour rather than the stock market behaviour. The overriding objective was to predict reputational risk by analysing bank depositors' behaviour after operational risk events. In this paper, focus was 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. In order to achieve the aim of this research paper the following alternative hypotheses are postulated: Alternative hypothesis (H_{a1}): There is a relationship between operational events and reputational risk. Alternative hypothesis (H_{a2}): There is a relationship between bank perception and depositors' behaviour to withdraw. Alternative hypothesis (H_{a3}): There is a relationship between depositors' behaviour to withdraw and behavioural finance bias. Alternative hypothesis (H_{a4}): Depositors level of risk tolerance does influence depositors' behaviour to withdraw.

3. Methodology

3.1. Research purpose and design

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, Van Rensburg, & Smit, 2004, p. 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, p. 68; Myers, 2013). In the study, the researcher was concerned with passive human behaviour in terms of financial decisions that can be controlled and determined by the external environment and which is based on realism.

3.2. Study area and sample

The target population for the study comprised of bank depositors in Gauteng, see Figure 1. 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. Due to the extensive number of small, medium and large banks registered in South Africa,

Figure 1. Map of the Gauteng province and its municipal borders.

a decision was undertaken to only use the top five banks as these represent most of the population. The top five banks in terms of market share (largest customer database) 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, Wolfinbargen, Ortinau, & Bush, 2008, p. 140). The list of characteristics for this sample includes the following participant characteristics:18 years or older; have some form of education; a bank depositor for more than five years; earns a monthly salary which is deposited into a bank account; 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. The sample size of this study consisted of 417 South African depositors. This figure is in line with the sample used in similar studies of Mäenpää, Kaleb, Kuusela, and Mesirantaa (2008); Zhu and Chen (2012); Zarvrsnik and Jerman (2012); Vazifedoost, Ansar, and Yekezare (2013); Boyle et al. (2015), and Ozkan-Tektas and Basgoze (2017). 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. 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, Birks, & Wills, 2012, p. 120) recommend that a sample with a ratio of at least five items per variable is required. For the same statistical analysis, Pallant (2013, p. 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 indeed meet the requirement for the statistical analysis employed in the study.

3.3. Survey design and procedure 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. The questionnaire consisted of the following sections: (A) demographic information, (B) operational risk scenarios (C) bank perception and reputational risk, (D) behavioural finance and (D) risk tolerance. Section B consists of a 24-item scale (3 statements per operational risk event), 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 was measured on a six-point Likert scale (1 = very unlikely, 6 = very likely). Hypothetical operational risk statements were formulated to assert the responses on how likely depositors will be to withdraw:

(1) 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?

(2) Hackers have stolen valuable client information leading to financial losses to customers, how likely are you to withdraw?

(3) External parties have managed to steal millions by means of credit card and debit card fraud, how likely are you to withdraw?

The third section (Section C) focused on bank perception and reputational risk. Depositors were asked to indicate the amount that they would 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 withdrew. 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) included a nine-item behavioural finance scale, which included statements aimed to elucidate the biases on which depositors base their financial decisions. Depositors had to relate their decisions to withdraw on the behavioural finance biases using the six-point Likert scale (1 = strongly disagree, 6 = strongly agree). The nine behavioural finance statements were formulated based on the literature:

(1) I base my financial decision on the past performance of the bank
(2) My superior financial knowledge drives my decisions
(3) I rely only on a single piece of information (past or current information) to make financial decisions
(4) My financial decisions are based on future market predictions
(5) My decision are based on the most recent information
(6) I would rather take the risk to keep my money at my current bank than to switch to another bank
(7) My previously incorrect financial decisions which led to a financial loss drives my decisions
(8) I receive a good interest rate on my account and will rather leave my account as is to earn higher future interest rates
(9) I exercise self-control when making financial decisions

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, p. 43).

3.4. Reliability of scales

To validate the internal reliability consistency of this scale, Cronbach alpha values for all eight factors were calculated. According to Cronbach (1951, p. 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 for continuous variables. However, when using human responses with categorical variables, a benchmark value of 0.6 may be used where values below 0.6 indicates low internal reliability (Malhotra et al., 2012, p. 320). All eight operational risk events had Cronbach alpha values higher than 0.6. Since the factors grouped well together and had high Cronbach alpha values greater than 0.6, it can be assumed that all eight of the initial factors are reliable. Internal consistency reliability was also tested for the variable reputational risk where this variable was constructed out of two sections. A Cronbach alpha value of 0.93 was obtained make this reputational risk scale highly reliable. Behavioural finance biases are aimed at explaining the relationship of depositors' financial decision-making behaviour. Moss, Prosser, and Costello (1998, p. 178) and Hilton, Brownlow, Mcmurray, and Cozons (2004, p. 363) argues that the reliability of Cronbach alpha values may differ according to the field of study 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. The subjective risk tolerance scale SCF was a validated single question scale that was used.

