

https://dspace.org/

The impact of Basel III on lending behaviour (credit extension) of South African banks in relation to small medium enterprises (SMEs)

Ramere, Thapelo Joseph

2018
https://hdl.handle.net/10539/26412

Downloaded from a DSpace repository. https://dspace.org/

The Impact of Basel III on lending behaviour (Credit Extension) of South African banks in relation to Small Medium Enterprises (SMEs)

Thapelo Ramere

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2016

ABSTRACT

Banking has developed rapidly over the past few years. In 2007, the Basel Committee On Banking Supervision (BCBS) introduced Basel II to align regulatory capital with the actual underlying risks as such improving banks' ability to absorb losses. However, the 2008 Bank crisis that originated in the United States of America (USA) and later progressed to the European banking sector revealed that banks did not have sufficient quantity and quality of capital and liquidity to absorb losses and that they could increase leverage without breaching the regulatory capital requirements. This Bank crisis exposed weaknesses in the global bank regulations as it revealed that it lacks development in the banking sector. The Basel III Accord was introduced across the globe in 2013. It sought to improve the banks' ability to absorb losses. Basel III would be implemented over a seven-year period, from January 2013 to December 2019.

This study investigates the impact of introducing capital requirements under Basel III banking regulation. Specifically, how it affects access to funding for SMEs. Access to funding for these entities is scarce thus, an important inquiry is whether Basel III capital requirement advances or worsens the situation in South Africa.

The investigation undertook to achieve three objectives i) To establish how South African banks respond to changes in capital requirements and assess trends in the capital ratio. ii) To examine whether banks respond to capital requirement changes by changing Risk Weighted Assets (RWA) or by adjusting capital or both and in particular to analyse whether banks reduce exposure to assets and loans that are an important source of funding for SMEs. iii) To assess trends in Exposure at Default (EAD), in particular to analyse whether banks' exposure has shifted away from SMEs.

Three empirical findings and the discussion in this study found evidence that banks reduced their exposure to SMEs in the two years before the implementation of Basel III, a phase called Preparatory Phase.

Policy makers need to take note that although activities of SMEs are classified as high risk in the banking sector they are vital for economic growth. SMEs depend largely on bank funding: as such, any reduction will result in failure of some SMEs. This classification has led to banks reducing lending to SMEs and if this trend continues, South Africa will not be able to realise its objective to improve the SMEs role in the economy and its role will diminish.

DECLARATION

I, Thapelo Ramere, declare that this research report is my work except as indicated in the references and acknowledgements. I submit in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Thapelo Ramere

Signed at ……

On the …… day of …… 2016

DEDICATION

To my wife and daughter, I appreciate your understanding when I took up this challenge and your steadfast love, encouragement and support gave me the will to persevere and complete my Thesis, thank you.

ACKNOWLEDGEMENTS

I would like to thank my Thesis Advisor Prof. Dr. E. Schaling of the Jelle Zijlstra, Chair in International Finance at Wits Business School. He consistently allowed this paper to be my own work, but steered me in the right direction whenever he thought I needed it.

TABLE OF CONTENTS

ABSTRACT ii

DECLARATION iv

DEDICATION v

ACKNOWLEDGEMENTS vi

LIST OF TABLES x

LIST OF FIGURES xi

CHAPTER 1. INTRODUCTION 12

1.1 PURPOSE OF THE STUDY 12
1.2 CONTEXT OF THE STUDY 13
1.3 PROBLEM STATEMENT 17
1.3.1 MAIN PROBLEM 17
1.3.2 SUB-PROBLEM 1 17
1.3.3 SUB-PROBLEM 2 18
1.4 SIGNIFICANCE OF THE STUDY 18
1.5 DELIMITATIONS OF THE STUDY 20
1.6 DEFINITION OF TERMS 21
1.7 ASSUMPTIONS 23

CHAPTER 2. LITERATURE REVIEW 24

2.1 INTRODUCTION 24
2.2 DEFINITION OF TOPIC AND BACKGROUND DISCUSSION 26
2.3 INVESTIGATION OF THE IMPACT OF THE CAPITAL REQUIREMENT UNDER BASEL III ON BANK BEHAVIOUR 40
2.3.1 INCREASE IN EQUITY CAPITAL 42
2.3.2 CHANGE THE ASSET PORTFOLIO 45
2.4 INVESTIGATE THE IMPACT OF CAPITAL REQUIREMENT UNDER BASEL III ON CREDIT EXTENSION TO SMES 46
2.4.1 CAPITAL REQUIREMENTS 47
2.4.2 PROPOSITION 2 53
2.5 CONCLUSION OF LITERATURE REVIEW 53

CHAPTER 3. RESEARCH METHODOLOGY 55

3.1 RESEARCH METHODOLOGY /PARADIGM 55
3.2 RESEARCH DESIGN 57
3.3 POPULATION AND SAMPLE 57
3.3.1 POPULATION 57
3.3.2 SAMPLE AND SAMPLING METHOD 57
3.4 THE RESEARCH INSTRUMENT 58
3.5 PROCEDURE FOR DATA COLLECTION 59
3.6 DATA ANALYSIS AND INTERPRETATION 60
3.7 LIMITATIONS OF THE STUDY 61
3.8 VALIDITY AND RELIABILITY 61
3.8.1 EXTERNAL VALIDITY 61
3.8.2 INTERNAL VALIDITY 61
3.8.3 RELIABILITY 62

CHAPTER 4. PRESENTATION OF RESULTS 64

4.1 INTRODUCTION 64
4.2 RESULTS ABOUT PROPOSITION 1 64
4.2.1 CAPITAL ADEQUACY 64
4.2.2 COMPOSITION OF CAPITAL ADEQUACY FIGURES 65
4.2.3 COMPOSITION OF ASSET MIX 66
4.2.4 GROWTH IN LOANS IN SOUTH AFRICAN BANKING SECTOR 67
4.3 RESULTS ABOUT PROPOSITION 2 68
4.3.1 CUMULATIVE EXPOSURE AT DEFAULT (EAD), 2008 – 2013 69
4.3.2 EAD (PERCENT CHANGE) PER ASSET CLASS, 2008 – 2013 70
4.3.3 SHARE OF EXPOSURE AND PROPORTION OF CAPITAL CHARGE 71
4.4 SUMMARY OF THE RESULTS 71
4.4.1 THE FINDING WITH REGARDS TO THE FIRST PROPOSITION: 72
4.4.2 THE FINDING WITH REGARDS TO THE SECOND PROPOSITION: 73

CHAPTER 5. DISCUSSION OF THE RESULTS 74

5.1 INTRODUCTION 74
5.2 DISCUSSION ABOUT PROPOSITION 1 74
5.2.1 CAPITAL ADEQUACY 74
5.2.2 COMPOSITION OF CAPITAL ADEQUACY FIGURES 75
5.2.3 COMPOSITION OF LOANS AND ADVANCES 76
5.2.4 SECURED AND UNSECURED LENDING 78
5.3 DISCUSSION ABOUT PROPOSITION 2 80
5.3.1 EXPOSURE AT RISK (EAD) 80
5.3.2 SHARE OF EXPOSURE AND SHARE OF CAPITAL CHARGE 82
5.4 CONCLUSION 83

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS 86

6.1 INTRODUCTION 86
6.2 CONCLUSIONS OF THE STUDY 86
6.3 RECOMMENDATIONS 88
6.4 SUGGESTIONS FOR FURTHER RESEARCH 90

REFERENCE 91

APPENDIX A 98

1 PHASE-IN ARRANGEMENTS FOR THE MINIMUM REQUIREMENTS (SOUTH AFRICAN RESERVE BANK, 2013B) 98
2 CAPITAL FRAMEWORK FOR SOUTH AFRICA BASED ON THE BASEL FRAMEWORK, AFTER THE PHASE-IN PERIOD (SOUTH AFRICAN RESERVE BANK, 2013B) 99

LIST OF TABLES

Table 1: Basel 1 regulatory capital calculations (Jul-Larsen, 2014) 26

Table 2: Financing gap regarding SMEs numbers based on the definition by NSB Act of 2006 (Underhill Corporate Solutions, 2011) 35

Table 3: Basel III Impact on Credit and GDP Growth (Santos and Elliott, 2012) 39

Table 4: Summary and side by side comparison of the following Basel Accord requirements (South African Reserve Bank, 2013b)..... 41

Table 5: Basel I and Basel II SA to measuring the credit risk of a corporate (Jul-Larsen, 2014)..... 49

Table 6: South African banking sector: number of entities registered or licenced. Source (South African Reserve Bank, 2013a) 58

LIST OF FIGURES

Figure 1: Capital Adequacy - Capital ratio of South African banking sector, 2008 – 2014 (SARB Bank Supervision annual reports, 2008 – 2014) 64

Figure 2: Growth rates in components of capital adequacy ratio of South African banking sector, 2008 – 2014 (SARB Bank Supervision annual reports, 2008 – 2014)..... 66

Figure 3: Composition of loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2014) 66

Figure 4: Growth in loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2013) 67

Figure 5 – Percent change Exposure At Default, between beginning of2008 to end of 2013 (SARB Bank Supervision annual reports, 2008 – 2013) 69

Figure 6 – Change in Exposure At Default since beginning-2008 to end-2013 (ZAR' million) (SARB Bank Supervision annual reports, 2008 -2013)..... 70

Figure 7: Exposure at Default and Share of Capital Charge (SARB Bank Supervision annual reports, 2008 – 2013) 71

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

Cumming and Nel (2005) conducted a study which they investigated the possible impact of Basel II on the lending behaviour of South African banks. In their study, they covered the period from 1998 to 2004, which is a period up to the advent of Basel II. Their findings were that since 1988, Basel Accord I impacted the lending behaviour of the South African banking sector (or "the sector"), specifically liquidity and credit shifted from high risk-weighted assets to low risk-weighted assets. This paper extends the work of Cumming and Nel by covering the new regulations under Basel II.5 and III with a particular focus on Basel III.

This study will cover the period beginning 2008 to the end of 2013; this period includes the implementation of Basel II in 2008, Basel II.5 in 2009 and Basel III in 2013. In 2013, a study by Hansen, Grossman, and D'Albert concluded that Basel III resulted in a shift in the lending behaviour of banks in line with Basel's objective to reduce the riskiness of banks.

This paper will investigate firstly, the effect of Basel III on the South African banking sectors' lending behaviour, and if there is any change, the result of this impact on the credit expansion in the South African banking sector in general and specifically to Small Medium Enterprises (SME or SMEs) as defined by BCBS will be highlighted. SMEs throughout the world play a major role in economic growth, as they are the source of innovation, competition and job creation. South Africa is no exception as such, it is important to understand what the impact of the new regulation will be on SMEs and its implication on economic growth.

Secondly, this paper will explore what alternative arrangements are needed to avoid any negative impact on economic growth.

The main questions this report will focus on include:

1. How will Basel III capital requirement affect the South African banking sectors' lending behaviour in general?
2. How will possible changes in the South African banking sectors' lending behaviour affect credit expansion to SMEs?

This report will also explore alternative arrangements to mitigate the negative impact of lending to SMEs.

The report will be guided by the questions below to investigate the issues described above:

- What is Basel III and what implications does it have on banks' lending behaviour?
- What are SMEs?
- What is the capital structure of SMEs?
- What are the different sources of funding for SMEs?
- How will capital requirement under Basel III affect SMEs' access to bank funding?

1.2 Context of the study

In 2008, the global financial system experienced a banking crisis as a result of the failure of some international banks' risk management practice, (corporate governance issues and inadequate liquidity management framework) BCBS (2009). This crisis originated in the United States of America's Mortgage market and then spread across the regional and local banking sector of the world where bank regulation was not robust thus revealing the inter-linkages between the financial systems of the developed economies and those of the emerging and developing economies. The inter-linkage of the financial systems of the world is a result of international banks. The international banks play a significant

role in global banking, with operations across developed and developing economies. BCBS saw the need to introduce a global regulation that governs international banking to avoid regulatory arbitrage across the global banking sector.

Padgett (2012) reasoned that the banking crisis was a result of the slow regulatory development in the United States of America (USA), as it was slower than the rate at which the banking sector was changing hence there was a gap that banks exploited that eventually led to the banking crisis. Elliott (2010) elaborated that at the time of the bank crisis, the USA banking sector was still governed by Basel I principles and had not implemented the Basel II revisions.

The crisis prompted a response from the Global Regulatory Body, BCBS and Bank of International Settlement (BIS). At the end of the banking crisis, BCBS conducted a rigorous analysis and consultation with all stakeholders including local regulators, banks and public institutions to develop a response to the crisis and to try to prevent such crises in the future. The review and analysis process concluded that the banking crisis was due to three fundamental reasons including excessive sheet leverage on and off balance, erosion of level and quality of capital and insufficient liquid buffer in banks to absorb losses resulting from operations.

As such, the revised regulatory framework aimed at addressing the three fundamental reasons that led to the banking crisis. This was done through enhancing the resilience of financial systems and institutions, improving the quality and quantity of bank capital, improving liquidity rules and preventing overleveraging. However, it also addressed some of the weaknesses relating to corporate governance, risk management, disclosure and transparency measures in banks (BCBS, 2009).

Basel III has generated a diverse response from different sectors of the society including criticism and outright celebration. BIS and BCBS attempted to integrate all categories of feedback into the final regulatory document under the

title: Consultative document, strengthening the resilience of the banking sector (BCBS, 2009).

It is worth investigating the critical consequences of Basel III on credit expansion in general and specifically to SMEs. The specific concerns are as follows: First, some theorists claim that the new regulation will not promote a sounder banking environment and that it may aggravate volatility in the global economy (Allen, Chan, Milne and Thomas, 2010) which will have a pro-cyclical negative impact on SMEs. Second, some critics of Basel III argue that it will negatively impact SMEs (Padgett, 2012), (Martin Hansen, Grossman and D'albert, 2013), (Jul-Larsen, 2014) and emerging economies (Salasa, 2013), (Kasekende, Bagyenda and Brownbridge, 2011).

The concern is because regulation by its nature restricts banks in their ability to provide liquidity and funding to the economy (Cumming and Nel, 2005). Thus, capital adequacy restrictions can affect economic output by reducing bank lending, but only if the excess demand for loanable funds was satisfied by direct finance or non-bank institutions including venture capital, family, developmental agencies and private equity funds. However, bank funding remains a significant source of financing for companies in general and SME's in particular, and because the specific bank-client relationship is significant in determining access to credit, it seems likely that restrictions on capital requirements may trigger reductions in output as was confirmed by Hancock and Wilcox (1998) in their study. However, if this is the case, it may well be compensated for by the overall increase in financial stability arising from the capital adequacy restrictions as argued by proponents of the new regulation.

In South Africa, Cumming and Nel (2005) found that South African banking sector's behaviour changed in line with changes in capital requirements introduced by different Basel Accords. They observed that every capital requirement measure introduced reduced bank credit to asset classes that consume high risk-weighted assets, which included SMEs. Their research also illustrated that despite Basel II making provisions for SMEs to receive lower risk

weighting, they are still classified as riskier when considered as corporates compared to when classified as retail. This finding is consistent with findings by Altman and Sabato (2005) who found that banks (in the specific country of their research) will be able to hold small capital against SMEs classified as retail, using the Basel II Internal Ratings Based Approach and will manage them on a pool basis. However, for anything outside this framework, the SMEs will attract a high capital charge.

Allen et al (2010) argue that the inquiry regarding the possible impact of Basel III is focusing on large corporates in developed economies and little attention is given to the impact on SMEs, and particularly those in developing economies. SMEs are momentous contributors to the global economy; they contribute about 60 percent to EU's Gross Domestic Product (European Commission, 2011), 70 percent of Germany's economy (Angelkort and Stuwe, 2011) and approximately 90 percent of the South African economy. Studies conducted in Austria (Schwaiger, 2002), Germany (Angelkort and Stuwe, 2011), Spain (Saurina and Trucharte, 2004) and USA (Padgett, 2012), suggest that, others have argued that Basel III is likely to reduce financing for SMEs. A reduction in financing of SMEs in South Africa negatively affected the economy, which was already growing at less than half the average pace of the economic growth of the Sub-Saharan African region in 2013. The South African economy and Sub-Saharan Africa achieved annual growth of 1.9percent and 4.2percent respectively in 2013 (Global Economic Prospects, 2015).

A study conducted in Europe argued that there is already a shift in the credit landscape as a result of Basel III (Hansen et al., 2013). This shift is a move from high risk-weighted assets (these include Corporates, Financial Institutions, Retail, and Securitisation) as defined by the BCBS (2005) to low risk-weighted assets including sovereign/ government debt and residential mortgages.

This study will provide a preliminary assessment of the impact of Basel III, preliminary because it will analyse the first year of Basel III in which implementation of the capital requirement will have taken place. The capital

requirement was phased in from January 2013. Implementation of Basel III will take six to seven years beginning in 2013 and achieve full implementation by 2019. It is also important to note that this study is carried out on the entire banking sector as reported and defined by the South African Reserve Bank Supervision Department and therefore it will not consider the differences that may exist among the individual banks or analyse the implications that such differences might entail.

The sections to be covered in this report include the following: Section 2 is about literature review on Basel III reforms and highlights the other reforms currently under discussion. Section 3 is the research methodology. Section 4 examines the relevance of the liquidity requirements proposed in Basel III. Section 5 evaluates the Basel III capital requirements, which intended to improve quality and quantity of capital. Section 7 provides a conclusion, recommendation, and suggestions for further studies.

1.3 Problem statement

1.3.1 *Main problem*

The aim of this study is to investigate the impact of the capital requirement under Basel III on bank behaviour and its consequence of credit expansion to SMEs.

1.3.2 *Sub-problem 1*

Investigate the impact of capital requirement on the behaviour of the South African banking sector. The South African banking sector managed to survive the 2008 bank crisis because it was well capitalised, however, to meet the increasing capital requirement banks will change the asset portfolio mix, shift exposure to loans that attract low risk-weighted assets increase while they build capital.

1.3.3 *Sub-problem 2*

Investigate the impact of capital requirements on credit expansion to SMEs. Basel III will require banks to hold more capital for SMEs because of their perceived high probability of default as such attracting high risk weighting compared to big business. For this reason, banks will be inclined to reduce lending to them to meet the capital requirement.

1.4 Significance of the study

This study will provide some evidence on the impact Basel III has on the lending behaviour of the South African banking sector and how it relates to the economy. Basel III will be fully implemented by 2019; as such this study can only show the impact of the capital requirement in place by 2013. The most recent study in South Africa on the impact of Basel on liquidity and credit expansion is eight years old and was by Cumming and Nel (2005). This study laid an important foundation. However, it focused on the broader and not the specific impact of Basel. This study will use the same method; however, it will focus specifically on its impact on SMEs and the unintended consequence of economic growth in South Africa.

Despite South Africa being one of the members of the Basel Committee and one of the first adopters of Basel III, there is not a lot of academic papers produced engaging the possible impact of Basel III generally in the South African banking sector, in the general economy and on lending to SMEs. This research will add an African perspective and more specifically a South African one to the current research on the impact of Basel III on SMEs bank funding.

Furthermore, there is little research done to understand the impact of the different aspects of Basel III on access to credit by riskier borrowers, in this case, SMEs in Africa including South Africa. However, some relatively riskier borrowers, such as small business, development projects in Africa and the rest of the emerging markets have little or no alternative source of funding other

than bank funding as such restricting access to funding for SMEs might spell disaster for Africa's economy.

There are many comments, opinions and theories in the media by senior banking sector participants on the impact of Basel III on economic growth in South Africa, most of which argue that Basel III will negatively affect economic growth. Johannes Grosskopf from Price Waterhouse Coopers (PWC) publicly stated that the Basel III framework might have a negative impact on the economy by restricting liquidity and credit extension (Ndzamela, 2010). Makura Nyandoro (2012) argued that the largest four South African banks are likely to see their funding costs increase by 20percent to 40percent most of which will be passed on to borrowers, SMEs and other high risk customers that attract high risk-weighted assets will be the most impacted. However, such comments draw from practitioners' "hunches" and are not backed up by rigorous independent and objective research. Thus, this study will provide an objective assessment of the issue.

South Africa's financial sector is the largest and most developed in Africa (World Economic Forum, 2013). Thus, it is probably the most suitable market to begin examining the impact of Basel III regulations on commercial banks' lending behaviour in Africa. In this regard, the proposed study seeks to provide the first serious academic attempt at shedding light on this issue in South Africa.

The research findings of this study will also be relevant to a range of stakeholders in South Africa including South African Reserve Bank (SARB) (as the regulator), the Ministry of Finance, SMEs and bank clients whose activities are classified as high risk and any corporates in general. It will give preliminary findings of the possible impact of capital requirement on access to credit by riskier borrowers and how this impact can have a negative impact on innovation, productivity improvements, employment and the growth rate of economic output.

This research will also provide evidence of alternative arrangements that need to be in place for the South African banking sector to avert reduction of funding to SMEs.

1.5 Delimitations of the study

This paper limits its coverage to the preliminary assessment of the consequences of the capital requirement under Basel III on the banks' lending behaviour and its implied impact on credit expansion in South Africa using data collected from the South African Reserve Bank between periods of 2008 and 2013. The full impact of Basel III will only be acknowledged after its full implementation in 2019. BCBS has undertaken to introduce Basel III in phases, and the first phase includes the introduction of capital requirement, which happened in January 2013. However, consistent and reliable data that can be studied is only available between 2008 and 2013. The chosen study period is relevant as it is the only period between 2006 and 2015 in which SARB has disclosed data in a way that could be compared but also means that this study will investigate the preliminary impact of capital requirement.

This research will not assess the impact of other Basel III measures including leverage and liquidity standards and how the numerous variables that drive economic growth relate to Basel III.

The study will focus on the South African banking sector, with a specific focus on the Small and Medium Enterprises asset class (SMEs) as defined by Basel III. The study will not assess the impact on firms that fall outside that definition.

This study will not assess the assumed benefits of Basel III terms of reduced frequency and severity of the banking crisis as analysed in the BCBS.

1.6 Definition of terms

Abbreviation:	Definition
A-IRB	Advanced Internal Ratings Based
BCBS	Basel Committee on Banking Supervision
Basel III	A wide-ranging set of improvement measures to fortify the parameter, supervision and risk management of the global banking sector (Basel Committee On Banking Supervision, 2009)
Basel Capital Ratio	Under Basel III, the measure of the bank's capital to its risk weighted assets. Minimum capital adequacy ratio that banks must maintain is 8 percent
CAR	Capital Adequacy Ratio
CR	Capital requirement
DG	Default Grade
D-SIB	Domestic Systemic Important Banks
EAD	Exposure at Default. This input represents the total exposure banks' have extended to a specific borrower. It is the amount banks' stands to lose at the time of default
G-SIB	Global Systemic Important Banks
IRB	Internal Ratings Based
LGD	Loss Given Default. This input provides an estimate of the losses a bank

	may incur if a borrower defaults
LC	Leverage Cover
LCR	Liquidity Coverage Ratio
NSFR	Net Stable Funding Ratio
Off Balance Sheet Asset (OBS)	An asset that does not appear on the banks' balance sheet. These includes commitments (including liquidity facilities), whether or not unconditionally cancellable, direct credit substitutes, acceptances, standby letters of credit and trade letters of credit (Basel Committee On Banking Supervision, 2014)
PD	The Probability of Default. This input yields an estimate of the probability, on an annual basis, that a borrower will default on its obligation to service a loan
Regulator	South African Reserve Bank (SARB), The Banking Supervision Department
RWA	Risk Weighted Assets
SA	Standard Approach
SARB	South African Reserve Bank
SME	Small and Medium Enterprises
Tier 1 CAR	Common Equity Tier 1 Capital Adequacy Ratio
Tier 1 Capital	It is the combination of common equity and capital with low priority and likelihood of repayment if a bank was to be declared insolvent

Tier 2 Capital	It is considered supplementary bank capital as it includes items such as subordinated debt, reserves, and hybrid instruments

1.7 Assumptions

- The data used is from a reliable source.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

There is not a lot of academic research conducted in South Africa and the world over on this topic as such; most of the literature and references used in this report are articles by researchers, organisations, industry practitioners and economists. Some of the literature introduces some bias to this paper; however, they were published by a reputable establishment and in reputable economic journals.

In this chapter, relevant literature will be reviewed relating to the importance and consequence of Basel III. Specifically, this section will cover the definition of Basel III and its key regulatory measures including capital requirement, liquidity ratio, leverage cover ratio and SMEs. This section will also outline the importance of SMEs to economic growth. In this chapter, we will also identify gaps in the literature, which this study will attempt to highlight and address where possible.

Past research suggests that pre-Basel III accords strove to improve the soundness of international banking, achieve financial stability and strengthen the solvency of banks and liquidity without diminishing the flow of credit. However, this has not always been the case, for instance, Padgett (2012) argues that the recent global bank crisis was a result of weaknesses in Basel II. She continues to reason that the crisis occurred from the slow evolution of bank regulation versus evolution of new technologies in the banking sector. The slow development meant that there was always regulatory gaps that banks could and did exploit which led to the USA bank crisis in 2008. The cracks in the regulation are as follows: first, banks could bypass the regulatory measure and increase leverage without increasing assets on their balance sheet by placing assets off balance sheet. As such they would be able to avoid having to hold capital against them (Blundell-Wignall and Atkinson, 2010). Secondly, banks

could repackage those assets into AAA rated investment vehicles (Acharya and Richardson, 2009). Banks, however, did not have enough liquidity to absorb any losses that originated from their normal operations.

Therefore, BCBS has since introduced the Basel III measures including improvement of capital, the introduction of leverage and two liquidity measures to close the gap that existed between bank risk and capital management and bank regulation. However, this new bank regulation, Basel III, like its predecessors has ignited lots of debates about the possible impact of the capital requirement, liquidity cover ratio and leverage ratio on banks' lending behaviour including access to funding by SMEs.

Cumming and Nel (2005) argued that banks response to Basel Accords' minimum capital requirement has been consistent from 1988, that is, shifting their portfolio towards low risk-weighted assets which are widely large, investment grade corporates at the expense of high risk-weighted assets which happen to be smaller, unrated companies which are largely SMEs. Chan, Grossman, D'Albert, Scott, Scarafia, Van Vuuren, Adkins, and Mitropoulos (2014) and Hansen, Grossman, D'Albert (2013) in their studies found that Basel III had already started to shift credit from high risk-weighted assets to low risk-weighted assets which includes residential mortgage and sovereign risk. However, (Cumming and Nel, 2005) argue that this is not the only way they have responded but that is not the focus of this report.

Riportella, Trujillo, and Briozzo (2011) found that amongst the Spanish SMEs, Basel III would require banks to hold more capital per unit of SMEs risk compared to the amount held under Basel II. The implication is that banks will hold high regulatory capital for SMEs than any other asset class because SMEs are perceived to be riskier than large corporates. These findings are consistent with a previous study done by Dietsch and Petey (2004) who found that SMEs have a high probability of default compared to corporates as such they will attract high risk-weighted assets. However, other studies have argued that

Basel III will improve banks' resilience and make them less susceptible to the liquidity crunch creating an economic environment in which SMEs could thrive.

As discussed above, there are many sources of funding for SMEs, but the most preferred source of finance is bank funding. The implication is that access to bank funding is crucial for the development and growth of SMEs. It is for this reason that this study is essential to investigate how Basel III capital requirement will affect access to funding by SMEs.

2.2 Definition of topic and background discussion

2.2.1 What is Basel III?

Basel III builds on Basel II, which mainly focused on risk-based capital of the bank. Basel II advances a principle that when lending money, banks engage in activity bearing some level of risk, that the bank could incur some loss and for this, there should be some capital set aside to cover the losses. The Basel II accord was officially implemented in South Africa in 2008 (South African Reserve Bank, 2004), representing a significant departure from the original Basel guidelines launched in 1988. It improved the capital regulation framework by taking into account the material risks that are inherent in the business model for banks in which they need to work out capital requirement. Basel II introduced a uniform international capital regulatory framework prescribing what capital banks should hold per asset class and that there is risk associated with each asset which needs to be accounted for in the capital requirement (BCBS, 1988). Table 1 below outlines how capital is allocated per asset class under Basel 1.

Table 1: Basel 1 regulatory capital calculations (Jul-Larsen, 2014)

Type of bank asset	90-day government bill	Residential Mortgage	Corporate Loan
Asset value	ZAR100m	ZAR100m	ZAR100m

Basel risk weight	0percent	50percent	100percent
Risk weighted asset (asset value * risk weight)	ZAR0	ZAR50m	ZAR100m
Minimum regulatory capital charge (risk weighted asset *8percent)	ZAR0	ZAR4m	ZAR8m

Basel II has improved Basel I by broadening the risk that has to be taken into account when working out the capital requirement of banks. The main risks considered in the capital requirement calculation includes credit risk, operational risk, traded market risk, and securitisation risk all classified under Pillar 1 of Basel II. However, the main risk that banks have to deal with is credit risk as it accounts for most of the risk. The other benefit of Basel II is that it acknowledged that internationally- active banks had invested many resources to develop their risk assessment, measurement and manage tools/ systems. Banks can use one of two methods to measure and manage risk depending on the robustness of their internal developed risk management system these include Standard Approach (SA) and Internal Ratings Based Approach (IRB).

The standard method is the basic approach that incorporates Basel I principles and adjusts for risk measure per asset for capital requirement calculation. Whereas the IRB approach is more sophisticated and allows banks to use their internally developed systems to measure and manage risk, however, the bank needs to get approval from the regulator to use IRB. The regulator will stipulate quantitative and qualitative requirements; which banks have to meet to use IRB. Under Basel II, banks assets are categorised into five asset classes due to the different risk profile of each asset, and this is the main contributor of Basel II. The asset classes include sovereign, corporate, bank, retail and equity,

however, corporate, and retail fall into number five and three classes, respectively (BCBS, 2003).

Table 5 illustrates the different capital requirements for a corporate loan using SA under Basel II and Basel I. The SA under Basel II produces varying capital requirements depending on the credit rating (a measure of riskiness) of the loan while using proxy ratings from rating agencies. Basel I, as illustrated in Table 5 in its capital requirement does not account for the credit rating of the loan, i.e. all corporate loans are the same.

Basel II introduces regulator/ supervisor review process, whereas Pillar I involves credit, operational, securitisation traded market that a bank faces, Pillar 2 under which supervisory review process falls, mainly seeks to ensure that banks adhere to the regulatory capital framework for all risks as adopted in the local market. In South Africa, the regulator is the Banking Supervision Department in the South African Reserve Bank.

Basel III builds on the principles laid down by Basel II but improves quality and quantity of capital that banks have to hold. It focuses on risk by emphasising that risk is not the same for all the loans that banks issue as such banks have to hold capital for each risk. Basel II prescribes that each loan should be weighted to calculate the total RWA for each loan. Basel II required banks to issue common equity equal to 2 percent of RWA, Basel III uses the same concepts but requires banks to hold 4.5 percent and even more depending on the type of bank and nature of the lending activity.

Basel II made a provision that loans to SMEs be attributed to a low risk weighting which will result in low risk-weighted assets on the condition that the SMEs borrower produces revenue not greater than EUR500m per annum and that each bank manages SME exposure as a portfolio. On fulfilment of these two conditions, SMEs exposure should attract low risk weighting as a consequence low capital charge (BCBS, 2003). The reason for this provision is to incentivise banks not to reduce their exposure to SMEs by attributing low risk weighting. However, SMEs have not been able to attract low capital charge

because as illustrated in the study by Dietsch and Petey (2004) SMEs have a high probability of default compared to corporates as such they will attract high risk-weighted assets.

Basel III introduced another measure to help improve the bank's ability to absorb losses through the Liquidity Cover Ratio (LCR) which was phased in from 2015 and will be fully implemented by 1 January 2019. The banks crisis revealed that liquidity was as much a problem as solvency and leverage. The LCR seeks to get banks to have equilibrium between its deposits and loans or assets and liabilities for each period, ensuring that banks have sufficient, unencumbered, high-quality liquid assets to deal with severe market conditions. However, liquidity depends on the activity of each bank as such Basel III introduces a standard stress test to measure every bank's liquidity. The standard stress test will seek to test if a bank has adequate, unencumbered, good quality liquid assets to give the bank the liquidity it needs during the 30-day stress period. The banks are required to have quick and easy access to liquidity during the stress period to avoid any spill over of the banking crisis to the real economy as was witnessed in the 2008 banking crisis (Yan et al., 2012).

The last element addresses longer-term funding using the Net Stable Funding Ratio (NSFR). NSFR seeks to ensure that banks have medium and long-term funding by encouraging banks to use stable finance and reduce dependency on short-term funding (Yan et al., 2012). The NSFR requires that Available Stable Funding (ASF) exceed Required Stable Funding (RSF) for assets and off balance sheet assets. Stable funding includes preferred stocks, capital and debt with maturities of more than a year, while deposits with maturities with less than a year are also expected to remain in the bank during a stress period. It establishes the minimum stable funding required by each bank based on its assets and liabilities over a one year period (BCBS, 2009).

2.2.2 What are the expected benefits of Basel III?

Basel III is anticipated to foster a robust banking system which is less prone to systemic risks and prevent banking crisis without restricting the flow of money from the credit market. The proposed changes will achieve its objective mainly through improvement in quality and quantity of capital, leverage and liquidity ratio. These measures will ensure that banks have adequate capital to absorb losses, reduce excessive risk, and minimise the need for government getting involved to rescue the banks and provide security of customer's deposits (BCBS, 2009).

The European Commission (2011) and the BCBS (2010) conducted separate studies in which they each found that the introduction of Basel III will have a long-term positive impact on the banking system and provide a conducive environment for SMEs to grow. The two organisations argue that a stable economic climate is suitable for SMEs performance because SMEs require a solid global and local economic performance to produce. They continue to argue that Basel III will bring about a positive impact on the world economy in general and local economies in particular by reducing the frequency of banking crisis (Allen et al., 2010).

Hannoun (2010) maintains that well capitalised banks and a stable banking system are fundamentally good for SMEs who are dependent on bank backing throughout the economic cycle. Hannoun (2010) and Yan et al. (2012) found in their studies that a percentage decrease in the probability of a banking crisis, in turn, produces an annual Gross Domestic Product (GDP) benefit of between 0.2 percent and 0.6 percent.

2.2.3 What are the consequences of Basel III?

Since December 2010 when BCBS released Basel III documents under the title: "Strengthening the resilience of the banking sector", (Basel Committee On Banking Supervision, 2009) for public comment, there has never been a lack of sceptics and advocates for and against it. The proponents and sceptics came from various sectors of society including academics, practitioners, regulators, policy makers and the public throughout the world. South Africa is no exception;

there are sceptics and proponents of Basel III as there were for the other Basel Accords from inception. The main concerns of the critics relate to whether Basel III will have the same effects as the other two previous accords and its consequence for SMEs.

However, there is no doubt that changing the rules changes the game. Banks will adapt to the new regulation by changing their operating model. Research demonstrates that the USA and European banks will bear most of the brunt of the new law. Research estimates that European G-SIB has to raise between EUR700m and EUR1 trillion of new equity to meet the capital requirement or they will have to reduce RWA as they build the capital base. The unintended consequences of Basel III include international banks withdrawing from operations considered noncore (as witnessed in the recently announced disposal of Barclays Africa Limited by Barclays Group Plc) and an increase in lending rates. All of the above will inadvertently reduce global economic growth. The primary objective of the sale of noncore assets is to reduce credit to high risk-weighted assets including SMEs (Hansen et al., 2013) and emerging markets (Salasa, 2013).

Padgett (2012) argues that the biggest negative consequence of Basel III will be a restriction of access to credit by SMEs, which are the hub of world economic growth as banks reduce lending to SMEs as they are perceived as high risk and as such require high RWA.

Barfield (2011) argues that there are some notable examples of countries that survived the banking crisis; these include Asia, Australia, Brazil, Russia, Canada and South Africa. As such, Basel III might not have the same impact on them, as it will have on the European and American banks; however, there is no research to date to argue the contrary is true specifically in South Africa.

The South African government as the only African country, which is a member of the Banking Committee on Bank Supervision (BCBS), working through the South African Reserve Bank, is actively participating in the creation of this new global regulation. However, it is not transparent what will be the impact of this

regulation on the South African banking sectors' lending behaviour, on access to credit by SMEs and indirectly on the broader economy. As such, there is a need for studies that will investigate the impact of Basel III on the South African banking sector and the economy through assessment of the impact on its customer, specifically on SMEs. South Africa already meets the capital regulatory requirement and its banking regulation is robust. However, like any law, it will bring about change in the operating model of banks.

The new regulation comes at the time when South Africa has renewed its focus on SMEs development with the recent launch of the SMEs Ministry led by Ms Lindiwe Zulu and the National Development Plan (NDP) prescribing a significant role of SMEs in job creation, in the creation of new products to bring about the competitive pressure to established firms. However, South Africa has amongst the highest SMEs failure rates in the world with 75 percent of new SMEs failing within 42 months of existence. Reasons for failure that were shown by previous research included the inability to develop or grow the SMEs sectors access to finance, with only 2percent of SMEs having access to bank funding, and 75 percent of new applicants rejected National Small Business (NSB) Act of 2006 (Underhill Corporate Solutions, 2011). As such, access to funding including bank funding is relevant to the ongoing discussion on how to grow the SMEs sector in South Africa (Olawale & Garwe, 2010). Any regulation that impacts on the ability of the country to develop the SMEs sector (Basel II classifies it as SMEs asset class) has to be thoroughly understood to be able to take preventative measures.