3.5. Ethical considerations

High values and norms were kept throughout the research process. The study was conducted according to the ethical guidelines and principles as prescribed by the North-West University (NWU, 2016, p. 15). 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. Prior to the participation in the study, the research purpose was fully explained to participants by the respective fieldworkers. After consent was given, participants were assured that responses would be recorded confidentially whilst all collected data would be reported on anonymously. Participants were informed that participation was strictly voluntary and that they could withdraw at any stage without any repercussions. No incentives were provided that could possibly encourage participation

3.6. Data analysis

After the quantitative data were collected, it was coded and captured through the use of the Statistical Packages of Social Sciences (IBM SPSS) version 25 and AMOS. Data analysis involved the use of descriptive statistics including frequency distributions in order to report the demographics of the sample. In addition, correlation and structural equation modelling (SEM) were employed.

4. Results of the study

This section reports the results of the collected and analysed data. Firstly, the demographic composition of the sample is reported on. Secondly, the section presents the inter-item correlation and the reliability analysis. The last section provided the structural model and the model fit assessment.

4.1. Demographic background of the sample

The majority (32%) of depositors were between the ages of 30 to 39 years of age. Age group 18 to 29 represented 26.1% of the sample, whereas the age group 40 to 49 represented 22.3% of the sample. The minority of the sample were represented by depositors older than 60 years. A total of 54.9% of depositors were female while 45.1% were male depositors. Just over 20% of the sample had a high school education. Almost 50 percent (49%) had university education which included any undergraduate degree, honours degree, masters degree or doctoral degree. The majority of depositors (30.3%) earned an annual income of between R200 001-R400 000 per annum.

4.2. Correlation analysis

Table 1 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. 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). When inspecting the correlation between all of the factors, the Pearson correlation coefficient was significant at 1% ($p < 0.01$). These results are indicative of a positive linear association between all of the operational risk factors which further suggests nomological validity (Hair, Celsi, Oritinau, & Bush, 2013, p. 610). The correlations between the factors ranged from a small to a strong effect. However, the factors in this study exhibited correlation coefficients lower than 0.7 (less than 0.9 threshold). Therefore, the likelihood of multicollinearity can be excluded (Malhotra et al., 2012, p. 322). Further collinearity diagnostics were performed: Tolerance and the variance inflation factor (VIF). The collinearity diagnostic values indicated that the multicollinearity assumption was not violated. The tolerance levels were bigger than 0.1 (more than the 0 to 0.1 threshold for multi-collinearity) and all VIF values were smaller than 4.0 (less than the VIF value above 10.0 for multicollinearity).

Table 1. 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	Execution	Reputational event	Bank perception	Behavioural biases	Risk tolerance
Internal fraud	1										
External fraud	.690**	1									
Employment practice and workplace safety	.586**	.416**	1								
Clients, products and business practice	.728**	.639**	.472**	1							
Damage to physical assets	.369**	.271**	.577**	.394**	1						
Business disruptions and system failures	.359**	.383**	.265**	.489**	.309**	1					
Execution, delivery and process management	.615**	.628**	.414**	.719**	.329**	.508**	1				
Reputational event	.502**	.544**	.367**	.593**	.363**	.604**	.708**	1			
Bank Perception	.300**	.386**	.228**	.416**	.155**	.238**	.438**	.391**	1		
Behavioural biases	.172**	.179**	.248**	.288**	.365**	.213**	.217**	.251**	.297**	1	
Risk tolerance	−0.036	−0.018	0.039	−0.008	−.109*	−0.034	−0.045	0.006	−0.051	0.054	1
Reputational risk	.521**	.492**	.423**	.607**	.420**	.484**	.606**	.573**	.410**	.252**	−0.032
Tolerance	0.324	0.444	0.480	0.312	0.558	0.593	0.336	0.404	0.741	0.782	0.950
VIF	3.086	2.253	2.083	3.209	1.791	1.687	2.976	2.478	1.350	1.279	1.053

** Correlation is significant at the 0.01 level (2-tailed).

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, p. 775). In order for SEM to be appropriate, the Bartlett's test of sphericity should be significant ($p < 0.05$) (Field, 2009, p. 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. The eight factors accounted for 74.08% of the variance. A total of eight factors were extracted for the purpose of FA. Operational risk events obtained a Kaiser-Myer-Olkin (KMO) value (0.920) which is higher than the minimum requirement (0.5) as recommended by Kaiser (1994, p. 31) and falls in the superb category (larger than 0.9) (Field, 2009, p. 659). This is an indication that the data of the sample were a good fit for FA.