This report will help fill in the gap in the literature relating to the impact of Basel III on the South African bank's lending behaviour and specifically about finance for the SMEs. Nevertheless, it will also provide an initial view on the possible impact of Basel III on access to funding by SMEs.

2.2.4 SMEs and economic growth in South Africa

The debate about the impact of Basel Accords is rather an old one, dating back to the introduction of Basel I in 1988 (Jul-Larsen, 2014). SMEs play a vital role

in the global economy, and South Africa is no exception (Underhill Corporate Solutions, 2011). However, SMEs are still faced with the same old problems that inhibit their growth. Abor and Quartey (2010) add that these include but are not limited to restricted access to formal bank finance despite the fact that SMEs are the engines of many local economies across the globe. For instance, in Germany the SME sector contributes approximately 70 percent of all workers and constitutes 99 percent of all companies (Angelkort and Stuwe, 2011). In South Africa, SMEs play a similarly significant role in the economy contributing between 52 percent to 57 percent of all workers, and approximately 61 percent of the economy (Olawale and Garwe, 2010).

BCBS and European Commission (2011) conducted their research to illustrate that SMEs will benefit from a stable economic and banking environment. The two institutions concluded that the impact to SMEs would be minimal if any, contrary to the pronouncements of the SMEs proponents. However, the protests by SMEs did not stop; they continued to a point where BCBS had to listen and eventually make provision in Basel II for banks to be able to hold less RWA against SMEs based on their size and total exposure of the bank to this asset class. Basel II allows for exceptional treatment of SMEs depending on the scale of the SMEs, the size of exposure to the SMEs asset class and how the bank manages this exposure.

a. Definition of SMEs

There is no universally agreed definition of SMEs. Definition of SMEs differs from country to country. Depending on one's definition the answer to the question, how significant is the SMEs sector in the world and South Africa mainly could be varied. For instance, the Statistics South Africa Labour Force Survey in 2007 estimated that there are 2.4 million SMEs in South Africa, two years later in 2009 the Sunday Times found the existence of 2.2 million SMEs, while FinScope estimated that there were 6 million registered SMEs in 2010 (Underhill Corporate Solutions, 2011).

The widely used definition of SMEs is one that uses a measure of size including some employees, turnover, profitability, and net worth. However, others use only some steps of size, for instance, Egypt, Brazil and the USA use the number of employees to categorise SMEs while others use employees, revenue and financial assets like in the EU. BRICS countries (Brazil, Russia, India, China and South Africa) excluding Brazil and the widely quoted Global Entrepreneur Monitor (GEM) use entrepreneurship instead of SMEs (Underhill Corporate Solutions, 2011, Abor and Quartey, 2010).

In South Africa, the National Small Business Act of 1996, was amended and replaced by the NSB Act of 2006 and it provides an official definition of SMEs. However, its definition is not used consistently by state agencies and the private sector. More importantly, the NSB Acts' definition of SMEs is not aligned with the definition of SMEs as defined by Basel II.

According to the NSB Act, SMEs make up a relatively small proportion of South African companies while according to the Basel II definition, SME is defined as a company with consolidated group sales, not more than EUR50 million (BCBS, 2003). This sale measure is equivalent to approximately ZAR850 million (based on the 19 February 2016 spot rate, Rand to the Euro) and it increases the number of SMEs significantly above the 6 million mark as indicated by FinScope in 2010[1]. This conclusion is consistent with recent research by Olawale and Garwe (2010), Abor and Quartey (2010) and Underhill Corporate Solutions (2011) that SMEs in South Africa make up about 91 percent of corporates in South Africa contributing between 52 per cent – 57 per cent of GDP and providing about 61 percent of employment.

b. SMEs' access to funding and growth impact

[1] Table 2: Financing gap regarding SMEs numbers based on the definition by NSB Act of 2006 (Underhill Corporate Solutions, 2011)

Based on Table 2: Financing gap regarding SMEs numbers based on the definition by NSB Act of 2006 (Underhill Corporate Solutions, 2011), South Africa has approximately 6 million SMEs. These include only SMEs as defined in the NSB Act of 2006. About 17 percent of the 6 million are eligible to open bank accounts and only about 100 000 successfully applied and receive funds from banks. A significant number of SMEs, about 2.3 million are informal operators, meaning that they do not have registration with Companies and Intellectual Property Commission (CIPC) and as such are not eligible to open a bank account or to tap the formal financial markets. An overwhelming majority of these, approximately 85.7 percent are financially excluded, that is they do not have access to the capital markets, while 15.3 percent receive informal financial support.

Table 2: Financing gap regarding SMEs numbers based on the definition by NSB Act of 2006 (Underhill Corporate Solutions, 2011)

Description	Number of SMEs	
	FinScope Survey (2010)	Label
Total SMEs	5, 979, 510	A
Registered SMEs (formal): 17.3percent	1, 034, 455	B
Average applying for a loan: 84.4percent	873, 080	C
Average loan application success rate (formal): 33.2percent	343, 439	D
Those who receive funds after successful application: 27.3percent	93, 759	E
Financing Gap (C-E)	779, 321	F

Total Informal: 41.8percent	2, 334, 439	G
Less: Informal served (15.3percent)	357, 169	H
Total Financially Excluded (G-H)	1, 977, 270	I
Total Financing Gap (Formal and Informal): F+I	2, 756, 591	J

Chavis et al. (2010) argue that, corporates including SMEs use different types of financing depending on the stage of the business, and Jul-Larsen (2014) adds that, the corporate funding model also correlates with the age of firm, the size of the corporate, economic cycles and economic situation in the country. They continue to argue that when a company is younger, it tends to depend primarily on alternative sources of funding including family, friends, savings, angel finance, equity in the residential property, venture capital and loans underwritten by the government. However, as they age their reliance on alternative funding declines, and they put more reliance on bank funding.

Falkena, Abedian, Von Blottnitz, Coovadia, Davel, Madungandaba, Masilela, and Rees (2001) elaborate that as corporates reach growth and stable stage they will place significant reliance on bank debt including term funding, factoring, trade credit and asset-backed finance. While reducing reliance on equity capital market, debt capital market and another alternative including equity, friends, the family are used less to fund the business.

Bank funding is essential for SME growth, throughout the world and specifically in South Africa. Banks provide approximately 85percent of SMEs financing needs in South Africa (Mazanai and Fatoki, 2012), and the same in Europe versus 30percent in the USA (European Commission, 2013). Bank funding is susceptible to changes in bank regulation and economic fluctuations. The 2008 bank crisis and subsequent widespread economic downturn saw banks reduce

their lending to SMEs in a drive to reduce risk; this strategy is revealing as it gives an indication of how banks see SMEs as a risk (Dalberg, 2011).

There are other sources of funding including government funding. However, the South Africa government finance and support have not been very successful for the following reasons, a long administrative process that often results in user fatigue and poor delivery on its mandate (Underhill Corporate Solutions, 2011).

In conclusion, SMEs' funding model changes with size and the stage of the firm. In the early stages SMEs place significant reliance on alternative sources of finance including family, friends, angel financing and venture capital. As they reach growth and stable stage they reduce their reliance on alternative sources of financing and increase use of bank finance and capital markets specifically equity and debt capital markets. But equity is less preferred, and debt capital markets are not easy to access for small firms compared to large corporates. Even though equity and capital markets are available to SMEs, they are not readily available or are not preferred for reasons explained above as such SMEs put significant reliance on bank funding for their growth. This also means they become vulnerable to changing conditions in credit markets as they impact banks.

The picture painted by Table 2 above illustrates that approximately 45percent – 48 percent of the 6 million SMEs in South Africa have limited access to bank funding (Olawale and Garwe, 2010) despite researchers arguing that lack of funding is one of the main reasons for the failure of these businesses. It would be good to understand the category of SMEs that experienced the most impact as such including groups like the stage of the firm, the age of the business and size to help better understand the extent of the impact. The categorisation would be helpful as there it is generally known that access to bank funding and equity capital market correspond to age, size and stage of development of the firm. Implementation of Basel III will likely exacerbate this situation by further restricting access to bank funding for small enterprises (Organisation for Economic Co-operation and Development, 2014).

c. Importance of SMEs to the South African economy

The world over, SMEs are recognised as engines of local and global economic growth. The Organisation for Economic Co-operation and Development (2014) elaborates that the reason SMEs play this vital role in the local and world economy is that economic growth is sustainable and inclusive. They further add that SMEs provide about 60 percent of employment to the global workforce and they come up with ideas to create new markets and improve existing markets which further bolsters economic growth.

Angelkort and Stuwe (2011) add that, SMEs employ more than 70 percent of all workers (Padgett, 2012). Ayyagari, Beck, and Demirgüç-Kunt, (2003) prove that SMEs enhance competition, drive entrepreneurship, drive job growth and spur economy-wide efficiency, innovation, growth and poverty alleviation. It is on these principles that the South African government pins its hopes on SMEs for improvement in GDP and employment (Alloggio and Thomas, 2013).

As discussed above, SMEs as defined by Basel II make up 91percent of formal businesses in South Africa and the trend is similar across the world including in the leading economies of the world. They contribute about 52 percent – 57 percent of GDP in South Africa and absorb 61 percent of employed persons (Abor and Quartey, 2010). This phenomenon is not unique to SA, United Nations Industrial Development Organisation (UNIDO) estimated that SMEsmake up over 90percent of the private businesses and contribute more than 50percent of employment and GDP in most African countries (Ceglie and Dini, 1999).

As such any negative impact on the growth of SMEs will translate into negative growth of the economy. According to the Institute of International Finance (2010), Basel III will hurt economic growth; they found that, for instance, in Japan and Switzerland the impact could lead to a loss of 3.2 percent of GDP over five years from implementation of the regulation. They prove that this will be as a result of increased cost of credit and the reduction of overall availability of credit.

Padgett (2012) adds that SMEs will be the affected by the increase in the cost of debt and reducion in credit extension because they are perceived to be high risk linked with high RWA and high capital requirement as argued in the sections above. He further elaborates that between 2007 - 2010 lending to SMEs has declined by approximately 20 percent in the USA while lending rates have gone up. This impact on SMEs will result in most of them failing, reducing their output, hiring fewer people, together these components will eventually lead to a reduction in economic growth.

In conclusion, there are different views relating to the impact of the possible size of the impact of Basel III on economic growth, but they all agree that Basel will have negative consequences for local and global economies of course at different rates, see

Table 3: Basel III Impact on Credit and GDP Growth (Santos and Elliott, 2012)

Basel III impact	Impact on credit spreads (bps)			Impact on annual GDP growth (percent)			Credit (bps)	GDP (percent)
Zone	Europe	Japan	U. S	Europe	Japan	U. S	Global Impact	
IIF 2012 - 2019	328	181	243	-0.40	-0.30	-0.10	281	-0.2
IIF 2011 - 2015	291	202	468	-0.60	-0.80	-0.60	364	-0.70
OECD 5 years transition	54	35	64	-0.23	-0.09	-0.12	53	-0.16

BIS Long-term (capital)	52	N/A	52	-0.07	N/A	-0.03	52	-0.06
BIS Long-term (liquidity)	25	N/A	25	-0.03	N/A	-0.03	25	-0.03
BIS Long-term (combined)	66	N/A	66	-0.08	N/A	-0.04	66	-0.08

2.3 Investigation of the impact of the capital requirement under Basel III on bank behaviour

Cumming and Nel (2005) including other studies like (Hansen et al., 2013), Jul-Larsen (2014) and Chan et al. (2014) argued that capital requirement under Basel III will change the behaviour of the banking sector. The Basel regulation will heighten banks' sensitivity to borrowers risk profile and increase capital required per unit of risk held by the bank.

The capital requirement is the tool used to drive behaviour change of the banking sector. The capital requirement is calculated using Basel Capital Ratio which includes two key components and these are capital and RWA as illustrated by equation one below :

Equation 1: Basel Capital Ratio:

$$Basel\ capital\ ratio\ = \frac{\text{capital (tier 1 and tier 2)}}{\text{risk weighted assets}}$$

For example, if a bank wants to maintain a risky portfolio without breaching capital ratio requirement it can either increase capital or reduce RWA.

However, equity is expensive and finite and as such tends to be a limiting factor for banks if they want to meet capital ratio requirement. As a result, banks tend to reduce RWA to lessen the riskiness of their portfolio; this phenomenon is called lending behaviour change in this study which is also seen in the study conducted in Europe by Chan et al. (2014) and Hansen et al. (2013).

This study is out during the implementation of Basel III. However, it will not be fully implemented making it difficult to assess its full impact on the behaviour of the banking sector. It also implies that it is not possible to predict alternative ways that the banking sector will adapt to the new regulation. Table 4 below gives a brief summary of the main difference and changes between Basel II and III.

Table 4: Summary and side by side comparison of the following Basel Accord requirements (South African Reserve Bank, 2013b)

Item	Basel II	Basel III
Minimum Common Equity Capital Ratio	2percent	1 January 2013 equal to 3.5percent 1 January 2014 equal to 4percent 1 January 2015 equal to 4.5percent
Capital conservation buffer	NA	1 January 2016 equal to 0.625percent 1 January 2017 equal to 1.25percent 1 January 2018 equal to 1.875percent 1 January 2019 equal to 2.5percent
Tier 1 Capital Ratio	4percent	Phased in from 1 January 2013 equal 4.5 per cent 1 January 2014 equal 5.5 per cent 1 January 2015 equal 6 per cent
Total Pillar 2A (Systemic risk add-on)	N/A	Phased in from 1 January 2013 to 31 December 2015, after that to cater for D-SIB requirements. It will not exceed 3.5 per cent in respect of the total capital adequacy

		ratio
Countercyclical Capital Buffer	NA	1 January 2016 equal to 0.625percent 1 January 2017 equal to 1.25percent 1 January 2018 equal to 1.875percent 1 January 2019 equal to 2.5percent
Liquidity Capital Ratio and Net Stable Funding Ratio	NA	Introduced starting 1st January 2015, expected to be implemented in full by 2019.

The sub-sections below offer a discussion on how one of the capital ratio measures will impact bank behaviour. It has two options these include raising equity capital or reducing RWA.

2.3.1 *Increase in equity capital*

During the 2007-2008 bank crisis, it became very apparent that part of the problem was that banks did not have the right quality and quantity of capital to absorb losses; as such, the focus of Basel III is on improving quality and quantity of capital in the banking sector. On the issue of the quality of capital, Basel III will retain the Tier 1 and Tier 2 concept of capital while Tier 3 will be phased out. However, Tier 1 and Tier 2 will be reconstituted to increase their loss-absorbing capacities (Hannoun, 2010). For instance, Tier 1 Capital will incorporate common equity and other loss-absorbing instruments on a “going concern” basis, and Tier 2 will continue to provide loss absorption on “gone concern” basis. Tier 1 Capital will be made up of 75percent common equity and 25percent additional Tier 1 Capital. Capital conservation buffer will impose a further 2.5percent to the total capital in the form of Common Equity Tier 1. In total, this will increase the bank's Common Equity Tier 1 percent to 7 percent of RWA. The banking sector can recapitalise Tier 1 by either raising equity or retaining earnings, this option includes reduction of dividends and bonuses (Hannoun, 2010).

However, Jul-Larsen (2014) argues that the banking sector is accustomed to raising equity instead of reducing lending or reducing distribution to employees and shareholders. However, equity is relatively more expensive than customer's deposits. The increase in equity will require banks to pass on that cost to the consumers if they are to retain profitability and avoid low return on equity assuming everything else remains the same.

Jul-Larsen (2014) further argues that because of equity being expensive, equity is the last resort for banks as such banks will avoid issuing equity if there are other alternative avenues that could be used to meet capital ratio. Other studies argue that cost of debt for banks will not increase; as banks will now be well capitalised as less risky. Demand for loans and cost of debt are correlated, this means that cost increases and demand reduces. If this happens, there will be an adverse impact on the global economy

Research by Macroeconomic Assessment Group (2010), Härle et al. (2010) and more recently Salasa (2013) have added that European banks require between EUR700 billion and EUR1 trillion to meet increasing minimum capital requirements which is considered too large and will need an extended period to raise it for the banking sector.

Angelkort and Stuwe (2011) further elaborate that this means equity is a limiting factor, the ability or availability of equity will limit the activities of the bank including the limiting extension of the balance sheet. If banks cannot raise the required capital, they will have to either consider reducing RWA, via reducing loans that consume lots of RWA or reduce the total amount of RWA.

Jul-Larsen (2014) and Angelkort & Stuwe (2011) argue that Global Systemic Important Banks (G-SIB) and Domestic Systemically Important Banks (D-SIB) will find it much easier to raise equity compared to community banks, smaller and regional banks, which are major lenders to SMEs and retail customers. This is because they have large balance sheetsand substantial revenues as a result they have better credits than their smaller counterparts.

As argued by Jul-Larsen (2014), the banking sector prefers raising equity instead of cutting lending. However, the banking sector's ability to raise equity is largely dependent on the viability of the countries equity capital market, for instance in developed markets the equity capital markets are enormous, very active and liquid. When it comes to raising equity in the equity capital markets, Sub-Saharan Africa banks will be the most impacted because the equity markets in Sub-Saharan Africa are mostly tiny, relatively inactive and illiquid as such they will not be able to provide support to all banks requiring a capital raising (Piesse and Hearn, 2005).

Undercapitalised banks will be required to raise equity either in the capital markets or from its existing shareholders instead of reducing lending, whereas well capitalised banks will raise equity in response to their internal objectives in line with changing regulatory environment. For instance, it has been argued that European and American banks are undercapitalised and need to raise a significant amount of equity for them to meet capital ratio. The banking sector has often maintained that they will take a long time to convert retained earnings into equity enough for them to meet capital requirement.

The South African Reserve Bank (2010) states that the South African banking sector is well capitalised which Ndzamela (2010) interprets to mean that capital requirements will have limited impact on the South African banking sector. However, the South African Reserve Bank (2013a) will introduce extra loss-absorbency capital requirement for (D-SIB), which will be phased in over a period of three years from 1 January 2016 to 31 December 2018. The extra capital will increase minimum capital requirement from 9.5 percent in 2013 to between 14 percent and 18 percent by 2019. D-SIB makes up about 83.4 percent of the South African banking market which implies that 83.4 percent of the market’s capital ratio will increase within the three periods to 2019 (South African Reserve Bank, 2013a).

What comes out of the literature above and needs to be investigated regarding the South African banking sector is the following: 1. How much equity will be

required to capitalise the South African banking sector? 2. Can the Equity Capital Market supply the required equity to capitalise the South African banking sector? 3. How will the South African banking sector respond to the increase in minimum capital requirement, will they reduce lending or raise more equity and is the equity capital market big enough?

In conclusion, equity is a limiting factor in that the extent to which it is available will limit each bank's ability to expand as well as its operating model. For instance, if a bank is not able to raise equity it is required to meet capital requirement and will have to build capital through retained earnings, as such reducing payout to shareholders and employees, or reducing lending or assets that attract high risk weighting.

2.3.2 *Change the asset portfolio*

Jul-Larsen (2014) introduces an argument that banks have two levers they can use to satisfy the increased capital ratio; these include increasing the capital as discussed above or reducing the capital they hold against each asset class. This is attainable in two ways including acquiring assets that attract low RWA or general reduction in RWA.

The first option relates to adjusting the capital mix and is discussed above. If a bank cannot raise equity, it will have to either reduce RWA or shift exposure from assets that attract high risk weighting to those that draw low risk weighting Jul-Larsen (2014); Martin Hansen et al. (2013). This phenomenon is already seen in Europe in the study by Martin Hansen et al. (2013) in which SMEs loans were reduced while increasing commercial mortgages and sovereign. Jul-Larsen (2014) adds that risk-adjusted lending is eternally pro-cyclical in nature. To cut either RWA or shift to low RWA requires the banking sector to change the composition of assets in their balance sheets.

2.4 Investigate the impact of capital requirement under Basel III on credit extension to SMEs

This section will examine the impact of the capital requirement under Basel III on credit expansion in general to the South African economy and specifically to SMEs.

The overall incidence of Basel III will differ in each country because of the differing regulatory regimes and economic frameworks. For instance, Barfield (2011) argued that there are few countries whose banking sector was not affected by the 2008 bank crisis because they had robust banking regulation in place that required good quality assets and restricted excessive leverage of the banking sector. These include South Africa, Asia, and Australia. Kasekende et al. (2011) further argue that most African countries have capital requirement above the Basel requirement since 2008 (South African Reserve Bank, 2014, South African Reserve Bank, 2009). For countries that escaped the 2008 banking crisis, it might mean that they do not have to make significant changes to their operating model to respond to the new regulatory, particularly the increase in capital adequacy requirement, rather how they respond is dependent on their internal targets. For instance, the South African banking sector keeps excess capital above the minimum capital requirement. Banks build excess capital/ buffer based on internal goals not regulation (Cumming and Nel, 2005). However, the introduction of leverage and liquidity measures will have a significant impact.

The debate about the impact of Basel Accords on access to funding by SMEs is not new; it started from the beginning of the capital adequacy reform in 1998. Since then the Basel Committee has considered ways of minimising the impact of Basel Accords and improving access to funding for SMEs (Altman and Sabato, 2005, Saurina and Trucharte, 2004).

In South Africa, the government is putting its hopes on SMEs to bring about economic growth and reduce poverty, (Alloggio and Thomas, 2013). The debates about how Basel under the current reform is likely to impact credit

extension to SMEs continues and this paper will provide evidence from the South African perspective.

2.4.1 *Capital requirements*

Few studies have specifically analysed the impact of Basel Accord on banks' capital requirement and its effects on access to funding for SMEs. The prominent studies in this regard include Riportella et al. (2011) whose studies look at Basel II and Basel III in the Spanish economy. Altman and Sabato (2005) looked at Basel II in the United States of America (USA), Italian, and Australian economies, whereas Scellato and Ughetto (2010) researched its impact on the Italian economy and Saurina and Trucharte (2004) in the Spanish economy. Other relevant studies include Schwaiger (2002) in the Austrian economy and Cumming and Nel (2005) for the South African economy. These include Angelkort and Stuwe (2011) for the Germany economy, Schizas (2012) for the Spanish economy, Padgett (2012) for the USA economy Jul-Larsen (2014) for the Norwegian economy and Piroli (2014) for the Italian economy.

Basel III builds on principles established and maintained under Basel II, however, it seeks to improve aspects of Basel II that are not adequate to deal with the changing world of banking. The main aspects of Basel II will remain, for instance, more relevant for this study is the provision to hold less RWA for SMEs exposure under certain conditions. This research is equally interested to find out whether this provision has benefitted SMEs lending. Therefore, it is important to understand the origin of the question on the impact of Basel III on access to funding by SMEs. Basel II introduced two methods to manage risk in the bank namely: Standardised and Internal Rating Based approach. These two approaches are used to work out the RWA associate to each asset class and individual borrower.

The Basel II SA represents an improvement on Basel I as it introduced risk sensitivity to capital requirement. However, it proved inadequate as it had serious weaknesses in dealing with the changing world of banking. The flaws

included strong reliance on credit ratings from rating agencies which were established to have pro-cyclical tendencies (Sy, 2009). Saunders and Allen (2010) also argued that it also fails to capture the credit quality of each borrower because of the broad credit rating categories.

Rating agencies had unrated category for unrated exposure (some of which are high risk-weighted). However, the unrated category attracts lower risk weighting than assets or borrowers classified below as BB- (Saurina and Trucharte, 2004). Table 5 below compares the two approaches, for instance, Basel I and Basel II. The unrated risk category encourages banks to allocate relatively weak credit, or credit that attracts high RWA in that category by so doing they become riskier with less capital held for that risk as such defeating the whole purpose of the risk-sensitive capital requirement.

However, this approach allows incorporation of the changes that BCBS (2004) made to minimise the negative impact of the regulation on SMEs. The SA approach makes it possible to distinguish SMEs exposures to those of large firms based on the criteria laid out by Altman and Sabato (2005). As per the BCBS criteria, three main traits need to be true for a borrower to be classified as SME. Firstly, the borrowers revenues should not be greater than EUR50 million. Secondly, the banks total exposure to the borrower should not be greater than EUR1 million. Lastly, the bank should manage this exposure as retail exposure. With the three traits met, the borrower could be dealt with as SME retail which implies that their risk-weightings qualify to be less 25percent, moving from 100percent to 75percent (BCBS, 2004). This distinction implies that SMEs need to categorise separately into retail and corporate asset classes as defined by BCBS (2002).

However, like any other approach SA has its weaknesses. Saunders and Allen (2010) argue that SA encouraged banks to classify most of its relatively weaker credits in the unrated category, thus defeating the objective of the whole approach.

Table 5: Basel I and Basel II SA to measuring the credit risk of a corporate (Jul-Larsen, 2014)

Item	Basel II					Basel I
Credit rating	AAA to AA-	A+ to A-	BBB+ to BB-	Below BB-	Unrated	All loans
Asset value	ZAR100m	ZAR100m	ZAR100m	ZAR100m	ZAR100m	ZAR100m
Basel risk weight	20percent	50percent	100percent	150percent	100percent	100percent
Risk weighted asset (asset value * risk weight)	ZAR20m	ZAR50m	ZAR100m	ZAR150m	ZAR100m	ZAR100m
Minimum regulatory capital charge (risk weighted asset *8percent)	ZAR1.6m	ZAR4m	ZAR8m	ZAR12m	ZAR8m	ZAR8m

Saurina and Trucharte (2004) reasoned that banks would hold less capital for SMEs retail than they will for SMEs corporates. They illustrate that the capital requirement reduced to 6.5 per cent and 6 per cent from 8 per cent when SMEs are classified as retail using Advanced Internal Ratings Based Approach (AIRB) and SA respectively and will hold higher capital for SMEs classified as corporate of 8.94 per cent and 10.23 per cent when using SA and AIRB.

A later study by (Altman and Sabato, 2005) further clarified that banks would need to classify 20 percent and 40 percent of the SMEs portfolio as retail for them to derive the benefit of low capital requirement and still maintain the 8

percent capital requirement when using SA and AIRB respectively. The AIRB approach requires banks to classify a higher percentage of SMEs portfolio as retail because AIRB supercharges RWA (Martin Hansen et al., 2013). AIRB requires banks to understand the risk of the credit better by requiring banks to calculate capital requirements key drivers for RWA these include the Probability of Default (PD), Loss Given Default (LGD) and EAD (BCBS, 2003). Whereas, SA allows banks to depend on the regulator for inputs on LGD, EAD and effective maturity and rating agencies for PD, which was found to be less sensitive to the risk of the asset class.

Riportella et al. (2008) argued that AIRB is the most risk-sensitive method of calculating capital requirements for banks as it aligns capital requirements that banks have to hold to the credit risk of asset class/ bearer of the exposure. They also argue that risk sensitivity has a direct correlation to credit risk premium and interest rates charged on the loans to SMEs. They further underlined that because of Basel III, banks will hold more capital for SMEs exposures and that credit premiums will also be high. SMEs have high PD compared to large corporates asset classes. However, this is because high PD correlates to the general economic environment.

The study by Riportella et al. (2011) illustrates that SMEs asset class will attract high capital requirement because of high PD, but they also established the link between high PD and general economic performance. Their findings also indicated that along with high capital requirements, SMEs would also be charged high-interest rates to absorb the cost of high capital requirement.

Also managing SMEs has high administrative cost for banks as such it is most probably the large, well-diversified, high-quality banks that can afford the cost of adopting AIRB. The studies by Altman and Sabato (2005) and Ruthenberg and Landskroner (2008) agree, however, Altman and Sabato (2005) argue that, if this happens, big banks will be able to eliminate the smaller banks that lend to SMEs. The reason being that smaller banks will not be able to carry the cost of lending to SMEs using AIRB. A study by Ruthenberg and Landskroner (2008)

argues that small banks will not move to AIRB but will continue using SA, as such, they will continue to lend to SMEs, although SMEs are high risk and, as such, they become high risk themselves. If this happens, it will result in the demise of smaller banks, a situation that is not right for SMEs, competition and market dynamism in general.

Riportella et al. (2008) and Riportella et al. (2011) argue that, there are few credit risk mitigation techniques including Loan Guarantee Associations (LGA), collateralized transactions and on-balance sheet netting that could be used to reduce capital requirements for SMEs. In the USA to avoid adverse impact on small business lending, the Treasury Department provided aid to small undercapitalised banks through the Small Business Lending Fund (Padgett, 2012).

It is unknown what will be the required percentage level under Basel III when including two additional measures, namely, a capital conservation buffer and a countercyclical buffer. In South Africa the capital requirement is already at 9.75 percent as of 1 January 2013 and might get between 14 percent to 18 percent by 2019, global will be at 10.5 percent) (BCBS, 2009, South African Reserve Bank, 2013b).

A study by Padgett (2012) based on USA data argues that Basel III capital requirement will have a greater impact on smaller lending institutions that give credit largely to the SMEs and retail customers. She underlined that Basel III capital requirement would exacerbate the problems faced by smaller, community-based and regional banks that lend to retail clients and the small businesses amongst the SME population. She argues that small banks play a vital role in keeping the banking market dynamic; as such, any negative impact on the ability of these banks to extend credit will have a consequence to its customers. She further argues that the main issue for the small, community and regional banks is that these banks do not have the resources required to offset the risk of lending to SMEs and they do not have the same ability to raise equity in the capital markets like the large, well-capitalised diversified banks.

However, not all agree that smaller, community and regional banks deserve special treatment; some critics are less sympathetic arguing that these banks are equally reckless with lending when given an opportunity. The South African market has seen an evidence of this when African Bank went under because of reckless lending and failure to adhere to local regulatory precepts (South African Reserve Bank, 2014).

It is important to note that the finding of studies conducted in USA and Europe might not be directly applicable in South Africa because each country has a different banking model and economic structure that would exacerbate or lessen the impact of the regulation. However, unlike in Europe and the USA, the South African banking sector is well capitalised (Kasekende et al., 2011, South African Reserve Bank, 2013a) as it was insulated from the 2007/2008 bank crisis (Barfield, 2011).

The lessons learnt from the studies conducted in Europe, and the USA might be significantly different to how the regulation will impact the South African banking market. In the same way, the bank crisis did not affect the South African banking sector. It is for this reason that there is a need for this study to understand what the impact will be in the South African banking sector vs. what is going on in Europe and the USA where the bank crisis started.

However, when the crisis hit the USA and some of the European banks, they had not even fully applied Basel II (Barfield, 2011) which means that their capital requirement was way below the level now required under Basel III. The implications seem aligned to what research proves that those markets will be significantly impacted by Basel III capital requirement then, for instance, in South Africa.

This study contributes to the previous empirical literature by using South African samples of banks extracted from SARB database, with information from the supply side of the credit market. It also considers a relevant period, from 2008 to 2013, which takes into account the global economic crisis that started in 2007 and deepened in 2008 and implementation of Basel III capital requirement.

2.4.2 *Proposition 2*

Basel III requires banks to hold more capital for SMEs because of their perceived high PD and as such attract high risk weighting compared to large business for this reason; banks will be inclined to reduce lending to them to meet the capital requirement.

2.5 Conclusion of Literature Review

From the literature review above there could be three major findings: Firstly, the banking sector will need to increase their capital ratio to meet the minimum capital requirement as stipulated by Basel III. Secondly, the 2008 USA and European bank crisis helped us understand that there are two types of banks in the global banking sector, the well capitalised and under capitalised banks. Under capitalised banks will respond to increasing capital requirement under Basel III by reducing lending as they improve the quality and quantity of capital to meet the increasing capital requirement. Whereas well capitalised banks will not necessarily reduce credit rather, they will shift exposure from assets that attract high-risk weighting to those that attract low risk weighting.

Thirdly, the increase in capital requirement as a result of Basel III will lead to a reduction in credit extension in the local and global banking sector. It is SMEs that will be impacted most by a decrease in credit expansion and a shift in exposure to assets that attract low risk weighting, and the reasons are as follows: 1. They are perceived to be riskier than large corporates despite Basel making a provision for them to be assigned as low risk weighting. 2. In Spain, SMEs compared to large corporates were found to attract high capital charge under Basel III compared to under Basel II. 3. They were also found to have a high PD compared to large corporates. 4. SMEs are not as competitive in raising equity in the equity capital markets compared to large corporates. The impact will be greatest in Sub-Saharan Africa as the capital markets are not deep enough to accommodate SMEs, and their mostly illiquid and inactive accounts.

Fourthly, decrease in credit to SMEs as a result of increased capital requirement under Basel III will ultimately have negative consequences on the global and local economies as SMEs reduce their growth, hire fewer people and reduce their output. However, it is not known whether Basel III will continue the trend discovered by Cumming and Nel (2005) in their study in South Africa and what its impact will be on SMEs credit allocation.

The propositions that this study will investigate flows directly from the literature review.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter outlines the methodology used to conduct this research and how data was collected to determine the impact of Basel III capital requirement on the South African banking sector and how this affects credit extension to SMEs. This section will explain the selection parameters such as the research instruments and collected data. Section 3.1 outlines the research method used, Section 3.2 outlines research design, Section 3.3 describes the population sample used in this study, Section 3.4 describes the research instrument whereas Section 3.5 and 3.6 describes the procedure for data collection and method used to analyse and interpret the results.

3.1 Research methodology /paradigm

The method employed in the study is similar to that employed by Cumming and Nel (2005) in their research paper: *Capital Control and The Lending Behaviour of South African Banks: Preliminary Findings on the expected impact of Basel II*. Their study used trend analysis to analyse the data and derive their conclusion. Trend analysis is the practice of collecting information and attempting to spot a pattern or trend, in the information. The trend analysis is a method used to estimate indeterminate events in the past, such as how the banking sector behaviour changed over time in response to the evolution in Basel Accord from Basel II, II.5 and III respectively.

The relevance of Cumming and Nel (2005) study is that it is the only recent study in South Africa that examined the effects of the risk-based capital under Basel Accord and derived what was then the preliminary findings of how banks respond to the requirements of heightened risk sensitivity. Their study considered the effects of risk-based capital adequacy requirements by observing the actual and proportional change of key variables including capital adequacy ratio, RWA, and loans (Cumming and Nel, 2005) using aggregated

balance sheets of South African banking sector defined by SARB through the period of study, 2008 -2013.

The global and local banking sector will understand the full effect of Basel III after its full implementation in 2019. However, in January 2013 capital requirement was increased from 8percent to 9.5percent (see Phase-in Arrangements for the minimum requirements (South African Reserve Bank, 2013b) which will be the focus of this study. The increase in capital requirement will include the introduction of a new capital measure which includes Pillar 2A to strengthen the quality of capital and banking sector's ability to absorb losses. Pillar 2A which will not exceed 2.0 percent for CET1, 2.5 percent for Tier 1 and 3.5 per cent in respect of the total capital adequacy ratio. During the same period, starting January 2013 capital requirement will be phasing out capital that no longer qualifies as Tier 1 or Tier 2 capital.

By examining the effects of the new Basel Accords, in particular, the specific changes introduced to the regulatory environment, we can assess the banking industry's response to risk weighted regulatory capital. Before proceeding with the analysis, it must be noted that although changes in the capital regime have a significant impact on the banks' holdings of capital or RWA, they are not the only determinant of bank behaviour. This study will focus on RWA and loans to SMEs. Other factors include factors such as business cycle as a function of economic environment. Where possible, such factors are compensated by assessing general trends in volatility/stability, and by consulting the SARB's Bank Supervision Department report.

It is possible to identify three distinct phases in the regulatory capital environment over recent years. The first period is from 2008 to 2011 which marks the implementation phase of Basel II in South Africa. The second phase, 2011 to 2012, is a short change in regulatory environment. The third and final phase of the study is the period from January 2013 to December 2013, which was marked by two significant changes. The Basel Capital Ratio, defined as Tier1 plus Tier 2 divided by RWA increased from 8 percent to 9.75 percent

starting from 1 January 2013 and is expected to increase to between 14 and 18 percent by 2019 at the discretion of SARB as the regulator.

3.2 Research design

This study will employ the same method used by Cumming and Nel (2005) in their study to collect data as defined in the research methodology above, section 3.1. The period of this study is significant for the following reasons: (i) It covered the period during Basel II's full implementation in 2011; (ii) Covered introduction of Basel II.5 in January 2011 and the introduction of Basel III capital requirement on the 1st of January 2013, however, other measures will be fully implemented in 2019.

All the information analysed for this study was collected from Annual Reports of the Bank Supervision Department of South African Reserve Bank, and thus it will reflect any measurement or data collection procedure employed by SARB.

3.3 Population and sample

3.3.1 *Population*

The research population included all registered banks operating in South Africa between 2008 and 2013 as accounted for in the SARB Banking Supervision, Annual Report 2008 to 2013 and SARB data. Some banks recorded by the South African Reserve Bank fluctuated throughout the period of study; however, the fluctuations remained minimal and had had no impact on the results.

3.3.2 *Sample and sampling method*

The number of banking institutions covered in this study started as 33 in 2008 and was 31 by 2013 as reported by SARB Banking Supervision Department. The number of banks excludes three mutual banks but includes one institution conducting banking business regarding an exemption from the provisions of the

Banks Act 94 of 1990, namely Ithala Limited. Table 5 below represents the number of licenced institutions with the Department since 2008.