4.3. Structural model and model fit assessment

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, p. 452). Figure 2 indicates the structural model, which indicates the influence of operational events, bank perception, behavioural finance and risk tolerance on reputational risk.

Considering bank perception in Table 2, 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 correlations (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 exists 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 comparative fit index (CFI) was also performed where a value of 0.89 was obtained. This was followed by the IFI and the Tucker-Lewis index (TLI) where values of 0.90 and 0.83 were obtained.

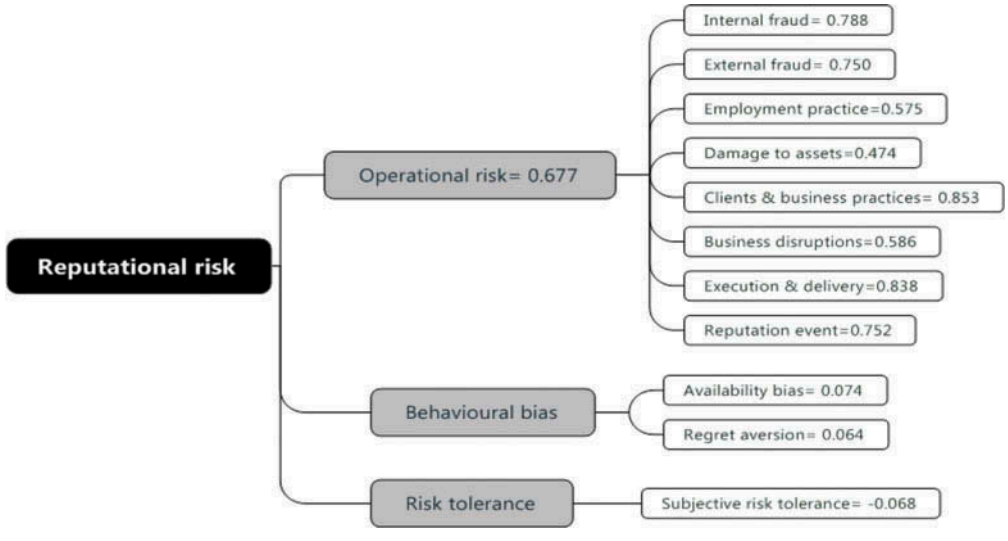

Figure 2. Structural model of reputational risk.

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Table 2. 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

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, p. 230). The values close to 0.9 indicates a marginal goodness-of-fit (Mueller, 1996, p. 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 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, p. 874). The chi-square value was obtained by dividing the minimum sample discrepancy with the degrees of freedom (CMIN/DF).

Mueller (1996, p. 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% 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. The last step in conducting SEM comprises of valuable conclusions and recommendations on the structured model for future research (Malhotra et al., 2012, p. 880).

In Table 3, it can be seen that operational risk events had a significant positive influence on reputational risk. Hence, all eight operational risk events will have an influence on the reputational risk of a bank. This indicated that the more likely depositors are to withdraw during an

Table 3. Model summary of SEM

	Factor	Variable	Positive/Negative influence	Significant
Reputational risk	Operational risk events	All eight risk events	Positive	($p < 0.01$)***
	Bank perception	All four variables	Positive	Non-significant
	Behavioural finance	Availability bias Regret aversion	Positive	($p < 0.1$)*
	Subjective risk tolerance	All four variables	Negative	($p < 0.1$)*

operational risk event, the higher will be the likelihood of reputational risk for a bank. Considering behavioural finance biases, the availability bias and the regret aversion bias were found to have a significant positive influence on reputational risk. Risk tolerance were found to have a negative influence on the reputational risk of a bank. This indicated that as depositors become less risk tolerant, the greater reputational risk will be imposed on a bank. 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 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. Conclusion and recommendations

South African banks operate in a very volatile and competitive industry facing numerous financial 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. Operational risk events had a significant positive influence on reputational risk. Hence, all eight operational risk events will have an influence on the reputational risk of a bank. Considering behavioural finance biases, the availability bias and the regret aversion bias were found to have a significant positive influence on reputational risk. Risk tolerance were found to have a negative influence on the reputational risk of a bank.

In addition, the empirical findings of this paper 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.

Considering the theoretical and empirical findings of this paper, 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 to consider:

- 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.
- Reputational 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.

Building on the foundation of this research paper, 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). It may also be worthwhile to test the risk perception of amongst smaller banks to see how it differs compared with the larger five banks that were used. Since 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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