Table 6: South African banking sector: number of entities registered or licenced. Source (South African Reserve Bank, 2013a)

	2008	2009	2010	2011	2012	2013
Banks	19	18	17	17	17	17
Branches of international banks in the Republic of South Africa	14	13	13	12	14	14
Total	33	31	30	29	31	31

3.4 The research instrument

To assess the effects of risk-based capital adequacy, this paper uses the method employed by Cumming and Nel (2005) based in South Africa. Their method is similar to the method used by Fitch Rating Research Reams Hansen et al. (2013) and (Chan et al., 2014) based on 16 G-SIB European Banks. The relevance of Cumming and Nels' (2005) study is that it is the only recent study in South Africa that examined the effects of the risk-based capital methodology under Basel Accord and derived what were then preliminary findings of how banks respond to the requirements of heightened risk sensitivity. Whereas, the other two studies by Fitch Rating Teams provide evidence of this method of research in the field but also provide proof of the impact of Basel III on banking lending behaviour as such providing for geographical comparisons.

This report assesses the effects of risk-based capital adequacy requirements through analysis of trends in the South African aggregate bank balance sheet over a period of six years, 2008 – 2013. Cumming and Nel (2005) study considered the effects of risk-based capital adequacy requirements through analysis of trends in the South African aggregate bank balance sheet over a period of twelve years. This study will employ the same method.

To this end, the research will cover trends in capital and RWA, and investigate what the impact of the introduction of specific regulatory capital regimes is. (iii) To assess the trends in risk weight assets, and in particular to analyse whether banks' assets have shifted towards more or less risky asset class in recent years.

This study will evaluate how banks respond to Basel new accord by analysing the Pillar 3 disclosures of the 31 South African banking institutions which include four banking institutions that the SARB designated in 2012 as "domestic systemically important banks or D-SIB". The D-SIB make up about 83.4 percent of the South African banking sector. Pillar 3 disclosures provide valuable risk and capital information. The information analysed was collected from Annual Reports of the Bank Supervision Department of the South African Reserve Bank, and thus it will reflect any measurement or data collection procedure employed by that department.

3.5 Procedure for data collection

The data used is documentary in nature, it is interval data, as such, there is no need to have it re-scaled.

The information is from SARB website, under SARB total banks data and published annual reports of SARB Banking Supervision for the period from 1 January 2008 to 31 December 2013. Different regulatory frameworks underpin the information presented on the South African banking sector. The information used is out on the website under BA forms which refer to the period after the implementation of Basel II on 1 January 2008. The presentation of information is in line with the regulatory frameworks in place at the time as follows:

- Basel II: 1 January 2008 – 31 December 2011
- Basel II.5: 1 January 2011 – 31 December 2012
- Basel III: 1 January 2013 – onwards

The information on EAD is found from the Banking Supervision annual reports.

In addition, the following measures obtained from total banks data South African Reserve Bank as accounted for on their website.

- Capital Adequacy Ratio
- Composition of capital adequacy figures
- Composition of loans and advances
- RWA per asset class
- Composition of Loans
- Loans per asset class
- Advances (Loans issued)
- Deposits (including current accounts)

A database with data for each measure was created in Excel to form a panel of data, and the completeness and accuracy check conducted. The data was used to determine the percentage changes of each of the measures over time.

3.6 Data analysis and interpretation

As stated above in section 3.1 that Basel III is only to be fully implemented through the globe including in South Africa by 2019. However, some of its measures including capital requirements are in full swing as of 1 January 2013. As such this study will not be able to determine the full impact of Basel III and will determine the preliminary impact of capital requirements. There is consistent information fit for analysing only 6 years, from 1 January 2008 to 31 December 2013.

This study will analyse the South African banking sector to examine how banks respond to Basel new accord. The banking sector includes four banking institutions that make up about 83.4 percent of the local banking sector. These banks include First National Banking (FNB), Absa, The Standard Bank of South Africa, and Nedbank. in 2012 the SARB designated these four banks as “domestic systemically important banks or D-SIB” (South African Reserve Bank, 2013a).

Regarding RWA, the various categories of risk are 0 per cent weighted, 20 per cent weighted, 50 percent weighted, and 100 percent weighted, which correspond to the definitions of risk in the 2009 Accord. The 0 percent category includes cash, central government and OECD government exposures. The 20 percent category includes on multilateral developmental banks and claims on non-OECD banks with maturities of up to one year. The 35 percent category reflects loans fully secured by a mortgage on the residential property. The 100 percent category includes claims on private sector including large corporate and SME borrowers, non-OECD central government exposure, and claims on non-OECD banks with maturities over a year (BCBS, 2009).

3.7 Limitations of the study

This paper will limit its coverage of the consequences of Basel III on banks' lending behaviour. This research will not assess how the numerous variables that drive economic growth relate to Basel III. This study will focus on what the change in the banking sector will mean for SMEs. This study will not assess the assumed benefits of Basel III regarding reduced frequency and severity of the banking crisis as analysed in the BCBS.

3.8 Validity and reliability

3.8.1 *External validity*

The findings of this study can be generalised to the entire population and across situations. This study has covered the lending behaviour that frequently occurs in the everyday life of any bank in South Africa. The population used in the study is representative of the entire South African banking sector population.

3.8.2 *Internal validity*

This study can establish a relationship between regulation and change in bank behaviour in a form of capital adequacy ratio, change in the riskiness of its

assets, change in the composition of the balance sheet and ultimately change in exposure to SMEs. It is possible to identify four distinct phases in the regulatory capital environment over recent years. The first phase of study starts on the 1st of January 2008 to December 2011 and marks the implementation of Basel II in South Africa. The second phase, 2011 to 2012, is a short change in regulatory environment. The third phase of the study is the period from 2012 to December 2012, is a pre-Basel III period during which banks were preparing for implementation of Basel III in January 2013. The fourth and final phase from 2013 sees an increase in Basel Capital Ratio[2] and was increased from 8 percent to 9.75 percent starting from January 2013.

Cumming and Nel (2005) proved in their study that it is possible to distinguish between different phases during the implementation of Basel Accord. They further argue that despite disagreements about the extent of the effects of Basel Accord, they haveproof that minimum capital requirement does influence bank behaviour of undercapitalised banks. This finding is in line with the primary purpose of the regulation to change bank behaviour away from high risk lending and that they have enough quality assets to absorb losses (BCBS, 2009).

As such assuming that change in bank behaviour involves a reduction in exposure to high risk asset class or reduction in assets to meet the capital requirement, then it is not unreasonable to assume that SMEs will be impacted more than larger companies because they attract high risk weights.

3.8.3 *Reliability*

This study can be conducted again and would produce the same results. It is an extension of an existing study that was initially completed by Cumming and Nel (2005), and a similar method has also been used in two studies in Europe

[2] Basel capital ratio =(capital (tier 1 and tier 2))/(risk weighted assets)

(Chan et al., 2014, Hansen et al., 2013). This method is in use by other researchers in similar studies internationally and produces reliable results. To test the reliability of this study, a similar study will have to be conducted using the same variables as was used in this study.

CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

The presentation of results in this section will be through tables and graphs and will be structured according to each research objective.

4.2 Results about Proposition 1

To meet the capital requirement, the South African banking sector increased capital rather than reduced lending; however, while building capital they changed the mix of the asset portfolio by shifting exposure to asset classes that attract low risk-weighted assets.

4.2.1 *Capital Adequacy*

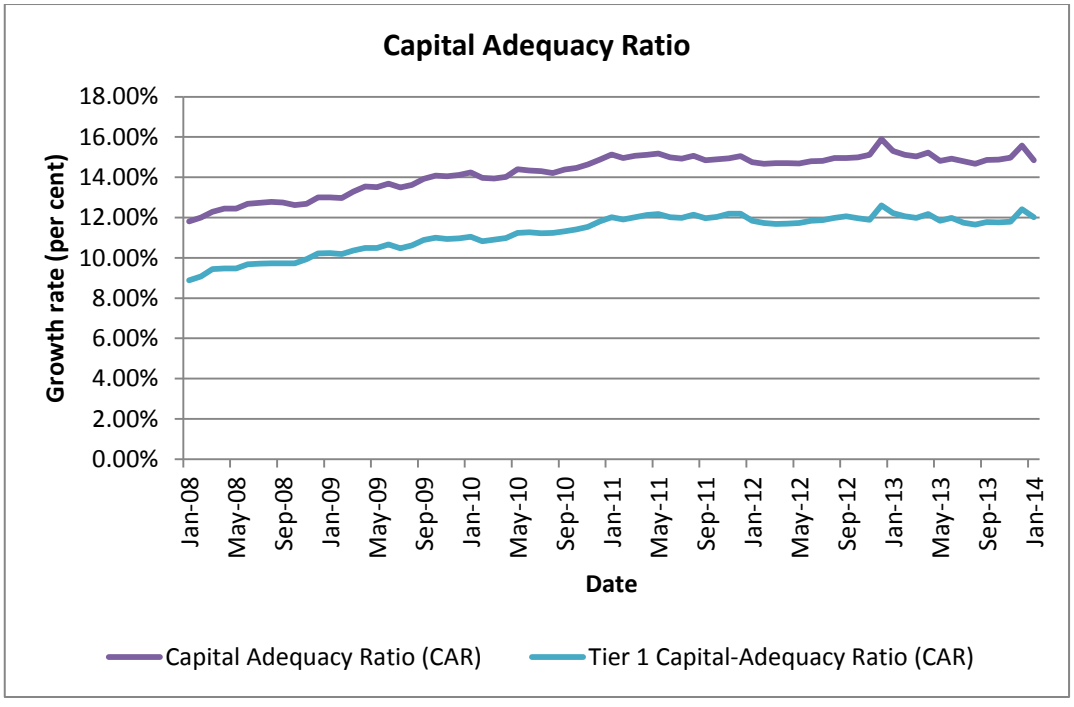


Figure 1: Capital Adequacy - Capital ratio of South African banking sector, 2008 – 2014 (SARB Bank Supervision annual reports, 2008 – 2014)

Capital adequacy ratio and Tier 1 Capital adequacy ratio as depicted in Figure 1: Capital Adequacy - Capital ratio of South African banking sector, 2008 – 2014 (SARB Bank Supervision annual reports, 2008 – 2014) above both exhibited a significant increase, increasing by approximately 25 percent and 34 percent respectively within 6 years, from 2008 to 2013. The increase is consistent with findings of literature reviewed which argued that banks will increase their capital adequacy ratio in line with the increase in capital requirement as necessitated by the new regulation, Basel III (BCBS, 2009, Jul-Larsen, 2014). These results also continue the trend witnessed in the study by Cumming and Nel (2005) who found that the South African banking sector reached the target capital requirement way before the deadline but continued to increase the capital ratio above the minimum capital ratio, possibly building headroom.

4.2.2 *Composition of capital adequacy figures*

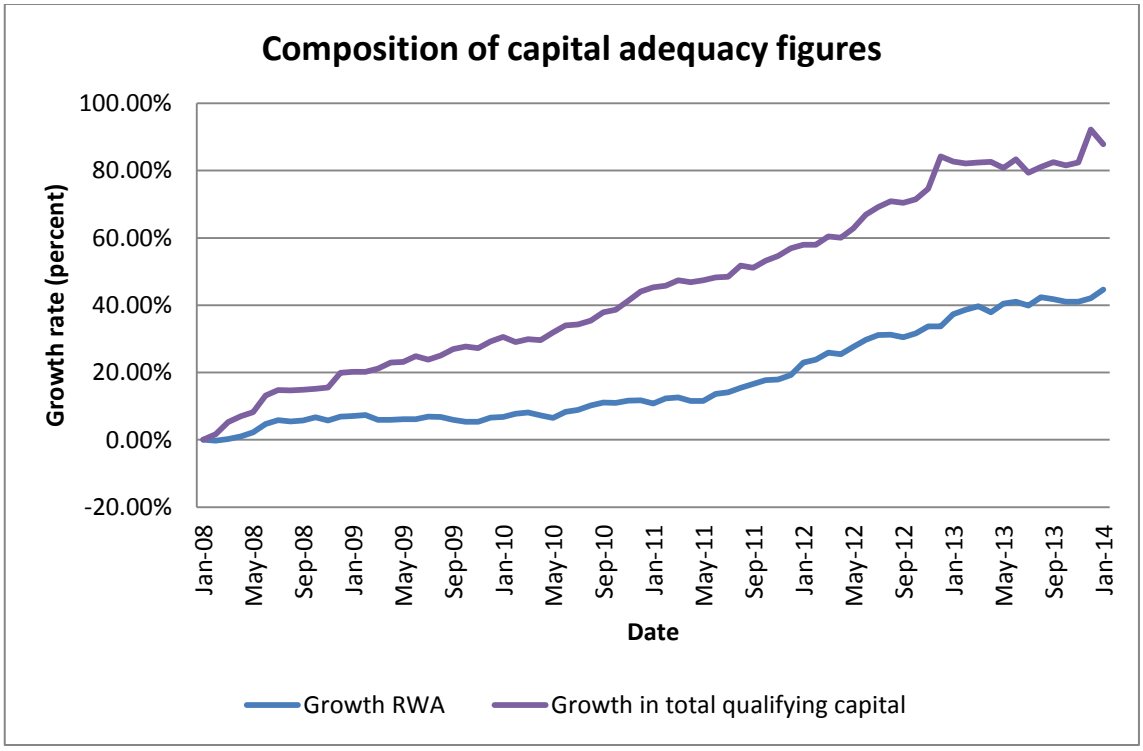


Figure 2: Growth rates in components of capital adequacy ratio of South African banking sector, 2008 – 2014 (SARB Bank Supervision annual reports, 2008 – 2014)

Similar to a conclusion of a study by Cumming and Nel (2005), the rise in capital ratio and Tier 1 CAR is mostly attributable to a significant, 92,2percent, an increase of qualifying capital that banks held about a 42.06percent increase in RWA. The increase illustrates the fact that the South African banking sector did not reduce lending to achieve above minimum capital requirement.

4.2.3 *Composition of asset mix*

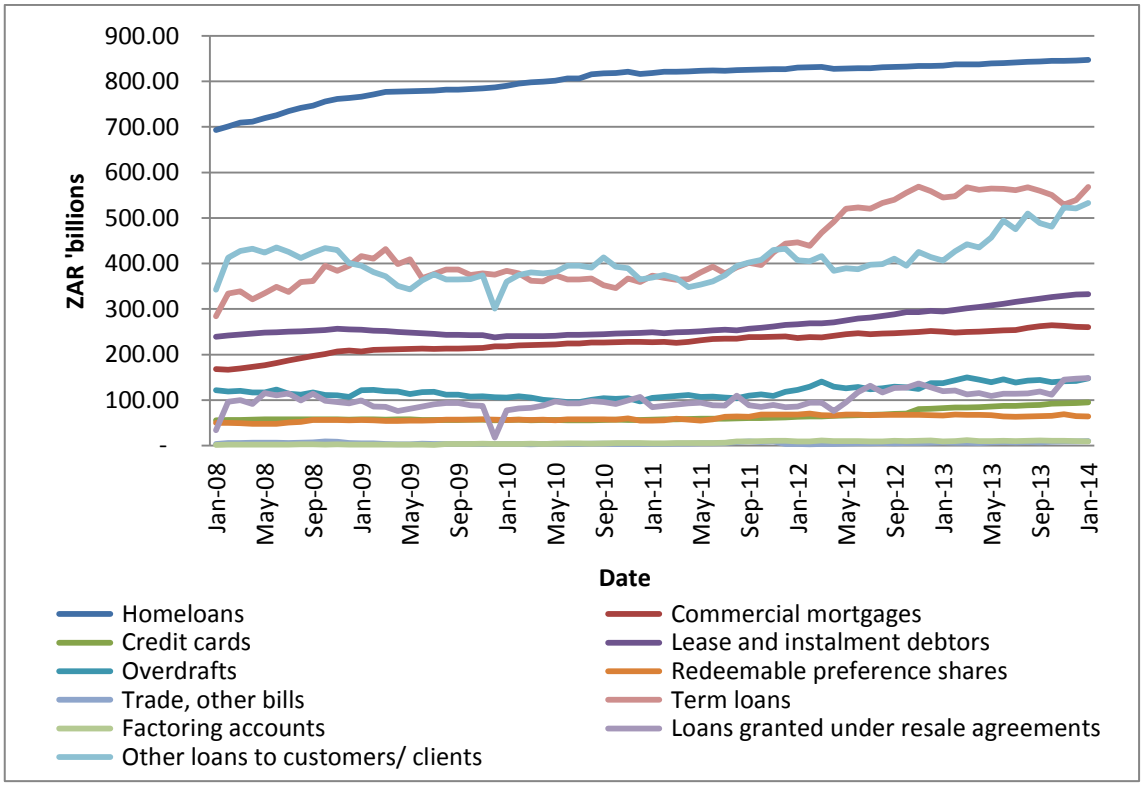


Figure 3: Composition of loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2014)

Residential mortgage loans make up a significant proportion of loans issued by the South African banking sector, followed by term loans. This trend is consistent with literature reviewed (Chan et al., 2014, Hansen et al., 2013)

which expects that banks will have a significant proportion of their loans as residential mortgage loans, but will also grow that segment of loans over time as seen in Figure 3: Composition of loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2014) above. However, literature created an expectation that well capitalised banks in the South Africa banking sector, can afford to increase exposure to high risk-weighted assets because they have enough capital headroom to be able to take on loans that attract relatively high risk-weighted assets onto their books without breaching the required minimum level. Figure 3: Composition of loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2014) show increases of the term and other loans that attract higher RWA compared to mortgage loans.

4.2.4 *Growth in loans in South African banking sector*

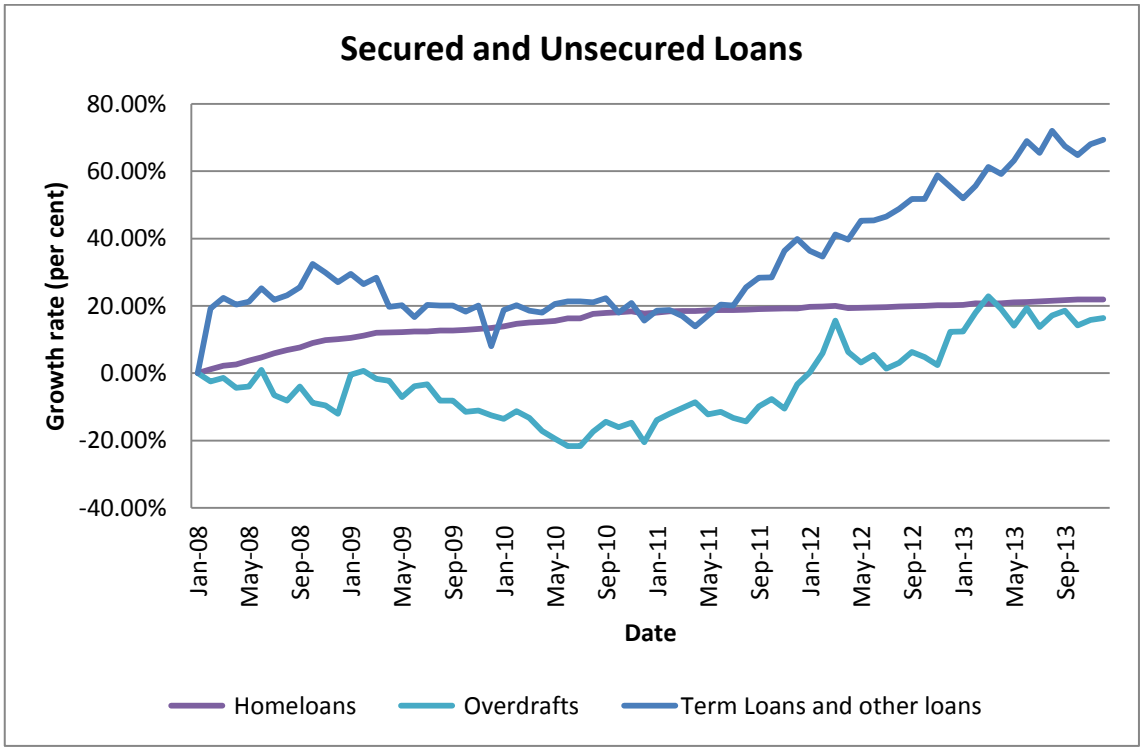


Figure 4: Growth in loans in the South African banking sector, 2008 – 2013 (SARB Bank Supervision annual reports, 2008 – 2013)

Figure 4 indicates that even though residential mortgages constitute a significant proportion of loans, however, term and other loans increased at combined 110 percent above the growth rate of residential mortgage loans. This finding is not surprising given that the South African banking sector's capital adequacy ratio is more than the minimum capital requirement enabling the sector to increase exposure to term and other loans which consume more capital than mortgage loans and possibly more than overdrafts as well. Future research should investigate how the picture painted by Figure 4 above changes as additional capital requirements come into effect. However, it is not clear from these findings what could be the cause for the increase in term loans while overdrafts have grown at a slower pace. The two loan groups including term and overdraft consume the same RWA, so what could be reasons for aloocating credit differently, for instance, could it be that the term loans are structured in such away that they attract less RWA, or because their more profitable than overdrafts or simply a matter of demand?

4.3 Results about Proposition 2

Proposition 2 above shows props versus hypotheses. It seeks to investigate how bank assets on and off balance sheets exposure change and to understand whether banks reallocate risk or reduce exposure to SMEs asset class to meet target minimum capital requirement. The study by Hansen et al. (2013) demonstrated that for European banks to meet requirements of the new capital requirement they had to shift risk from one asset class to another instead of reducing exposure overall. Specifically, they reduced exposure to SMEs and another corporate lending to the benefit of sovereign lend.

4.3.1 *Cumulative Exposure at Default (EAD), 2008 – 2013*

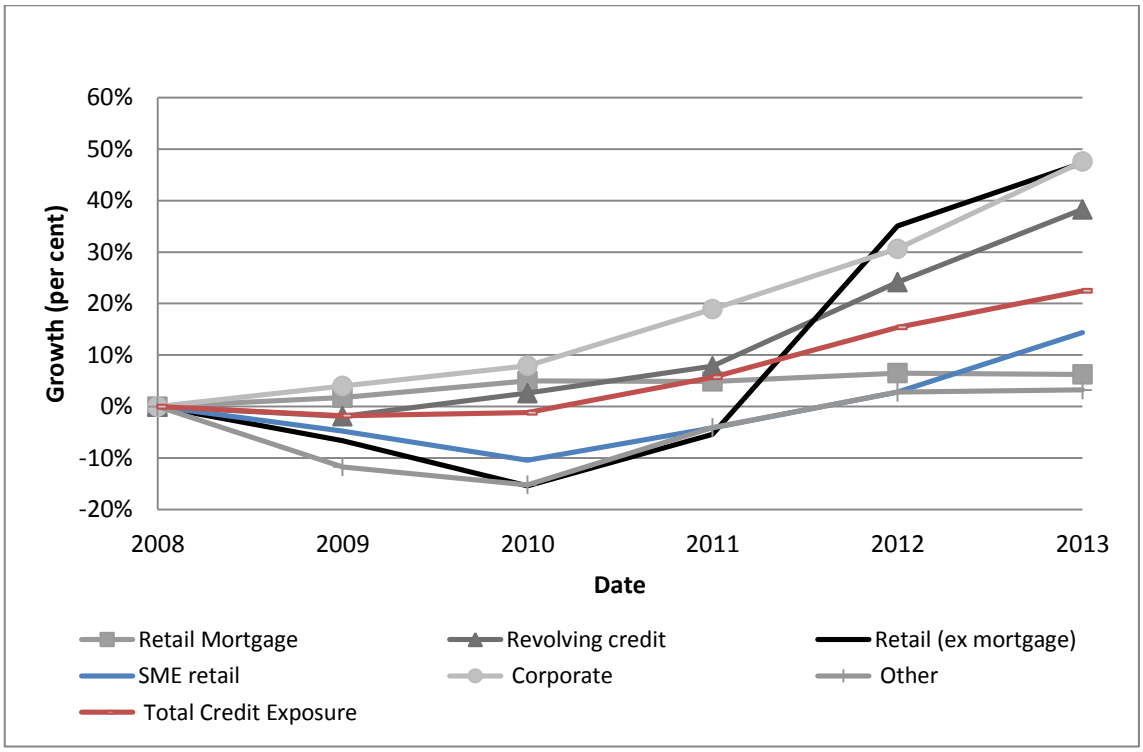


Figure 5 – Percent change EAD, between beginning of2008 to end of 2013 (SARB Bank Supervision annual reports, 2008 – 2013)

Between 2008 and 2013, South African banking sector's EAD, which is Basel's measure of credit exposure, increased by 22.5 percent from about ZAR2, 578 billion to just above ZAR3, 158 billion, which is a ZAR579 billion increase. However, over the six-year period of study, banks have significantly reallocated exposure, reducing exposure in one sector, increasing it in another until getting to a stable, balanced portfolio. SMEs, as many researchers argued in the literature reviewed above are the most impacted, it was one of the asset class that experienced a drop in exposure. Between 2009 to 2011 exposure to SMEs decreased on average 6.5 percent whereas exposure to corporate increased on average 10.3 percent over the same period. It illustrates the point that during crunch time, banks need to balance their capital requirement to RWA, SMEs remains one of the primary targets for reduction.

4.3.2 *EAD (percent change) per asset class, 2008 – 2013*

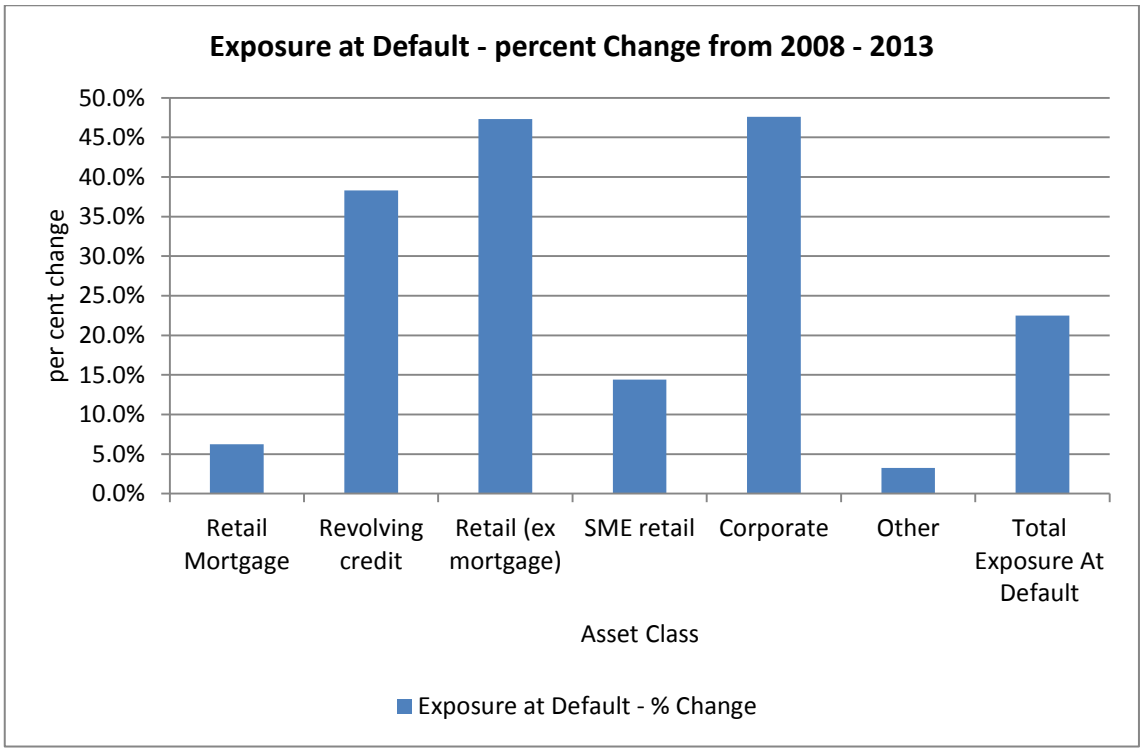


Figure 6 – Change in EAD Since begginig-2008 to end-2013 (ZAR' million) (SARB Bank Supervision annual reports, 2008 -2013)

During the period of study, the South African banking sector's EAD increased across all asset classes with corporates and retail (ex-mortgage) receiving a substantial portion of the increase of 47.6 percent and 47.3 percent. These percentage changes correspond to ZAR344.5 billion and ZAR97.7 billion respectively. During the same period, SME retail received the smallest increase of 14.4 percent which corresponds to ZAR20.7 billion.

Overall corporates accounted for 33.8 per cent of total EAD in 2013 versus 5.2 percent for SMEs retail. SMEs categorised as retail represents a small proportion of banks credit allocation despite SMEs constituting a significant proportion of companies in South Africa, the rest are categorised as SMEs corporate.

4.3.3 *Share of exposure and proportion of capital charge*

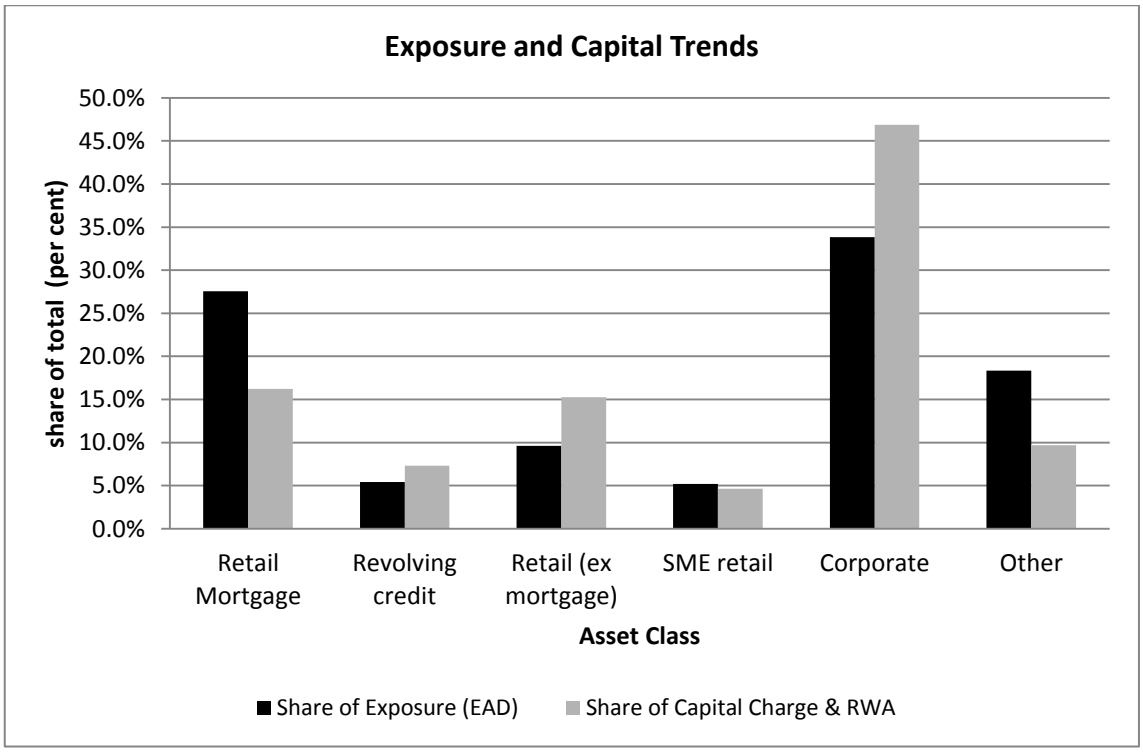


Figure 7: EAD and Share of Capital Charge (SARB Bank Supervision annual reports, 2008 – 2013)

Corporate lending consumed the most capital within the South African banking sector. It consumed approximately 34 percent of total EAD but accounted for nearly 50 percent of credit risk capital requirement. It contributed disproportionately to total capital requirements, so cutbacks in this segment might be of greater benefit to banks' overall capital ratios. Yet SMEs retail lending consumed the least capital within the South African banks. It made up 5.2 percent of total EAD but accounted for almost 4.7 percent of credit risk capital charge. It contributed proportionally to total capital requirements as such increasing exposure to this sector might prove beneficial to banks capital ratios.

4.4 Summary of the results

The structure of the summary of results is according to each research objective.

4.4.1 *The finding with regards to the first proposition:*

South African banking sector is well capitalised, however, to meet the increasing capital requirement banks will increase capital while changing the asset portfolio by shifting exposure to asset classes that attract low risk-weighted assets.

The South African banking sector is well capitalised for both CAR and Tier 1 CAR and has been since 2008. However, CAR and Tier 1 CAR continued to increase in pursuit of increasing capital requirement until the end of 2013. At the beginning of the study, for instance, between beginning 2008 to May 2010, total capital increased by 49.3 percent above the entire sector of RWA to allow banks to remain well above the minimum capital requirement, build excess capital and not reduce RWA (which is a proxy for lending).

Following May 2010, the sector grew RWA rapidly until it reached 42 percent growth by December 2013, while also it continued to increase capital until it reached 92 percent growth by December 2013. The increase in RWA corresponds to growth in total loans to the economy, which achieved growth of 47.2 per cent from 2008 to December 2013. It is fascinating to note that residential mortgage made up 32.5 percent of total loans to the economy, this is because of its low risk weighting; however, the sector also increased exposure to term and other loans that attract 100 per cent and above.

All this meant that the South African banking sector continued on the trend witnessed in the study by Cumming and Nel (2005) that is: 1. The South African banking sector exceeded minimum capital requirement target before the new regulation came to effect but also built excess capital above the minimum requirement 2. The sector continued to increase capital while increasing RWA 3. The sector balanced exposure to loans that attract low risk weighting and those that attract high risk weighting. The sector kept a significant exposure to a residential mortgage, which attracts low risk weighting while significantly increasing exposure to loans that attract high risk weighting over a six-year period.

4.4.2 *The finding with regards to the second proposition:*

South African banking sector will reduce exposure to SMEs to avoid reducing lending to the entire economy. Between 2008 and 2013, the South African banking sector's EAD, which is Basel's measure of credit exposure, increased by 22.5 percent. However, banks have significantly reallocated exposure, reducing it to SMEs during the bank crisis and in the following years, between 2008 and 2011. SMEs as many researchers argued in the literature reviewed that they are the most affected, exposure to SMEs decreased to an average 6.5 per cent whereas exposure to corporate increased to average 10.3 percent over the same period. All this points to the fact that during the period when capital is scarce, and careful allocation of credit is mandatory, SMEs exposure becomes one of the primary targets for reduction.

CHAPTER 5. DISCUSSION OF THE RESULTS

5.1 Introduction

This section of the paper will discuss the results of this study and mainly focus on the main question of the paper, that is how is credit expansion to SMEs affected by the change in bank behaviour that results from a change in the capital requirement under Basel III.

5.2 Discussion about Proposition 1

The South African banking sector is well capitalised, however, to meet the increasing capital requirement banks will increase capital while changing the asset portfolio by shifting exposure to asset classes that attract low risk-weighted assets.

5.2.1 *Capital Adequacy*

During the period beginning 2008 and ending 2013, the capital adequacy ratio and Tier 1 Capital adequacy ratio as depicted in figure 2 above showed an upward trend in both, Capital: RWA ratio and Tier 1 CAR: RWA increasing by approximately 25 percent and 34 percent respectively within 6 years. The increase in the two measures is consistent with conclusions of literature review and precisely consistent with conclusions by Cumming and Nel (2005). Cumming and Nel (2005) argued that the banking sector will increase its capital adequacy ratio in line with the growth in capital requirement as necessitated by the new regulation, Basel III (BCBS, 2009, Jul-Larsen, 2014).

Nevertheless, these results are also in line with findings by Cumming and Nel (2005) who found that the South African banking sector presented a trend in which it reached the target capital requirement way before the deadline but continued to increase the capital ratio above the minimum capital ratio. The

excess capital, over and above the required minimum serves as buffer capital, which allows the banks to absorb more losses without having to reduce lending significantly.

But then again, the excess capital over and above the minimum required capital allows banks to absorb the impact of the additional capital requirement that will be in place in 2016. The additional capital requirement includes introduction of five capital measures and these include: 1. Phasing out of non-Basel III compliant capital instruments (Tier 3 capital); 2. Introduction of additional Tier 1 Capital requirement including capital conservation buffer (0 per cent to 2.5 per cent, phased in from 1 January 2016); 3. Countercyclical buffer (0 per cent to 2.5 per cent, phased in from 1 January 2016); 5. Domestically Important Bank capital add-on (0 per cent to 2.5 per cent phased in from 1 January 2016); lastly accounting for additional operational risk weighted exposures without falling below the required minimum level.

A capital instrument that no longer qualifies as additional Tier 1 and Tier 2 capital will be phased out over 10 years beginning 1 January 2013. As such taking into account the additional capital to be phased in 2016 (which will depend on the regulator's discretion), the minimum capital requirement might range between 14percent and 18percent, which will mean that the 12.45percent Tier 1 CAR achieved by the South African banking sector will not be enough.

However, similarly, these findings are not surprising as they are consistent with the objective of Basel III, specifically increasing capital requirement, to encourage banks to increase the quality and quantity of capital base so as to minimise moral hazard.

5.2.2 *Composition of capital adequacy figures*

As was concluded by Cumming and Nel (2005), the rise in the South African bank sector capital ratio can be attributed to increases in capital and also in risk weighted assets. The composition of qualifying capital and primary capital on a

consolidated basis as depicted in Figure 2 above illustrates that the growth in capital base remained higher than growth in RWA throughout the study period.

Growth in RWA remained flat for two and half years until May 2010, growing at an average rate of 5.38 per cent, it was in June 2010 when the trend started increasing rapidly until it reached growth of 42.06 per cent in December 2013. This finding is significant as it demonstrates that credit extension to the economy, in general, did not decrease.

These findings are consistent with literature reviewed for this study which argues that banks prefer to raise equity than reduce lending. However, the period between 2008 and May 2010 corresponds with a decrease in exposure at risk (EAD) to SMEs, which Martin Hansen et al. (2013) argued that an increase in capital requirements will result in a shift in exposure between assets that attract low risk weighting and those that attract high risk weighting.

As seen in Figure 2, banks continued to increase their capital base to create a buffer that would cater for the expected additional increases in the capital requirement that will be phased starting on 1 January 2016. The increase in primary capital across the banks is in line with a focus on (Common Equity) Tier 1 Capital under Basel III. The combination of significant growth in capital base and assets resulted in an increase in the capital ratio throughout the study period. However, the growth happened at the expense of SMEs' exposure.

5.2.3 *Composition of loans and advances*

It is the aim of this study to establish how bank assets (on and off balance sheet exposures) change and to understand whether banks reallocate risk or reduce exposure to certain assets to meet target minimum capital requirement. The study by Hansen et al. (2013) and Chan et al. (2014) demonstrated that for European banks to meet requirements of the new capital requirement they had to reduce risk from one asset class to another instead of reducing assets overall.

Specifically, they found that banks reduced exposure to loans that attract high risk-weighted assets and reallocated it to loans that attract low risk-weighted assets like residential mortgages and other secured loans. This finding is consistent with what Cumming and Nel (2005) found in their study, but is also consistent with BCBS (2009) expectation on how banks behaviour should change.

As illustrated in Figure 2 above, to fulfil capital ratio requirements under the Basel Accord, the South African banking sector increased both RWA and qualifying capital, however, at different rates. Figure 3 depicts various loan categories over the study period. For our purposes, we will focus on the two most significant categories of loans including residential mortgage loans and overdraft and other loans. Residential mortgage loans plus overdraft and loans remained the largest constituent of gross loans and advances, representing an average of 79.61 percent across the entire period under study.

According to the South African Reserve Bank (2013a) not only does residential mortgage form a significant part of bank activity, but they are also treated differently for calculating capital requirements. Qualifying residential mortgages loans in South Africa are given a lower risk weighting (35 percent), compared to other loans that attract risk weighting ranging between 100 percent to 150 percent (this category including overdrafts which are mostly used by SMEs). As such, it is expected for banks to issue more residential mortgage loans, term loans and overdrafts to meet capital requirements. Figure 3 confirms that residential mortgages loans make up 40.2 percent of the total loans, that is the largest share of loans and advances, followed by overdraft and term loans which when combined make up 39.40percent.

This trend is consistent with literature, which expects that banks will have a significant proportion of their loans as residential mortgage, but also will grow terms and other loans. Literature also hopes that well capitalised banks like South African banks can afford to increase exposure to high risk-weighted assets because they are well capitalised and have enough capital headroom to

be able to take on loans or assets that attract higher risk weighting onto their books without breaching the minimum capital requirement.

However, this trend is expected to change as banks are required to meet additional capital requirements, which will be phased in starting 1 January 2016 to 1 January 2019.

5.2.4 *Secured and unsecured lending*

Figure 4 above illustrates that even though residential mortgage loans make up a significant proportion of all loans, the growth of these loans was much slower than the growth in term loans and other loans. The other types of loans including term and other loans category grew at a rate of 110percent above the other type of loans. This growth corresponded with an increase (21.9 percent) in residential mortgage loans which consumes low risk-weighted assets (35 percent) and increase (16.39 percent) in overdrafts, which consume high risk-weighted assets (between 100 percent and 150 percent).

These findings are consistent with the theory that regulation will affect banks' loan behaviour, for instance, when banks have a capital ratio above the minimum capital requirement they can afford to increase exposure to loans that attract high risk-weighted assets and when undercapitalised they will employ a combination of two approaches. The two approaches include reducing RWA and shift exposure from certain assets that attract high risk weighting to those that attract low risk weighting while building a capital reserve. The banking sector has not entirely reduced exposure to assets that consume high risk-weighted assets, rather it has reduced exposure to certain asset classes including SMEs and certain loan types including overdrafts.

Throughout the study, the South African banking sector remained well capitalised and kept excess capital above the minimum capital requirement; see Figure 1 above. The surplus capital allowed the South African banking sector to take on loans that attract high risk weighted assets namely term, other loans and overdrafts without being in breach of the minimum capital requirement.

However, it is evident from Figure 1 that there are differences in appetite for different types of loans, for instance, overdrafts flactuated during the 6 year period while term and other loans grew consistently.

However, the evidence is not conclusive on the reasons why term loans and other loans increase while overdrafts attract high risk-weightings. The SARB does not disclose RWA per loan category whereas European banks disclose risk weighting for each loan category making it possible to do further analysis on which loan category or asset class attracts high.

In conclusion, throughout the six year period, encompassing implementation of Basel II, Basel II.5 and Basel III, there is evidence that the South African banking sector shifted credit away from overdraft loans, and SMEs asset class while increasing exposure to other loan types and other asset classes that attract high risk weighting including corporate loans. Figure 4 demonstrates that term, other loans and home loans increase with increasing capital while overdrafts decreased for a period before increasing, corresponding to an increase in RWA as depicted in Figure 1. The implication of this finding is that the South African banking sector raised capital and avoided reducing general lending.

What will be interesting to understand is what will be the impact of the proposed additional capital to be phased until 1 January 2019, will this trend prevail in which the banking sector increases capital and avoid reducing lending. However, as demonstrated in Figure 4, loans are not all treated the same, for instance, overdraft loans decreased immediately after full implementation of Basel II between 2008 and May 2010, while term and other loans increased despite them attracting the same risk weighting as per Basel regulation. So the question remains what is driving the decision to raise exposure to certain loan types and not others?

5.3 Discussion about Proposition 2

Basel III requires the banking sector to hold more capital for SMEs because of their perceived high PD which means they attract high risk weighting compared to big business, for this reason, the banking sector will be inclined to reduce lending than to meet the increase in capital requirement.

5.3.1 *Exposure at Risk (EAD)*

Between 1 January 2008 and December 2013, the South African banking sector's EAD, which is Basel's measure of credit exposure, increased by 22.5 percent from ZAR2, 578 billion to just above ZAR3, 158 billion, which implies ZAR579 billion as depicted by Figure 6. However, during the same period, banks have significantly reallocated exposure, reducing exposure to one asset class, increasing it in another until getting to a stable, balanced portfolio according to their set targets.

Regarding assets class credit flows, the most significant absolute increase was to retail mortgage, corporate (which include corporate, specialised lending, SME corporate and purchased receivables from corporations) and revolving credit asset class grew by 47.3 percent, 47.6 percent and 38.3 percent respectively. Whereas, retail (ex-mortgages but including vehicle and asset finance), retail revolving credit defaults (including credit cards), SMEs retail and other (public sector entities, local government, sovereign entities all jointly defined as "other") experienced the lowest growth of 6.2 percent, 14.4 percent and 3.0 percent respectively.

This finding is consistent with the conclusion of the literature review about SMEs retail that the banking sector will not prioritise this asset class as demonstrated by the low growth of exposure to them. However, it is not consistent about lending to public sector entities, local government, and sovereign entities which have also seen the lowest growth. For instance, Martin Hansen et al. (2013) concluded that exposure is shifting to sovereign entities including public sector entities, local government, and residential mortgages.

These findings show that while it is true, exposure increased to the residential mortgage but sovereign entities including public sector and the local government credit exposure, which did not receive the increase witnessed in Europe.

However, between the beginning of 2008 and the end of 2011, the South African banking sectors' EAD decreased by ZAR30, 902 million or 1.2 percent, it decreased to ZAR2, 547 billion in 2010 from ZAR2, 578 billion in 2008, see Figure 5. The significance of this period is that it is during the time where there is a significant decrease in EAD. The reduction in EAD meant that some asset classes experienced growth while others declined. The asset classes that witnessed the most impact include retail (excluding mortgages or ex-mortgage), SMEs retail and others, together these asset classes experienced a total decrease of ZAR132.2 billion counterbalanced by an increase of ZAR101.3 billion for retail mortgages, revolving credit, and corporate exposures. SMEs retail exposure decreased by approximately ZAR15 billion while corporate exposures increased by ZAR57 billion within the same period.

The 2008 to 2011 period coincides with a period of which the sector had just finished a benchmarking exercise in 2011 and is immediately post full implementation of Basel II (Joana Malotana, 2014). The finding is significant because it highlights exactly how the South African banking sector will act when under pressure to meet increases in regulatory capital that is to reduce lending to SMEs asset class as was emphasised by critics of Basel III.

However, it is not clear what drove the EAD drop for the other category (which consists mainly of public sector entities, local government and municipalities, and sovereign counterparties) as these attract the lowest risk weighting and Basel III incentivises banks to increase exposure to this asset class. This observed shift is not consistent with the incentives of Basel III. However, what is clear is that it is not apparent from the data to what extent this decline also reflects weaker loan demand and increase in borrowing costs as banks gear up for Basel III's higher capital charges.

The limited growth of credit to SMEs retail does not correspond with incentivising created under Basel II for SMEs to be allocated low risk weighting compared to corporates as illustrated in Figure 7. But the decrease in exposure to SMEs implies that few SMEs receive bank funding to support their growth and thus help grow the economy as such achieving the NDP projected growth objectives. SMEs do not have the same opportunity as corporates to move their funding from banks to capital markets.

Between the end of 2010 and the end of 2013, EAD achieved growth of ZAR610.4 billion or 24 percent as illustrated by Figure 5, ZAR287.1 billion attributed to growth in corporate EAD or 36.8 percent increase, and only ZAR35.7 billion or 27.7 percent increase is due to SMEs retail EAD. The weak growth in EAD for SMEs illustrates the point that corporates are still the largest beneficiary of the reallocation compared to SMEs retail.

In conclusion, overall sector EAD increased corresponding to increase in capital ratio, and increase its components including an increase in high-quality capital and RWA as illustrated in Figure 1 and Figure 2. However, SME asset class is one of the first targets of capital rationing during an increase in capital requirement.

Overall the credit flows remained positive which means that sectors of the economy that depend on bank funding for growth still received support from the banking sector despite the introduction of Basel III. However, it is important to note that there are certain aspects of Basel III that are still outstanding including increasing the capital requirement between 14 percent and 18 percent, and implementation of measures including leverage, and liquidity.

5.3.2 *Share of exposure and share of capital charge*

Corporate lending consumed the most capital within the South African banking sector. It made up 38 percent of total EAD but accounted for nearly 50 percent of credit risk capital charges. It contributed disproportionately to total capital requirements, so cutbacks in this segment might be of greater benefit to banks'

overall capital ratios, and yet SMEs retail lending consumed the least capital within the South African banking sector. It made up 5.2 percent of total EAD but accounted for almost 4.7 percent of credit risk capital charge. It contributed proportionally to total capital requirements as such increasing exposure to this sector might prove beneficial to banks capital ratios.

Sovereigns experienced marginal increase in EAD regarding sector credit flows, see Figure 6. Its cumulative six-year growth was 3.2 per cent or ZAR18.2 billion. Interestingly, the banks decreased their sovereign exposure by ZAR85.4 billion or 15.2 per cent between beginning of 2008 and end of 2010 before increasing it by ZAR103.6 billion or 21.8 percent in the next two subsequent years. The increase in sovereign exposures is consistent with incentives provided in Basel III's LCR requirement that encourages banks to deposit funds with central banks and increase sovereign exposure. Sovereign exposure helps enhance liquidity ratios and lower risk weights ahead of the implementation of LCR in 2015. LCR also discourages interbank lending by creating a disincentive against holding other banks debt. This asset class made up 18.4 percent of total EAD but accounted for almost 9.7 percent of capital credit charge. It contributed positively disproportionally to a total capital requirement by attracting the least capital charge.

5.4 Conclusion

This study covers critical periods in which all aspects of Basel II are implemented and at the onset of Basel III. Some aspects of Basel III are still outstanding including additional capital requirement. For example, the D-SIB capital add-on, the capital conservation buffer and the countercyclical buffer will only be introduced in 2016 to 2019. However, some preliminary conclusions can be made based on trends observed in the industry.

In conclusion for the first hypothesis proposition, throughout the period of study, the South African banking sector has continued the trend that was evident in the study by Cumming and Nel (2005) that at the advent of Basel Accords and

extending to Basel II.5 and III. Firstly, banks met their capital ratio requirement by increasing both capital and RWA. Secondly, the South African banking sector exceeded minimum capital requirement minimum two years before implementation of the new capital requirement under Basel III. The banking sector kept excess capital above the required capital requirement throughout the duration of the study. Lastly, the sector (South African banking sector) was able to increase exposure to loans and asset classes that attract high risk weighting.

However, not all loans and asset classes are treated the same; overdraft loans and SMEs retail (asset class) saw exposure (credit) reduction during the capital build-up period of 2008 and 2011. Overdraft loans are a significant source of funding for SMEs, so a decline in overdrafts credit has an unintended consequence of SMEs financing and growth (Chavis et al., 2010). But then again SMEs as asset class experienced credit reduction during the same period. The decrease in overdraft loans and SMEs retail exposure is as Basel III critics have propounded that while banks build capital they will reduce exposure to SMEs and their linked exposures as they are perceived to be high risk compared to large corporate and large corporates linked funding.

The South African banking sector maintained a capital buffer; that is capital over and above the required minimum level. The excess capital acts as a buffer that allows the South African banking sector to increase exposure to loans and assets that attract high risk weighting without breaching the minimum capital level. This trend, in as far as, it related to the impact of capital requirement, is expected to continue even during phasing in additional capital requirement and capital ratio increase to 18percent. The trend will continue as long as banks can raise capital in the equity capital markets, however, if their ability to raise capital changes or the capital market closes then the sector will have to reduce possibly RWA, which implies a reduction in lending. This study has indicated that when the sector is under capital constraints, they reduce exposure to SMEs retail and SME linked funding. The question remains what were some of the considerations for the banking sector to reduce exposure to SMEs' retail and

any funding related to them? Despite the study indicating that SMEs attract less capital charge than large corporates as such capital charge was not a factor in the decision-making whether to increase exposure to SME or not.

On the second proposition, SMEs retail received the lowest share of EAD and actual decrease in growth of EAD despite making up a significant proportion of companies in South Africa and attracting the least capital charge. Whereas Corporates received the largest share of EAD, most significant growth in EAD over the study period they attracted the largest capital charge. The result of this study makes it evident that low capital charge assigned to SMEs retail is not a solution to getting the sector to increase exposure to SMEs during periods when capital is scarce for the South African banking sector. The South African banking sector reduced exposure to SMEs during the period when building capital reserves and yet in the same period it increased exposure to corporates and retail (excluding mortgage).

The full impact of Basel III on the South African banking sector, on SMEs access to funding and implication on the economy will not be fully known until it is fully implemented in 2019. Some of the outstanding measures of Basel III include implementation of a further capital requirement for D-SIB, NSF, Leverage Cover Ratio and Liquidity requirement.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

The following chapter presents an outline of the conclusions made from the analysis presented in the preceding chapter five. This chapter discusses the research findings and their conclusions, recommendations and finally suggestions for future research.

6.2 Conclusions of the study

Basel III seeks to close the gap in the global bank regulation that was revealed in the 2008 bank crisis that originated in the USA sub-prime mortgage sector. The bank crisis of 2008 revealed that the USA and European banks were not well capitalised to absorb losses that arise from their operations. But again it also exposed that banks did not have the liquidity to keep banks solvent during the crisis. The affected banks managed to increase leverage without breaching capital adequacy ratio as they built leverage via off balance sheet assets, and finally, the failure of these banks had consequences for the global economy.

Basel III seeks to close that gap/ weakness in the current regulation. Basel III seeks to ensure that banks have the right quality and quantity of capital to absorb losses originating from banks operations, and as a result minimise moral hazard, it will also introduce leverage and liquidity ratios to restraint the other problems.

However, like any other regulation, Basel III is meant to achieve its objective by changing the behaviour of banks. However, its critics have argued that Basel III's unintended consequence is reduction global economic growth, reduction in lending to a vital sector of the economy, specifically SMEs. The critics continue to argue that it also result in the increased cost of bank debt and main victims

will be SMEs as they do not have access to alternative sources of capital including the capital markets as large corporates.

Basel III will not affect all countries, regions and banks the same way because each country, economic region and the bank have its different regulatory structure, varying levels of compliance with the previous regulation that means that the gap between the past and proposed regulation is for each one. However, some countries and regions in the world did not experience the bank crisis as seen in Europe and the USA. South Africa is one of the countries that was not affected by the 2008 bank crisis that originated in the USA, because the sector is well capitalised. However, the new regulation requires minimum capital requirement to increasing significantly from current 9.0percent to possibly 18percent in South Africa. What this means is that the South African banking sector will have to change its behaviour to meet the increasing minimum capital requirement and other measures including leverage and liquidity measures.

This research sought to investigate the impact of increasing minimum capital requirement under Basel III on lending behaviour of the South African banking sector, specifically examining credit extension to SMEs as the key sector of the economy that drives economic growth.

The conclusion from this study is that the South African banking sector is well capitalised, its capital ratio is more than the minimum capital requirement. The additional capital is achieved by increasing both capital reserves and RWA. Overall lending increased as the RWA increased which is a proxy for lending levels. However, two years before implementation of Basel III (a period called preparation phase) the sector reduced overdraft loans. The significance of this finding is that overdraft loans make up a big proportion of loans to SMEs as such reducing these loans mean reducing SMEs funding and growth prospects. The reduction in overdraft loans and reduction in credit to SME retail asset class corresponds to the preparatory phase of Basel III. The decrease is consistent to what is seen in the study by Cumming and Nel (2005)

The decrease in overdraft loans also corresponds to a drop in EAD for SMEs retail asset class whereas EAD for Corporates increased by a significant proportion. SARB does not disclose risk-weightings and LGD for loans and asset class as such it was not possible to determine the risk profile of each loan and asset class that would have influenced allocation decision. It is important to understand the riskiness of overdraft versus term loans and other loans, and that of SMEs retail class versus Corporates asset class to understand how this could have influenced the decision to reduce allocation each one of them. The literature confirms that reduction in funding to SMEs corresponds with high risk weighting (driven by high PD and LGD) assigned to SMEs.

SMEs retail asset class attracted low capital charge which implied a decrease in cost related to these assets about Corporates and the capital requirement under Basel III. The decrease in EAD to SMEs retail is surprising given that this asset class attracted much less capital charge compared to large corporates. However, this drop corresponds to the introduction of Basel III. Specifically, the sector was preparing for an increase in the minimum capital requirement in 2013. It is evident from this study that capital charge was not the only consideration when making a decision whether to increase exposure to SMEs retail and loans that support SMEs like overdraft loans.

6.3 Recommendations

The implementation of Basel III will not be complete until 2019, meaning more changes are on the way these include an increase in minimum capital requirement. Also, the regulation is under continuous evaluation and modifications. Regardless, to secure a stable, robust economy without compromising the prospects of innovation, job creation and all-inclusive economic growth, regulatory authorities have to balance bank regulation with comprehensive risk assessment against unintended consequences like reduction in SMEs funding and potential reduction in economic growth.

The SARB has to be concerned to disclose information regarding risk weighting of each asset class and loans so that further studies can access the riskiness of the sector and specifically that of its different operations. For instance, between 1991 and 2003 SARB Bank Supervision Department published risk profiles of the sector which is currently not published. This study has shown that the sector is more than the minimum capital requirement, but there is no data to indicate whether the sector is becoming less risky or not. But more importantly, SMEs, contributing 90percent to the private sector and approximately 50 percent of GDP receive the smallest share of bank loans and an experienced decrease in exposure despite provision provide under Basel II to afford SMEs low risk weighting. The regulator has to encourage the sector to disclose risk weighting for loans and asset classes so that it could also be clear whether SMEs are receiving the benefit of low risk weighting as envisioned under Basel II and continued under Basel III.

National Treasury needs to find ways to work with the sector to get it to utilise fully the support mechanism they have put in place to help commercial banks increase their funding for SMEs including guarantees provided by National Empowerment Fund, Industrial Development Corporation and Department of Trade and Industry. The current support mechanism is not efficient.

SMEs Ministry and SMEs customers receive less than their fair share of loans despite making up a big proportion of South African companies and making a significant contribution to GDP. The European SMEs lobbied key stakeholders including BCBS, Local regulators and European Commission to change the regulation to accommodate them to reduce the impact of the regulation their ability to access bank funding. In the same way, South African SMEs should lobby the regulator and National Treasury to come up with a solution that will encourage banks to increase exposure to SMEs.

A final recommendation is to establish a Commission of Inquiry to investigate in detail why SMEs do not receive an equitable share of funding from commercial banks despite playing such a significant role in the economy and establish why

government support mechanism including the provision of guarantees by Development Financial Institutions is ineffective. This commission should include SMEs, SMEs Ministry, National Treasury, The SARB Bank Supervision Department, and the Banking Association of South Africa.

6.4 Suggestions for further research

The literature argues that there is a correlation between SMEs funding and economic growth. It demonstrates that SMEs are a hub of economic growth, absorb unemployed people, introduce new technologies in the economy and challenges large and mature companies as such are important also for competition in the economy. Large and mature companies have limited promises of (further) increasing GDP and employment. There is a need to investigate the relationship between SMEs' funding and economic growth and how central is bank regulation in this regard.

Once Basel III is fully executed, then there will be a need to do follow-up studies looking into the same question that is Basel IIIs' impact on access to funding for SMEs. Literature expects that leverage and liquidity measures will have a significant impact in the South African context on the availability of bank funding.

SARB does not disclose risk weighting for loans and asset categories; future studies need to look into risk profile of exposures carried by the sector, specifically to understand the riskiness of SMEs exposure. Some studies indicated that SMEs have a higher PD than Corporates hence banks shift exposure from SMEs in a bid to reduce RWA.

REFERENCE

Abor,J. & Quaartey, A. (2010). Issues in SME Development in Ghana and South Africa. *International Research Journal of finance and Economics,* 39**,** 215-228.

Acharya, V. V. & Richardson, M. (2009). Causes of the financial crisis. *Critical Review*, 21**,** 195-210.

Allen, B., Chan, K. K., Milne, A. & Thomas, S. (2010). Basel III: Is the cure worse than the disease? *Social Science Research Network*. Retrieved from http://ssrn.com/abstract=1688594.

Alloggio, S. & Thomas, K. (2013). Resisting the lure of deferral: realising the South African National Development Plan. *Social Dynamics*, 39**,** 108-110.

Altman, E. I. & Sabato, G. (2005). Effects of the new Basel Capital Accord on bank capital requirements for SMEs. J*ournal of Financial Services Research,* 28**,** 15-42.

Angelkort, A. & Stuwe, A. (2011). Basel III and SME Financing. Germany: *Friedrich-Ebert-Stiftung and Zentrale Aufgaben*.

Ayyagari, M., Beck, T., & Demirguc-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics*, 29(4), 415-434.

Barfield, R. (Ed.) (2011). *A practitioners Guide to Basel III and Beyond*. Thomson Sweet & Maxwell.

Basel Committee on Banking Supervision. (1988). *International convergence of capital measurement and capital standards*. Basel Committee on Banking Supervision.

Basel Committee on Banking Supervision. (2002). Quantitative Impact Study 3. Basel Committee on Banking Supervision.

Basel Committee on Banking Supervision. (2003). *The New Capital Accord: Third Consultative Document.* Basel Committee on Banking Supervision.

Basel Committee on Banking Supervision. (2004). *International Convergence of capital measurement and capital standards: a revised framework.* Bank for International Settlements.

Basel Committee on Banking Supervision. (2005). *An Explanatory Note on the Basel II IRB Risk Weight Functions*. Basel Committee On Banking Supervision.

Basel Committee on Banking Supervision. (2009). *Consultative Document: Strengthening the resilience of the banking sector.* Bank for International Settlements.

Basel Committee on Banking Supervision. (2010). *Long-term Economic Impact of Higher Capital Levels Basel Committee Publications.* Basel Committee On Banking Supervision.

Basel Committee on Banking Supervision. (2014). *Basel III leverage ratio framework and disclosure requirements.* Basel Committee On Banking Supervision.

Blundell-Wignall, A. & Atkinson, P. (2010). Thinking Beyond Basel III: Necessary Solutions For Capital and Liquidity. *OECD Journal: Financial Market Trends, 2010* (1), 9-33.

Cardone Riportella, C., Trujillo Ponce, A., & Casasola, M. J. (2008). Credit risk mitigation and SMEs bank financing in Basel II: the case of the Loan Guarantee Associations.

Cardone Riportella, C., Trujillo, A. & Briozzo, A. (2011). *What do Basel Capital Accords mean for SMEs?* (No. wb111004).

Ceglie, G. & Dini, M. (1999). *SME cluster and network development in developing countries: the experience of UNIDO.* Geneva: UNIDO.

Chan, C., Grossman, R., D'albert, K., Scott, G., Scarafia, C., Vuuren, G. V., Adkins, A. & Mitropoulos, A. (2014). *Basel III: Shifting the Credit Landscape*. Fitch Ratings.

Chavis,L., Klapper, L. & Love, I. (2010). *International Differences in Entrepreneurial Finance*. Age, 1**,** 2.

Cumming, S. & Nel, H. (2005). Capital controls and the lending behaviour of South African banks: preliminary findings on the expected impact of Basel II. *South African journal of economics,* 73(4)**,** 641-656.

Bouri, A., Breij, M., Diop, M., Kempner, R., Klinger, B., & Stevenson, K. (2011). Report on support to SMEs in developing countries through financial intermediaries. *Dalberg, November*.

Dietsch, M. & Petey, J. (2004). Should SME exposures be treated as retail or corporate exposures? A comparative analysis of default probabilities and asset correlations in French and German SMEs. *Journal of Banking & Finance,* 28 (4)**,** 773-788*.*

Elliott, D. J. *Basel III, the Banks, and the Economy*, Brookings Institutions, 2010.

European Commission. (2011). *Proposal for a regulation of the European parliament and the council on prudential requirements for credit institutions and investment firms*. Brussels.

European Commission. (2013). *SMEs' Access to Finance survey.* Brussels.

Falkena, H., Abedian, I., Von Blottnitz, M., Coovadia, C., Davel, G., Madungandaba, J., ... & Rees, S. (2001). SMEs Access to Finance in South Africa–A Supply-Side Regulatory Review by the Task Group of the Policy Board for Financial Services and Regulation.

Prospects, G. E. (2014). Global Economic Prospects. *The World Bank. January.*

Hancock, D., & Wilcox, J. A. (1998). The “credit crunch” and the availability of credit to small business. *Journal of Banking & Finance,* 22(6), 983-1014.

Hannoun, H. (2010). The Basel III capital framework: a decisive breakthrough. *BIS, Hong Kong*.

Härle, P., Lüders, E., Pepanides, T., Pfetsch, S., Poppensieker, T., & Stegemann, U. (2010). Basel III and European banking: Its impact, how banks might respond, and the challenges of implementation. *EMEA Banking*, 16-17.

Institute of International Finance. (2010). *The Cumulative Impact on the Global Economy of Changes in the Fiancial Regulatory Framework. Washington, DC, USA: Institute of International Finance*.

Joana Malotana. (2014). *The impact of Basel III compliance on South African Banks.* Master of Business Administration, University of the Witwatersrand, Johannesburg.

Jul-Larsen, L. (2014). Basel III-Financial stability at the Expense of innovation and economic growth?: An Analysis of the Possible Effects Basel III have on Access to Funding for Small and Medium Sized Enterprises, Entrepreneurs and Economic Growth.

Kasekende, L., Bagyenda, J. & Brownbridge, M. (2011). *Basel III and the global reform of financial regulation: How should Africa respond? A bank regulator's perspective*. Available: http://fsbwatch.org/pdf/Basel_III_2011_kasakende.pdf.

Macroeconomic Assessment Group. "Interim Report, Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements." *Bank for International Settlements, August (2010).*

Martin Hansen, Robert Grossman & D'albert, K. (2013). Basel III: Shifting the Credit Landscape.

Mazanai, M., & Fatoki, O. (2012). Access to finance in the SME sector: A South African perspective. *Asian Journal of Business Management*, 4(1), 58-67.

Ndzamela, P. (2010, August 4). The costs of Basel III for SA Banks. *Moneyweb*. Retrieved from http://www.moneyweb.co.za/archive/the-costs-of-basel-iii-for-sa-banks/

Olawale, F. & Garwe, D. (2010). Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management*, 4(5)**,** 729-738.

Organisation for Economic Co-operation and Development (2014). Financing SMEs and Entrpreneurs 2014 - An OECD scoreboard. Financing SMEs and Entrpreneur. France: Organisation for Economic Co-operation and Development.

Padgett, S. (2012). Negative Impact of Basel III on Small Business Financing, The. *Ohio St. Entrepren. Bus. LJ*, 8, 183.

Piesse, J. & Hearn, B. 2005. Regional Integration of Equity Markets in Sub-Saharan Africa. *South African journal of economics*, 73(1)**,** 36-52.

Piroli, M. (2014). The impact of the Basel (2.-3.) Accords on SME credit provision: a comparison between European and Italian SMEs.

Ruthenberg, D. & Landskroner, Y. (2008). Loan pricing under Basel II in an imperfectly competitive banking market. *Journal of Banking & Finance*, 32**,** 2725-2733.

Salasa, L. (2013). *An in-depth analysis of the Basel Accords, and the implication of adopting these accords in the Emerging Markets (Doctoral dissertation),* University of the Witwatersrand.

Santos, M. A. & Elliott, D. (2012). *Estimating the costs of financial regulation.* International Monetary Fund.

Saunders, A. & Allen, L. 2010. *Credit risk management in and out of the financial crisis: New approaches to value at risk and other paradigms* (Vol 528). John Wiley & Sons.

Saurina, J. & Trucharte, C. (2004). The impact of Basel II on lending to small- and medium-sized firms: a regulatory policy assessment based on Spanish credit register data. *Journal of Financial Services Research*, 26(2)**,** 121-144.

Scellato, G. & Ughetto, E. (2010). The Basel II reform and the provision of finance for R & D activities in SMEs: An analysis of a sample of Italian companies. *International Small Business Journal.* 28(1)**,** 65-89.

Schizas, E. (2012)*. Basel III and SMEs: getting the trade-off right.* Technical report, The Association of Chartered Certified Accountants. 4.

Schwaiger, W. S. (2002). Basel II: Quantitative impact study on Austrian small and medium-sized enterprises. *Technical University of Vienna.*

South African Reserve Bank. (2004). Implementation of the new Basel Capital Accord. Pretoria: South Africa.

South African Reserve Bank. (2009). Bank Supervision Department: Annual Report 2009. Pretoria, South Africa.

South African Reserve Bank. (2013a). Bank Supervision Department Annual Report 2013. Pretoria: South Africa.

South African Reserve Bank. (2013b). Capital framework for South Africa based on the Basel III framework. Pretoria: South Africa.

South African Reserve Bank. (2014). Remarks by the Governor of the South African Reserve Bank, Gill Marcus. Press Conference August 10th. Pretoria: South Africa.

Sy, A. N. R. (2009). T*he systemic regulation of credit rating agencies and rated markets.*

Underhill Corporate Solutions. (2011). Literature review on small and medium enterprises' access to credit and support in South Africa. *Underhill Corporate Solutions. National Credit Regulator (NCR): Pretoria, South Africa.*

World Economic Forum. (2013). *Africa competitiveness report*. Geneva.

Yan, M., Hall, M. J. & Turner, P. (2012). A cost–benefit analysis of Basel III: Some evidence from the UK. *International Review of Financial Analysis*, 25**,** 73-82.

APPENDIX A

1 Phase-in Arrangements for the minimum requirements (South African Reserve Bank, 2013b)

	Basel III	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Common Equity Tier 1 requirements (CET1)											
Minimum CET1 Ratio (per Basel III)	4,5%	3,5%	4,0%	4,5%	4,5%	4,5%	4,5%	4,5%			
Pillar 2A for CET1		1,0%	1,5%	2,0%	1,75%	1,50%	1,0%	0,50%			
Minimum CET1 plus Pillar 2A		4,5%	5,5%	6,5%	6,25%	6,0%	5,5%	5,0%			
Phasing in of D-SIB requirements at CET1 level [1]					25%	50%	75%	100%			
Capital Conservation buffer [2]	2,5%				0,625%	1,25%	1,875%	2,5%			
Countercyclical buffer (maximum per cent, if imposed) [2]	2,5%				0,625%	1,25%	1,875%	2,5%			
Tier 1 requirements (T1)											
Minimum Tier 1 Ratio (per Basel III)	6,0%	4,5%	5,5%	6,0%	6,0%	6,0%	6,0%	6,0%			
Pillar 2A for T1		1,5%	1,5%	2,0%	1,5%	1,25%	1,0%	0,75%			
Minimum T1 plus Pillar 2A		6,0%	7,0%	8,0%	7,5%	7,25%	7,0%	6,75%			
Phasing in of D-SIB requirements at Tier 1 level [1]					25%	50%	75%	100%			
Total capital requirements											
Minimum Total Capital Ratio (per Basel III)	8,0%	8,0%	8,0%	8,0%	8,0%	8,0%	8,0%	8,0%			
Pillar 2A for Total Capital (maximum 2.0%)		1,5%	2,0%	2,0%	1,75%	1,50%	1,25%	1,0%			
Minimum Total Capital plus Pillar 2A		9,5%	10,0%	10,0%	9,75%	9,5%	9,25%	9,0%			
Phasing in of specified D-SIB charge at Total Capital level [1]					25%	50%	75%	100%			
Capital instruments that no longer qualify as additional Tier 1 or Tier 2 capital	Phased out over 10-year horizon beginning 2013										

Shading indicates transition periods – all dates are as of 1 January

1. The aggregate requirement for Pillar 2A and D-SIB will not exceed 2.0 per cent for CET1, 2.5 per cent for Tier 1 and 3.5 per cent in respect of the total capital adequacy ratio
2. The capital conservation buffer together with the countercyclical buffer will be applied at CET1 level and will also be required to be met at both a Tier 1 and Total capital level

2 Capital framework for South Africa based on the Basel framework, after the phase-in period (South African Reserve Bank, 2013b)

Capital tiers	Reference in the Regulations	CET 1 Capital Requirement	Tier 1 Capital Requirement	Total Capital Requirement	Effective date
BCBS Basel III minima		4,5%	6,0%	8,0%	Phased in from 1 January 2013
South African minima	**Reg 38(8)(b) & Reg 38(8)(e)(i)**	**4,5%**	**6,0%**	**8,0%**	**Phased in from 1 January 2013**
Systemic risk add-on[1] (Total Pillar 2A range 0,5% to 2,0%)	Reg 38(8)(e)(ii)	$A_1 \geq$ 50% of P2A	$A_2 \geq$ 75% of P2A	P2A (≤2.0%)	Phased in from 1 January 2013 to 31 December 2015, thereafter adjusted to cater for D-SIB requirements
South African base minima	**Reg 38(9)(a)(i) to (iii)**	**4,5% + A_1**	**6,0% + A_2**	**8,0% + P2A**	**Phased in from 1 January 2013**
Bank-specific ICR add-on (Pillar 2B)[2]	Reg 38(8)(e)(iii) & Reg 38(4)	B_1 = 50% of ICR	B_2 = 75% of ICR	ICR	Fully effective from 1 January 2013
South African minima (prudential minima)		**4,5% + A_1 + B_1**	**6,0% + A_2 + B_2**	**8,0% + P2A + ICR**	**Phased in from 1 January 2013**
Domestic Systemically-Important Bank capital add-on[1] (0% to 2.5%)	Reg 38(8)(e)(vi)	C_1 = min(1% or 50% of DSIB)	C_2 = min(1,5% or 75% of DSIB)	DSIB (max of 2,5%)	Phased in from 1 January 2016
Conservation buffer range (0% to 2.5%)	Reg 38(8)(e)(iv) & Reg 38(8)(f)	D_1 = 100% of CB	D_2 = 100% of CB	CB (≤2.5%)	Phased in from 1 January 2016
Countercyclical buffer range[3] (0% to 2.5%)	Reg 38(8)(e)(v) & Reg 38(8)(g)	E_1 = 100% of CCB	E_2 = 100% of CCB	CCB	Phased in from 1 January 2016
SA minima including countercyclical buffer, conservation buffer and D-SIB requirements[4]		**7,0% + B_1 + E_1 + min(2,0% or (A_1 + C_1))**	**8,5% + B_2 + E_2 + min(2,5% or (A_2 + C_2))**	**10,5% + ICR + CCB + min(3,5% or (P2A + DSIB))**	

1. The aggregate requirement for Pillar 2A and D-SIB will not exceed 2.0 per cent for Common Equity Tier 1 (CET1), 2.5 for Tier 1 and 3.5 per cent in respect of the total capital adequacy ratio
2. The current bank-specific ICR (or Pillar 2B) for each bank or banking group will remain unchanged during 2013, unless this Office has specific reasons to adjust the ICR and pertinently informs the relevant banks in writing of such changes
3. In line with BCBS's paper released in December 2010, entitled "Basel III: Global Regulatory Framework for more Resilient Banks and Banking Systems", revised June 2011, under paragraph 137, the countercyclical buffer is likely to be imposed on an infrequent basis in order to serve its intended purpose
4. As specified in the regulation 38(9)(a) of the Regulations, as from 1 January 2015 the South African minima ratios, including the Higher Loss Absorbency (HLA) requirement for D-SIBs, the capital conservation buffer and the countercyclical buffer, shall not be lower than 6.5 per cent for CET1, 8 per cent for Tier 1 and 10 per cent in respect of the total capital adequacy ratio.